

**The development of appropriate and
consistent information for
policy-making in post-conflict
settings:**

**lessons from the use of a household
survey in Bosnia and Herzegovina.**

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January 2012

Dedicated to Miroslava Jokanovic

1926 – 2008

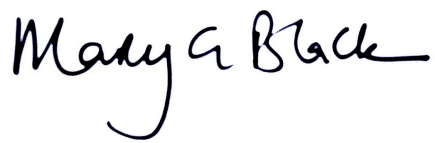
who encouraged me to finish this study.

DECLARATION

This thesis has not been submitted as an exercise for a degree at any other university. Except where stated, the work described therein was carried out by me alone.

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Signed:

A handwritten signature in black ink that reads "Mary Ethna Black". The script is cursive, with the first letters of each word being capitalized and prominent. The signature is written in a fluid, connected style.

Mary Ethna Black

ACKNOWLEDGEMENTS

I am indebted in the preparation of this thesis to my advisor, Professor Charles Normand; he provided just the right amount of support at the right time. I am very grateful to Attila Hancioglu, former Professor of Demography at Ankara University and since 2002, Global Coordinator of the Multiple Indicator Cluster Surveys (MICS) in UNICEF. He has been both a friend and a helpful advisor on the MICS surveys.

Several colleagues provided feedback on specific sections and drafts. They are listed in alphabetical order below, together with their area of assistance, and I thank them all.

Professor Heather Jeffrey – the thesis outline and parts of the results and discussion chapters.

Loraine Hawkins – the structure of the introduction and a critique of the discussion chapter.

Dr. Ozren Tasic – the overall approach, the history of Bosnia and Herzegovina (BiH), and a review of the graphs and tables.

Over 70 colleagues and partners within and outside the UN were interviewed for the historical review of the MICS survey and I appreciate their contribution. Special thanks are due to Dr. Trevor Croft, Emma Holmberg, Nicolas Pron and Tessa Wardlaw of UNICEF HQ's Strategic Information Section who provided detailed feedback.

Thanks are due to the families who responded to the BiH MICS 2000 survey. I appreciate their trust at a time when trust was in short supply, and the time they spent answering the survey. Over 250 colleagues were involved in technical or field aspects of the survey. The survey teams, including coordinators, field staff and data entry staff, carried out their work diligently. A critical success factor in the BiH MICS 2000 survey was the co-operation between BiH ministries and other organizations. The names of all individuals and institutions in BiH who directly participated in the survey are noted in **Appendix B** and I thank them all. I would like to particularly acknowledge Dr. Amela Lolic who provided a strong technical presence throughout the survey and Miroslav

Stijak who assisted with merging of the two entity datasets and production of preliminary tables at the national level.

Anthony (Tony) G. Turner contributed substantially to developing the sampling methodology during a field visit to BiH; he patiently reviewed with me the masses of incomplete and out-of-date sources and maps until we reached a practical solution. Ivana Bjelic assisted with additional statistical analysis of the BiH MICS 2000 dataset.

The Department for International Development (DFID UK) provided direct funding. Resources in cash and in kind were provided by the UNICEF BiH country office and by the UNICEF HQ Strategic Information Section. The survey could not have been completed without this help.

UNICEF has supported my deepening understanding of the MICS over the past 10 years. UNICEF appointed me to lead the BiH MICS 2000 survey; supported my three-month secondment to UNICEF HQ in New York to undertake the literature review and interviews for the MICS history paper; granted a research sabbatical; appointed me as manager for the global evaluation of the second series of MICS (from 2007 - 2008); and appointed me as team leader for the global evaluation of DevInfo (2008 - 2009), a major presentation tool for the MICS survey data from participating countries. I thank UNICEF for these opportunities.

Carol Kiernan proofread the entire document and I appreciate her attention to detail and forbearance with my grammatical errors. Una Memisevic provided valuable assistance in the layout and formatting of the final document.

Special thanks are due to my family and friends, who have encouraged me at every step.

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LIST OF ABBREVIATIONS

AIDS	Acquired Immunodeficiency Virus
APHA	American Public Health Association
ARI	Acute Respiratory Infection
BCG	Bacillus-Cereus-Guérin (<i>tuberculosis vaccine</i>)
BiH	Bosnia and Herzegovina
BiH MICS 2000	Bosnia and Herzegovina Multiple Indicator Cluster Survey, 2000 (second series of the Global MICS survey)
BMI	Body Mass Index
CBO	Community Based Organization
CDC	Centers for Disease Control and Prevention (US)
CEDAW	Convention on the Elimination of all Forms of Discrimination Against Women
CEE/CIS	Central and Eastern Europe and the Commonwealth of Independent States (<i>a UNICEF region</i>)
ChildInfo	Child Information System
CIDA	Canadian International Development Agency
CLS	Child Labour Survey
CO	Country Office (<i>of UNICEF</i>)
CRC	Contract Review Committee (<i>of UNICEF</i>)
CRC	Convention on the Rights of the Child
CRIN	Child Rights Information Network
CSCE	Conference on Security and Cooperation in Europe
CSF	Community Systems Foundation
CSPro	Census and Survey Processing System (<i>a public domain statistical package developed by the U.S. Census Bureau</i>)
DAC	Development Assistance Committee (<i>of the OECD</i>)
DECRG	Development Research Group (<i>of the World Bank</i>)
DEEDS	Data Entry, Enhancement and Display system
DELPHI	<i>a consultation process involving experts</i>
DESA	Department of Economic and Social Affairs (<i>of the UN</i>)
DevInfo	Development Information System (<i>database software</i>)
DFID (UK)	Department for International Development (<i>United Kingdom</i>)
DHS	Demographic and Health Survey
DPP	Division of Policy and Planning
DPT	Diphtheria-Pertussis-Tetanus
EAPRO	East Asia and Pacific Regional Office (<i>of UNICEF</i>)
EPI	Expanded Programme on Immunisation
EpilInfo	<i>a computer package for data entry and analysis</i>
ESARO	Eastern and Southern Africa Regional Office (<i>of UNICEF</i>)
ESC	Economic and Social Council
EU	European Union
EUROPERISTAT	European Perinatal Statistics Network
EuroStat	<i>The statistical office of the European Union</i>

EUSR	European Union Special Representative (<i>in BiH</i>)
ExDir	Executive Directive
FBiH	Federation of Bosnia and Herzegovina
Fox-Pro	<i>Proprietary data analysis software</i>
FRY	Federal Republic of Yugoslavia
GAVI	Global Alliance for Vaccines and Immunisation
GDP	Gross Domestic Product
GFATM	Global Fund to fight AIDs, Tuberculosis and Malaria
GIS	Geographic Information Systems
GNP	Gross National Product
HepB	Hepatitis B
HFS	Health Facility Survey
HIS	Health Information System(s)
HIV/AIDS	Human Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
HMN	Health Metrics Network
HQ	Headquarters (<i>of UNICEF</i>)
IBEP	Inquérito Integrado Sobre o Bem-Estar da População
ICD	International Classification of Diseases
ICF MACRO	<i>An ICF International company that implements the USAID funded DHS under time-limited contracts</i>
ICT	Information and Communication Technology
IDRC	International Development Research Council
IFOR	The Implementation Force (<i>a NATO-led multinational peace-keeping force in Bosnia & Herzegovina Dec 20th 1995 – Dec 20th 1996</i>)
IHMN	International Health Metrics Network
IHSN	International Household Survey Network
ILO	International Labour Organisation
IMCI	Integrated Management of Childhood Illnesses
IMF	International Monetary Fund
IMPS	Integrated Microcomputer Processing System (<i>a public domain statistical package developed by the U.S. Census Bureau</i>)
IMR	Infant Mortality Rate
IOM	International Organisation for Migration
IPEC	International Programme on the Elimination of Child Labour
IPTF	International Police Task Force
ISSA	Integrated System for Survey Analysis (<i>a data entry and analysis package</i>)
ITD	Information Technology Division (<i>of UNICEF</i>)
IUD	Intra Uterine Device
JMP	(WHO/UNICEF) Joint Monitoring Programme (<i>for progress towards MDGs on water and sanitation</i>)
KAP	Knowledge, Attitude and Practice
LAM	Lactational Amenorrhoea Method
LDC	Less Developed Country
LFS	Labour Force Survey
LIC	Low Income Country

LSMS	Living Standards Measurement Survey
M&E	Monitoring and Evaluation
MD	Millennium Declaration
MDG	Millennium Development Goals
MENA	Middle East and North African Region (<i>of UNICEF</i>)
MGRS	Multicentre Growth Reference Study (<i>of WHO</i>)
MICS	Multiple Indicator Cluster Survey
MIS	Malaria Indicator Survey
MMR	Measles-Mumps-Rubella
MoFA	Ministry of Foreign Affairs
MoH	Ministry of Health
MOU	Memorandum of Understanding
MTSP	Medium Term Strategic Priorities (<i>of UNICEF</i>)
N/A	Not Applicable
NATO	North Atlantic Treaty Organisation
NCHS	National Center for Health Statistics (<i>of the USA</i>)
NGO	Non-governmental Organization
NHSCP	National Household Survey Capability Programme
NPAC	National Plan of Action for Children
NSO	National Statistical Office
OECD	Organization for Economic Cooperation and Development
OECD	Organisation for Economic Cooperation and Development
OHR	Office of the High Representative
OPV	Oral Polio Vaccine
OR	Other Resources (<i>funds within UNICEF from a variety of separate sources, in contrast to Regular Resources or RR, which come from UNICEF core funding</i>)
ORS	Oral Rehydration Solution
ORT	Oral Rehydration Therapy
OSCE	Organization of Security and Cooperation in Europe
PARIS 21	The Partnership in Statistics for Development in the 21st Century (<i>an alliance of international agencies that encourages developing countries to improve national statistical capacity</i>)
PATH	Programme for Appropriate Technology in Health
PDA	Personal Digital Assistant (<i>a hand-held computer device</i>)
PEPFAR	The US President's Emergency Plan for AIDS Relief
ProMS	Programme Management System (<i>of UNICEF</i>)
PRSP	Poverty Reduction Strategy Paper
R	Reliability Coefficient
RC	Resident Coordinator
RHF	Recommended Home Fluid
RHINO	Routine Health Information Network
RHIS	Routine Health Information Systems
RO	Regional Office (<i>of UNICEF</i>)
ROSA	Regional Office for South Asia (<i>of UNICEF</i>)
RR	Regular Resources (<i>a type of UNICEF funding</i>)
RS	Republika Srpska

SD	Standard deviation
SECA	<i>a multi-national company that manufactures measuring equipment</i>
SEMS	Socio Economic Monitoring Survey
SFOR	The Stabilisation Force (<i>a NATO-led multinational peacekeeping force in Bosnia & Herzegovina January 1996 – December 2004</i>)
SFRY	The Socialist Federal Republic of Yugoslavia
SHHS	Sudan Household Health Survey
SIMPOC	Statistical Information and Monitoring Programme (<i>of UNICEF</i>)
SIS	Strategic Information System (<i>of UNICEF</i>)
SPA	Service Provision Assessment
SPSS	<i>a software package used for statistical analysis (www.spss.com)</i>
STATCAP	<i>a World Bank longer-term financing programme for national statistics development</i>
TCD	Trinity College Dublin
TEM	Technical Error of Measurement
TFSCB	The Trust Fund for Statistical Capacity Building. (<i>A World Bank grant programme for countries to improve statistical capacity</i>)
TRANSMonee	<i>a database of indicators for children in CEE/CIS maintained by UNICEF's Innocenti Centre</i>
UFW	Unaccounted For Water
UN	United Nations
UNAIDS	The Joint United Nations Programme on HIV/AIDS
UNDAF	United Nations Development Assistance Framework
UNDG	United Nations Development Group
UNDP	United Nations Development Programme
UNESCO	UN Education, Scientific and Cultural Organisation
UNHCR	United Nations High Commission for Refugees
UNICEF	United Nations Children's Fund
UNMIBH	United Nations Mission in Bosnia and Herzegovina
UNPROFOR	United Nations Protection Force
UNSD	United Nations Statistics Division
UNSTATS	United Nations Statistics Division
US	United States (<i>of America</i>)
USA	United States of America
USAID	United States Agency for International Development
WB	World Bank
WCARO	West and Central Africa Regional Office (<i>of UNICEF</i>)
WDR	World Development Report
WFFC	World Fit for Children
WFS	World Fertility Survey
WHA	World Health Assembly
WHO	World Health Organization
WHS	World Health Survey
WSC	World Summit for Children
WSSCC	Water Supply and Sanitation Collaborative Council

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THESIS SUMMARY

This study looks at the challenges in developing a national health information system (HIS) that is 'fit for purpose' to support policy-making in poorly resourced and post-conflict settings. It examines how, and to what extent, a national household survey tool can contribute to the development of a sustainable HIS under the control of the national authorities. This includes getting data that is sufficiently accurate, timely, consistent between countries and across time and that is useful for national planning purposes. It also includes the improvement of national capacity to collect data, and the development of an integrated approach that is nationally relevant.

This study aims to develop a better understanding of the role of UNICEF's multiple indicator cluster survey (MICS) in providing information to support health policy in a post-conflict setting. It does this by a mixed-methods country case study using both qualitative and quantitative approaches. Bosnia and Herzegovina in 2000 was selected as an example of a post-conflict, resource-poor country facing typical challenges of a newly created administrative structure, gaps in population health data for child and maternal health, and a destroyed health information system. The complex national context included multiple international agencies with varying mandates and approaches to improving the national HIS.

The governance and management model of the BiH MICS 2000 survey successfully addressed the fractured administrative structure in the country. A model for that enabled further national household surveys in BiH was created. The lessons learned in implementing the BiH MICS survey might be useful in other fragile states.

The BiH MICS 2000 survey measured 32 internationally agreed indicators in the following health domains: education and literacy, access to clean water and sanitation, child nutrition, childhood immunization, the UNICEF/WHO global programme 'Integrated Management of Childhood illness', HIV/AIDS awareness, contraceptive prevalence, orphanhood, and child labour. A lack of socio-economic, ethnic or refugee/displaced information meant that population disparities, beyond urban and rural, could not be elicited from the data.

The data provided substantial inputs into the four main national human development monitoring processes in close time proximity to the survey. They were: the National Report on Follow up to the World Summit for Children (2000), the National Action Plan for Children in Bosnia and Herzegovina 2002-2010 (2002), the Bosnia and Herzegovina Human Development Report/Millennium Development Goals 2003, and the Bosnia and Herzegovina Medium Term Development Strategy (2004).

Comparison of the 32 indicators from 2000 with measures from 1990, 1995 and 2006 was limited by lack of comparable data from these three time points. A second BiH MICS survey, in 2006, provided the closest comparable indicators. The planned third BiH MICS survey in 2011 will create a unique national resource of information extending over 15-year period. The MICS data is widely presented, however there is currently no set of tools and guidelines for analysis of the MICS data over time.

This study acknowledges the useful contribution by the BiH MICS survey indicators to international monitoring of child and maternal health, but not all indicators were relevant for a middle-income country, and the regional and national policy context of BiH was not sufficiently addressed.

The survey draws attention to the need for a longer-term and more integrated approach to strengthening health information systems in post-conflict countries. Conducting a standalone household survey can produce data, but a national health information system requires a locally built and designed HIS architecture.

Future MICS surveys and other data collection efforts should take into account the aspirations of BiH to join the European Union and the core indicator set being developed and maintained by EuroStat, the statistical office of the European Union.

1 INTRODUCTION

1.1 The problem addressed by this study

This study looks at the challenges in developing a national health information system (HIS) that is ‘fit for purpose’ to support policy making in poorly resourced and post-conflict settings. It uses the entry point of a major national household survey to consider the issues of getting sufficiently accurate and timely data in a post-conflict setting. It examines whether the data obtained can be compared across countries and across time within a country, and analyses how in the long run an internationally developed model household survey tool can contribute to a sustainable HIS under the control of the national authorities.

National HISs play an important role in ensuring that reliable health information is available for operational and strategic decision-making.⁽¹⁾ There is a broad consensus in the literature that strengthening a developing country’s HIS is desirable, and there is a growing set of networks and tools that support how to best do this.⁽²⁾ Many of the sources of health information, including census, civil registration and surveys, are overseen not by the health services but by national statistical offices (NSOs). The health sector needs the data that is controlled by the NSOs, together with data from within the health services, to be able to make health-related decisions. However, HISs do not always match the architecture of health policy and decision-making within a country and so HIS development may not always meet the needs of such decision-makers.

In addition to the national determination of health data needs in poorly resourced countries, further complexity is added by the commitments of such countries to report on internationally agreed goals and targets, and by the differing agendas of international agencies, donors and disease-specific control programmes. There is a growing consensus that efforts should be made by international stakeholders to obtain data they need from national systems rather than getting the data directly themselves, or by relying solely on surveys. As a result there is increasing emphasis on using one-

off data collection methods sparingly and transitioning towards more sustainable data collection systems as soon as is practicable.

This dilemma is acutely faced by poorly-resourced countries that are in or recovering from conflict. They can face an influx of aid and international support exactly when they need to reform and rebuild their HISs, yet the international support provided is likely to be for short-term rather than longer-term assistance and may be tied to particular disease, programme or population group agendas by a donor partner. The particular challenges to collecting data in fragile post-war states cannot be underestimated. Agency supported one-off initiatives such as household surveys can produce much-needed data, but their contribution to developing a sustainable national HIS may be overlooked. In such settings, a successfully implemented household survey can be a useful confidence and capacity building exercise for a country, and be a starting point for wider reform of the HIS.

One such tool is UNICEF's Multiple Indicator Cluster survey (MICS), a global household survey series first developed in 1995 to help countries report on progress towards the end-decade goals of the World Summit for Children⁽³⁾ and entering its fourth global survey round in 2010. Although several MICS surveys have been implemented in post-conflict settings, little has been written analysing the use of this survey tool in such settings. This study contributes to closing this knowledge gap. It explores the evolution of the MICS survey since its inception, and uses a mixed-methods case study of the implementation of a MICS series 2 survey in BiH in 2000 to explore wider questions in relation to the usefulness of the data obtained and the contribution made to strengthening the national HIS.

1.2 Structure of the study

The study aims are listed, followed by the reasons for selecting BiH for the case study. Then the study outline is presented, describing the focus of each chapter.

1.2.1 Study aims

This study aims to develop a better understanding of the role of United Nations Children's Fund (UNICEF) multiple indicator cluster survey (MICS) in providing information to support health policy in a post-conflict setting. It will do this by:

- Describing for the first time the evolution of the MICS survey tool between 1995 and 2010;
- Describing the implementation of the Bosnia and Herzegovina (BiH) MICS 2000 survey in the context of the national HIS;
- Determining if the data produced from the BiH MICS 2000 survey was accurate, timely, and relevant in BiH;
- Determining if the data produced from the BiH MICS 2000 survey was useful for national human development monitoring;
- Determining if the MICS process affected national capacity in BiH to conduct household surveys;
- Determining how the national HIS was affected by the implementation of the BiH MICS 2000 survey;
- Drawing lessons that may be useful for the future development of the HIS system in BiH and the role of the MICS survey in BiH in future, and
- Drawing lessons that may be of use for using the MICS survey tool to build HIS in other post-conflict settings in future.

1.2.2 Selection of Bosnia and Herzegovina for the case study

The study focuses on post-conflict BiH in 2000, five years after the devastating conflict between 1991-1995. There are three reasons for the selection of BiH for the case study. Firstly, the author had detailed, and in part unique, knowledge of the country over a 20-year period between 1990 and 2010. This included direct, practical experience of the health and social services and the HIS pre-war, during the 1991 – 1995 conflict, and during the post-war recovery phase. Secondly, implementation of a MICS 2 survey in BiH in 2000 (led by the author) was a major initiative intended to fill data gaps for child and maternal health and to strengthen the capacity of the local statistical and health information systems. It is therefore a useful initiative to examine.

And thirdly, BiH faced all the challenges and dilemmas of a poorly resourced post-conflict country and some additional ones, making BiH both typical of post-conflict

countries and yet unique. These challenges and dilemmas are described in more detail next.

In 2000, there were major gaps in population-based health and social indicators in BiH, including for children and women. These gaps fell into a number of categories. Basic demographic data was missing: there had been no agreed annual projections made on for the estimated national population (the most recent population census was pre-war from 1991, and estimates for migration were weak or absent). Vital statistical data was being collected, including for births and death; however, national collation was proving problematic due to the lack of collaboration between the administrative components of the country. Newer international population health and development indicators that had been defined during the nineties had not yet been collected. Implementation of household surveys or an overhaul of the existing data collection systems was required and this had not occurred. Attempts to conduct national surveys following the end of the war had failed.^a

The out-dated pre-war HIS had been badly damaged and had undergone no significant reform or change between 1990 and 2000, a decade in which such systems had evolved significantly in other countries. Key staff within the HIS had emigrated, or had been killed or wounded, and there was a resulting lack of trained and experienced staff able to define indicators and collect data. The decision-making process was fragmented along newly agreed divisions within the territory.

Some data had been collected since the ending of the conflict on the more 'traditional' health indicators for children; for example, on immunization and acute respiratory infections. There was some concern, however, about the accuracy of this officially reported data. A survey of children in the Federation of Bosnia and Herzegovina (FBiH), one of the two entities of BiH, revealed a decrease in immunisation coverage of 5-15 percentage points from that reported from local collection centres through

^a Personal communications between the author, the Public Health Institutes and the World Bank.

official reporting systems, to 94.3% for BCG,^a 75.2% for DPT,^b 72.1% for OPV,^c and 63.8% for measles.⁽⁴⁾ There were some surprising trends reported from cantonal authorities.^d For example, acute respiratory infection (ARI) was the leading reported cause of death in children in 2000. This is the case in most developing countries but extremely rare in developed countries and was thought at the time to evidence the collapse of the health care system after the war.⁽⁵⁾ However the impression from clinicians was that this was an unlikely finding and due to incomplete reporting, coupled with a very low rate of autopsies.^e

As the country was structured as two largely self-governing entities, there was no consolidated information at the national level on any health indicator due to political constraints. As a result, BiH had a backlog of annual population data submissions to various UN specialist agencies tasked with maintaining global databanks. An end-of-decade report to the UN on progress towards the goals and targets for children made at the World Summit for Children (WSC) was due in 2000; however, most of the data for this report was not available.

UNICEF had an established survey programme, MICS, specifically developed to collect the information needed to report on the WSC at the national level. The BiH MICS 2000 survey produced a unique set of data on child and maternal health and children's rights. The indicators from the BiH MICS 2000 survey formed the basis of the country's first national report to a UN body and provided baseline data for a National Plan of Action for Children (NPAC) and other national development plans. A second MICS survey was conducted in 2006, with a wider range of indicators measured and changes in approach and methodology. A third MICS survey is planned

^a The Bacillus-Cereus-Guérin vaccine against tuberculosis.

^b The combined vaccine against diphtheria, pertussis and tetanus.

^c The oral polio vaccine.

^d A Canton is an administrative sub-division of the Federation of Bosnia and Herzegovina (FBiH), one of the two largely self-governing entities of BiH. The structure of the country is explained in more detail later in this chapter.

^e Personal observation by the author. The practice in the muslim community in BiH was and still is to have rapid burial of the dead, usually within a day or two. The rate of autopsies in 2000 was known to be low, due to lack of trained personnel and a great reluctance by the local population to agree to autopsy.

for 2011. The two survey reports from 2000 and 2006 have been published and the indicators used in a range of databases and national and international reports.

However, an analysis has not been made of the wider effects of the MICS approach in strengthening the national HIS, nor have the indicators been compared between the 2000 and 2006 BiH MICS surveys. The relevance of the survey indicators to the national setting had not been assessed. Summarising, BiH represented a unique opportunity as a case study to answer some of these broader questions. The BiH MICS 2000 survey is therefore a vehicle to learn more about the process of improving HIS in challenging post-conflict settings, and to draw lessons for the future in both BiH and other countries.

1.2.3 Study outline

This study is presented in five chapters.^a The content of each is outlined below.

Chapter 1 – Introduction (the current chapter). Background information is presented relevant to the study topic. This includes a review of relevant issues relating to HISs, child and maternal health, the effects of conflict, domains of child and maternal health addressed in the study, approaches to collecting data in post-conflict settings, and the context of BiH in 2000.

Chapter 2 – Methods. This describes the case study approach and describes the mixed quantitative and qualitative methods used in this case study.

Chapter 3 – Case narrative. This is in two parts. The first part outlines the history and development of the MICS survey tool. This is original work collated from a review of documents and semi-structured interviews with key informants. The second part presents the case narrative of the BiH MICS 2000 survey itself, including the approach taken to the survey governance, the adaption of the generic global MICS 2 survey tool, the survey implementation, and the key survey results.

Chapter 3 – Results. The results of the mixed-methods case study are presented, including analysis of the survey implementation, the data accuracy, relevance and comparability, the data gap analysis, and indicator trends over time.

Chapter 4 – Discussion. The implications of the results are discussed. These include lessons learned in relation to household survey implementation and HISs for both the specific setting of BiH and the more general settings of post-conflict, resource-poor countries. The chapter also includes an assessment of the strengths and weaknesses of the methods, and a forward-looking conclusion section.

^a Several different ways of presenting the study materials were trialed. The final decision was to present two types of material separately as methods (chapter 3) and case narrative (chapter 4). This is intended to clearly show the approach used, and to separate the descriptive materials for the methods and the case narrative from the analytical materials, which are given in the results (chapter 4) and discussion (chapter 5).

1.3 Health information systems

In order to clarify the context of this study, HISs are introduced in this section. HISs are composed of key elements, which can be disparate or well integrated. No country has an ideal HIS, but there are some common features of successful systems that can be used as benchmarks. Rapid changes in technology have allowed greater connection with HIS and sharing and use of data. These concepts are addressed here, followed by challenges faced in defining national stakeholders roles, and the role of the UN and other international stakeholders. The section concludes with examples of key international alliances for data and monitoring that are relevant to this study.

1.3.1 Key elements of health information systems

HISs are used to derive information about health status, health care, provision and use of services and health impact. According to WHO, country HISs include a range of population-based and health facility-based data sources.⁽⁶⁾ The main population-based data sources are censuses, household surveys and vital registration systems. The main health facility-related data sources are public health surveillance, health services data^a, and health system monitoring data^b. There is no 'one size fits all' approach to HISs. Different components within a HIS offer different entry points for use in policy-making. For example, national health accounts (NHAs) can produce a comprehensive picture of health financing⁽⁷⁾, while communicable disease surveillance can give information on outbreaks and epidemics.

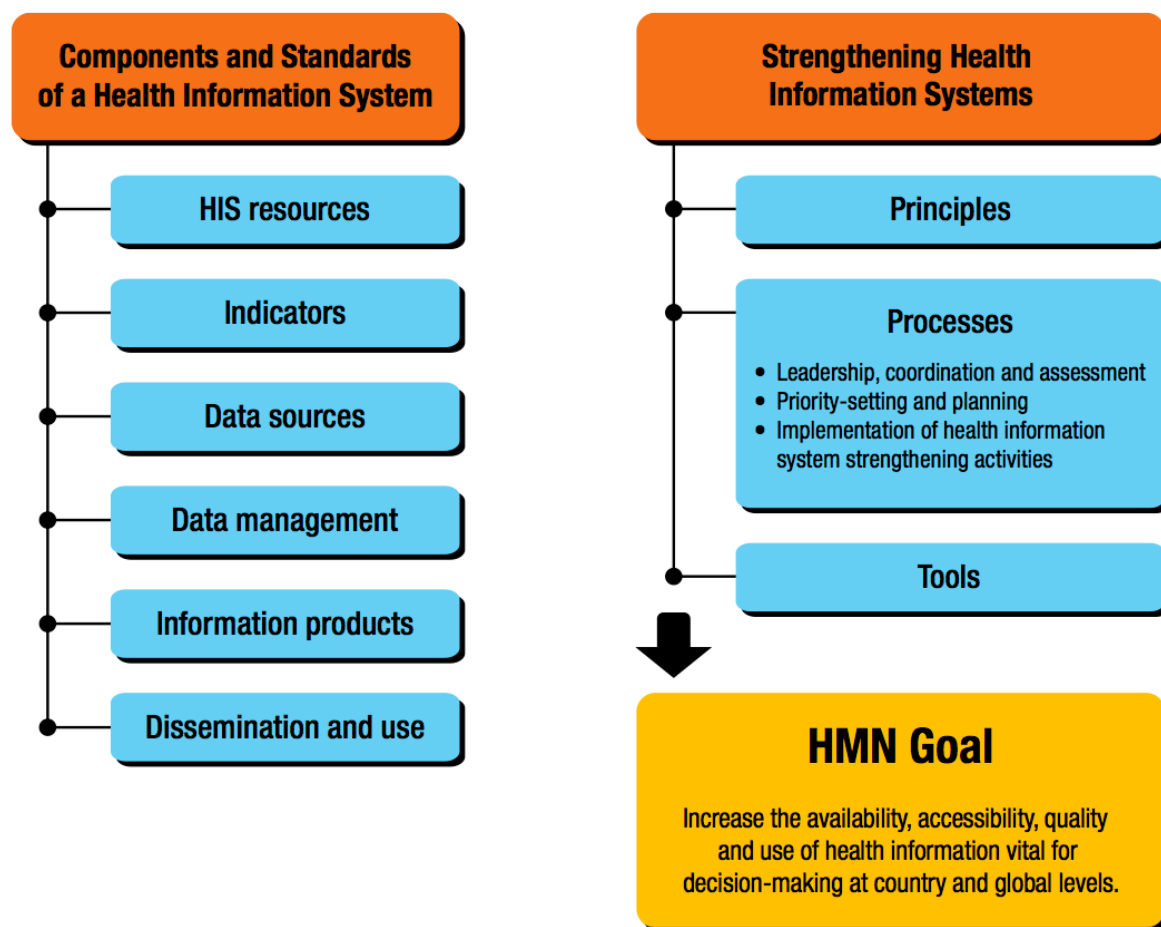
The components and standards of a HIS together with ways of strengthening HISs have been proposed by the Health Metrics Network (HMN)^c and are presented as a framework in **Figure 1** below. This framework is intended to become the universally accepted standard for guiding the collection, reporting and use of health information by countries and global agencies.⁽²⁾

^a Also sometimes referred to as health management information systems or routine health information systems.

^b This includes, for example, human resources, health infrastructure and financing.

^c The Health Metrics Network is described in more detail later in this section.

Figure 1 HMN Framework for Health information systems



Source: derived from the HMN's 'Frameworks and standards for country health information systems, chapter 4, Components and standards of a health information system, page 24.

The six key components of a HIS (listed on the left hand side of the figure above) can be divided into inputs, processes and outputs. These are described more fully in **Table 1** below.

Table 1 Key components of a health information system

	Component	Description
INPUTS		
1	HIS resources	These include the legislative, regulatory and planning frameworks required to ensure a fully functioning HIS, and the resources that are prerequisites for such a system to be functional. Such resources involve personnel, financing, logistics support, information and communications technology (ICT), and coordinating mechanisms within and between the six components
PROCESSES		
2	Indicators	A core set of indicators and related targets for is the basis for a HIS plan and strategy. Indicators need to encompass determinants of health; health system inputs, outputs and outcomes; and health status
3	Data sources	These can be divided into two main categories;(1) population-based approaches (censuses, civil registration and population surveys) and (2) institution-based data (individual records, service records and resource records). A basic set of standards for each source and strategic elements in achieving these standards are established. It should be noted that a number of other data-collection approaches and sources do not fit neatly into either of the above main categories but can provide important information that may not be available elsewhere. These include occasional health surveys, research, and information produced by community based organizations (CBOs).
4	Data management	This covers all aspects of data handling from collection, storage, quality-assurance and flow, to processing, compilation and analysis Specific requirements for periodicity and timeliness are defined where critical – as in the case of disease surveillance
OUTPUTS		
5	Information products	Data must be transformed into information that will become the basis for evidence and knowledge to shape health action
6	Dissemination and use	The value of health information can be enhanced by making it readily accessible to decision-makers (giving due attention to behavioural and organizational constraints) and by providing incentives for information use

Over the past two decades there have been considerable international efforts to delineate standards and norms for data collection and national HISs. Some examples of this are given next. The 1994 UN guidelines ‘Fundamental principles of official statistics’ established the main principles of impartiality, scientific soundness, professional ethics, transparency, consistency and efficiency, coordination and collaboration.⁽⁸⁾ The Paris21 secretariat has released a ‘Guide to designing a national strategy for the development of statistics’ in 2004,⁽⁹⁾ and the Organisation for Economic Cooperation and Development (OECD) has issued, and regularly updates, guidelines for data protection. The connections between national HISs and the wider international HIS network are less well delineated and this will be discussed later in this study.

1.3.2 National stakeholders

An important feature of the HMN framework is that it captures the wide range of stakeholders for any HIS. For example, Ministries of Health (MoHs) are usually responsible for data derived from health service records, National Statistical Offices (NSOs) are usually responsible for conducting censuses and household surveys, and Ministries of Education are usually responsible for education and literacy data. Some functions may be shared: responsibility for vital statistics including births and deaths may be shared between the NSO, the Ministry of Home Affairs and/or local government, and the MoH. If the wider social determinants of health (as discussed later) are included, the list of official responsible bodies becomes even longer. The wider stakeholders of the HIS will include those who use the data, including policy makers, civil society and the wider public.

There is never a single institutional ‘home’ for a national HIS, but rather a collection of organizations and different data collection systems that comprise it. This usually gives rise to boundary issues in relation to sharing of data and responsibility for collecting and maintaining shared data, and issues in relation to the user-friendly presentation of data, examples of all of which will be demonstrated later in this study.

1.3.3 The United Nations and other international agencies

The UN has a key role in the delineation, measurement and use of global indicators through its many agencies and funds; collaboration in this area is increasingly complex with multiple, layered, internal (to the UN) and external partnerships. Perhaps the most important role of the UN globally is that of agreeing norms and standards in data definition, collection and collation. In relation to data and statistics, UN agencies usually decide by a process of consultation to demarcate areas of responsibility so that there is some reduction in overlap. They also share data and present it jointly in the various databases available globally. A selection of UN agencies and key international bodies involved in statistical work is described next, together with examples of how they collaborate.

The **United Nations Statistics Division** (UNSTATS) compiles and disseminates global statistical information, develops standards and norms for statistical activities, and supports countries’ efforts to strengthen their national statistical systems.

UNSTATS facilitates the coordination of international statistical activities and supports the functioning of the UNSTATS as the apex entity of the global statistical system.⁽¹⁰⁾ As a working example, UNSTATS coordinates the preparation of data analysis to assess progress made towards the Millennium Development Goals (MDGs) and maintains the database containing the data series related to the selected indicators.⁽¹¹⁾ Within the database, each indicator has agreed metadata listed, and a lead agency named as focal point.

There are over 40 specialized UN agencies, and many have a health-related mandate. Within the UN and Bretton Woods agencies^a, the specialized agencies and funds have separate mandates that are population, disease, initiative or subject specific. Where there is overlap, there is usually a consensus on which agency will take the lead on a topic. Examples of the varied roles in statistics and HIS of key agencies that focus on human health are given next.^b

The **World Health Organisation** (WHO), the lead UN agency on human health, has a key role in health statistics and data,⁽¹²⁾ maintains several health topic specific indicators databases, and administers the WHO-led World Health Surveys (WHS),⁽¹³⁾ which by consensus do not collect data on children.

UNICEF measures the situation of children and women and tracks progress through data collection and analysis. It maintains and updates global databases and promotes dissemination of evidence-based data for planning and advocacy. UNICEF is the lead UN agency responsible for the global monitoring of the child-related MDGs.⁽¹⁴⁾ UNICEF has a specific internal culture and organisation in relation to data. This goes beyond mere data collection and includes the capacity building of local statistical bodies with particular emphasis on data use and national ownership of data collection processes. UNICEF is the progenitor of the MICS surveys, originally designed to meet the data monitoring needs of the 1990 World Summit for Children (WSC); these are central to this thesis and will be discussed in greater detail later.⁽¹⁵⁾

^a The International Monetary Fund (IMF) and the World Bank Group (WB) were established under the charter of the United Nations at a special conference held at Bretton Woods, New Hampshire, in 1944, hence the name.

^b This is not an exhaustive list of international health agencies working in the area of HIS and statistics.

UNAIDS has a particular role in collecting disease-specific data on HIV/AIDS, and works closely with WHO on estimates of HIV/AIDS based on all available data, including surveys of pregnant women, population-based surveys, and other surveillance information.⁽¹⁶⁾ In contrast, the mandate of the **United Nations High Commission for Refugees** (UNHCR) is directed towards the population group of refugees and displaced, and this includes children.⁽¹⁷⁾

The **World Bank** (WB) is increasingly taking a key role in health statistics and data; the focus of this Bretton Woods organization has shifted from the purely quantitative to include more qualitative approaches to health data and datasets. Previously available on subscription, WB global and national datasets are now free of charge.^a The WB maintains global statistics on health, nutrition and population.⁽¹⁸⁾ It also produces the annual World Development Reports (WDRs), a key overview of development progress; the planned 2011 report will focus on Conflict and Development. The WB also has a lending programme for statistics called STATCAP, established in 2004.

These, and other UN and Bretton Woods agencies act in partnership in relation to data and indicators and some examples of partnerships are given next, to illustrate the complexity of these relationships.

1.3.4 International alliances for data and monitoring

The global environment for HISs, indicator development and monitoring is becoming increasingly complex. There has been rapid growth in interagency and global collaboration, particularly in the past decade. Increasingly, alliances and not single agencies are responsible for key areas in monitoring and are advocating for improvements in HIS. Academics are included in global partnerships, as independent experts, implementers of development projects and, increasingly, in academic networks that help build local capacity and transfer knowledge and skills. Some examples of international alliances are given here, to demonstrate the complex architecture of the organizational landscape.

The WHO/UNICEF **Joint Monitoring Programme** (JMP) for water supply and sanitation⁽¹⁹⁾ is a close partnership with joint lead-agency status and a range of

^a Including the World Development Indicators dataset.

partners. The two agencies collaborate closely as the official UN mechanism tasked with monitoring progress towards the Millennium Development Goals (MDGs) relating to drinking water and sanitation^a which is to: ‘halve, by 2015, the proportion of people without sustainable access to safe drinking water and basic sanitation.’

In addition to the coordinating role played by UNSTATS, **PARIS21, the Partnership in Statistics for Development in the 21st Century**, has a wide ambit, and emphasizes capacity building at the national level in low-income countries (LICs).^b It is supported by a global Trust Fund for Statistical Capacity Building (TFSCB), which is used to finance agreed national projects.^c

Partnerships where academics have a strong role include the **International Health Metrics Network** (HMN), convened by WHO. This is the first global partnership on Health Information System (HIS) strengthening, which includes international agencies, academic bodies, national partners and donors and is currently (as of 2010) chaired by Richard Horton, editor of *The Lancet*.⁽²⁰⁾ The HMN is a global partnership that facilitates better health information at country, regional and global levels. The network was formally launched in May 2005 during the 58th session of the World Health Assembly (WHA). The HMN aims to increase the availability and use of timely and accurate health information by catalysing the joint funding and development of core country HISs.⁽²¹⁾ The HMN develops tools that can be used to strengthen national

^aMDG 7, Target 7c

^b PARIS21 was founded in November 1999 by the UN, the European Commission (EC), the OECD, the International Monetary Fund (IMF), and the WB. This was in response to the UN Economic and Social Council (ESC) resolution on the goals of the UN Conference on Development. The goal of PARIS21 is to develop a culture of evidence-based policy making and implementation which then serves to improve governance and government effectiveness in reducing poverty and achieving the Millennium Development Goals. PARIS21 pursues this goal by encouraging and assisting low-income countries to design, implement, and monitor a national strategy for the development of statistics.

^c Established in 2000 to complement PARIS21 activities, the Trust Fund for Statistical Capacity building (TFSCB) was set up as a WB-administered, multi-donor trust fund to provide grants to developing countries for statistical capacity building activities. Since their inceptions, both PARIS21 and the TFSCB have been seen as part of an effort to build a culture of evidence-based policy making. PARIS21 promotes dialogue and advocacy, and TFSCB provides the financial and technical resources to kick-start a sustainable capacity building process. Once countries have a strategic plan well linked to their national plans, STATCAP is an option to consider for longer-term financing.

HISs, most notably by the promotion of a framework and standards for HIS ⁽²⁾ an assessment tool for national HIS and a selection of topic specific guidelines and tools.^a The HMN also disburses grants to countries for assessing and improving their HIS.

Increasingly, networks are taking a central role in advocacy and the dissemination of idea, information and resource materials. **The Routine Health Information Network (RHINO)** is an example of such a network.⁽²²⁾ Established in 2001 through collaborative efforts supported by USAID, the World Bank, WHO, and other international organizations, it is low-cost with an annual operating budget in 2009 of just over 22,000 US\$.⁽²³⁾ RHINO is a recognized advocate for the need to invest and support improvements in the field of facility- and community-based information systems. As such, RHINO advocates for the important role of routine health information systems (RHIS) through it's membership on international steering committees and advisory groups, and through participating in national and international meetings by discussing the state of the art, as well as presenting advances in the field and publishing on new RHIS developments.

The UN and international agencies exist in a global environment for indicator development and measurement that is evolving rapidly. The rapid growth in interagency and global collaboration, the increased speed in communication via the internet, and the sheer volume of household survey and other routine HIS data now available have compounded the work involved. The internet has allowed a more extensive global collaboration, and has enhanced sharing and presentation of data and the availability of analytical tools and frameworks in relation to HIS. This has led to a rich mine of global data, which is used to produce a multiplicity of statistical tables and databases. The academic analysis of this data has lagged behind its presentation. This will be addressed further in the discussion chapter.

1.3.5 Factors driving the evolution of indicator measurement over time

The history of measuring indicators and changes in health and social status commenced with measures of mortality and morbidity and then broadened over time to include more complex indicators related to human rights, prevalence of disability

^a Available for download from the organization website <http://www.who.int/healthmetrics/en/>

and measures of knowledge, attitudes and practices. There has been an ‘incredible evolution of statistics over the last 60 years, perhaps even a revolution.’⁽²⁴⁾ The growth of measurable health indicators in the last 20 years has been exponential, and this pattern looks set to continue.

The origin of vital statistics (births and deaths) can be traced to an analysis of the English bills of mortality published in 1662 by one of the first demographers, John Graunt, who attempted to create an early warning system for outbreaks of bubonic plague in London.⁽²⁵⁾ The concept of using population-based measurements of morbidity and mortality to document the natural history of disease or the results of interventions took longer to be accepted. In one of the earliest explorations of patterns of mortality, the North American clergyman Cotton Mather noted during a severe smallpox epidemic in 1721 in Boston, that more than one in six of the natural cases died, but only one in 60 of the inoculated cases died.⁽²⁶⁾ John Snow solved the Broad Street pump cholera outbreak of 1854 in East London using statistics to show the connection between the water from the pump and cases of disease, thus establishing epidemiological approaches to disease investigation and control.⁽²⁷⁾

Later, efforts were made to produce wider classifications of vital statistics and diseases. A prominent and internationally prevalent classification system is the International Classification of Diseases (ICD). The ICD originated when a French physician, Jacques Bertillon, introduced the Bertillon Classification of Causes of Death in 1893 at the International Statistical Institute in Chicago. A number of countries adopted Bertillon’s system and the American Public Health Association (APHA) recommended, in 1898, that the registrars of Canada, Mexico, and the United States also adopt it. The APHA recommended revising the system every 10 years to ensure it remained current with medical practice advances. This led to the first international conference to revise the International Classification of Causes of Death, convened in 1900, with revisions every ten years thereafter. A broader set of classification systems has arisen, encompassing diseases, causes of death, medical and surgical procedures and other health-related events and materials, collectively referred to as

the ICD system. The WHO oversees the revision of the ICD; and the most recent version, developed in 1992, is ICD 10.^a

The analysis of health indicators from the perspective of other contributing factors such as socio-economic status or measures of educational attainment adds an additional perspective to the measurement of health status, as do self-assessed measures of health and measurements of knowledge, attitude and practice (KAP) in analyzing patterns of health behaviour. The MICS survey, which is discussed in detail later in this chapter, contains elements of these approaches.

Consensus around the definition of indicators, and rapid growth of the number of indicators in active use, has been fuelled by the internet. Online systems have increased the availability of core data and the sharing of records of meetings and discussions. More recently, Web 2.0 approaches and social networks have led to more interactive collaboration on indicators and monitoring and the inclusion of a wider range of opinions and views. For example, the next version of ICD, ICD 11, is expected to be presented to the World Health Assembly in 2014 and will include social networking (Web 2.0) methods to develop it, a departure from the usual process of iterative expert committee review.⁽²⁸⁾

The increased availability of data has led to a more open yet focused debate. Online data presentation and display systems such as the UN's Development Information System (DevInfo)⁽²⁹⁾ encourage the presentation of different sources of data and compilation into single graphs. The display of more than one set of data in a single graph (for example, infant mortality data from vital statistics, national household and ad hoc surveys), together with the relevant meta-data^b and indicator definitions, encourages debate around numerical differences in the results.⁽³⁰⁾

^a ICD 10 has 155,000 codes, a significant expansion from ICD 9, which has only 17,000 codes. Codes are used to describe particular diagnoses and interventions. The ICD 10 also has country modifications, for example Canada's ICD 10 CA. Australia developed the ICD 10 AM (Australia modification), which is in the process of being widely adopted in the Balkans including in Bosnia and Herzegovina.

^b Meta-data is a concept that applies mainly to electronically archived data and is used to describe the definition, structure and administration of data files with all contents in context to ease the use of the captured and archived data for further use. It can include indicator definitions, statistical methods applied, and quality control tests.

International human rights conventions have been an important historical driving force for internationally comparable health indicators. They have led to the development of global plans of action and commitments to reach agreed goals and targets. For example, the CRC^a and the Convention on the Elimination of all forms of Discrimination against Women (CEDAW)^{(31) b} informed the Declaration reached at the 1990 WSC and subsequent efforts to measure progress by setting agreed targets, and the definitions of population-based indicators for these targets.^c The WSC was, in turn, highly influential in the Millennium Declaration (MD)^{(32) d} and the subsequent formulation of the eight MDGs.^{(33) e} This was in part because the WSC and attempts to monitor its progress broke ground in creating internationally agreed and measurable targets.

^a The CRC has been ratified by 194 countries, including BiH and every member of the United Nations apart from Somalia and the USA. The original Convention is dated 1989, the 30th anniversary of the Declaration on the Rights of the Child. Two optional protocols were adopted on 25 May 2000. The first restricts the involvement of children in military conflicts, and the second prohibits the sale of children, child prostitution and child pornography. Both protocols have been ratified by more than 120 states, including Bosnia and Herzegovina.

^b Adopted in 1979 by the United Nations General Assembly. Described as an international bill of rights for women, it came into force on 3 September 1981. The United States is the only developed nation that has not ratified the CEDAW. Several countries have ratified the Convention subject to certain declarations, reservations and objections.

^c Held on 29-30 September, 1990, and at the time the largest gathering of world leaders in history assembled at the United Nations. The World Summit adopted a Declaration on the Survival, Protection and Development of Children and a Plan of Action for implementing the Declaration in the 1990s. A set of six major goals was then developed with supporting sectoral goals for women's health and education, nutrition, child health, water and sanitation, basic education, and children in difficult circumstances.

^d The adoption of the Millennium Declaration in 2000, by all 189 member states of the UN General Assembly, was a defining moment for global cooperation in the 21st century. The Declaration sets out, within a single framework, the key challenges facing humanity in the new millennium, outlines a response to these challenges, and establishes concrete measures for judging performance through a set of inter-related commitments, goals and targets on development, governance, peace, security and human rights.

^e The MDGs were developed in 2001 from the eight chapters of the United Nations Millennium Declaration. There are eight goals with 21 targets to be achieved by 2015, agreed by 23 international organisations and 192 countries. There is a series of measurable indicators for each target.

The process of the development of indicators continues with the advent of new international initiatives. Indicators that go beyond the more traditional measures of mortality and morbidity pose a particular challenge. They are at an earlier stage both of development and consensus; also the history of their measurement is limited.^a This is of particular relevance to this study, as some of the indicators measured in the BiH MICS 2000 survey were at an early stage of international use. For other indicators, the definition has evolved over the time series of this study, and this poses particular problems for the comparison of data.

Our understanding of international health and human development monitoring processes such as the MDGs and their associated indicators increases with their use over time. The usefulness of a 'one size fits all' approach to monitoring human development is now questioned. For example, Bernd Rechel et al (2005) argues that the health-related MDGs do not appropriately address the challenges faced by the countries of Eastern Europe and Central Asia. By ignoring adult mortality, their achievement would result in relatively small gains in life expectancy overall.⁽³⁴⁾

1.4 Child and maternal health

This study focuses on child and maternal health. The key challenges of child and maternal health are introduced next, together with key definitions of health and its social determinants that will be used in the study and the concept of disparities within population groups.

1.4.1 Why monitor the population health of children and women?

Population health can be defined as 'the health outcomes of a group of individuals, including the distribution of such outcomes within the group.'² Children as a group have specific health patterns and health care needs. Further, population health is

^a It should be remembered that even a simple definition such as birth took many years to reach consensus as there were differing views on what constituted birth including length of gestation, apgar scores (signs of life), weight and the difference between a live birth, stillbirth and miscarriage.

influenced by 'physical, biological, social, and economic factors in the environment, by personal health behaviour, and health care services'.³

Knowing the health status of children and women aids in defining health and social policy, advocating for change, holding national governments accountable, measuring the impact of global and national programmes and defining national and international public health policy. Measurement requires the standardization of terminology and methodology to allow for useful comparison over time and between different countries and population groups. Without this, change cannot be documented. Gaps in information makes advocacy for change difficult.

Each year, more than nine million children worldwide die, mostly from preventable and treatable causes.⁽⁷⁾ Millions of children in developing countries suffer from the short- and long-term adverse consequences of illness, malnutrition and injuries that impact their well-being and options in life, including fewer educational opportunities and diminished future economic prospects. 'Such disadvantaged children are likely to do poorly in school and subsequently have low incomes, high fertility, and provide poor care for their children, thus contributing to the intergenerational transmission of poverty.'⁽³⁵⁾

The health of women and children continues, as argued by Richard Horton of *The Lancet*, and others, to be invisible despite 20 years in operation of the UN CRC and international programmes such as the Safe Motherhood Initiative.^a The reasons for this include the gradual diminution of the UN's voice around the social and political mission related to women's and children's health, lack of public awareness, insufficient attention to evaluating the effects of policies on maternal and child health, failure to apply known science to the problems, and to address the root social causes of ill health. There is also a need for integration of approaches within the health community, community empowerment, improved organisation, stronger advocacy and clear strategic alliances and leadership.⁽³⁶⁾

Poor health and developmental delays during childhood can have a long term and possibly permanent impact. An adult who does not receive adequate food will lose

^a This multi-agency initiative aimed to address maternal mortality. The official launching of the Safe Motherhood Initiative took place in Nairobi in 1987.

weight and/or suffer from nutritional deficiencies, which can usually be regained later. A child, however, may be permanently stunted and never catch up in height or may experience permanent developmental delays. In theory, there are a series of 'windows' for each stage in developing motor control, vision, language and feelings. If a child misses such a 'window', the child may miss out on that particular development opportunity, and its brain may not develop its circuitry to full potential for a specific function.⁽³⁷⁾ There is also speculation that the general window of opportunity for most behavioural functions narrows considerably around the age of 10, and that although developmental catch-up for children who have missed an opportunity window does occur it may not be complete.⁽³⁸⁾

Child health is closely related to maternal health, as nutrition during pregnancy, birth conditions, birth spacing, and the health status and behaviour of the mother impacts on the health of the child prior, during, and after birth. Approximately three million infants are stillborn each year, largely due to maternal health-related factors.⁽³⁹⁾

1.4.2 Disparities

Disparities exist between groups of people. Subgroups of children and women may be additionally disadvantaged or excluded due to race, geographical location, ethnicity or economic status, thus making it important to measure population health at sub-national levels and within specific subgroups of the population. Ethnicity can have a significant negative impact on population health of women and children. For example, the Roma of Eastern Europe exhibit consistently poorer health than national averages, yet population health data is weak for this group.⁽⁴⁰⁾ In addition, disparities within the population may be enhanced by war, and by socio-economic transition.

Any health information system should be able to capture and report on disparities, and be adjusted to suit local circumstances and patterns of disparities, as these will vary between countries. Measuring disparities can be technically challenging and also politically and culturally sensitive, and this will be discussed in more detail later in relation to BiH.

1.4.3 Key definitions relevant to the study

Basic definitions are described next. They set the parameters for the discussion that follows and are essential to understanding the rationale of this study. A glossary of technical terms is given in **Appendix A**. The definitions used in this study are those primarily adopted or advocated by the UN. The UN has a particular role at the international level in setting norms and standards for population health indicators and the process of global ‘rapprochement’ runs alongside the local definition and use of indicators that measure population health. It is important to understand the variations between international and local definitions. They will be compared in later sections of the introduction and in the study chapters on methods and discussion.

A **child** is considered in many societies to be a human being between the stages of birth and puberty. The CRC assumes a longer timeline. It defines a child as ‘a human being below the age of 18 years, unless under the law applicable to the child majority is attained earlier.’⁽⁴¹⁾ **Majority** is a legal definition. It is the chronological age when minors cease to legally be considered children and assume control over their persons, actions and decisions, thereby terminating the legal control and responsibility of their parents or guardian over them. In most countries, including in BiH, majority is reached on the 18th birthday. In demography, vital statistics and household surveys, childhood is defined as the period from birth up to the age of 18 years (the actual day of the 18th birthday is not included).

Child-bearing is possible between the menarche and menopause. In demography, vital statistics and household surveys, women of child-bearing age are defined as females between the ages of 15 and 49^a although it is possible for an individual woman to bear children before the age of 15 and after the age of 49. The category ‘women of child-bearing age’ also includes girls aged 15 - 18 who are children in international and most national laws; therefore when demographic, fertility or related tables are presented a sub-category of females aged 15 - 18 is often used.

The many definitions of **health** include *cultural definitions* (health as a standard of physical and mental well-being appropriate to a particular society), *normative definitions* (health as a fixed level or an ideal physical and mental state) and *functional*

^a The actual day of the 50th birthday is not included.

definitions (health as a state of being necessary to perform certain physical and mental activities.) Cultural definitions vary between countries and groups. The most commonly used definition in international settings is a normative one dating back to the creation of WHO in 1948. Then, WHO defined health as ‘a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.’^a This broad definition is widely debated, including the use of the word ‘complete’ and the definition’s lack of operational value. WHO later gave a more functional definition of health in the 1986 Ottawa Charter for Health Promotion, that health is ‘a resource for everyday life, not the objective of living. Health is a positive concept emphasizing social and personal resources, as well as physical capacities.’⁽⁴²⁾ This thesis uses agreed international indicators of population health status and the discussion chapter will examine the results based on these different definitions of health.

Population health has been defined as the health outcomes of a group of individuals, including the distribution of such outcomes within the group.⁽⁴³⁾ Population health is fundamental to the field of **public health**, which aims to improve the health of the entire population and to reduce health inequities among population groups. This is in contrast to the field of medicine, which largely focuses on the health of individuals. In this study indicators of population health are measured, and these indicators are then related to efforts to improve public health.

Determinants of health are factors that contribute in aggregate to health status in an individual or populations. Commonly considered determinants are: income, education level, living environment, personal behavior, health care access, genetics and social/cultural issues. Health care and individual behaviour seem to be less important than societal factors. The factors that have the strongest effect on health are generally rooted in society's economic and social relationships and are often referred to as the **social determinants of health**. Such determinants are shaped by the distribution of money, power and resources at local, national and global levels, which are themselves influenced by policy choices of local and national governments. The social

^a Preamble to the Constitution of WHO as adopted by the International Health Conference, New York, 19-22 June 1946; signed on 22 July, 1947 by the representatives of 61 States (Official Records of the World Health Organization, no. 2, p. 100); and entered into force on 7 April, 1948.

determinants of health are mostly responsible for **health inequities** - the unfair and avoidable differences in health status seen within and between countries and groups of people.⁽⁴⁴⁾ Several social determinants of health are examined in this study.

All analytical frameworks require measures that can be used to compare health status. **Health indicators** are measures that indicate the state of health of persons in a defined population. Examples include measures of birth or death, disability, quality of life, self-assessed health, happiness and well-being, where these cover a group of people and not just one individual. A general measure of population health is useful for comparing the health status of a population over time or between populations at a single point in time; such a measure permits comparisons of health systems and health programmes, and may highlight populations in need of particular attention from health services. This study includes both quantitative health indicators and quantitative measures of social determinants of health. All of these are referred to throughout this study using the broad term of 'indicators'.

A statistically significant difference in a quantitative health indicator between groups that persists over time is known as a **health disparity**. Over the past decade there has been considerable progress in understanding the scale and mechanism of health disparities; the influential 2008 WHO report, led by Michael Marmot, on the social determinants of health, noted that inequities are killing people on a grand scale.⁽⁴⁵⁾

There are specific terms in relation to health information systems, data and household surveys in particular that bear explanation. **Administrative data** collection is the set of activities involved in the collection, processing, storage and dissemination of statistical data from one or more administrative sources. It is the equivalent of a survey but with the source of data being administrative records rather than direct contact with respondents.⁽⁴⁶⁾ A **household** is a small group of persons who share the same living accommodation, who pool some, or all, of their income and wealth and who consume certain types of goods and services collectively, mainly housing and food.⁽⁴⁶⁾ A **survey** is an investigation about the characteristics of a given population by means of collecting data from a sample of that population and estimating their characteristics through the systematic use of statistical methodology. If every unit of the population is included in the sample, the survey may be described as a full coverage survey or

census.⁽⁴⁶⁾ Further technical terms in relation to data collection and household surveys are given in **Appendix A**.

1.4.4 Evolution of definitions over time and between languages

It is important to note that definitions and terminology evolve over time, as do value systems in relation to health. Even the simplest and most obvious terms have evolved and continue to evolve. For example, the definition of ‘child’ has evolved to include those up to the age of 18 years; this is still not accepted in all parts of the world. The most ‘stable’ indicators, i.e. those that have remained unchanged over a long time, are those that relate to mortality and morbidity. The least stable are those that are newer and that relate to social determinants of health and health service usage. This provides challenges in comparing indicators over time, as will be seen later in this study.

Definitions also vary between countries and within cultures. Language plays an important part, as terminology, an evolving science in itself, plays out through the transition from one language to another. New terminology ^a is often developed in a dominant language ^b and it takes time to be understood, placed in context and to acquire generally accepted and agreed meaning in different languages.

The translation of a new term may simply be a direct adoption from the dominant language term (for example, the English word ‘manager’ is often translated phonetically as *menadzer* in Bosniak, Croatian and Serbian) or the creation of a new word. This definition and understanding of the term into a new language takes time, use and debate. Often there are conflicting translations, terms and definitions in use

^a **Terms** are words and compound words that are used in specific contexts. The International Network for Terminology <http://www.termnet.org> (founded by UNESCO) describes this field as follows. Terminology denotes a more formal discipline which systematically studies the labeling or designating of concepts particular to one or more subject fields or domains of human activity, through research and analysis of terms in context, for the purpose of documenting and promoting correct usage. This study can be limited to one language or can cover more than one language at the same time (multilingual terminology, bilingual terminology, and so forth) or may focus on studies of terms across fields.

^b The UN has six official languages at international level (Arabic, Chinese, English, French, Russian and Spanish). In practice, a wider range is often used at regional and national level and by specialist agencies.

and it takes time until one persists above others and becomes adopted in the new language. The dominant global language for health policy in Europe and for household surveys internationally is English. However, it should not be assumed that there is the same understanding of terminology amongst colleagues based in the countries of the former Yugoslavia. The Internet has assisted terminology transfer and online glossaries are increasingly available, synchronized, cross-referenced and used by practitioners and academics alike. The impact of the internet is discussed in more detail later in this section and in the discussion chapter.

In the next section, issues in relation to health and measuring population health status in conflict and post-conflict countries are discussed. This will help set the context for the central case study of BiH in 2000, which at the time was a country five years post-conflict.

1.5 Conflict and child and maternal health

In 2000, BiH was a post-conflict, middle-income country⁽⁴⁸⁾ in economic transition to a market-driven economy. Reference is made to middle-income countries,^a as BiH was ranked in this group economically in 2000 (and remains so in 2010). The effects of conflict on population health are summarized, as are the consequences of economic transition, and how conflict and transition can be synergistic in their effects.

1.5.1 The effects of conflict on child health

Armed conflict and war are societal factors that directly cause death and injury.^b They also lead to secondary causes of morbidity and mortality, including for example,

^a The ranking in 2000 was based on data from 1998. A middle-income country had an annual gross national product (GNP) per capita equivalent to more than \$760 but less than \$9,360 in 1998. The standard of living is higher than in low-income countries, and people have access to more goods and services, but many people still cannot meet their basic needs. In 2000 there were about 65 middle-income countries with populations of one million or more. Their combined population was more than 1.5 billion.

^b The difference in terminology being largely a semantic one; war is a state of usually open and declared armed hostile conflict between states or nations, and civil war is between parties within a state or nations. Armed conflict is a broader term.

reducing health care access by the destruction of hospitals and clinics, limiting access to and the availability of basic supplies such as food, water and shelter, and impoverishing society in general and population sub-groups in particular.

War obviously has negative effects on child health, and this can persist through the post-conflict period. The pattern of mortality and morbidity in conflict has progressively altered over the past century towards a majority of civilian deaths. It is claimed that 80% or more of deaths and injuries in contemporary wars are civilian; however there is no objective evidence for this as little accurate information is available. Recent surveys suggest, however, a proportion of between 35 and 65%.⁽⁴⁹⁾ Children may be more deeply affected both directly and indirectly by conflict than adults.⁽⁵⁰⁾

Recent approaches to the estimation of war-related mortality and morbidity confirm that the effects of war are widespread and persist for many years after the conflict has ended.⁽⁵¹⁾ During the first five years of peace after a civil war, the average under-five mortality rate remains 11% higher than its corresponding level before the conflict.⁽⁵²⁾ Other indicators that may be impacted negatively during and after conflict are related to the use of health services, school attendance and nutrition. However, data collected during a war and in the period afterwards may vary in quality, with particular difficulties gaining a nationally representative picture.

The likely changes in patterns of health and health-seeking behaviour are multiple. Malnutrition may be more prevalent due to disruption of food supplies, increased poverty and migration away from farmland. The morbidity patterns may also have changed due to reduced immunisation coverage, overcrowding, a breakdown in preventive health measures and primary health care. Health-seeking behaviour may have changed post-conflict due to a decrease in health education, a reduction in available health services or a change in family priorities. There may be a reduction in school attendance, reduced access to clean drinking water and a breakdown in sanitation services.

Documenting such gaps and filling them is an important part of understanding the public health status of the population and tracking recovery during the rebuilding phase post-conflict. It is also never certain how quickly recovery will occur or how

complete it will be; data is essential for tracking this. Rebuilding the national or regional HIS is has therefore great value to recovery and development after a conflict.

1.5.2 Measuring the effects of conflict

Earlier efforts to measure the cost of conflict focused on military expenditure and economic losses, but were later broadened into the wider development costs. Comprehensive analysis of the overall costs of human conflict were boosted by Michael Cranna's 1994 analysis which extended the range of impacts that should be measured and the time over which effects should be considered.⁽⁵¹⁾

The Strategic Foresight Group,⁽⁵³⁾ a think tank based in India, has been developing the *Cost of Conflict* tool, which attempts to calculate the cost of conflict to the human race. The idea behind this tool is to examine this cost, not only in terms of the deaths and casualties and the economic costs borne by the people involved, but also to calculate the social, developmental, environmental and strategic costs of conflict. A key benefit of using this tool is to encourage people to look at conflict in new ways, to widen public discussion of the subject, and to bring new insights to the debate on global security.

Civil registration systems that track deaths in peacetime typically fall apart during war, and many wars occur in places without a pre-existing surveillance infrastructure.⁽⁵⁰⁾ There is often a breakdown in routine data collection services and so there may be gaps in data. Therefore, during and following a conflict, countries usually have major gaps in population data on children. Pre-war demographic data may no longer be applicable due to population movement, changes in demographic structure due to migration outside national boundaries, conflict-related mortality and altered birth rates during and after the conflict. This means that projected data is no longer reliable and the determination of rates and ratios is a major challenge, as the population base is not stable and the denominators may not be known.

The analysis presented here so far has referred only to quantitative data. Qualitative data is also important in understanding the patterns, contributing factors and relevance of quantitative data. Qualitative data can be used to validate and confirm the relevance of quantitative data.⁽⁵⁴⁾ This study will discuss later the issue of how

much the selected health indicators from the BiH MICS 2000 survey contributed to understanding the cost of the conflict and the pace of the recovery in BiH.

A more detailed discussion of the domains of child and maternal health and the indicators that will be examined in this study is given next.

1.6 Domains of child and maternal health in this study

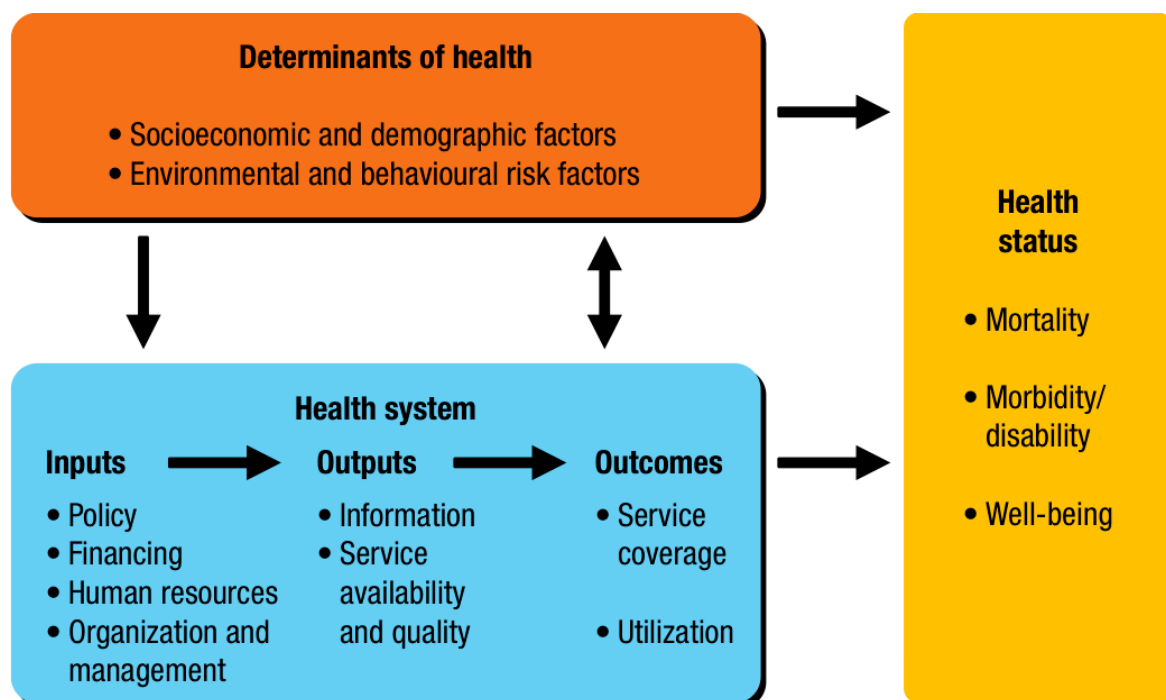
In this section, domains of measurement for HISs are presented. These map out the various measurement areas that may be included. Next, an overview of selected domains of child and maternal health measurement in this study are given. The relevance of each domain is explained, and the process by which the selected indicators in each domain have been developed is described. These health domains and their indicators are not exhaustive and focus on those that are analysed later in this study. The domains are education and literacy, water and sanitation, childhood nutrition, immunization and illness, HIV/AIDs awareness, contraceptive prevalence, antenatal and maternity care, birth registration, orphanhood and child labour. Also, towards the end of this introductory chapter, the key international and national monitoring processes relevant to BiH that use these indicators to monitor child and maternal population health are presented.

1.6.1 Domains of measurement for health information systems

The HMN succinctly notes that ‘the boundaries of a national HIS are not confined to the health sector alone and overlap with information systems in other fields. In addition, data is required for various needs, including information for improving the provision of services to individual clients, statistics for planning and managing health services, and measurements for formulating and assessing health policy.’⁽⁵⁵⁾

For each of the three major domains of measurement (determinants of health, health system and health status) shown in **Figure 2** below, core indicators are required to track progress and assess change.

Figure 2 Domains of measurement for Health Information Systems



Source: The Health Metrics Network – assessment tool (accessed Nov. 2010)

Indicators selected should have the features of any indicator i.e. be valid, reliable, specific, sensitive, both feasible and affordable to measure, and should reflect changes over time.

The HMN also notes that they ‘must also be relevant and useful for decision-making at data-collection levels, or where a clear need exists for data at higher levels. The precise indicators used and their number will vary according to the epidemiological profile and development needs of individual countries.’ Further ‘if carefully selected and regularly reviewed, the use of core indicators are a vital part of national HIS strengthening and can be viewed as the backbone of the system, providing the minimum information package needed to support macro and micro health system functions. All countries therefore need a nationally defined minimum set of health indicators used regularly in national programme planning, monitoring and evaluation.’

Health indicators must be measurable, robust, transferable to different cultural contexts and understood in the same way across time and countries; this is central to global efforts to define and use indicators in a standardised way. The key indicators relating to child and maternal health discussed in this study are introduced next. They

are a mixture of health status indicators, determinants of health, and health system indicators.

1.6.2 Education and literacy

In 2000, an estimated 70 million children worldwide were out of school. One in five adults were not literate, and two-thirds of illiterate adults were women.^a Educational attainment and literacy of mothers is closely connected to the health status of their children.

The earliest measures of educational attainment in censuses were simple questions about the ability of the respondent to read and write. In 1940, the highest grade or year of school was added to the USA census and this question has persisted in the US and many other national censuses. Most household surveys still use literacy and school attendance as indicators for educational attainment. More in-depth education monitoring requires testing of knowledge. Literacy testing has moved on from the reported ability to read and write to direct testing of functional literacy, for example the direct reading of text during survey interviews.

Primary school attendance rate and completion of primary school are included in the BiH MICS 2000. A question on attendance at pre-school education is also included. These indicators do not assess quality of education, or educational attainment, but attendance and years of completion. They therefore represent the basic child education indicators only.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) defines literacy as the 'ability to identify, understand, interpret, create, communicate, compute and use printed and written materials associated with varying contexts. Literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society'. However, UNESCO does not advocate a single 'model' of literacy and it states that 'the understanding of who is literate and who is illiterate has evolved considerably over the years, giving rise to new implications for both policies and

^a Source: UNICEF annual monitoring reports 2002.

programmes. The uses of literacy are changing rapidly in contemporary societies in response to broad social, economic and technological changes.’

UNESCO’s concept of literacy has moved beyond the simple notion of a set of technical skills for reading, writing and calculating, to one that encompasses multiple dimensions of these competencies. In acknowledging recent economic, political and social transformations - including globalization and the advancement of information and communication technologies (ICTs) - UNESCO recognizes that there are many practices of literacy embedded in different cultural processes, personal circumstances and collective structures.⁽⁴⁸⁾ This complex area of literacy was reduced in the MICS 2 methodology to a single self-reported question on whether the respondent was able to read a newspaper ‘easily, with difficulty or not at all’. This is a very simple measure of functional literacy.

1.6.3 Water and sanitation indicators

The connection between contaminated drinking water and infectious disease was made by Dr John Snow during the 1854 outbreak of cholera from a sewage-tainted water pump in Broad Street in East London.⁽⁵⁶⁾ Since then, a mainstay of improving public health has been tackling problems in water and sanitation. The UN estimates that currently^a 884 million people worldwide do not have access to clean water and 2.6 billion people worldwide lack adequate sanitation. Inadequate disposal of human excreta and poor personal hygiene is associated with a range of diseases, including diarrhoeal diseases and polio. An estimated 3.57 million people each year die from water-related diseases, the vast majority (98%) live in developing countries; 43% of deaths are due to diarrhoea and 84% are in children aged 0-14 years.^b

Clean drinking water can be measured approximately by using data regarding the source of the water or directly by testing of water quality. Important additional measures are access to water, time spent collecting water and carrying out water-related tasks by gender of the collectors. **Sanitation** is the hygienic means of promoting health through prevention of human contact with the hazards of wastes.

^a Data from 2005

^b Source: Water Supply and Sanitation Collaborative Council (WSSCC), a multi-stakeholder international partnership that works to improve the lives of poor people. <http://www.wsscc.org/>

This thesis uses a narrower definition related to the management of human faeces at the household level, usually referred to as basic sanitation.

The WHO/UNICEF Joint Monitoring Programme (JMP)^a defines drinking water and sanitation as either improved or unimproved. **Improved drinking water** sources are defined in terms of the types of technology and levels of services that are more likely to provide safe water than unimproved technologies. Improved water sources include household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collections. **Unimproved water sources** are unprotected wells, unprotected springs, vendor-provided water, bottled water (unless water for other uses is available from an improved source) and tanker truck-provided water.⁽⁵⁷⁾

In 2008, the JMP created two water and sanitation ‘ladders’ to show what is considered improved and unimproved in a more refined way than the pass/fail former presentation, without changing the MDG definitions. This ladder currently allows a disaggregated analysis of trends in a three rung ladder for drinking water as shown in **Table 2** below.

Table 2 WHO/UNICEF JMP Drinking Water Ladder

Category		Source
Unimproved	Unimproved Drinking Water sources	Unprotected dug well, unprotected spring, cart with small tank/drum, tanker truck, surface water (river, dam, lake, pond, stream, canal, irrigation channels) and bottled water
	Improved drinking water sources (other than piped water)	Public taps or standpipes, tube wells or boreholes, protected dug wells, protected springs and rainwater collection
Improved	Piped into dwelling, plot or yard	Piped water connection located inside the users dwelling, plot or yard

Improved sanitation facilities are defined by the JMP in terms of the types of technology and levels of services that are more likely to be sanitary than unimproved technologies. Improved sanitation includes connection to public sewers or septic systems, pour-flush latrines, simple pit latrines and ventilated improved pit latrines.

^a Established to monitor progress towards the water and sanitations MDG goals

Unimproved sanitation include service or bucket latrines (where excreta is manually removed), public latrines and open latrines.⁽⁵⁷⁾

There is also a four-rung ‘ladder’ for sanitation developed by the JMP, as shown in **Table 3** below.

Table 3 WHO/UNICEF JMP Sanitation Ladder

Sanitation Category		Method of Disposal
Unimproved	Open defecation	When human faeces are disposed of in fields, forests, bushes, open bodies of water, beaches or other open spaces, or disposed of with solid waste
	Unimproved sanitation facilities	Do not ensure hygienic separation of human excreta from human contact. Unimproved facilities include pit latrines without a slab or platform, hanging latrines and bucket latrines.
	Shared sanitation facilities	Sanitation facilities of an otherwise acceptable type shared between two or more household. Only facilities that are not shared or public are considered improved.
Improved	Improved sanitation facilities	Ensure hygienic separation of human excreta from human contact. They are use of the following facilities: flush/pour flush to piped sewer system, septic tank or pit latrine; Ventilated Improved Pit Latrine (VIP); pit latrine with slab; and composting latrine

All the MICS surveys have used the WHO/UNICEF indicators, which mean there have been slight changes in the indicator definitions with each survey round.

1.6.4 Child malnutrition

Children’s nutritional status is a reflection of their overall health. When children have access to an adequate food supply and are not exposed to repeated illness, they reach their growth potential and are considered well nourished. The nutritional status of children is one of the fundamental areas of population health monitoring.

Malnutrition is a state of poor nutrition resulting from an insufficient, excess or unbalanced diet or an inability to absorb nutrients. Malnutrition can be measured by looking for physical signs of poor nutrition such as skin discoloration, hair colour, thin

arms or potbelly, or by using anthropometrical information on children's length^a, height, or weight.^b Key nutritional indicators include type and length of infant feeding, measures of food and micronutrient intake, and anthropometry or body measurement. Anthropometric results need to be compared against standardized reference curves for child growth, calibrated for other variables such as age and sex. Under-nourishment in a population can be gauged by comparing children to this standard distribution. In the BiH MICS 2000 survey^c only specific anthropometry measures are recorded and so these are discussed next.

Weight for age is a measure of both acute and chronic malnutrition, when a child is **underweight**. Obesity or being **overweight** is also a nutritional concern. Height for age is a measure of linear growth and **stunting** may be a reflection of chronic malnutrition, as a result of failure to receive adequate nutrition over a long period or of recurrent or chronic illness. However, other factors may also contribute to high scores on this indicator. **Wasting** is usually the result of a recent nutritional deficiency. This indicator may exhibit significant seasonal shifts associated with changes in the availability of food or disease prevalence.

The international use of reference curves for child growth dates back to 1977. Then, the United States National Center for Health Statistics (NCHS) produced growth references using weight-for-age, height-for-age, and weight-for-height distributions from studies conducted in the United States to identify underweight, stunted, wasted, and obese children.⁽⁵⁸⁾ These references were widely used in the US health services and were adopted by WHO for use worldwide, rapidly becoming the international norm. However, they had limitations.^d The NCHS/WHO standards were based largely

^a Length is used as a measure for infants, height for older children who can stand up.

^b In various combinations including Body Mass Index (BMI), skin-fold measurements, and arm circumference: All depend on comparison with reference tables.

^c A module existed on breast-feeding practices and iodine deficiency. However these were not included in the BiH MICS 2000 survey as there had been entity level surveys during the previous year. In retrospect, this may have been a missed opportunity.

^d The reference data for infants was based on information collected among infants in the Fels Longitudinal Study from 1929 to 1975 in Yellow Springs, Ohio. The limitations noted by the WHO working group at the time included: 1) the sample was limited to Caucasian infants from mostly middle-income families; 2) data was collected every three months rather than monthly, which limited the

on Caucasian, non-breastfed babies from middle income families and tended to distort levels of low weight-for-age (underweight) for breastfed infants. Subsequent studies in Brazil demonstrated differences in ethnicity, and noted that breastfed babies had a different growth curve compared to those who were not breastfed. Breastfed infants measured against the NCHS standards were falsely perceived as not getting adequate nutrition through breast milk.⁽⁵⁹⁾

As a result, there was pressure on WHO to develop better growth curves for assessing the growth and development of infants and children around the world. In 2000 the US Centers for Disease Control and Prevention (CDC) published a new set of growth charts⁽⁶⁰⁾ which were intended to replace the NCHS growth reference charts.

^a These were regarded as an improvement on the 1977 reference curves in relation to US infants, the majority of which were fed on breastmilk substitutes, but were still inadequate for global use. Meanwhile, a WHO Multicentre Growth Reference Study (MGRS) was undertaken between 1997 and 2003.⁽⁶¹⁾^b Finally, after 11 years of debate, and 29 years after the original NCHS standards were adopted, WHO issued new growth curves: the WHO child growth standards for 0-60 months published in April 2006 and the WHO Reference 2007 for aged 5 – 19 years.⁽⁶²⁾ These standards use the original NCHS 1977 data set supplemented with data from the WHO MGRS. They more accurately assess childhood malnutrition in developing countries, particularly in settings where the large majority of infants are breastfed.

However, many countries and settings in the field still use the old (1977) NCHS/WHO standards due to poor technical assistance and capacity building in countries, which are often those with a high burden of malnutrition. Even WHO itself has only updated

accuracy of developing the growth curve, particularly from 0–6 months of age; and 3) the majority of the infants in the sample were bottle-fed, and if they were breastfed it was only for a short duration (typically less than three months).

^a These charts were based on national data from the US for infants and children from birth to 20 years of age from five national health examination surveys and supplemental data. The study sought to be more ethnically diverse and to better represent breastfed and bottle-fed infants.

^b The MGRS collected primary growth data and related information from approximately 8500 children from widely different ethnic backgrounds and cultural settings (Brazil, Ghana, India, Norway, Oman and the USA)

its own IMCI and humanitarian emergency guidelines in 2008 to reflect the new standards.⁽⁶³⁾ Critics argue that WHO has demonstrated significant delays and failed to adequately support the dissemination and appropriate use of these standards in countries with a high burden of malnutrition.⁽⁶⁴⁾

The BiH MICS 2000 survey measured children up to the age of five years, specifically height and weight. This allowed the calculation of growth stunting (short for age), wasting (low body weight for age) and underweight or obesity (low or high body weight for height). The standard reference curves used in MICS 1, MICS 2 and MICS 3 were the NCHS/WHO reference curves. Due to genetic and other factors, children and adults from BiH are likely to be taller than the average heights in the standard reference curves used; the MICS methodology may therefore underestimate stunting in children from BiH.

1.6.5 Low birth weight

The 30 million low birth weight babies born annually in the world comprise 23.8% of all births, often face severe short and long term health consequences. Low birth weight is a major determinant of mortality, morbidity and disability in infancy and childhood and has a long-term impact on health status outcomes in adult life.⁽⁶⁵⁾ There are two main reasons why a baby may be born with low birth weight: premature birth (before 37 completed weeks of pregnancy) and fetal growth restriction. Rates world-wide are falling, but are still higher in developing rather than in developed countries.

1.6.6 Childhood immunisation coverage

Vaccine preventable diseases are responsible for 14% of global deaths among children; this amounted to 1.2 million children in 2002. The six major vaccine preventable diseases are considered to be: tuberculosis, diphtheria, pertussis, tetanus, polio, and measles. The main childhood immunisations administered to prevent them are Diphtheria-Pertussis-Tetanus (DPT), Bacillus Cereus Guerin (BCG), Polio, and the oft-used combined Measles-Mumps-Rubella vaccine (MMR). One of the best indicators for health system performance is the coverage level of the third dose of DPT for one year olds.⁽⁶⁶⁾

Herd immunity is important in preventing disease spread and so targets are set for vaccine coverage at the population level. WHO has a recommended childhood immunisation schedule which each country adapts. National protocols can vary from WHO guidelines. Vaccination rates may fall rapidly in conflict zones.

There are additional childhood immunisations including Hepatitis B (Hep B) and Haemophilus influenza B (HIB). These are not measured in MICS but may be included in future surveys or can be added by the choice of the country.

1.6.7 Integrated Management of Childhood Illnesses (IMCI)

The Integrated Management of Childhood Illnesses (IMCI) is a programme developed by UNICEF and WHO that combines strategies for control and treatment of five major killers of children – acute lower respiratory tract infections, diarrhoeal dehydration, measles, malaria and malnutrition. IMCI includes both preventive and curative elements that are implemented by families and communities as well as by health facilities.⁽⁶³⁾ The IMCI programme focuses on the improvement of case management skills by health workers, improvement of the health system, and improvement of family and community practices in the prevention and early management of childhood illnesses.

Appropriate home management of illness is one component of IMCI. The approach teaches mothers/carers that appropriate home management of diarrhoea or any other illness requires administering more fluids and continuing to feed sick children as they are normally fed. Dehydration caused by diarrhoea is a major cause of mortality and morbidity among the children of the world. Home management of diarrhoea – either through oral re-hydration salts (ORS) recommended home fluid (RHF) - can prevent many of these deaths. Preventing dehydration and malnutrition by increasing fluid intake and continuing to feed the child are also important strategies for managing diarrhoea.

1.6.8 Contraceptive use

The contraceptive prevalence rate is an indicator of health, population, development and women's empowerment. It also serves as a proxy measure of access to reproductive health services that are essential for meeting many of the MDGs,

especially those related to child mortality, maternal health, HIV/AIDS, and gender equality.

The following are the indicators used in the MICS survey. The **contraceptive prevalence rate**, as defined by WHO, is the proportion of women of reproductive age who are using (or whose partner is using) a contraceptive method at a given point in time. Contraceptive methods include clinic and supply (modern) methods and non-supply (traditional) methods. Clinic and supply methods include female and male sterilization, intrauterine devices (IUDs), hormonal methods (oral pills, injectables, and hormone-releasing implants, skin patches and vaginal rings), condoms and vaginal barrier methods (diaphragm, cervical cap and spermicidal foams, jellies, creams and sponges). Traditional methods include rhythm, withdrawal, abstinence and lactational amenorrhoea (LAM).⁽⁶⁷⁾

1.6.9 Antenatal and maternity care

High quality prenatal care can contribute to the prevention of maternal mortality by detecting and managing potential complications and risk factors, including pre-eclampsia, anaemia and sexually transmitted diseases. Antenatal care also provides opportunities for women to learn the danger signs of pregnancy and delivery, to be immunised against tetanus, to learn about infant care, and be treated for existing conditions, such as anaemia. The provision of delivery assistance by trained attendants can greatly improve the outcome for mother and child by the use of appropriate technical procedures, and accurate and speedy diagnosis and treatment of complications.

All women should have access to skilled care during pregnancy and at delivery to ensure detection and management of complications. **Antenatal care coverage** is an indicator of access and use of health care during pregnancy. It is defined by WHO as 'the percentage of women who used antenatal care provided by skilled health personnel for reasons related to pregnancy at least once during pregnancy, as a percentage of live births in a given time period.'⁽⁶⁸⁾ Antenatal care constitutes screening for health and socioeconomic conditions likely to increase the possibility of specific adverse pregnancy outcomes, providing therapeutic interventions known to be effective; and educating pregnant women about planning for safe birth, emergencies during pregnancy and how to deal with them.

As it is difficult to accurately measure maternal mortality, and model-based estimates of the maternal mortality ratio cannot be used for monitoring short-term trends, the proportion of **births attended by skilled health personnel** is used (including in the MICS survey) as a proxy indicator for this purpose. Percentage of live births attended by skilled health personnel in a given period of time⁽⁶⁹⁾ is the second related indicator measured in the BiH MICS 2000 survey. A skilled birth attendant is an accredited health professional such as a midwife, doctor, or nurse, who has been educated and trained to proficiency in the skills needed to manage normal (uncomplicated) pregnancies, childbirth, the immediate postnatal period, and in the identification, management and referral of complications in women and newborns. Traditional birth attendants, trained or not, are excluded from the category of skilled attendant at delivery. In developed countries and in many urban areas in developing countries, skilled care at delivery is usually provided in a health facility.⁽⁶⁹⁾ The usual practice in BiH in 2000 was (and still is) to give birth in hospital.

1.6.10 Birth registration

The CRC ⁽⁴¹⁾ states that every child has the right to a name and a nationality, and to protection from being deprived of his or her identity. Birth registration is a fundamental means of securing these rights for children.

The absence of reliable data for births, deaths and causes of death are at the root of the scandal of invisibility, wherein people can be born and die without leaving a trace in any legal record or official statistic. Civil registration and the resulting vital statistics are essential public goods that benefit individuals and societies. If vital statistics of births and deaths are combined with accurate cause of death data, their usefulness for health decision-making is greatly increased. ⁽⁷⁰⁾

There are an estimated 48 million unregistered births each year, but the vast majority (99%) of these are in developing countries. Only 2% of births in Europe are estimated to be unregistered. ⁽⁷¹⁾

1.6.11 Orphanhood

Children who are orphaned or living away from their parents may be at increased risk of impoverishment, discrimination, denial of property rights and rights to inheritance,

various forms of abuse, neglect, and exploitation of their labour or sexuality. Monitoring the numbers of orphans and the living arrangements of children assists in identifying those who may be at risk and in tracking changes over time.

Children who have no or only one living parent are regarded as vulnerable and are more likely to have poor health and a lower educational attainment. This is an indicator particularly affected by conflict as it is more likely that one or both parents may have been killed. In BiH, as in most countries, the legal definition of an orphan includes all children under 16 who have no living parents.^a During the war, BiH had four options for caring for children who had been orphaned: care in a children's home, care in a foster home, and adoption either abroad or nationally. International adoptions were strongly discouraged by the national authorities after the war ended, due to concerns about children who had been taken overseas during the war without a clear legal framework or follow up.

The two indicators measured in the BiH MICS 2000 survey are the proportion of children aged 0-14 years in a household who have lost both parents or who have only one living parent. As it is a household survey, children who are living in an institution such as a children's home or orphanage were not be included and so the MICS survey is likely to underestimate orphanhood in BiH.

1.6.12 Child labour

It is important to monitor the extent to which children work, and the type of work in which they participate, for several reasons. Children who are working are less likely to attend school and more likely to drop out. This pattern can trap children in a cycle of poverty and disadvantage. Working conditions for children are often unregulated with few safeguards against potential abuse. In addition, many types of work are intrinsically hazardous and others present less obvious hazards to children, such as exposure to pesticides in agricultural work, carrying heavy weights and scavenging in garbage dumps.

^a There are variations on the definition of orphan. For example in some countries children under 15 who have lost only their mother but who still have a living father are considered to be orphans. In the MICS survey, the broader term 'orphanhood' is used to cover loss to death of one or both parents.

There is no universally agreed definition of child labour. UNICEF defines child labour as work that exceeds a minimum number of hours, depending on the age of a child and on the type of work. Such work is considered harmful to the child and should therefore be eliminated. The UNICEF guidelines on what constitutes exceeding the minimum number of hours stratified by age are:⁽⁷²⁾

- Ages 5-11: At least one hour of economic work or 28 hours of domestic work per week.
- Ages 12-14: At least 14 hours of economic work or 28 hours of domestic work per week.
- Ages 15-17: At least 43 hours of economic or domestic work per week.

The intention is that the indicator in MICS should be a measure of childhood work which may interfere with school attendance. Thus, MICS records the duration of work, intending that it be compared to national legislation (if any) and cultural norms during data analysis.

1.6.13 HIV/AIDS awareness

The HIV/AIDS pandemic is a relatively recent disease and so indicators have undergone considerable change over time.

The BiH MICS 2000 survey measured the indicator 'proportion of women who correctly state the three main ways of avoiding HIV/AIDS infection' one of which was given as abstaining from sex. Abstinence is rarely a primary HIV/AIDS prevention method among sexually active adults. In addition, people who know that HIV/AIDS is sexually transmitted are highly likely to know that abstaining from sex reduces the risk of transmission. Negative responses to this question are more likely to come from people who believe that abstinence is not feasible rather than from those who believe that abstinence does not offer effective protection.

Another area is that of measures of discrimination against those who are HIV positive or who have AIDS. In the MICS 2 survey, tests of perception and belief are used using a set of questions that were used globally and that have since been superseded.

1.6.14 What domains of measurement are not included in MICS?

The indicators given in the preceding paragraph are only a few of the possible for each health domain. Also many domains are not included, in relation to all of the three domains of measurement for a HIS – social determinants of health, health service usage and health status. This partial listing was constrained by those available within the MICS survey tool. Whether this is useful and relevant list of indicators in the context of BiH is one of the questions this study attempts to address.

The approach taken in deciding which of the many potential indicators to measure is explored next, followed by a description of the various measurement methods available for quantitative data.

1.7 Approaches to collecting data in developing and post-conflict countries

Population health monitoring systems, including statistical systems, are introduced next as essential tools in recovery after conflict and during economic transition. However, until national statistical systems are in place, population based data is still needed for policy and decision-making.

Approaches to the national monitoring of child and maternal health, including the strengthening of national data collection systems are introduced next. There are several quantitative approaches to measuring indicators. Each one suits a particular situation; the various options are discussed in more detail below and this will set the scene for why a household survey was the only feasible choice in 2000 for collecting the indicators in the BiH MICS survey. The methods described include: population census data, civil registration systems, national data collection systems, sentinel surveillance, ad-hoc surveys and household surveys (including the MICS survey). A greater emphasis is placed on describing household surveys, as they are the focus of this study.

1.7.1 National monitoring of child population health

For an individual child, monitoring health means tracking that particular child's growth and development, and their use of health and other social services. When it comes to

children in a population, the aspects of population health that are being monitored are determined by a set of requirements such as national administrative requirements and legislation, or increasingly by a national or international reporting framework or plan. Countries collect internationally and nationally agreed indicators plus many other indicators that have been included due to different administrative decisions or agreed national programmes. Often data continues to be collected yet is no longer used. As interest in monitoring and reaching targets increases, new data requirements are also continually included.

Although health indicators are needed to monitor local and national priorities, indicator definitions must also meet international technical standards. Moreover, national indicators should be consistently linked and harmonized with key indicators in major international and global initiatives, such as the MDGs, the Global Fund to fight AIDS, Tuberculosis and Malaria (GFATM) and the Global Alliance for Vaccines and Immunisation (GAVI). The HMN also notes that 'core health indicators and related data-collection strategies should also be linked to a broader national statistics strategy, and notably a poverty-monitoring master plan in countries with a poverty-reduction strategy paper (PRSP). National and international stakeholders should therefore take part in defining core indicators, and targets set for the number of indicators that match national plans or international goals.'⁽⁵⁵⁾

Some attempts have been made to identify a minimum set of national statistical activities needed to monitor the goals and targets of country PRSPs and the MDGs. These include a demographic survey every three to five years, an income and consumption survey at the same frequency but in staggered years, a health information system that tracks major diseases, service delivery, and vital events, and an education monitoring system that accurately measures the performance of the education system.⁽⁷³⁾ These activities are especially difficult to implement in post-conflict countries, yet they are most needed in such data-poor settings.

1.7.2 Strengthening health information systems

Strong statistical systems are needed to ensure that developing countries, and especially those that are post conflict or in economic transition, have the data required to support policy decisions. The awareness of this requirement and the understanding of what that means in practical terms has grown rapidly over the last 20 years,

together with the recognition that efforts should be sustainable and tailored to each country. There is a collective responsibility to support the compilation, publication and application of statistics to ensure that, in the words of the Millennium Declaration,⁽³²⁾ they ‘help make globalization a positive force for all the world’s people.’⁽⁷⁴⁾

After the November 2009 conference in Senegal on ‘Statistics for development’, celebrating the tenth anniversary of Paris21, the Dakar Declaration took an important stage forward in setting the principles for development of national statistical systems, which had been lacking in 2000 when the BiH 2000 survey was implemented.

The four principles set out were:

1. All countries must be encouraged and supported to define their own priorities, integrating user needs, and set out their own development pathways for statistics, from collection to dissemination, respecting internationally recognised quality standards.
2. All partners should support the development of statistical systems and methods that anticipate and respond to new and emerging requests for data at all levels.
3. Efforts to support statistics should support, strengthen and sustain the institutions and agencies that make up the national statistical system.
4. Development partners should help strengthen and use developing countries statistical systems in line with the Accra Agenda for Action^a.

These principles set the framework in which household surveys such as MICS should be implemented in future in order to sustainably build national health information systems. They are a counsel of perfection, describing the goal and manner of operation. However there are practical considerations in both the timely need to fill data gaps, the availability of resources and the political and organizational will.

Most countries have a National Statistical Office (NSO), often with branch offices, and most NSOs are responsible for collating and reporting on vital statistics and routine data. However, responsibility for specific data areas may rest with line ministries or

^a This was signed at the Third High Level Forum on aid effectiveness, 2-4 September 2008 in Accra, Ghana. It was attended by 80 partner countries, some 60 civil society organisations and all Development Assistance Committee (DAC) countries.

other national and specialist agencies. Most major household surveys will be carried out by the country's NSO. There may also be involvement of the private sector, with subcontracting out of survey work to specialized companies, even in developing countries. This may represent a lost opportunity to build national capacity or it may simply be the most feasible way to recruit the additional field workers and other staff that are needed.

The BiH MICS 2000 survey was implemented at a time when the national data collection systems needed both reconstruction of physical and human resources capacity and reform in the way they worked of including data collection methods. In reality, compromises must often be made, and the implications of this in the BiH MICS 2000 survey will be discussed later in this study.

1.7.3 Population census data

Population census data are important sources of information on the total population, its age structure and geographical distribution. Census data can provide denominators for indicators; for example, the number of under-fives or children of primary-school age. A national census is usually held every 10 years in stable countries, in conflict settings they may be abandoned altogether. It can take up to three or more years to elicit from census data information that may be needed by the health sector, and so its usefulness for health monitoring is limited.

1.7.4 Civil registration systems

Civil registration systems include registration of birth, death and cause of death. Vital statistics are most effectively generated by comprehensive civil registration. Civil registration has a dual function, both statistical and legal; it also helps with economic development.⁽⁷⁵⁾ These systems tend to break down during conflict, when reporting systems may falter and records are lost or destroyed. Developing countries are less likely to hold searchable electronic records of vital statistics.

1.7.5 Routine health service data

Routine health service data is relatively cheap and easy to collect, but often those responsible for their collection at the local level are not taught how to use the data

themselves, overburdened by demands to fill in forms and do not receive feedback on how this data is used. For these reasons, the quality of the data collected is often quite low. Moreover, health service statistics are usually collected for administrative rather than monitoring purposes. Information required on the proper denominators for the indicators is usually not available.

1.7.6 Sentinel surveillance sites

Sentinel surveillance is the collection and analysis of data by designated institutions selected for their geographic location, medical or public health specialty, and ability to accurately diagnose and report high quality data. Specific sites are selected on the presumption that the information obtained is indicative of the situation in other places or that the events recorded may serve as an early warning system for epidemics or other population health problems. Generally, sentinel surveillance is useful for answering specific epidemiologic questions, but, because sentinel sites may not represent the general population or the general incidence of disease, they may have limited usefulness in analyzing national disease patterns and trends. Sentinel surveillance is often used for monitoring communicable diseases and offers some advantages over passive surveillance systems, which rely on disease notifications from physicians and laboratories, and which are known to have limitations due to incomplete reporting. Sentinel surveillance is perhaps best known for monitoring HIV/AIDS and other infectious diseases.

Efforts were made by WHO (involving the author) between 1992 and 1993 to establish a sentinel monitoring system in Croatia and BiH to provide routine data on communicable diseases to allow health predictions to be made. A bulletin was produced to disseminate surveillance results and health advice. The system obtained sufficient data (mostly from 'ad hoc' sources) for WHO to take informed decisions about medical aid but the sentinel system was not established successfully.⁽⁷⁶⁾ A second paper about the same surveillance system two years later was more favorable, noting that the data generated was valuable in planning interventions to minimize the possibility of major outbreaks of infection, reduce the impact of infectious disease and in guiding the humanitarian aid effort.⁽⁷⁷⁾ During conflict, there are so few reliable sources of data that even very incomplete ones can be helpful.

Sentinel surveillance has been advocated in developing countries, in particular in the African sub-continent, as an alternative to comprehensive health information systems. The rationale is that investing in a few sites is more feasible and cost-effective and it is likely that data can then be extrapolated to the rest of the country. The United States President's Emergency Plan for AIDS Relief (PEPFAR) has focused on strengthening surveillance, including sentinel surveillance in developing countries.^a

1.7.7 Ad-hoc surveys

Ad-hoc surveys can be useful to explore particular data gaps or specific subjects at a particular time or place. Sometimes the data can be combined with other sources. For example, a survey can be used to estimate the number of diarrhoea cases treated with oral rehydration salts (ORS), while a sentinel disease surveillance system may provide good data on seasonal patterns of diarrhoeal disease incidence, which can then be used to adjust survey estimates of diarrhoea incidence. Ad hoc surveys are unlikely to produce nationally representative data.

1.7.8 Household surveys

Enumeration of households dates back at least to the collection of budget data in the late 18th century.⁽⁷⁸⁾ In England, the Reverend David Davies reported detailed budgets of 127 households engaged in agriculture in 1795.⁽⁷⁹⁾ Sir Frederick Eden compiled information on the diet, dress, fuel, and habitation spending as well as earnings of households from 86 households in 1797.⁽⁸⁰⁾ The development of practical methods of probability sampling, and a theory to support estimation and inference based on those samples, had a major impact on the design and implementation of household surveys commencing in the 1930s, but it was not until the 1950s that national level household surveys became commonplace.

In terms of structure, serial household surveys repeat the same questions at different points in time, producing repeated measures of data. There are three basic designs for a study with more than one measurement occasion: cross-sectional design,

^a Reputedly (and as noted in promotional materials) PEPFAR is the largest commitment by any nation for an international health initiative dedicated to a single disease.

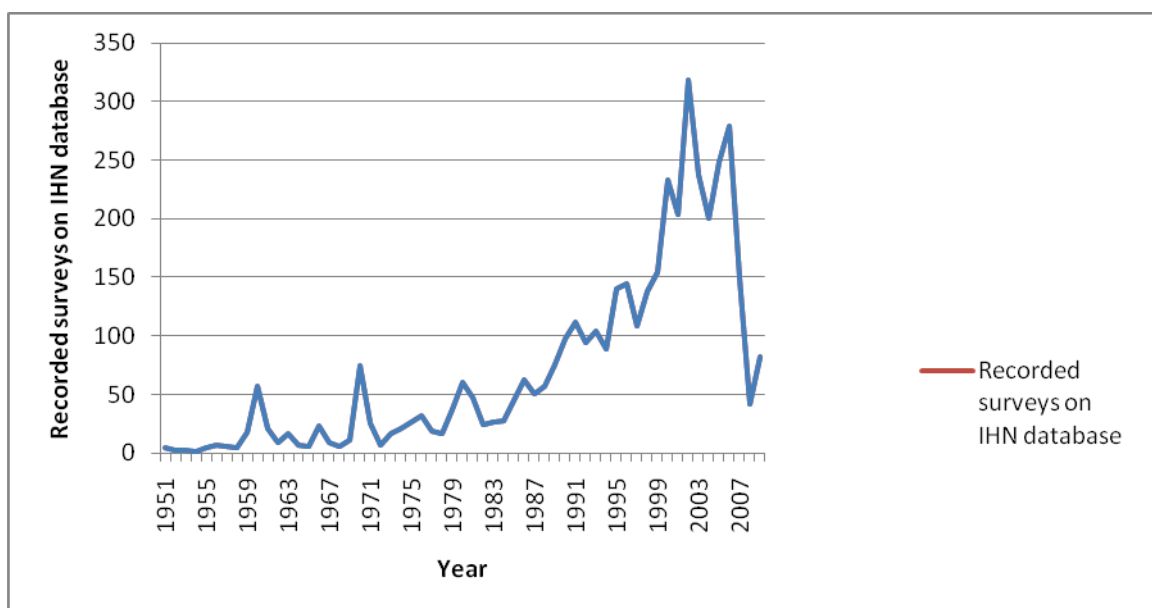
longitudinal design, and time-series design^a. The major global health and social indicator surveys used to generate globally comparable data are cross-sectional surveys. Surveys can also be classified as user-paid surveys sponsored by international agencies and country-budgeted surveys conducted as part of the regular survey programmes of national statistical systems.⁽⁸¹⁾ MICS is one of the former types of survey.

The International Household Survey Network (IHSN)^b maintains a catalogue of national household surveys in developing countries dating back to 1950. This catalogue listed 4145 such surveys as at June 2010. The annual numbers recorded between 1950 and 2010 by IHSN catalogue category are given in **Figure 3** below, showing an exponential rise to 2004, with some peaks and troughs due to particular household survey series. The sharp decline between 2006 and 2010 is most likely an artifact; after a major effort to collate surveys in 2006 updates have been sporadic, some surveys have started but are not yet completed and so not entered into the catalogue, and planned or upcoming surveys are not included at all. Although survey listing is incomplete, it is the best source currently available on the number and type of household surveys that have been conducted in developing countries.

^a **Cross-sectional** surveys use different units (respondents) at each of the measurement occasions, by drawing a new sample each time. The time intervals may be different between measurement occasions, but they are the same for all units (respondents). A study that administers a survey once is also considered cross-sectional. **Longitudinal** surveys use the same units (respondents) at each of the measurement occasions, by re-contacting the same sample from the initial survey for the following measurement occasion(s), and asking the same questions at every occasion. The time intervals may be different between measurement occasions, but they are the same for all units (respondents). **Time-series surveys** also use the same units (respondents) at each of the measurement occasions, but the difference with longitudinal study designs is that in time-series designs both the number of measurement occasions and the time intervals between occasions may be different between units (respondents).

^b The IHSN was established in September 2004 as a result of the Marrakech Action Plan for Statistics.

Figure 3 Household Surveys in Developing Countries 1950 – 2010*



**Source: International Household Survey Network, central survey catalogue*

The same data is presented in **Table 4** below, grouped into categories and types of surveys.

Table 4 Household Surveys in Developing Countries by category, 1950-2010*

	Abbrev.	Agency	No. of surveys	Comments
1-2-3 Survey	none	Various	3	Measures the non-observed economy of a country
Agricultural Census	none	Various	184	A census of agriculture
Agricultural Survey	none	Various	65	A household survey related to agriculture
Child Labour Survey	CLS	ILO	14	Measures child labour
Core Welfare Indicators Questionnaire	CWIQ		29	Measures indicators of social welfare
Demographic and Health Surveys	DHS	USAID	224	Population, health and nutrition
Health Facility Surveys	HFS	WHO	60	Health facilities and quality of care

Income/Expenditure/Household Survey	none	Various	529	Measures income and expenditure by households
Integrated Survey (non-LSMS)	none	Various	317	A multi-topic survey
Labor Force Survey	LFS	ILO and national agencies	530	Labour force issues
Living Standards Measurement Study	LSMS	WB	117	Measures living standards
Multiple Indicator Cluster Survey	MICS	UNICEF	142	Children and Women's health, well-being and rights
Other	Various	Various	217	A catch-all category for those that do not fit the other categories
Population and Housing Census	Various	Various, national authorities	924	National census
Priority Survey	None	World Bank	64	Identifies policy target groups
Socio-Economic Monitoring Survey	SEMS	Various	65	Data collected for social and economic planning
Statistical Information and Monitoring Programme on Child Labour **	SIMPOC	ILO/IPEC	0	Launched in 1998 to assist countries in the collection, documentation, processing and analysis of child labour relevant
World Fertility Surveys ^a	WFS		42	Demographic and reproductive data collection
World Health Surveys	WHS	WHO	72	Health survey

**Source: International Household Survey Network, central survey catalogue*

^a The World Fertility survey was one of the most important international undertakings in demographic data collection and analysis of the 21st century. Between 1973 and 1964, 66 countries carried out comparable surveys of human fertility. Of these, 44 were developing countries that received substantial support and technical assistance through the WHF headquarters in the Office of Population at USAID and funding from the UN Fund for Population Activities. The survey was managed in the Netherlands and executed in the United Kingdom. Some of the largest countries (Brazil, China, India and the Soviet Union) declined to participate. It paved the way for the Measure DHS project.

** An example of underreporting of household surveys in the IHSN database itself – at least 29 SIMPOC surveys have been completed between 1998 and 2007

A selection of the major global household surveys together with their management models are described next.

The household survey tool used in this study is the **Multiple Indicator Cluster Survey (MICS)**,⁴ developed by UNICEF^a in consultation with other agencies and technical experts, as a way of measuring progress towards international commitments made by country delegations at the WSC in 1990.⁵ Since the mid-1990s, UNICEF's international household survey initiative, **MICS**, has enabled over 60 countries to produce statistically sound and internationally comparable estimates of a range of indicators in the areas of health, education, child protection and HIV/AIDS. MICS is overseen by UNICEF staff but implemented by national statistical offices. 'National ownership' is encouraged. The history and development of MICS is discussed in detail later.

USAID provides assistance with the **Demographic and Health Survey (DHS)**, the **Service Provision Assessment (SPA) Survey**, the **HIV/AIDS Indicator Survey (AIS)**, the **Malaria Indicators Survey (MIS)** and qualitative research.⁽⁸²⁾ The DHS are nationally representative household surveys that provide data for a wide range of monitoring and impact evaluation indicators in the areas of population, health, and nutrition. Sample sizes range from 2,000 to 30,000 households, and surveys are conducted in over 75 countries approximately every 5 years. The DHS are commonly regarded as the 'gold standard' in international household surveys and they provide data on population, health and nutrition.^b The DHS are currently implemented by ICF

^a UNICEF was created by the United Nations General Assembly on December 11, 1946, to provide emergency food and healthcare to children in countries that had been devastated by World War II. In 1953, UNICEF became a permanent part of the United Nations System and its name was shortened from the original **United Nations International Children's Emergency Fund** but it has continued to be known by the popular acronym based on this old name. Headquartered in New York City, UNICEF provides long-term humanitarian and developmental assistance to children and mothers in developing countries. <http://www.unicef.org>

^b There are two main types of DHS Surveys: Standard DHS Surveys have large sample sizes (usually between 5,000 and 30,000 households) and typically are conducted every 5 years, to allow comparisons over time. Interim DHS Surveys focus on the collection of information on key performance monitoring

Macro, a for-profit commercial market research and consulting firm. The relationship with USAID is based on a series of tendered five-year contracts.⁽⁸³⁾

In contrast, WHO directly manages the **World Health Survey** (WHS). The WHS is overseen by WHO headquarters staff and implemented by NSOs. The WHS compiles comprehensive baseline information on the health of populations and on the outcomes associated with the investment in health systems; baseline evidence on the way health systems are currently functioning; and, ability to monitor inputs, functions, and outcomes.⁽⁶¹⁾

The **Living Standards Measurement Study** (LSMS) was established by the Development Economics Research Group (DECRG) of the WB to explore ways of improving the type and quality of household data collected by statistical offices in developing countries. Its goal is to foster increased use of household data as a basis for policy decision-making. Specifically, the LSMS is working to develop new methods to monitor progress in raising standards of living, to identify the consequences for households of past and proposed government policies, and to improve communications between survey statisticians, analysts, and policy makers.⁽⁸⁴⁾

There have been several initiatives of the United Nations Department of Economic and Social Affairs/Statistics Division (DESA/UNSD), to improve the quality of survey methodology and strengthen the capacity of national statistical systems. The most comprehensive of these initiatives over the last two decades^a has been the **National Household Survey Capability Programme** (NHSCP). The aim of the NHSCP was to assist developing countries to obtain critical demographic and socio-economic data through an integrated system of household surveys, in order to support development planning, policy formulation, and programme implementation.

This programme largely contributed to the statistical development of many developing countries, especially in Africa, which benefited from a significant increase in the

indicators but may not include data for all impact evaluation measures (such as mortality rates). These surveys are conducted between rounds of DHS surveys and have shorter questionnaires than DHS surveys. Although nationally representative, these surveys have smaller samples than DHS surveys (2,000–3,000 households).

^a Between 1985 and 2005

number and variety of surveys completed in the 1980s.⁽⁸¹⁾ The NHSCP supported methodological work leading to the publication of several technical studies and handbooks. The 1984 Handbook of Household Surveys (Revised Edition)⁽⁸⁵⁾ provided a very useful general overview of issues related to the design and implementation of household surveys. It was followed by a series of publications addressing issues and procedures in specific areas of survey methodology,^{(86) (87) (88) (89) (90) (91) (92)} including a publication focused specifically on health.⁽⁹³⁾

Of concern has been how to harmonise standards, tools and methods for the burgeoning range of global household surveys and how to use them to support the planning, implementation and monitoring of development policies and programs. The **International Household Survey Network** (IHSN) was formed in December 2004 based on the Marrakech Action Plan for Statistics⁽⁷³⁾ with the platform to better coordinate and manage socio-economic data collection and analysis, and to mobilize support for more efficient and effective approaches to conducting surveys in developing countries.⁽⁹⁴⁾ The IHSN has contributed greatly to standardizing meta-data, sharing tools and datasets, using online systems to do so. A growing area of interest is in the dissemination and subsequent use of data from household surveys in developing countries and the newer field of evidence-based policy making and decision-making.

In countries that are in conflict or have recently emerged from conflict, there may be strong international encouragement to conduct household surveys, as a means of filling data gaps and this may come (as in the MICS survey) the provision of funding and technical assistance. Donors are usually interested in having benchmarks of development progress or measures of impact of programmes and it is common for them support an increase in monitoring and evaluation activities. The household survey may represent a one-off solution to lack of data in a sector and can give quicker results than the longer term rebuilding of an entire statistical system.

In developing countries, household surveys have become a dominant form of data collection, supplementing or sometimes even replacing other data collection programmes and civil registration systems.⁽⁸¹⁾ They are often the primary source for key indicators, especially where routine data collection systems are weak or have failed. In countries in transition, that pattern may be different. And with all countries the

particular context or setting will determine which method of data collection is utilized, and how it will then impact on that country's HIS.

1.8 Context of Bosnia and Herzegovina in 2000

This section describes BiH and includes a synopsis of its history between 1990 and 2010 with reference to the 1992 – 1995 conflict and its consequences, the post-war organizational structure as defined by the Dayton Accords, and relevant geographical, climatic, language, cultural and social features that may relate to national level household surveys. It is unusually difficult to carry out single, nation-wide surveys in fragile and/or newly emerging states. Securing government agreement on the survey, sign off on findings and reports and commitments to disclose the data can prove impossible. This section explains the particular challenges of BiH and gives the context for both the failure of attempted post-war national surveys between 1995 and 1999 and the considerable barriers overcome by the BiH MICS 2000 survey.

1.8.1 The formation of the country

Bosnia and Herzegovina is located in South-East Europe on the Balkan Peninsula. Bordered by Croatia to the north, west and south, Serbia to the east, and Montenegro to the southeast, BiH is almost landlocked, except for 26 kilometers of coastline. In 1991, six socialist republics (BiH, Croatia, Macedonia, Montenegro, Slovenia and Serbia) and two socialist autonomous provinces (Vojvodina and Kosovo) constituted the Socialist Federal Republic of Yugoslavia (SFRY), as shown in **Figure 4** below.

Figure 4 Map of the Socialist Federal Republic of Yugoslavia, 1991



The disintegration of the SFRY due to economic, political, ethnic and other tensions^a led to Slovenia, and then Croatia officially declaring independence on 25 June 1991 followed by the Republic of Macedonia on 8 September 1991.

As a result of the conflict that followed these declarations, the UN Security Council unanimously adopted UN Security Council Resolution 727 on 27 November 1991, which paved the way for the establishment of UN operations in what was then still the SFRY.⁽⁹⁵⁾ BiH was the fourth republic to declare independence on 5 April 1992^b.

^a A comprehensive explanation of the complex set of circumstances and differing explanations for the disintegration of the SFRY is beyond the scope of this thesis.

^b This is an abbreviated version of events. BiH first declared sovereignty in October 1991, followed by the declaration of the Croatian Community of Herzeg-Bosna on 18 November 1991, and by the Serbian Republic [Republika Srpska] of Bosnia and Herzegovina on 9 January 1992. A national referendum in BiH for independence followed in February and March 1992 and was largely boycotted by the Serbian population. The vast majority of those who voted (99.7%) elected for independence which was declared on 5 April 1992. Fighting broke out in Sarajevo the next day.

1.8.2 The 1991 - 1995 conflict and its consequences

A complex civil war followed, which included the longest siege of a capital city in the history of modern warfare. Serb forces of the Republika Srpska (RS) and the Yugoslav People's Army besieged Sarajevo, the capital city of BiH, from 5 April 1992 to 29 February 1996.⁽⁹⁶⁾

As of 15 November 1993, an estimated 9,539 persons had either been killed, died of malnutrition or from the cold, or were missing in Sarajevo. This total included 1,525 children. Additionally, 55,801 persons had been wounded, including 14,538 children. The structural and property damage in Sarajevo resulting from the siege included specifically protected targets such as hospitals and medical complexes, medical facilities (including ambulances) and medical personnel, as well as cultural property.⁽⁹⁶⁾ The total deaths in BiH during the war have been variously estimated at 97,207,⁽⁹⁷⁾ a 102,622,⁽⁹⁸⁾ 200,000,^b and 250,000 and over^c. There is further discussion of the effects of this conflict on people and on infrastructure later in this chapter.

The conflict was officially ended with the signing of the General Framework Agreement for Peace in BiH, also known as the Dayton Accords in 1995^d. This

^a This figure was released in 2007 from the database of the Sarajevo Documentation Centre and includes 97,207 names of Bosnia and Herzegovina's citizens, killed and missing during the 1992-1995 war. An international team of experts evaluated the findings before they were released. Of the 97,207 documented casualties, about 60 percent were soldiers and 40 percent civilians. 65 percent of all victims were Bosniaks, 25 percent were Bosnian Serbs, and just over 8 percent Croats. 83 percent of civilian victims were Bosniaks, 10 percent of civilian victims were Bosnian Serbs, and more than 5 percent of civilian victims were Bosnian Croats, followed by a small number of others such as Jews or Roma. The percentage of Bosniak victims would be higher had survivors of Srebrenica not reported their killed relatives as 'soldiers' to access social services and other government benefits. The figure could rise by a maximum of another 10,000 due to ongoing research.

^b 200,000 is the most widely cited figure. There is no clear origin of this data however the author recalls being at an unofficial meeting in 1992 where UN health experts made a "guesstimate" and then this was reported year on year for the remainder of the war.

^c Estimates of 250,000 and over are widely cited in newspapers and biography but have no scientific basis.

^d The General Framework Agreement for Peace in Bosnia and Herzegovina is also and more commonly known as the Dayton Accord(s) as the negotiations took place at the Wright-Patterson Air Force Base

created a geographical and administrative solution to the territorial disputes through an internationally brokered peace treaty. The Dayton Accords effectively ended the war, though skirmishes and intimidation of minorities continued afterwards. The conflict had a catastrophic effect on the economy of BiH. In 1990, BiH had a GDP of US\$ 11 billion and a per capita annual income of US\$ 2,400. By 1995, the GDP had declined to US\$ 2 billion and the per capita income to US\$ 500. By 2001, the GDP had recovered to US\$ 7 billion and the per capita income to US\$ 1,800.^a

1.8.3 National policy-making and administrative structure

The national boundaries of the new state of BiH are those of the former republic. BiH has a state-level parliament (and two entity parliaments) and is divided by an inter-entity line into two largely self-governing political entities, the Bosniak-Croat Federation of Bosnia and Herzegovina (FBiH) and the Serb-dominated Republika Srpska (RS), based on the territories held by the warring parties at the time of the Dayton Accords. There is also a third, smaller area (population estimated at 34,000 in 2000), known as District Brcko, in the top North East corner of the state at a key crossing point between the two main parts (Eastern and Western) of RS and the larger Southern and smaller Northern parts of FBiH. A final agreement could not be reached on which of the two entities Brcko should belong. Under the Dayton Accords, Brcko officially belongs to both entities. However it is governed by neither and functions under a decentralized form of local government with an international administrator^b.

outside Dayton, Ohio. The negotiation process was led by Richard Holbrooke, the chief U.S. peace negotiator, and the US Secretary of State, Warren Christopher. The General Framework Agreement, including 11 annexes, was signed formally in Paris on 14 December 14, 1995. The signatories were Bosnian President Alija Izetbegović, Serbian President Slobodan Milošević, Croatian President Franjo Tudjman, and French President Jacques Chirac, U.S. President Bill Clinton, UK Prime Minister John Major, German Chancellor Helmut Kohl and Russian Prime Minister Victor Chernomyrdin.

^a Source: World Bank Statistics.

^b After the Dayton Agreement in 1995 the status of Brcko was left unsolved for a number of years. An arbitration tribunal worked on the issue and in 2000 a decision was made that Brcko District should be a special, separate, unit of BiH and not a part of either Entity (RS or FBiH). Brcko is governed by an international official with the status of Ambassador. Due in part to this special status it is one of the most prosperous areas in the country.

The internal boundaries of BiH are shown in **Figure 5** below. The FBiH entity (displayed in green, blue and yellow based on an approximation of majority ethnicity in each canton) is subdivided into Cantons and the RS entity (given in pink) is subdivided into Regions. A further explanation of the administrative structure within these subdivisions is described in the next paragraphs.

Figure 5 Cantons and Regions in Bosnia and Herzegovina, 1999



Source: International Management Group, 1999

The Dayton Accords gave rise to a complex governance structure with multiple levels of administration that has persisted to date. There are four levels of administration in the FBiH, and three in the RS if the combined national administrative level is included. At the national level, a bicameral parliamentary assembly was established consisting of the House of Representatives^a and the House of Peoples.^b Each entity has its own president, government and parliament, and weak central institutions link the two. The

^a The *Predstavnički dom/Zastupnički dom* has 42 members elected for a four year term by proportional representation.

^b The *Dom Naroda* has 15 members appointed by the Parliaments of the constituent entities.

FBiH entity was further sub-divided into ten Cantons^a each with their own elected governing body and these were further subdivided into 83 municipalities.^b The RS did not have a cantonal sub-division, instead it has nominally seven regions^c and a total of 64 municipalities.^d

Despite being established as a parliamentary democracy, the Dayton Accord named the High Representative (HR) in BiH^e, as the highest political authority in the country and Chief Executive Officer for the international civilian presence in the country. Under the so-called Bonn Powers, the Office of the High Representative (OHR) has made nearly 900 decisions over thirteen years, including enacting laws and removing elected officials.

According to some, these decisions hold Bosnia together, while others argue that they have weakened the Bosnian body politic. The legitimacy of these powers has been repeatedly challenged, on the grounds that they are undemocratic and dictatorial, compelling the international community and the European Union (EU) to reconsider their use.⁽⁹⁹⁾ Foreign appointees, largely seconded from European and US governments, and local recruits staffed the OHR. The EU, which has had de facto control over international governance in BiH since 2006, has sought to close the OHR and terminate the Bonn Powers, while maintaining the presence of an EU Special

^a Bosansko-Podrinjski, Central Bosnia, Herzeg-Bosna, Herzegovina-Neretva, Posavina, Sarajevo, Tuzla-Podrinja, Una Sana, Western Herzegovina and Zenica-Doboj.

^b As of 2010 there are fewer official municipalities in FBiH (there are now 74) through the merging of municipalities that had previously been sub-divided along ethnic lines.

^c The seven administrative regions in the RS are Banja Luka, Bijeljina, Doboj, Sokolac, Srbinje (Foca), Trebinje and Vlasenica. They do not have the same level of autonomy or local government as the cantons in the FBiH. They were, however, used for functions such as delineating water supply areas.

^d There are also three official cities in FBiH (Mostar, Sarajevo and Sarajevo-east) and one in the RS (Banja Luka). They are included here for the sake of brevity in the total numbers of municipalities.

^e Selected by the Peace Implementation Council, an international body charged with implementing the Dayton Accords and comprising 55 countries who have contributed in some way to the peace process.

Representative (EUSR) to guide BiH.⁽⁹⁹⁾ These efforts at constitutional reform have stalled.^a

Most of the decision-making and budget holding was devolved to entity, cantonal or municipal level with a few key functions retained nationally. Indicative of the complexity of the post-Dayton structures is that in 2000, 182 government officials at national, entity and cantonal levels were Ministers. **Table 5** below summarises the multiple accountabilities at each level of the administration in 2000 including for statistical services.

Table 5 The political and administrative structure of Bosnia and Herzegovina in 2000

	Federation of BiH (51% of territory)*	Republika Srpska (49% of territory)*	Statistical Services at each level
International oversight	Office of the High Representative in Bosnia and Herzegovina. District Governor of Brcko reports to OHR		No formal data services but lobbies for national level data to be produced
National i.e. Central government level	Foreign Affairs, Army, International Trade.		Bodies at national level that have been growing slowly in power since 1995, including the BiH Statistical office which has no capacity to collect data directly, merely compiles from the two entities
Entity level	All other line Ministries including health, education, and social welfare.	All other line Ministries (including health and social affairs, education)	The Federal Statistical office of FBiH and the RS Statistical office.
Cantonal level	Cantonal Government, each with ministries including health, education and social welfare	This level does not exist in the RS.	Nine cantonal statistical offices in FBiH.
Municipal level	n = 74	n = 63	Municipalities compile some basic data as do the four official cities Banja Luka, Mostar, Sarajevo and East Sarajevo. These have city governments whose power is between that of a municipality and a canton. Municipalities are further sub-divided into communities.

**Both include the territory of District Brcko*

^a As of June 2010, with no sign of any future success.

The Governments of the FBiH and the RS are each responsible for internal affairs, environmental, economic, social and health sector policies, justice and taxation. This implies that BiH has three health care systems. Canton governments (in the FBiH) deal with health (through ten cantonal health ministries), education, culture, housing, public services, local land use and social welfare expenditure. The Council of Ministers of BiH has exclusive responsibility for foreign policy, defence, customs policy, monetary policy, immigration and asylum policies, air traffic control, payment of international financial obligations, inter-entity transport, communications and law enforcement. According to the Law on Ministries from March 2003, the Ministry of Civil Affairs of BiH is in charge of the overall coordination of health issues at the state level.

Since the founding of the state of BiH, there has been international pressure to place more accountability at the central government level, with resistance particularly from the RS. Such ongoing tensions must be understood and accommodated in relation to all projects and in particular to statistical collection and reporting.

There are deeper tensions that underlay the structure and organization of the country. Institutional appointments are deeply politicized through all levels of management which profoundly affect the professionalism of the institutions. The key element of the (post Dayton) power structure is what, in the former Soviet Union, was called the 'nomenklatura' system. In a particular geographical area, a dominant elected political party, through its various bodies and committees controls all significant appointments, promotions, allocation of privileges and dismissals. This prerogative of selection covers all of the institutions of State, including the legislature and judiciary, as well as managerial positions in the economy. The all-pervasive infiltration of public institutions by party personnel keeps them subordinate to the party, which maintains loyalty and discipline by excluding dissenting voices from influential positions.⁽¹⁰⁰⁾

Divisions persist for example in the city of Mostar in the FBiH. *Time* magazine reported in 2009: 'The Serb community is largely gone and Muslims and Croats live on opposite sides of the city. The barrier between the two sides is more psychological than real. There are no fences or walls dividing the city's east from west, but the two communities, like much of Bosnia (sic.), live largely separate lives. Muslims and Croats go to different schools and eat in different restaurants. They even receive their mail through different postal services.'⁽¹⁰¹⁾

Developing a health information system and attempting to conduct a nationally representative survey in such circumstances was bound to be problematic. There are challenges in encouraging the various parts of the non-cohesive administrative and statistical structures to work together, a deep sensitivity around ethnicity and displacement and security issues.

1.8.4 International policy context

In 2000, BiH was a post-conflict, middle-income country in economic transition to a market driven economy. Reference is made to middle-income countries^a as BiH was ranked in this group economically in 2000 (and remains so in 2010).

The international involvement in BiH during the war and afterwards was complex and involved hundreds of organizations. The engagements of BiH with these organisations shifted from member state, development aid donor even leader in some organisations pre-war, to recipient of humanitarian assistance during and after the war and finally to recipient of international development assistance in the post-war recovery phase. The final cycle will be completed when BiH once again becomes a member of the donor community.

Yugoslavia was a founding member of the UN^b and played a leading role in certain aspects of the UN. As a member state, it fully participated in the various UN bodies until it was formally expelled as a member on October 5, 1992. The various republics then acquired membership of the UN as they seceded from Yugoslavia and were formally recognized by the UN. They adopted the commitments to the UN formerly

^a The ranking in 2000 was based on data from 1998. A middle-income country had an annual gross national product (GNP) per capita equivalent to more than \$760 but less than \$9,360 in 1998. The standard of living is higher than in low-income countries, and people have access to more goods and services, but many people still cannot meet their basic needs. In 2000 there were about 65 middle-income countries with populations of one million or more. Their combined population was more than 1.5 billion.

^b The UN officially came into existence on 24 October 1945, after ratification of the United Nations Charter.

made by Yugoslavia, including the adoption of conventions and any data reporting agreements.^a

In parallel to the issue of BiH becoming a member of the UN, the UN intervened directly in the country. The UN became actively involved in what was still Yugoslavia on 25 September 1991; the Security Council, meeting at the ministerial level, unanimously adopted resolution 713 (1991), expressing deep concern at the fighting in that country and calling on all States to implement immediately a "general and complete embargo on all deliveries of weapons and military equipment to Yugoslavia". The Council commended and fully supported the efforts already undertaken by the European Community and its member States, with the support of the States participating in the Conference on Security and Cooperation in Europe (CSCE), to restore peace and dialogue in Yugoslavia. By its resolution, the Council invited the Secretary-General to offer his assistance in consultation with the Government of Yugoslavia and all those promoting the peace efforts.⁽¹⁰²⁾

The consequence was that a country that had been an active, and in some instances a leading, (part of) a UN member state including being (part of) a donor country, now had humanitarian assistance programmes in the newly emerging member states arising from its dissolution.^b This changed the power relations between the UN and its new members and gives additional perspective to the concept of 'national ownership' of the UNICEF supported MICS survey, which will be further addressed in the discussion chapter.

A brief summary of the key peacekeeping and humanitarian assistance and development structures is given below. The overall approach of the international interventions was nation-building efforts to transform BiH from an unstable country into

^a This happened at the constitutional level. For example, BiH within the Constitution of BiH, Annex I Item 12 included the Convention on the Rights of the Child in its legislative system and thus assumed the responsibility to implement all necessary activities aimed at implementing of the Convention. After that, the state adopted additional obligations as they arose. For example additional obligations for BiH stem from the Optional Protocol on the Involvement of Children in Armed Conflict and Optional Protocol on the sale of children, child prostitution and child pornography signed by BiH on September 7, 2000.

^b The former UN member state was the SFRY, of which Bosnia and Herzegovina was a constituent republic.

a democratic, peaceful, and prosperous partner. Key to this approach is the 1992 UN Agenda for Peace, a report that has defined the UN approach.^{(103)a}

The first peacekeeping mission was the UN Protection Force (UNPROFOR) from February 1991 to March 1995). Following the signature of the Dayton Accords, a NATO-led Multinational Implementation Force (IFOR) was tasked with implementing the military annexes from December 1995 to December 1996. This was succeeded by the NATO led Multinational Stabilization force (SFOR), which was in place between December 1995 and December 2004. The UN continued to play a key and related role in peace building. On 21 December 1995, by adopting resolution 1035, the Security Council established operations within the territory of BiH as the UN Mission in Bosnia and Herzegovina (UNMIBH) comprising two parts, the United Nations International Police Task Force (IPTF) and a UN Civilian Office: the UNMIBH succeeded the peacekeeping missions. UNMIBH worked together on a continuous basis with the High Representative for the implementation of the Peace Agreement in advancing the United Nations goals of peace building, policing and monitoring, humanitarian relief, de-mining and economic reconstruction.

In parallel to the peacekeeping operations was an extensive international humanitarian assistance effort. Most major multinational organizations had operations, staff and programmes in BiH including the UN, the OSCE and the European Union

^a The Agenda for peace noted that **preventive diplomacy** is action to prevent disputes from arising between parties, to prevent existing disputes from escalating into conflicts and to limit the spread of the latter when they occur. **Peacemaking** is action to bring hostile parties to agreement, essentially through such peaceful means as those foreseen in Chapter VI of the UN Charter. **Peacekeeping** is the deployment of a UN presence in the field, hitherto with the consent of all the parties concerned, normally involving UN military and/or police personnel and frequently civilians as well. Peacekeeping is a technique that expands the possibilities for both the prevention of conflict and the making of peace.

The text continues as follows: "The present report in addition will address the critically related concept of post-conflict **peace-building** – action to identify and support structures which will tend to strengthen and solidify peace in order to avoid a relapse into conflict. Preventive diplomacy seeks to resolve disputes before violence breaks out; peace-making and peace-keeping are required to halt conflicts and preserve peace once it is attained. If successful, they strengthen the opportunity for post conflict peace-building, which can prevent the recurrence of violence among nations and peoples."

EU). Hundreds of NGOs provided support and materials. The humanitarian and development assistance role of the UN was taken up by various specialist agencies of the UN. The role of UNICEF was to protect the rights of children and women. The particular role it was mandated to fulfill in relation to reporting on the 1990 WSC is noted here:

'As the world's lead agency for children, the United Nations Children's Fund is requested to continue to prepare and disseminate, in close collaboration with Governments, relevant funds, programmes and the specialized agencies of the United Nations system, and all other relevant actors, as appropriate, information on the progress made in the implementation of the Declaration and the Plan of Action. The governing bodies of the relevant specialized agencies are requested to ensure that, within their mandates, the fullest possible support is given by these agencies for the achievement of the goals outlined in the Plan of Action and to keep the General Assembly of the United Nations, through the Economic and Social Council, fully informed of progress to date and additional action required during the decade ahead, using existing reporting frameworks and procedures. We request the Secretary-General to report regularly to the General Assembly on the progress made in implementing the present Plan of Action.' ⁽¹⁰⁴⁾

This set the scene for the MICS, designed by UNICEF to help countries report to the UN on this declaration. The report prepared was the first one submitted nationally by the new member state to the UN and was therefore a landmark publication. BiH also inherited from Yugoslavia the commitment to prepare a National Plan of Action (NPA) for Children, and this followed in 2002.

However, the regional political context for BiH and, in particular, membership of the EU, may have an even greater significance than UN and global alliances. In aiming for accession to the European Union BiH has made some progress.^a The country has announced it will submit an EU membership application by the end of 2010.

^a Negotiations on a Stabilisation and Association Agreement (SAA),^a the first step before applying for membership, started in 2005 and were expected to be completed by late 2007. Negotiations stalled over police reform, which the EU insisted on centralising at state level. The Agreement was initiated on 4 December 2007, and, following the adoption of the police reforms in April 2008, signed on 16 June 2008.

Looking to the future, BiH will need to participate in public health programmes and monitoring that will bring it closer to standards across the EU. Part of the accession process is to assist potential members in bringing their systems up to standard and in line with EU guidelines, and these are developing rapidly in the arena of EU specific health indicators and vital statistics.⁽¹⁰⁵⁾ At the time of the BiH MICS 2000, there was little interaction with European initiatives and UN standards and processes predominated. Clearly in such a context the concept of ‘national ownership’ espoused by the MICS is a complex one.

1.8.5 The health information system

Given that there are in effect three different health care systems in BiH, it is no surprise that HIS in BiH was, and still is, fragmented and damaged, with a lack of connection between various components. There was no unified system of collecting data, and responsibilities were held by various parts of the system with no incentives to collaborate. The majority of records were paper and each health facility and institution maintained large books and records of vital statistics and key events. There was no unifying computer network and reporting of data to higher institutions was done by manual counting of events in a paper chain. WHO noted in 2001 that ‘the health information system is underdeveloped and does not provide the high-quality information needed for evidence-based policy-making. Health managers are largely deprived of a management information system.’

The statistical services are described in some detail here. Pre-war, BiH had a republic Statistical Office based in Sarajevo. The statistical services were substantially damaged during the war. Buildings and archives were destroyed and key personnel were killed, injured or migrated abroad, resulting in a collective loss of experience and skills. Training, staff development and travel to overseas conferences did not occur for almost a decade during the conflict and post-war period, and there was little funding or support for developing statistical services. By 2000, each entity had established a main statistical office (in the former republican Statistical Office in Sarajevo for FBiH, with cantonal sub-offices and in Banja Luka for the RS) and some basic services but they had not yet managed to successfully collaborate on a single joint national project or report. The distribution of the statistical services is given in **Table 6** below.

Table 6 Statistical Services in Bosnia and Herzegovina in 2000

	Statistical Services	
Office of the High Representative	No formal role in relation to data, but lobbies for national level data availability. Other bodies for example the OSCE mission has a particular role in elections and polling and in the maintenance of the electoral register	
Bosnia and Herzegovina	Plus other bodies at national level that have been growing in power since 1995, including the BiH Statistical office	
Entity level	The Federal Statistical office of FBiH.	The RS Statistical office.
Cantonal level	Nine Cantonal Statistical offices in FBiH.	This level does not exist in the RS

Statistical services have a particular role and set of accountabilities in BiH. In the pre-war system, the statistical services were responsible for vital statistics, including demographic and labour force data and the national census. This had persisted in the post-war system, even though worldwide, data needs and data collection systems are changing quite rapidly. The collection of more recently defined data and indicators was not clearly within the remit of any organization in the State.

In principle, HIS institutions and services were keen to take on new projects, and each entity and the national office had international departments tasked with handling these extra projects. However in practice staff within the institutions saw this work as 'additional' and expected (or rather hoped) to be reimbursed for it. There were territorial issues also over particular topics areas; for example, the boundary between health and social services was rather blurred in some newer areas. The statistical services could only ask for data from their sister agencies, they could not compel that it be produced and this posed challenges when there was a lack of cooperation. In

2000, such boundaries and rivalries were quite pronounced and exacerbated by the availability of international funding funds.

The lack of cooperation or links between the statistical offices in the two entities and a weak central coordinating statistical office with few resources left a vacuum in both decision-making and implementation of data collection reforms or national surveys. There were different options for how to address this lack of capacity in the short term (hire outside agencies to do any data collection exercises) and in the medium to long term (take a capacity-building approach to survey implementation and reinforce local structures whilst creating a political and pragmatic framework in which they could exist and collaborate.) Thus, it could be seen that the implementation of a national survey was part of nation-building for BiH and was entering challenging territory in terms of the RS perspective, as the RS has always been strongly opposed to integration into BiH and national structures.

1.8.6 The public health system and related sectors

Yugoslavia was a founding member of the World Health Organization^a and a leader in primary health care and public health, with a notable contribution being made by Professor Andrija Stampar, a distinguished scholar of social medicine and the first elected president of the World Health Assembly (WHA)⁽¹⁰⁶⁾

Health services were funded by a national health insurance system based on workers contributions and operating on a solidarity principle. The extension of free health care and education for all, state funded sporting and other activities created a cradle-to-grave social support network. The state services were free at point of entry to all children and women. The centrally planned system ensured that birth registration was almost universal. There were high levels of immunization and school attendance across the territory, and by the eighties almost all births took place in hospital.

The conflict caused extensive damage to health care infrastructure. In some cases, health services (and other community buildings such as school, churches and government offices) were deliberately targeted. There was widespread migration of

^a WHO officially came into existence on 7 April 1948, a date now celebrated annually as World Health Day.

health personnel. After the signing of the Dayton Accords, BiH's health system was divided between the FBiH and the RS. The organization, delivery and financing of all health, education and social services (including pensions) became the sole responsibility of each entity. Entity health authorities faced the double burden of rebuilding war-damaged health structures and adapting them to local needs.⁽⁵⁾

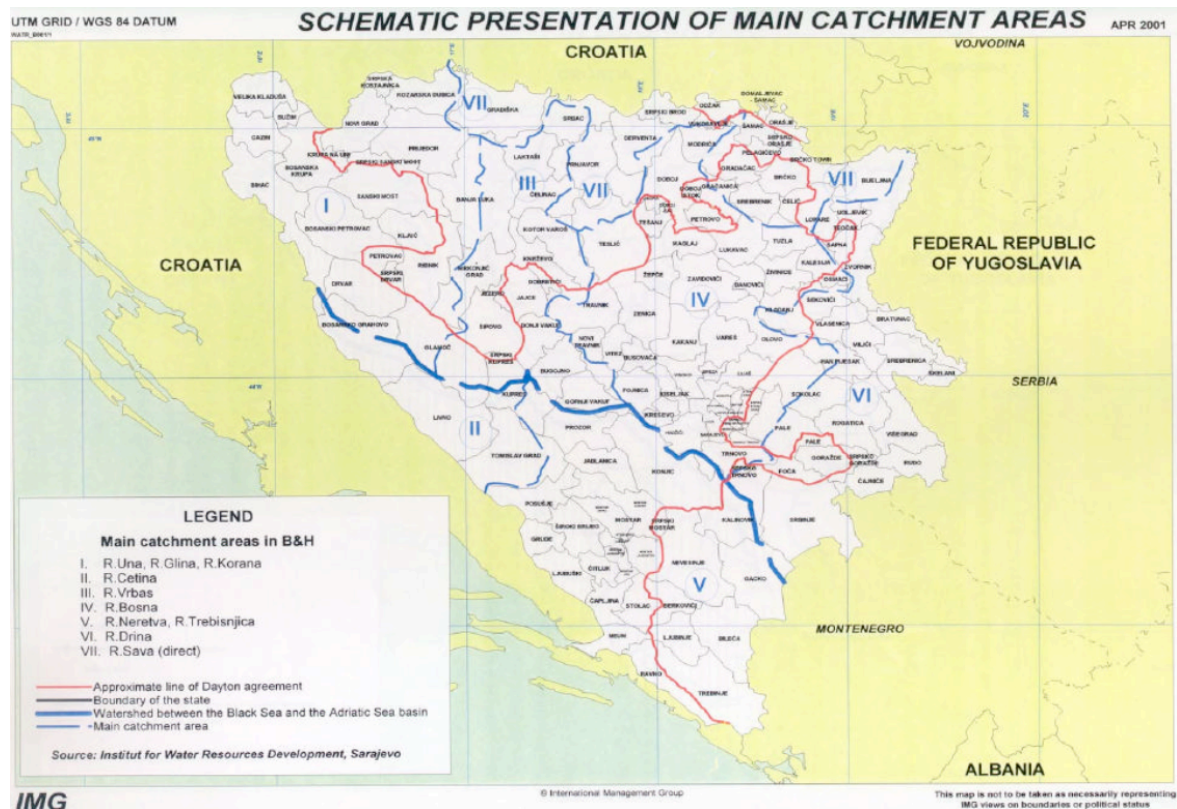
By 2000 many key buildings in the health sector had been repaired, but the funding of the health services remained a problem as did access to health services due to ethnic tensions in particular areas. Specialist services were not yet operating at pre-war levels and there was a lack of materials and supplies, with gaps still being covered by international assistance. Between 1998 and 2000, an estimated 70% of the annual national budget for drugs and pharmaceutical supplies was funded by humanitarian assistance,⁽⁵⁾ and UNICEF still procured basic vaccines for children.^a

A further challenge to the rebuilding of services was the issue of funding. The wartime economies were heavily dependent on external financial support. As these funding sources dried up, the nationalist parties were struggling to maintain funding for public sector salaries, pensions, health care systems and other public services.⁽¹⁰⁰⁾

To further illustrate the complex problems faced by the country, an example is given of one of the areas covered by the MICS survey, water and sanitation. The two main watershed areas in BiH drain towards the Black Sea (38,719 km²) and towards the Adriatic Sea in the south (12,410 km²). The map in **Figure 6** below shows the main water catchment areas.

^a Personal experience of the author.

Figure 6 Main water catchment areas in BiH, 2001



Pre-war, water regulation was under the control of municipalities and tariffs were raised and paid locally to each municipality. Water tariffs covered only operational and maintenance costs. Unaccounted for water (UFW)^a was relatively high at between 35% and 60% indicating significant water leakage and waste.^b During the conflict, there was considerable damage to urban water and sanitation through shelling, in addition to lack of maintenance and replacement of old equipment. Cities under siege including Sarajevo and Mostar had no municipal water supply for extended periods after direct targeting of the water pumping systems, lack of electricity and lack of spare parts. The urban population was reduced to collecting water from rivers or infrequently provided water tankers, and then using boiling or chlorine tablets to purify this water.

^a According to the World Bank, Unaccounted-for Water (UFW) is the difference between the quantity of water supplied to a city's network and the metered quantity of water used by the consumers.

^b In well-run water facilities, the World Bank estimates that UFW should be between 15 and 20%.

People who had been used to turning on a tap for clean purified water had to literally risk their lives from sniper attacks to collect river water.^a

Under the Dayton Accords responsibility for all natural resources (including water) was devolved to entity level. In the FBiH this is divided between the entity level and the cantons, however regulation and maintenance remained at municipal level. Post conflict there was considerable investment (an estimated 500 million US\$) in improving the water and sanitation infrastructure and organization in the country. However in 2000 the system was still inefficient with UFW of up to 70% and there were persistent problems with lack of qualified personnel, huge debts and challenges coordinating the national supply between many actors.⁽¹⁰⁷⁾

Overall, the major improvements to water and sanitation during the seventies and eighties had not been sustained. By 2000, the water and sanitation system had actually gone backwards, through lack of maintenance and war damage. BiH had lost a decade or more of what should have been continuous improvements. There was no available information on water supply at the population level.

1.8.7 Reporting on BiH child and maternal health

Pre-war, the national system of reporting on health consisted of an annual publication of official statistics on mortality and morbidity and the publication of health service data based on consumption (expenditure, bed days and staff numbers). During the war, ad hoc reporting and surveys were conducted. In 2000 and beyond, the international community supported national reporting and monitoring programmes with a more integrated approach. Four national monitoring and reporting processes are relevant to this study and these are introduced here, together with an explanation of why they are related to each other and how they evolved.

These four plans were the most closely related in time to the BiH MICS 2000 survey. In addition, they included quantitative targets and indicators that related to multiple aspects of child health and well-being and were intended to be linked to policy and services changes in the country. The first two processes were largely supported by

^a Personal observations of the author while working for Physicians for Human Rights (US), WHO and UNHCR in BiH during the war in 1991-1995.

UNICEF, the third one by UNDP (together with other UN Agencies) and the fourth one by the WB. This explains, in part, their emphasis and areas covered. The four processes are:

The **National Report on Follow up to the World Summit for Children**⁽¹⁰⁸⁾ in December 2000 and was the first national level government report to the UN on a monitoring commitment. This could not have been prepared without the BiH MICS 2000 data, which closely matched the WSC goals and targets. It was largely prepared by the author of this study, supported by local UNICEF staff and consultants, and then officially presented by the Ministry of Foreign Affairs (MOFA).^a

A **National Plan of Action for Children in Bosnia and Herzegovina 2002 - 2010**⁽¹⁰⁹⁾ was prepared in 2002 and was substantially built on the WSC goals and targets, with some local modifications and additions. The plan was created with UNICEF support to the consultation process and was based on linked entity plans. The implementation was to be monitoring by a National Council for Children, which as of 2010 had not yet been established.

The **Bosnia and Herzegovina Human Development Report/Millennium Development Goals 2003**⁽¹¹⁰⁾ was prepared with extensive support from the UN, in particular from UNDP, and was based on the MDGs, which were to be achieved by 2015. This was largely a benchmarking exercise and there was considerable reliance on the BiH MICS 2000 indicators for the 2001 baseline indicators in relation to children and women. Projected targets were set for each indicator for 2007, 2010 and 2015.

Finally, the **Bosnia and Herzegovina Medium Term Development Strategy/Poverty Reduction Strategy Paper**⁽¹¹¹⁾ was developed in a process led by the IMF and the World Bank in 2004.^b

^a This is a common role of the UN in newly emerging states, or countries with limited technical capacity and reporting, to technically support the production of such reports. Developed countries and most developing countries produce their own reports.

^b According to the IMF Website www.imf.org/external/np/prsp/prsp.asp 'Poverty Reduction Strategy Papers (PRSP) are prepared by the member countries through a participatory process involving domestic stakeholders as well as external development partners, including the World Bank and International Monetary Fund. Updated every three years with annual progress reports, PRSPs describe the country's macroeconomic, structural and social policies and programs over a three year or longer

This is an extensive document with hundreds of targets including numerical, quantitative and process indicators covering largely economic development but including also health, education, social welfare and rights indicators.

There were multiple other reports prepared between 2000 and 2010 in relation to health, rights and human development. BiH, as a new nation, had ratified the CRC in September 1993, but did not immediately undertake its full obligations as prescribed by article 44 of the convention.^a An initial report on the status of children's rights was prepared by each of the entities in 2000 but was not finally submitted as a national report until 2004.⁽¹¹²⁾ The delays were due to the lack of an administrative agreement between the entities (the persistent problem that the BiH MICS 2000 structure managed to circumvent). This report drew heavily on the quantitative indicators in the BiH MICS 2000 survey, as did the alternative non-governmental organisation (NGO) report, which was submitted in tandem.⁽¹¹³⁾

Specific reports were also made on sectors or in relation to specific diseases or programmes. These including HIV/AIDS reports, IMCI reporting and the JMP report, which all drew on BiH MICS 2000 indicators.

This may give some insight into the demand for quantifiable indicators, the scope and range of the indicators included as part of international reporting commitments and the burden this may place on a newly emerging nation state such as BiH with weak statistical capacity, very limited resources, a fractured administrative system, internal boundary issues and a poorly defined national HIS.

1.8.8 Factors affecting household survey implementation

Household surveys can be affected by the physical conditions of a country. BiH has a sub-continental climate with freezing winters followed by very hot summers, while the southwest coastal hinterland has a Mediterranean climate. The terrain is hilly throughout, with several high mountain ranges. Urban settlements are mostly located

horizon to promote broad-based growth and reduce poverty, as well as associated external financing needs and major sources of financing.'

^a One of the obligations of the present periodic reports to the Committee on the rights of the child on the country's efforts to comply with the provisions of the treaty.

war belonged to one of its three constitutive ethnic groups: Bosniaks 44% (predominantly Muslim), Serbs 31% (predominantly Orthodox Christians) and Croats 7% (predominantly Catholic Christians) with ethnic communities intermingled throughout the country's territory.⁽¹¹⁵⁾ The term *constitutive* refers to the fact that these three ethnic groups are explicitly mentioned in the constitution^a, and that none of them can be considered a minority or immigrant. Other ethnic groups included Hungarians, Jewish, Slovenes, and Vlachs. Regardless of ethnicity, a citizen of BiH is often identified as a 'Bosnian' in English.

The question of ethnic origin and religion is sensitive. The ethnic groups can be most easily distinguished by their religion, and historians debate whether the ethnic groups emerged from religious groups in the nineteenth or twentieth century. A y chromosome haplogroups^b study published in 2005 showed that overall, the three main groups of BiH, in spite of some quantitative differences, share a large fraction of the same ancient gene pool distinctive for the Balkan area.⁽¹¹⁶⁾ It is also important to note that land ownership is not proportional to ethnicity since Serbs pre-war lived predominantly in rural areas and therefore owned large portions of the land.

Ethnicity is further complicated by intermarriage. Urban areas had high percentages of intermarriage. Rural areas were less mixed with clearer delineation between Bosnjak, Croat and Serbian settlements. There are two streams of discourse on the topic of intermarriage. Officially reported national percentages of ethnically mixed marriages in 1956, 1963, 1971 and 1974 were 9.3%, 12.4%, 13.5%, and 13.5%, respectively.⁽¹¹⁷⁾ More technically sophisticated are the studies on intermarriage by the Yugoslav demographer Ruza Petrovic including her 1991 analysis of the ethnic identity of parents and children.⁽¹¹⁸⁾ Ethnic heterogamy, according to Petrovic, is "very high and it is permanently growing."⁽¹¹⁹⁾ This particular view was also supported by the post-war international agencies, keen to stress the level of inter-ethnicity of the new state of BiH.

^a The current Constitution of BiH is Annex 4 of The General Framework Agreement for Peace in Bosnia and Herzegovina, also known as the Dayton Agreement or Dayton Accords, signed in Paris on 14 December 1995.

^b Such studies examine DNA in the Y chromosome and so are used in family history research as the DNA in the Y chromosome is passed from father to son (females do not have a Y chromosome).

In contrast to this view is the work of Nikolai Botev and Richard A. Wagner who used homogamy patterns to show that the popular notion of a Yugoslav population characterized by increasing rates of interethnic marriage is highly erroneous. Their results show that ethnic homogamy has been, and remains, the norm in the former Yugoslavia. Further, over their study period of three decades (sixties, seventies and eighties) there was no clear trend, either in terms of increasing intermarriage or decreasing social distance between the various cultural traditions. They concluded that Yugoslavia was never really integrated, and the concept of a Yugoslav ethnicity within which people could jointly operate, never attained.⁽¹²⁰⁾ They also posed the question: what of those few who have chosen a spouse from an ethnicity now on the opposite side of the barricade?

The end-result of the delineation of the population on ethnic grounds was that a complex situation was provided a simplistic solution. Inter-married families were forced post-war to “declare” themselves on one ethnicity or another, and those that were truly mixed or considered themselves Yugoslav were faced with no category to which they could easily belong. This population delineation along ethnic lines was in direct contrast to the ethos of the former Yugoslavia, which had stressed “brotherhood and unity” and had suppressed expression of nationality or religion.

As of 2010, agreement on conducting a population census had not been reached. The major political parties considered that to do so, and to include identification of ethnicity, would cement the so-called “ethnic cleansing” or forced displacement of ethnic groups that profoundly changed the population distribution in the country.⁽¹²¹⁾

A December 2009 ruling by the Strasbourg-based European Court of Human Rights ruled that the Constitution of BiH, written hastily in an attempt to keep the peace in the immediate aftermath of the war, contains discriminatory and unlawful provisions in relation to ethnicity, because some positions were ‘tied’ to a certain ethnic group. For example, the State President of BiH must come from one of the three majority communities not from a minority group, and this has been challenged by minority or mixed origin citizens. There have also been challenges in elections when the ethnicity of a candidate was used as a voting tool, for example, when a candidate from one

ethnic group polls weakly from his or her own group yet still achieves an electable proportion of the votes.^a

The forces at play within Bosnian society are more complex than they first appear. Inter-ethnic conflict may seem to be the dominant feature, and the root cause of resistance to the peace process. However, ethnic reconciliation represents only one axis of the peace process. The other axis is the transition from a communist to a free society, building an infrastructure of democratic and free-market institutions, laws and traditions from a limited base.⁽¹⁰⁰⁾ This impacts on all efforts to build institutions, and on household survey implementation.

After 1995, only one-post war household survey had addressed ethnicity. A WB led survey on poverty and inequality at entity level in the FBiH in 1997 had included ethnic identification of respondents.⁽¹²²⁾ However, at national level ethnicity was deemed in 2000 to be a likely obstacle to success of a major household survey. The options of including ethnicity in the BiH MICS 2000 survey questionnaire was discussed, but the sensitivities involved proved to be an obstacle. Even the simplest questions on ethnicity had no easy answer and multiple political ramifications. The solution in terms of ensuring the completion of the BiH MICS 2000 survey was to avoid the issue, and so no questions on ethnicity were included.^b A related issue is that of cultural and religious identity and this is discussed next.

As noted earlier, the practice and display of ethnic and religious identity were moderated and controlled post World War Two by the communist party leadership, who emphasized “brotherhood and unity”. Marked differences between urban and rural settlements persisted, rural areas tending to be more traditional in outlook and attitudes and the main cities and towns more liberal and outward looking. The urban rural divide was perhaps the most marked difference to be found in Bosnian society. This was modified by the war; a case in point is Sarajevo, which had an influx of

^a For example, in the 2006 Presidency Election, although Željko Komšić was an ethnic Croat, as a member of the SDP he was alleged by his political opponents to have received votes mainly from Bosniaks and so not to have the support of his own ethnic group.

^b This decision was taken at the outset by the management team of the BiH 2000 survey after testing the waters with the two entity level steering committees.

mainly rural refugees. The war also accentuated religious practice, including the wearing of headscarves, crosses and other religious symbols.

The cultural segregation of women was not particularly marked. Though in some rural, traditional and especially muslim families, women would prefer to be interviewed in a household survey by other women, particularly on personal issues, there was no outright taboo against male interviewers. The practice of children staying with relatives at the coast or in the country during the school holidays meant that many children were not present in their homes during the months of July and August. Overall, this meant that the best time to conduct any household survey was early summer and early autumn, and the most suitable interviewers were women.

Pre-war, the language spoken across BiH was known as Serbo-Croatian or Croato-Serbian. Štokavski, štakavski, kajkavski i čakavski are variations of the language denoting the way the question 'what' is said, written and pronounced (šta, što, kaj and ča). Most prominent was the štokavian dialect, but there were variations or subtypes amongst the ethno lingual groups. There are also two alphabets or scripts, roman or 'latinica' (roman) and 'ćirilica' (cyrilic); both alphabets were taught in schools. After the breakup of Yugoslavia, the specifics of language acquired a strong political connotation. The language law of 1993 states that in BiH, the 'ijekavski'^a standard literary language of the three constitutive nations is officially used, designated by one of the three versions: Bosnian, Serbian, and Croatian. Both alphabets, Latin and Cyrillic, are equal. ⁽¹²³⁾

During the war and for a period afterwards, three local language versions were usually expected.^b By 2000, at the state level only one local language version of a written official document (such as a survey report) was needed, and it was usually prepared in roman script. Most reports that were to be read by the international community (or funded by them) were also published in English. At the FBiH entity level a compromise

^a 'Jekavski' and 'ljekavski' are another two distinctions of the Serbian or Croatian group of languages that denote the way certain words are written and pronounced, the closest comparison would be the difference between the 'American' English and 'English' English pronunciations of the word 'tomato'.

^b This created a lucrative market for local translators who were able to exploit gaps in UN contracting to charge separately for all three language versions of a document. Personal experience of the author.

and Bosniak and Croatian spelling were combined in roman script versions. At entity level in the RS, Serbian spelling in Cyrillic script was expected.

These language considerations had to be met to ensure acceptance of the survey questionnaires, tools, and entity level reports. In practice this made no difference to the ability of local people to read or understand the text, however there were additional costs involved.

An additional language issue relates to internationally agreed terminology that as yet had no commonly agreed equivalent in any local language. This is a common problem, as the terminology for health policy, indicators and data is constantly evolving. Equivalent translated terms must be defined, and this new terminology must then be widely accepted understood locally.

This process takes time. The process is also cumbersome, even in languages such as English that are in wide international and in which much new terminology is originally generated. The process is especially difficult for local languages, as they acquire these terms secondhand from the language of origin and often lack updated dictionaries and online resources. In 2000, there were gaps in commonly accepted survey and indicator related terminology in as Serbian, Croatian and Bosnjak, as they were spoken in countries that had been isolated professionally by years of conflict and UN sanctions.

1.9 Conclusions of the introduction chapter

Countries emerging from conflict face particular challenges in rebuilding and reforming their HIS. There are pressing needs to collect population health data and to assess the population health status of children and women. The implementation of globally mandated household surveys are one of several approaches to filling data gaps and strengthening HIS. The data collection environment in a post-conflict country is a complex one, with both national and international stakeholders present during the rebuilding phase.

BiH in 2000 was a post-conflict country with a fragmented national administrative structure and a damaged HIS. The BiH MICS 2000 survey, implemented five years after the conflict had ended, was a unique, large scale initiative in the country. The

survey was the first national level household survey in the post-conflict period and BiH MICS 2000 data can be found in multiple global indicator databases and reports, so at one level it must be considered a success.

However deeper questions remain. The approach taken ensured survey completion but the process used was to a great extent undocumented, the extent to which the data managed to fill data needs for international reporting (a stated survey aim) was not assessed, there had been little consideration of trends using comparable data from the pre- and post-war period. Finally, there were interesting areas to explore around whether the survey actually did provide useful data and strengthen the HIS at both the national and international level. There were potential lessons for BiH and for other post-conflict settings.

1.10 Study rationale

This section explains the rationale for study. It describes the role of the author in BiH and in the MICS household survey series, and her rationale for undertaking this study. The benefits of a mixed methods case study approach to analyzing the MICS 2000 survey in BiH and its contribution to building an effective health information system are reviewed.

1.10.1 Role of the author in Bosnia and Herzegovina and in MICS

The author has been engaged in the countries of the former Yugoslavia, including what is now BiH, for over 20 years (between 1989 and 2010) and in different aspects of the MICS survey series over ten years (between 1999 and 2009).

The author was closely involved with BiH during the conflict in 1990s and in supporting the public health services both during and after the conflict through to 2010 via her programme management and advocacy work with WHO, UNICEF, UNHCR, local authorities and NGOs. She was engaged in teaching, professional development and local capacity building in HISs and policy-making in the countries of former Yugoslavia. As a result, she was closely engaged in efforts to define data needs and fill data gaps.

The author has also had a varied engagement with the MICS surveys. After leading the implementation of the BiH MICS 2000 survey, UNICEF granted her a four-month research assignment in 2005 to UNICEF headquarters (HQ) in New York. During this period she produced a paper documenting, for the first time, the history of the MICS survey. She also prepared background materials for the planned external evaluation of the third MICS series, and subsequently managed the global external evaluation of the third round of the MICS 3 survey commencing in 2007.⁽¹²⁴⁾ This has given the author a wide-ranging understanding of how the MICS survey series operates and an interest in the wider impact and application of the survey technology.

1.10.2 Approach taken in this study

Given the author's experience of various components of the HIS in BiH over a time of considerable change and her unique understanding of the MICS survey both globally and in this particular national setting, a mixed methods case study centred around the BiH MICS 2000 survey is presented as a useful and unique contribution. Such a case study can offer practical insights into the general challenges that are discussed next.

In the implementation and reporting of household surveys in developing countries, the completion of a major national household survey itself usually takes a higher priority to a more long term and nuanced analysis of the survey process and the wider context of the data and its use. The pressure to finalise a survey and produce the data leaves little time for a more rigorous academic analysis. Reflection on and documentation of the process of data collection and subsequent data use may therefore be very limited.

There are both tensions and opportunities in using the different lenses of programmatic implementation and a more academic approach. Programmatic survey implementation and academia inhabit different worlds, with little overlap. The policy-making community, including governments, NGOs, and multilateral and bilateral agencies, documents its results in reports, which often contain large volumes of primary data. These reports, however, may not be easily accessible. Therefore, dialogue is often constrained, and different parties make quite different assessments based on the information available to them.

There has been significantly less academic publication in relation to MICS than either the USAID funded Demographic and Health Surveys (DHS)⁽⁸²⁾ or WHO's World Health

Surveys (WHS),⁽¹²⁵⁾ despite the extent of MICS survey coverage globally and the volume of data produced. Little has been published on the MICS survey in terms of history, development of the methodology, and approaches to integrated with national HIS, although there have been over 150 surveys produced to date. Using a case method approach for BiH may illustrate the key dilemmas and opportunities that arise in the particular context of a post-conflict, middle-income country.

In the next sections, the overall aims, the research questions and the hypotheses in this study are outlined

1.11 Aims of the study

This study aims to develop a better understanding of the role of UNICEF's multiple indicator cluster survey (MICS) in providing information to support health policy in a post-conflict setting. It will do this by:

- Describing for the first time the evolution of the MICS survey tool (MICS) between 1995 and 2010,
- Describing the implementation of the BiH MICS 2000 survey in the context of the national HIS,
- Determining if the data measured by the BiH MICS 200 survey was accurate,
- Determining if the indicators measured by the BiH MICS 2000 survey were timely, and relevant in BiH.
- Determining if the indicators measured by the BiH MICS 2000 survey could be used to demonstrate changes in child and maternal health over time.
- Determining if the data produced from the BiH MICS 2000 survey was useful for national human development monitoring,
- Determining if the MICS process affected national capacity in BiH to conduct household surveys,
- Determining how the national HIS was affected by the implementation of the BiH MICS 2000 survey,
- Drawing lessons that may be useful for the future development of the HIS system in BiH and the role of the MICS survey in BiH in future, and
- Drawing lessons that may be of use for using the MICS survey tool to build HIS in other post-conflict settings in future.

1.12 Research questions

- How did the MICS survey tool evolve between 1995 and 2010? What were the key factors influencing the inception of and subsequent development of the MICS survey tool?
- How was the MICS 2 survey adapted to suit the particular circumstances of the country and the national HIS in 2000? What were the consequences of these modifications? Did circumstances dictate compromises in the survey design or implementation and did that later affect survey results?
- Was the data measured by the BiH MICS 2000 survey accurate?
- Were the indicators measured by the BiH MICS 2000 survey timely and relevant to BiH?
- Could time trends be produced at five-yearly intervals between 1990 and 2006 for the BiH MICS 2000 indicators selected?
- Did the indicators measured by the BiH MICS 2000 survey contribute to filling data gaps for four national human development monitoring processes in BiH?
- Did the BiH MICS 2000 survey lead to improved national capacity within BiH to conduct national household surveys?
- Was the BiH HIS strengthened as a result of the BiH MICS 2000 survey?
- What lessons can be learned and conclusions drawn for the future development of the HIS system and the future role of the MICS survey in BiH?
- What lessons can be learned and conclusions be drawn and lessons learned in relation to the development of HISs in BiH and in other post-conflict and resource poor countries?

1.13 Research hypotheses

- The MICS survey arose from a centrally driven requirement within UNICEF to fulfill its mandate to support countries to measure global progress towards end-decade goals. Further developments were incremental within each of the four series and were influenced by international reporting and monitoring processes. The scope for customisation of the survey tool at the national level is limited.
- Modifications of the MICS 2 survey tool taking into account the particular circumstances of the country context enabled the BiH MICS 2000 survey to be implemented, but also restricted the survey design and implementation and affected the survey results.
- The data produced by the BiH MICS 2000 survey were accurate
- The indicators measured by the BiH MICS 2000 survey were timely, and relevant to BiH
- Comparable data was available for the indicators measured in the BiH MICS 2000 survey for the time points of 1990, 1995 and 2000, and the indicators could be compared over time.
- The indicators measured by the BiH MICS 2000 survey contributed to filling data gaps for key national human development monitoring processes in BiH.
- The BiH MICS 2000 survey increased BiH capacity to conduct national household surveys.
- The BiH HIS system was strengthened as a result of the BiH MICS 2000 survey.
- Useful lessons can be learned and conclusions drawn for the future development of the HIS system and the future role of the MICS survey in BiH.
- Useful lessons can be learned and conclusions drawn from the BiH MICS 2000 case study that may be applicable to other post-conflict and resource-poor settings in the future.

2 METHODS

2.1 Structure of the methods chapter

This study uses mixed methods (quantitative and qualitative) to examine the case of the BiH MICS 2000 survey. The aim of the study is to develop a better understanding of the role of MICS in providing information to support health policy in a post-conflict setting.

First, this chapter presents the case study approach that is used. Next, the case study process is presented including the study sequence, analytical framework and timelines. Finally, the mixed methods used in this case study are described.

2.2 The case study approach

A **case study** approach is a research methodology based on an in-depth investigation of a single individual, group, or event. The case study is an approach to research that facilitates exploration of a phenomenon within its context using a variety of data sources. Baxter and Jack (2008) note that this ‘ensures that the issue is not explored through one lens but rather a variety of lenses which allows for multiple facts of the phenomenon to be revealed and understood.’⁽¹²⁶⁾ In this case study, the BiH MICS 2000 survey is the phenomenon or event, and it is set within the context of the development of a functioning HIS in a post-conflict country.

Case study methods involve an in-depth, longitudinal (over a long period of time) examination of a single instance or event: a **case**. They provide a systematic way of looking at events, collecting data, analyzing information, and reporting the results. As a result the researcher may gain a sharpened understanding of why the instance happened as it did, and what might become important to look at more extensively in future research.

The case study approach is based on a constructivist paradigm, which according to Miller and Crabtree (1999) ‘recognizes the importance of the subjective human creation of meaning, but doesn’t reject outright some notion of objectivity. Pluralism, not relativism, is stressed with focus on the circular dynamic tension of subject and

object.’ They elaborate further: ‘one of the advantages of this approach is the close collaboration between the researcher and the participant, while enabling participants to tell their stories.’⁽¹²⁷⁾

A case study approach is useful when, according to Yin (2003),

- (a) the focus of the study is to answer ‘how’ and ‘why’ questions;
- (b) you cannot manipulate the behaviour of those involved in the study;
- (c) you want to cover contextual conditions because you believe they are relevant to the phenomenon under study; or
- (d) the boundaries are not clear between the phenomenon and context.

Conditions (a), (c), and (d) apply to this study. The focus is to ask ‘how’ the BiH MICS 2000 survey was implemented and ‘how’ it subsequently affected the development of a national HIS, and also to ask ‘why’ it was implemented in the manner selected. The contextual conditions are paramount, and they determined the scope and impact of the BiH MICS 2000 survey, as well as the selection of the indicators measured by it. Finally, the boundaries between the survey and its context i.e. the national HIS, health and development policies and monitoring systems are blurred, and the survey and its context influence each other. Condition (b) does not apply to this study as the researcher can, and did, manipulate the behaviour of those involved in the BiH MICS 2000 survey.

In defining the case or unit of analysis, Miles and Hoberman (1994) note that it should be ‘a phenomenon of some sort occurring in a bounded context.’ The case is, ‘in effect, your unit of analysis.’ This context of this study is bounded by time. MICS evolved between 1990 and 2010. The events and process comprising the BiH MICS 2000 survey occurred between the announcement of the MICS 2 survey series in early 1999 and the publication of the final survey report in the first quarter of 2001. The analysis of the survey process is limited to the examination of the processes of creating consensus and a working governance model, the adaptation of the MICS 2 survey tool, and the implementation of the survey itself. A limited analysis of selected indicators measured by the survey is undertaken, examining their accuracy, timeliness and relevance. A data gap analysis is restricted to four national monitoring processes. Four time points of 1990, 1995/6, 2000 and 2006 are used for examination of indicator

time trends. The context is further bounded by the framework of a national HIS and how the BiH MICS 2000 survey relates to this.

Mixed methods research is defined by Johnson (2004) as ‘the class of research where the researcher mixes or combines quantitative and qualitative research techniques, methods, approaches, concepts or language into a single study.’⁽¹²⁸⁾ Traditionally, qualitative and quantitative research have been viewed as the two dominant research paradigms. Sieber (1973) argued that this has resulted in two research cultures, one professing the superiority of ‘deep, rich observational data’ and the other the virtues of ‘hard, generalizable’ . . . data.⁽¹²⁹⁾ There is increasing interest in blending both, and Johnson (2004) further postulates that ‘mixed methods research should use a method and philosophy that attempt to fit together the insights provided by qualitative and quantitative research into a workable solution.’

Mixed methods involved the measurement constructs, or complex ideas that we as humans form in order to summarize observations about things that we cannot see directly. In social sciences, we are often faced with measuring these ideas that are not directly measurable. However, we are able to do so by describing specific qualities which, taken together, define a construct. Examples of constructs that this study addresses include: literacy, perceptions of HIV, and relevance of indicators. The research process forces these terms to be defined, and also challenges the definitions selected.

Triangulation, as broadly defined by Denzin (1978), is defined as ‘the combination of methodologies in the study of the same phenomenon.’ The triangulation utilised in this study is defined by Denzin as the ‘between or across methods’ type, and is largely a vehicle for cross-validation when two or more distinct methods are found to be congruent and to yield comparable data.⁽¹³⁰⁾ The hope is that is when more than one method is used, inconsistencies in findings will prompt the investigator to reframe the question, reconsider the methods, or both.

At one level this study has three stages: stating the research objective, collecting the data, and analyzing and interpreting the data.⁽¹²⁸⁾ However, according to Creswell (2003), researchers that use mixed methods for collecting data should address the sequence for implementation of the methods, the use of a conceptual framework, and

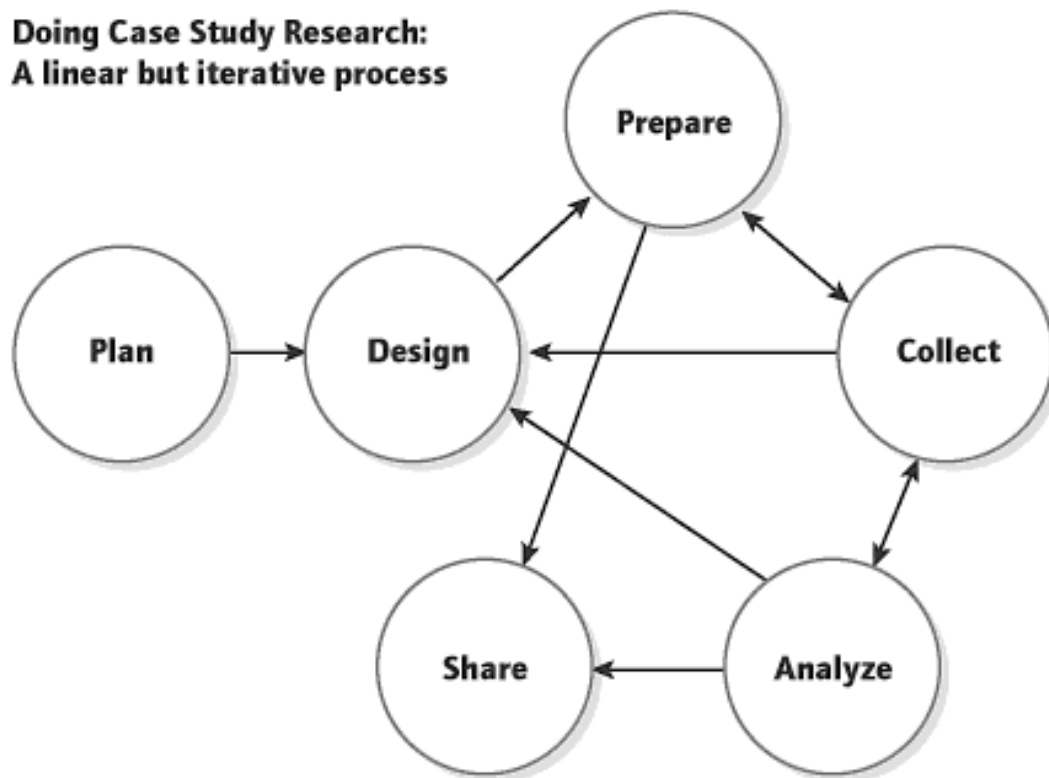
the priority or weight given to the quantitative or qualitative approach, including data collection, analysis, and integration of findings.⁽¹³¹⁾

2.3 Case study process

2.3.1 Study sequence

In describing the sequence for implementation of the methods in this case study, the schema proposed by Yin (2009) was used, and is given in **Figure 8** below.⁽¹³²⁾

Figure 8 Sequence of the case study



Iteration is part of the process of case study research. The **planning** phase took place in 2005 when the study was first conceived and involved arranging a research sabbatical in UNICEF HQ, discussions with Trinity College Dublin (TCD) to locate a supervisor and home department, and ensuring there were no institutional obstacles to using and analyzing the data. The original **design** was for a presentation of the BiH MICS 2000 survey with an in-depth quantitative analysis of the data. The initial

preparation took place in UNICEF HQ. BiH MICS 2000 survey materials were **collected**, and the first history of the MICS survey tool was written based on a document review and interviews. Initial **analysis** suggested that a more original and useful contribution would be to explore the BiH MICS 2000 survey within its local context and to examine wider issues. This analysis was then **shared** with supervisor and peers and the design was adjusted. There were further iterations of these steps of preparation, collection, analysis and sharing of the findings.

As a result, the design changed significantly. The final design utilises the BiH MICS 2000 survey as a significant event from which its contribution to and impact on the national HIS could be assessed. At this point, the history of the MICS survey tool and the BiH MICS 2000 survey materials were largely moved into a separate case narrative chapter.

Throughout this process, study hypotheses were shaped and tentative themes, concepts, and relationships between the variables began to emerge. Eisenhardt (1989) notes that in shaping hypotheses, 'the central idea is that researchers constantly compare theory and data-iterating toward a theory which closely fits the data.' Eisenhardt further notes that 'one step in shaping hypotheses is the sharpening of constructs. This is a two-part process involving (1) refining the definition of the construct and (2) building evidence which measures the construct in each case.'⁽¹³³⁾

With each iteration, sharing the findings with peers, the study supervisor and at conferences prompted a rethink of the design and a reformulation of the hypotheses. Time also played a part. At the time of the BiH MICS 2000 survey, little attention was paid in either practice of the literature to the wider effects of national households surveys, and analysis of HISs was at a preliminary stage. In any case study, an essential feature of theory building is comparison of the emergent concepts, theory, or hypotheses with the extant literature. The literature and conceptual thinking in relation to HISs and other aspects of this case study has greatly increased since 2010, particularly in the past five years.

The original study hypotheses formulated in 2005 were quite simple:

- The BiH MICS 2000 survey can provide up to date information for assessing the situation of children and women in BiH

- The BiH MICS 2000 data can furnish the data needed to monitor progress towards the goals of 1990 – 2000 established at the WSC
- The study can be a basis for future action to improve the situation of women and children in BiH
- Lessons can be learned for carrying out this kind of survey in transitional and unstable countries.

The final hypotheses in 2010 are:

- The MICS survey arose from a centrally driven requirement within UNICEF to fulfill its mandate to support countries to measure global progress towards end-decade goals. Further developments were incremental within each of the four series and were influenced by international reporting and monitoring processes. The scope for customisation of the survey tool at the national level is limited.
- Modifications of the MICS 2 survey tool taking into account the particular circumstances of the country context enabled the BiH MICS 2000 survey to be implemented, but also restricted the survey design and implementation and affected the survey results.
- The data produced by the BiH MICS 2000 survey were accurate
- The indicators measured by the BiH MICS 2000 survey were timely, and relevant to BiH
- Comparable data was available for the indicators measured in the BiH MICS 2000 survey for the time points of 1990, 1995 and 2000, and the indicators could be compared over time.
- The indicators measured by the BiH MICS 2000 survey contributed to filling data gaps for key national human development monitoring processes in BiH.
- The BiH MICS 2000 survey increased BiH capacity to conduct national household surveys.
- The BiH HIS system was strengthened as a result of the BiH MICS 2000 survey.

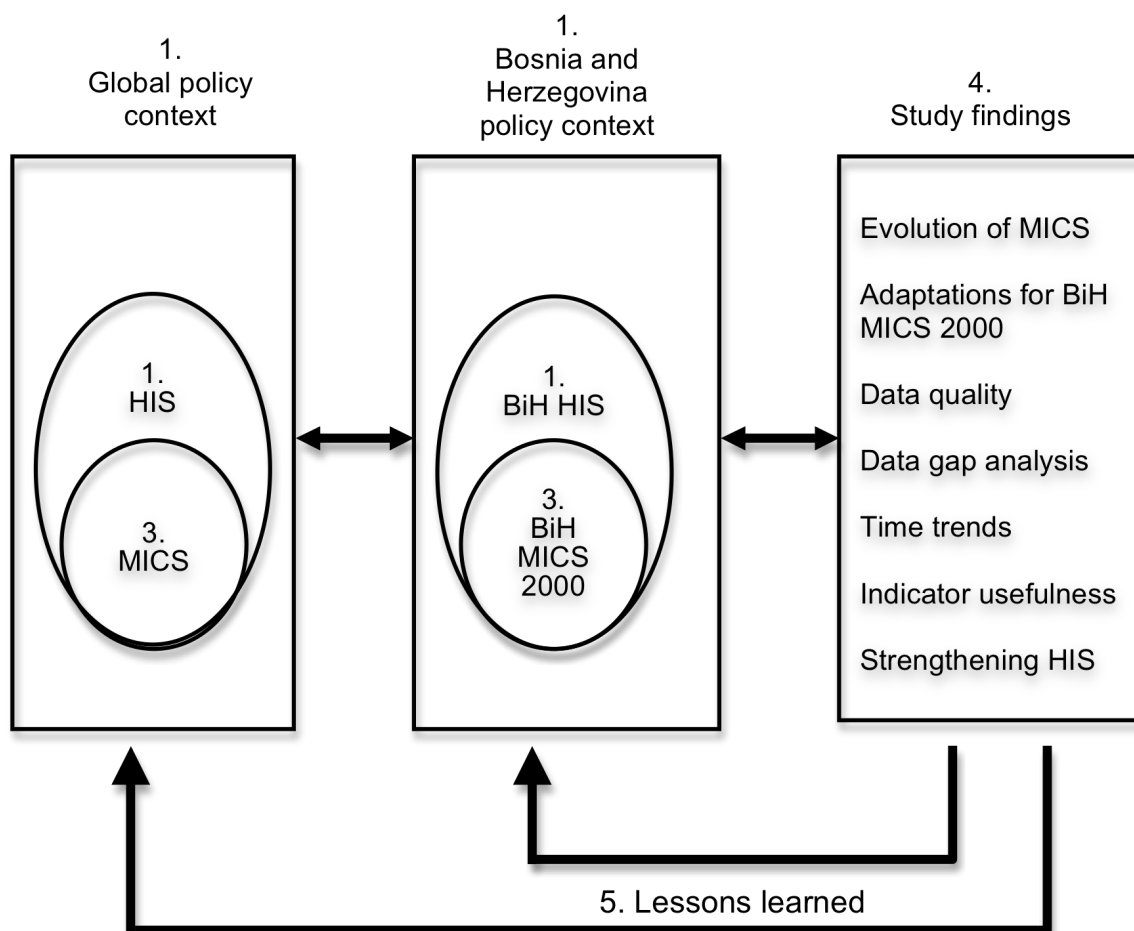
- Useful lessons can be learned and conclusions drawn for the future development of the HIS system and the future role of the MICS survey in BiH.
- Useful lessons can be learned and conclusions drawn from the BiH MICS 2000 case study that may be applicable to other post-conflict and resource-poor settings in the future.

The strategy of case method research is inductive, both exploratory and descriptive. This approach informs the researcher of possibilities which need to be shaped into putative theories and then hypotheses before further testing. The framework of analysis is presented next.

2.3.2 Framework of analysis

The framework of analysis changed considerably over the time of the study. The original aim of the study was to present and analyse the BiH MICS survey in some considerable depth and to examine the strengths and weaknesses of the data. It became clear however that the context of the survey itself had shaped and constrained the data, and also over time that the implementation framework within which the MICS surveys were implemented had also shifted away from simply data production towards strengthening of HISs. For example, as the quantitative data from the BiH MICS 200 survey were analysed, the construct of data relevance at the national level challenged. Thus, the analytical framework evolved over time and was adjusted and 'bounded' at each stage of the study. The final version is presented in **Figure 9** below.

Figure 9 Study framework of analysis



The three boxes represent the levels of analysis and follow the sequence followed within the study. The numbers refer to study chapters **1**, **3**, **4** and **5**. Not listed is **Chapter 2** - methods:

- The left-hand box represents the overall context of the global health policy context. Nested within this box is an overview of HISs, to which elements of MICS surveys are a contributing subset. The overall context and the background to HISs are presented in **Chapter 1** - introduction, and the MICS surveys are outlined in **Chapter 3** - the case narrative.
- The middle box represents the more specific health policy setting of BiH. Nested within this is the national HIS of which the BiH MICS 2000 survey is a subset. The context of BiH and its national HIS are described in **Chapter 1** - introduction, and the BiH MICS 2000 survey is outlined in **Chapter 3** - the case narrative.

- The right-hand box represent the first seven study findings, which are presented in **Chapter 4** - results. They relate to the factors driving the evolution of MICS, the adaptations for the BiH MICS 2000 survey, the data quality, the data gap analysis, indicator time trends, indicator usefulness and 'strengthening' of the national HIS. These terms are all defined below.
- Below the boxes are two arrows, which represent the final two findings of the survey relating to lessons learned. These are directed at MICS/national household surveys and HISs for 1) BiH and 2) other post-conflict or resource poor countries. The lessons learned are synthesized from the case narrative and the main findings and are presented in **Chapter 5** – discussion.

2.3.3 Study timelines

This process of iteration and adjustment in this study could have continued indefinitely, however two factors prevented this and ensured closure. Eisenhardt (1989) notes that in deciding 'when to stop iterating between theory and data, again, saturation is the key idea. That is, the iteration process stops when the incremental improvement to theory is minimal.'⁽¹³³⁾ This point was reached and further iterations would have added minimal value. A second factor was that of time, as the study had to reach closure in time for the findings to be useful for the launch of MICS 4 in 2010 and the inclusion of its findings in background materials for a global conference in 2011 on the MICS survey series.

Regarding to the timelines, the BiH MICS survey was completed between 2000 and 2001. This study was completed in stages between 2005 and 2010 as follows. The historical review of the MICS survey tool was conducted in late 2005 and then updated in 2009 and 2010. A literature review was conducted in 2005 and revisited in 2009 and 2010. The quantitative and qualitative data analysis and the study write up were completed in 2010.

2.4 Mixed methods used

2.4.1 Summary of the mixed methods

The methods used in this study are both quantitative and qualitative as noted in **Table 7** below.

Table 7 Study methods by quantitative or qualitative approach

Method No.	Research area	Method used	Quantitative or Qualitative approach?
1.	Analysis of the development of the MICS survey tool	Analysis of external and internal factors	Qualitative
2.	Analysis of adaptation of the MICS 2 survey tool in BiH	Analysis of modifications in survey design and effects on results	Qualitative
3.	Data quality	Error estimates and data quality	Quantitative
4.	Data gap analysis	Calculation of the % of indicators measured by the BiH MICS 2000 survey in four national monitoring and reporting processes	Quantitative
5.	Indicator time trends	Time trend analysis using BiH MICS 2000 indicators and available comparable data from 1990, 1995 and 2005/6	Quantitative
6	Indicator usefulness	Comparison of time to produce data with other relevant surveys and UN reporting deadlines and assessment of relevance against defined criteria	Qualitative
7	Strengthening of HIS	Evidence of strengthened HIS and increased household survey capacity	Qualitative
8	Lessons learned	Summary analysis of findings with triangulation of data	Qualitative

The methods are described in more detail below.

2.4.2 Analysis of the development of MICS

The relevant research questions are:

How did the MICS survey tool evolve between 1995 and 2010?

What were the key factors influencing the inception of and subsequent development of the MICS survey tool?

The evolution of the MICS survey tool is described in **Chapter 3** - the case narrative. The key external and internal (to UNICEF and the UN) factors in this evolution are presented in **Chapter 4** - results.

2.4.3 Analysis of adaptation of the MICS survey tool in BiH

The relevant research questions are:

- How was the MICS 2 survey adapted to suit the particular circumstances of the country and the national HIS in 2000?
- What were the consequences of these modifications?
- Did circumstances dictate compromises in the survey design or implementation and did that later affect survey results?

The adaptation of the MICS 2 global survey tool for the BiH MICS 2000 survey and these adaptations are described in **Chapter 3** – the case narrative.

The consequences of these modifications, the compromises in the survey design and implementation and effects on survey results are presented in **Chapter 4** - results.

2.4.4 Accuracy of the BiH MICS 2000 data

The relevant research questions are:

- Was the data measured by the BiH MICS 2000 survey accurate?

Validity has no single agreed definition but generally refers to the extent to which a concept, conclusion or measurement is well-founded and corresponds accurately to the real world.^a The validity of a measurement tool (i.e. test in education) is considered to be the degree to which the tool measures what it claims to measure.

^a The word 'valid' is derived from the Latin validus, meaning strong.

The BiH MICS 2000 survey sets out to measure aspects of population health. A prime concern is whether the data measured is accurate or not. The **accuracy** of the data was estimated by analysing sources of error and estimating the quality of data quality.

There are two types of errors in household surveys – sampling and non-sampling. **Sampling errors** arise when a representative probability sample is taken from a population. The sample of respondents selected in the BiH MICS 2000 survey is only one of the samples that could have been selected from the same population, using the same design and size. Each of these samples would yield results that differ somewhat from the results of the actual sample selected. Sampling errors are a measure of the variability between all possible samples. The extent of variability is not known exactly, but can be estimated statistically from the survey results for selected indicators.

Sampling errors were not measured at the time for the BiH MICS survey,^a but have since been measured for purposes of this study. The following were measured (where possible) for each of the selected indicators:^b

Value (r): This is the value of the indicator as measured in the survey. The denominator values given for each indicator used in the error measurement is presented in a table.

Standard error (se): Sampling errors are usually measured in terms of standard errors for particular indicators (means, proportions etc). Standard error is the square root of the variance. The Taylor Linearization Method^c was used for the estimation of standard errors.

^a The guidelines for the MICS 1 and MICS 2 survey series contained no specific recommendations on measuring or reporting on sampling errors for the surveys. Guidelines were provided for error estimation in MICS 3 and MICS 4.

^b Some indicators were composites i.e. made up of the answers to more than one question and so this calculation was not possible.

^c The Taylor series (linearization) method is the most commonly used method to estimate the covariance matrix of the regression coefficients for complex survey data. It is the default variance estimation method used by many statistical software packages. It is also the method recommended for MICS survey from series 3 onwards and so was used for consistency.

Coefficient of variation (se/r) is the ratio of the standard error to the value of the indicator.

Design effect (deff) is the ratio of the actual variance of an indicator, under the sampling method used in the survey, to the variance calculated under the assumption of simple random sampling. The **square root of the design effect (deft)** is used to show the efficiency of the sample design. A deft value of 1.0 indicates that the sample design is as efficient as a simple random sample, while a deft value above 1.0 indicates the increase in the standard error due to the use of a more complex sample design.

Confidence limits or intervals (C I) were calculated to show the interval within which the true value for the population can be reasonably assumed to fall. For any given statistics calculated from the survey, the value of that statistics will fall within a range of plus or minus two times the standard error ($p + 2.se$ or $p - 2.se$) of the statistic in 95.0% of all possible samples of identical size and design.

For the calculation of sampling errors in the BiH MICS 2000 survey, SPSS Version 18 Complex Samples module has been used. Sampling errors were calculated for indicators of primary interest, for the national total, and for urban and rural areas.

Non-sampling errors involve non-observation errors when there is a failure to obtain data from a sampling unit or a variable, or measurement errors that arise when the values for survey variables are collected. Non-observation errors are usually fixed in nature, and lead to considerations about bias in survey estimates. Measurement errors are sometimes fixed, but they may also be variable.

Among **non-observation errors**, two sources of error are most important: non-coverage and non-response. In probability sampling, there must be a well-defined population of elements, each of which has a non-zero chance of selection. **Non-coverage** arises when an element in the population actually has no chance of selection; the element has no way to enter into the selected sample. Within the BiH MICS 2000 survey, one element in the population that has no chance of selection is people who are of no-fixed abode, as if present in a household when the survey team enter they will not be listed as household members, nor will their temporary dwellings be included as actual households.

Non-response refers to the situation where no data are collected for an element response that has been chosen into the sample. This may occur because a household or person refuses to cooperate at all, or because of a language barrier, a health limitation, or the fact that no one is at home during the survey period. The response rates were calculated in the BiH MICS 2000 survey for a selection of questions and the results presented in tabular form.

Measurement errors arise from more diverse sources, including respondents, interviewers, supervisors and data-processing systems. Respondent measurement errors may occur when a respondent forgets information needed and gives an incorrect response, or distorts information in response to a sensitive question. These respondent errors are likely to constitute a bias, because the respondent consistently forgets, or distorts an answer, in the same way, no matter when he or she is asked a question. These errors can also be variable. Some respondents may forget an answer at one moment, and remember it another.

Potential measurement errors were addressed as follows. To ensure fieldwork quality 10% of households were re-interviewed by field supervisors and UNICEF staff conducted independent field checks on a small number of households. Filled questionnaires were checked by the fieldwork coordinator to ensure completeness of data, and those with missing or absent data returned for checking. Data was doubled entered and inconsistencies corrected. Having two separate entity teams allowed comparison at a number, including in determining outliers in question responses (only one part-question found to be an outlier, probably due to different understanding of the mean in the local language between the two teams). An additional consistency check was made looking for evidence of age distortions in the sample and rounding of anthropometry measurements.

2.4.5 Data gap analysis

The relevant indicator is:

- Did the indicators measured by the BiH MICS 2000 survey contribute to filling data gaps for four national human development monitoring processes in BiH?

For this study, key **reporting and monitoring processes** related to the health of children and women in BiH were identified. An estimate was made of the extent to

which indicators from the BiH MICS 2000 data matched the indicators in these processes, i.e. the extent to which gaps in the data could be filled by the BiH MICS 2000 data. This is referred to in the study as a **data gap analysis**.

There were methodological challenges in ascertaining if indicator gaps in the selected key international and national reporting mechanisms had been filled. These are described below.

- Indicator definitions may change over time. The changes can be in the indicator name, the definition, the numerator or the denominator.
- Indicators may also be collected from different sources, with higher or lower levels of data accuracy and generalisability. The metadata of the indicators should clearly state all of these factors and allow an informed decision, however not all indicators are presented with the associated metadata.
- Global indicator databases are maintained by various international bodies and consortia. As part of the process of compiling country indicators, database 'owners' review different data sources, and then adjust or clarify the numbers before publication. Thus, the numbers that appear in a global database may differ from those from originating from the same data source that are published as primary data, found in national reports, or presented in another global database.
- Monitoring processes also evolve over time. For example, the goals, targets and indicators in the MDGs have, over the years, been customised at the national level, so that additional or more locally specific indicators can be added and/or substituted.

The sections that follow describe the steps that were used for the data gap analysis, taking into account the methodological challenges posed.

Step 1: Key **national monitoring processes** related to the health of children and women in BiH were identified. The selection of these processes was based on the following criteria:

- National level process
- Inclusion of quantitative indicators for monitoring

- Timing of development close to BiH MICS 2000 (i.e. between 2000 and 2004)
- Inclusion of multiple indicators related to children and women
- Directly relevant to child and maternal health and well-being

Four BiH national level reporting and monitoring processes met these criteria and were selected for data gap analysis. They are all described earlier in the introductory chapter and are listed here:

1. National Report on follow up to the 1990 World Summit for Children of Bosnia and Herzegovina ⁽¹⁰⁸⁾
2. National Plan of Action for Children in Bosnia and Herzegovina 2002 – 2010 ⁽¹⁰⁹⁾
3. Bosnia and Herzegovina Human Development Report/Millennium Development Goals 2003 ⁽¹¹⁰⁾
4. Bosnia and Herzegovina: Medium Term Development Strategy/Poverty Reduction Strategy Paper ⁽¹¹¹⁾

The features of each are given in **Table 8** below

Table 8 Four selected reporting and monitoring processes

No.	Reporting area	Year	Description	Comments
1	National Report on Follow up to the 1990 World Summit for Children	2000	BiH adopted the commitments made by Yugoslavia at the WSC in 1990 as part of the BiH national accession process	A mid-decade review was not completed (due in 1995). A National Plan of action was not developed at this time
2	National Plan of Action for Children	2002	Commitment adopted by 189 member states including BiH at the UN Special Session for Children in May 2002. The National Plan of Action for BiH and monitoring indicators were developed after the MICS 2 survey was completed.	Prepared after (1). Required that a national Council for Children be established, which has not happened. Operational at Entity level mainly
3	Human Development report/ Millennium Development Goals BiH	2003	Derived from previous international commitments and officially established at the Millennium Summit in September 2000. There are 8 goals with 21 targets and 55 measurable indicators. BiH adopted a nationally adjusted plan in 2002	This was the first MDG report from BiH. The targets and indicators were adjusted further in 2004
4	Medium Term Strategic Plan BiH	2004	Preparations led by IMF/World Bank.	This was a modification of the PRSP process in BiH

To quantify the direct contribution made by the BiH MICS 2000 survey to each process, the following steps were then taken for each monitoring process.

Step 2: The total number of quantitative indicators in the monitoring process was counted. Disaggregation by urban/rural and gender was not counted separately for each indicator.

Step 3: The number (%) of indicators directly relevant to children/mothers was calculated

Step 4: The number (%) that could only be measured using the MICS 2 survey tool, was calculated

Step 5: Finally the number (%) of the total indicators directly relevant to children that were actually measured in the BiH MICS 2000 survey was calculated.^a

Taken together, these figures give an estimate of how far the BiH MICS 2000 survey contributed to filling data gaps in national reporting processes. For each of the selected indicators, if there was no alternative source at the time, the MICS data was considered to have filled a data gap.

2.4.6 Indicator trends over time

The relevant research questions are:

- Could time series data be produced over five yearly intervals between 1990 for the indicators selected?

The BiH MICS 2000 survey was conducted in 2000. Three additional 5-year time points were selected at five-yearly intervals. These were 1990 (pre-war), 1995 (immediately after the war), and 2005/6 (ten years after the war and five years after BiH MICS 2000). A five yearly-interval was a pragmatic one, matching the most likely points at which data was available.^b

- 1990 was the last year before the war in which relatively complete data was collected at the national level (apart from the census in 1991)
- No national level data was available during the war years, until the war officially ended in 1995 and the administrative structure was in place to collate national level data.
- A second MICS survey with largely comparable indicators was conducted in BiH in 2006.^c

^a Note: the global MICS 2 survey tool included more indicators than this. Some indicators were dropped from the BiH MICS survey itself due to irrelevance (for example, malaria does not exist in BiH) or lack of statistical power in the survey sample (for example, maternal deaths are too low to use with the BiH sample size).

^b Five years was also the interval until 2008 of the MICS surveys. They are now conducted at three-yearly intervals.

^c Some indicators can show changes within a much shorter period than five years (for example underweight is very time sensitive and can show changes within weeks or months,) whereas other may

For indicators from the additional three time points to be included, the following criteria were used:

- The indicator had the same definition as in the BiH MICS 2000 survey
- The measurement of the indicator was based on a national sample. In the case of data from 1990, BiH did not exist as a country so the Republic of Bosnia and Herzegovina was taken as the equivalent.
- The indicator could be disaggregated by gender.
- The measured indicator had already been included in a global database for national indicators, indicating that the measured indicator had been independently verified.^a

For each of the 32 selected indicators from the BiH MICS 2000 survey, a search was made for data from the three additional time points. For some indicators where there was more than one source of data and the results were not the same, the sources were noted, together with any disparities. A final selection was made based on what was used in the main international reporting database for the relevant indicator and topic area. The rationale for this was that inclusion in an international database means that a technical assessment on data reliability is like to have already taken place between international level and national experts about which data should be used.

2.4.7 Usefulness of the BiH MICS 2000 indicators

The relevant research question is:

- Were the indicators measured by the BiH MICS 2000 survey timely and relevant to BiH?

This is intended to measure the usefulness of the indicators. The BiH MICS 2000 survey indicators were primarily intended to fill data gaps in national reporting for the end decade goals of the WSC. The study examines the indicators from the perspective of national use. To be 'useful' at the national level, the indicators should

take years to show changes overall in the population (for example stunting takes longer than wasting to show changes)

^a The process of inclusion of national level indicators into global UN and other databases usually involves national screening and peer technical review by the database coordinators.

be produced in a timely manner, reflect changes over time, contribute to and match the national monitoring frameworks and make sense in the particular settings of BiH. For this a number of aspects of the indicators are examined.

The **timeliness** of the indicators was measured by time from measurement to production of data, and noting whether key time points for international and national policy processes were met.

The **relevance** of the indicators was estimated by examination of whether the indicators could show, or were likely to show, changes over time, were useful for national monitoring, and were relevant within the policy context of BiH as a post-conflict, middle-income country. (i.e. what did the data tell us about what we were trying to measure).

2.4.8 Strengthening of the health information system

The relevant research questions are:

- Did the BiH MICS 2000 survey lead to improved national capacity within BiH to conduct household surveys?
- Was the BiH HIS strengthened as a result of the BiH MICS 2000 survey?

The concepts of capacity building, institution building and systems strengthening have evolved over time within the development community. **Institution-building** originated in the 1970's as a more holistic and advanced approach to efforts previously classed as 'training'. Within the UN, this has involved building up the ability of basic national organizations, including in areas such as health, nutrition, education, to do their tasks well.

By 1991 the term **capacity building** emerged, coined to describe the assistance that is provided to entities, usually societies in developing countries, which have a need to develop a certain skill or competence, or for the general upgrading of performance ability, and a subsequent subtle change in emphasis was the recognition that most capacity is built by societies themselves. Philbin (1996) clarified that capacity building is the 'process of developing and strengthening the skills, instincts, abilities, processes and resources that organizations and communities need to survive, adapt, and thrive in the fast-changing world.'⁽¹³⁴⁾ **System strengthening** came into wider use from 2000

onwards, intended to convey an approach that aims at improving overall system performance.

Performance of a HIS should be measured not only on the quality of data produced, but on the evidence of the continued use of data to improve health system performance, to respond to emergent threats, and to improve health. Therefore, efforts to strengthen a HIS should be directed at improving its performance.

The BiH MICS 2000 survey was a major activity that can be viewed as a subset of the overall HIS in the country. Although not a specifically stated aim of the survey, this study examines in what ways the BiH MICS 2000 survey contributed to a number of strengthening the HIS, going beyond the provision of data and examine the wider and longer terms effects of the BiH MICS 2000. For this, the components and standards of HIS noted in the HMN framework for assessment⁽⁵⁵⁾ are used as the checklist for analysis. They are:

- HIS resources (effects on policies, financial and human resources, and infrastructure)
- Indicators (in the context of national HIS indicators)
- Data sources (contribution to extending the full range of HIS data sources including censuses, civil registration, population surveys, individual records, service records, and resource records. BiH MICS 2000 falls into the category of population survey)
- Data management (contribution to improvement of data management)
- Information products (what products were generated)
- Data dissemination and use (how the data and indicators from the survey were disseminated and used).

2.4.9 Lessons learned

The previous methods are directed at understanding specific aspects of the case. A final level of analysis aims at deriving lessons learned. The two relevant research questions are:

- What lessons can be learned and conclusions drawn for the future development of the HIS system and the future role of the MICS survey in BiH?
- What lessons can be learned and conclusions be drawn and lessons learned in relation to the development of HISs in BiH and in other post-conflict countries?

The lessons learned are drawn from a synthesis of the findings from the previous methods and a comparison with relevant examples and literature. They are presented within **Chapter 5** – discussion.

2.4.10 What this study is not

This study does not set out to cross-analysis data from the BiH MICS 2000 survey i.e. it relies on the indicators that were measured and reported from the study and does not attempt to draw out more. As it is based primarily on descriptive statistics, the study does not extend to extensive statistical analysis of relationships between the indicators that were measured within the BiH MICS 2000 survey and between that survey and the BiH MICS 2006 survey.^a Although it would be very interesting to compare data from the BiH MICS 2000 survey with MICS data from the same year in neighbouring countries or other regions, this is not within the scope of this survey. This kind of comparison using descriptive statistics can be done easily by examining the many league tables or indicator series that are available online.

The study does not set out to assess the status of the BiH HIS in great depth nor to present an exhaustive analysis of BiH health policy, legislation and decision-making structure in each of the health domains of the study, but to present key elements that relate to the argument presented. At some stage a formal assessment of the BiH HIS should be done, preferably as a multi-stakeholder participatory project using standard methodology from the Health Metric Network for this purpose.

The case narrative is presented in the next section, covering first the history and development of the MICS survey series, and then describing the BiH MICS 2000 survey itself.

^a This statistical analysis is more complex than it initially appears, and work may be considered in 2011 by the global MICS group to develop guidelines for how best to compare indicators over time between the MICS series

3 CASE NARRATIVE

Part A gives the history and development of the MICS survey tool is developed using a review of key documents and information gained during semi-structured interviews with key informants in 2005. The original research was conducted in late 2005 and subsequently updated.

Part B describes the case of the BIH MICS 2000 survey itself. The survey was planned in early 2000 and was completed within the calendar year 2000. The data was provisionally reported and data sets were prepared in October 2000 and a national survey report was published in March 2000.⁽¹³⁵⁾ ^a The case description sets out how MICS 2 was specifically adapted to the setting of BiH, and describes the key indicators that were measured and the key results that were obtained.

^a The survey report and data sets are available online at the MICS 2 survey at http://www.unicef.org/statistics/index_24302.html. Although the online version of the survey report is labeled as 'draft', it matches the final text of the published report, but omits the pictures that are in the final report.

Part A History and development of the MICS survey

3.1 Overview

In this section, the origins and development of the MICS household survey series are described.^a This is original work and is the first (and only to date) summary of the history and development of the MICS survey series.^b It is based on document review and interviews by the author with over 70 informants.

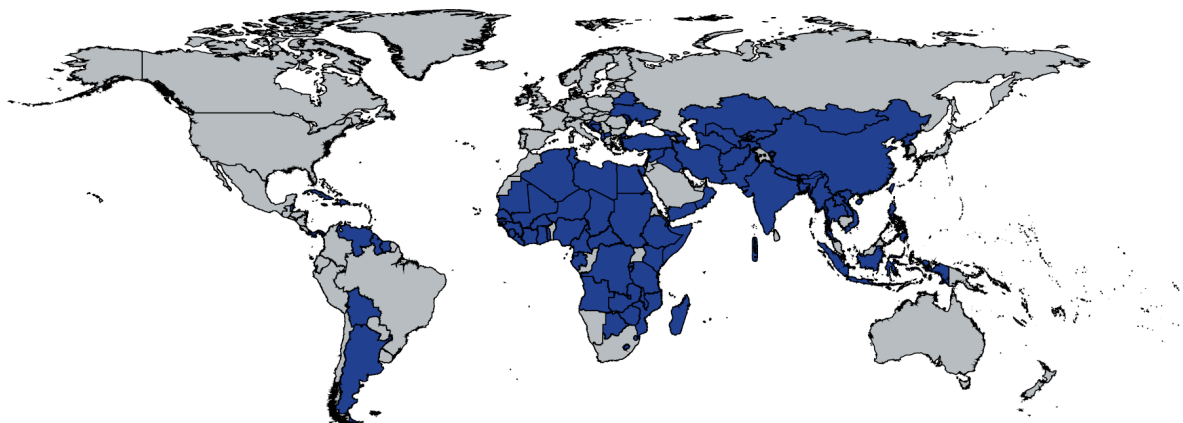
3.2 Global coverage of MICS surveys

MICS coverage in low and middle-income countries is extensive. There have been three rounds of MICS to date and a fourth has commenced. **Figure 10** shows the countries (in blue) that have completed a MICS survey in one or more of the three completed survey rounds to date.

^a To date there has been no published historical review of the MICS survey and few papers published about it, although there have been over 150 national survey reports produced across the three completed survey rounds. Institutional memory is lodged with a few key players at UNICEF Headquarters (HQ), Regional Office (RO) and Country Office (CO) level; there is rapid turnover of staff, especially at RO and CO level and amongst national counterparts. There has also been both migration and graduation of those involved with MICS – between the relatively few international organizations involved, between countries and regions and to positions that are more senior. Some of the evolution of MICS has been through various working group processes.

^b Much of the information in this section was obtained from document review, including of internal UNICEF memos, and personal interviews conducted by the author during a research sabbatical at UNICEF in late 2005.

Figure 10 Countries that have completed a MICS survey



Origin of the MICS survey

In the seventies and eighties UNICEF supported a series of non-systematic methods of survey-based data collection; MICS is UNICEF's first systematic effort at data collection that includes large numbers of countries. MICS was originally developed to support countries in measuring indicators to monitor the 1990 World Summit for Children, and was focused on developing countries where such data was absent or hard to measure. Over time, the MDGs and other goals and targets have all played a part in how MICS has developed and been used.

There are also several other monitoring efforts supported and led by UNICEF. The Child Rights Information Network (CRIN) collates and disseminates information in relation to child rights.⁽¹³⁶⁾ In Europe, UNICEF's Innocenti research centre in Florence maintains the TRANSMonee database, which includes a range of data relevant to the social and economic well being of children, young people and women in the countries of Central and Eastern Europe and the Commonwealth of Independent States (CEE & CIS).⁽¹³⁷⁾ UNICEF also produces an annual report on the State of the World's Children. The MICS data is an increasingly important component of this report.⁽¹³⁸⁾

There have been formal evaluations of the first series of MICS,⁽¹³⁹⁾ the third series of MICS⁽¹²⁴⁾ and some other evaluative activities.⁽¹⁴⁰⁾ These have been important in

documenting both the development and the results of MICS. **Table 9** summarizes the key reports.^a

^a There has also been a continuous feedback approach to evaluating and improving MICS helped by the fact that the small core team involved in MICS at UNICEF HQ has had few staff changes. Most of this informal evaluation and improvement has not been formally documented.

Table 9 MICS evaluations

MICS Series	Methodology	Areas covered	Comments
MICS 1 (1995/1996)	Desktop review of existing documentation. Questionnaire to all UNICEF offices (MICS and non-MICS). Key informant interviews (including 6 country visits)	Quality of MICS data and use in filling gaps Covered management, implementation, outputs, use of results, capacity building, future monitoring needs and costs	This was a largely internal UNICEF review with minimal external stakeholder consultations. Most recommendations were included in MICS 2 and MICS 3.
MICS 2 1999/2000	Concept paper for evaluation prepared		Evaluation not done due to lack of funding
MICS 3 2005/2006	Formal external evaluation by John Snow Inc., with advisory committee of senior academic, UN and other members. Nov 2007 - December 2008. Document review, stakeholder interviews, user questionnaire, data and sampling quality assessment. Six country studies.	Data quality, data collection and processing, use of MICS 3 data for monitoring, programming and policy development, data dissemination, organisational structure, organisational culture, resources, external environment and recommendations	An ambitious review. Feedback workshop at end of process.
MICS 4 2010-2011	Planned		

3.3 Structure of MICS

The structure of the MICS survey tool has remained the same throughout the four survey rounds, but the content has changed over time. The MICS survey tool is divided into modules, which are customizable. *Core* modules are essential for the survey and necessary for all countries. *Additional* modules contain essential information that is relevant only for some countries such as malaria and polygyny.^a Countries may decide which of the *optional* modules they include (for example,

^a A form of marriage in which a man has two or more wives at the same time. In polyandry, a woman may have more than one husband.

attitudes towards domestic violence; disability). Countries may also add additional questions and modules. Within MICS, there have been changes in the modules, the wording of questions and the definitions of indicators over time. The main types of changes have been:

- To harmonize with globally agreed definitions (for example, school attendance questions have been altered over the survey series)
- Redefinition to give better analysis and information (for example, the addition of “slab” to the definition of pit latrine in MICS 3)
- Additions in newly emerging areas (for example, child protection, child development, housing and socio-economic status).

3.4 Evolution of MICS indicators

There has been a global convergence in indicator definition over the lifetime of MICS. As household surveys have become more common, and also more widely discussed, MICS has contributed to, and also been influenced by, the international technical coordinating mechanisms with sister UN agencies and other technical groups such as the IHSN.

A full review of such changes is not presented here, but some indicative examples are given. For example, in relation to oral rehydration therapy (ORT), Macro^a now uses ‘child taking ORT’ rather than ‘child given ORT’, following discussions with UNICEF. Newer areas such as child development are included for the first time in a major household survey in MICS 3, together with discussions about whether such household surveys are the best way of measuring such indicators. The full range of questions needed to answer specific areas in depth cannot be included (for example, the child labour module in International Labour Organisation (ILO) questionnaires is as long as the entire MICS questionnaire), and so there was a cap held on the overall length of the MICS questionnaire by UNICEF. Another challenge was in the area of education, to actually extend indicators beyond access to school into areas such as attendance,

^a MACRO is the implementing agency for the USAID funded DHS surveys, seen by many as the “gold standard” of international household surveys for health and social indicators.

quality of learning, attainment and achievement. The need to measure disparities has led to the inclusion of a wealth index (trialed in MICS 2 and finalized in MICS 3) and in super-sampling to produce comparable data for specific sub-populations within a country (for example, the Roma in the Serbian MICS 3).

3.5 MICS survey tools

A manual has been prepared for each of the four MICS series. The length has been increasing between each and all four are available on Childinfo.org. They are revised between each series.

MICS anthropometry requires the measurement of weight and height of children up to the age of five. The weight scale recommended for all MICS fieldwork is the UNIscale. This was originally developed by the Program for Appropriate Technology in Health (PATH) and UNICEF with International Development Research Council (IDRC) support and is manufactured by SECA.^a The design has not changed during the lifetime of MICS. It is based on Australian technology, which was donated to UNICEF. It is easy-to-use, robust, relatively lightweight (4 kg) and so easily transported, small, looks like a common bathroom scale, and does not require special harnesses or pans, electricity or servicing. The scale is powered by a lithium battery sufficient for one million weightings and has a solar switch that turns the device on and off using ordinary daylight or the light from a normally lit room. UNIscales are not affected by extremes in temperatures or high humidity. Some countries, including BiH in 2000, used locally procured weighing scales when the recommended ones were not available on time or when there were budget limitations.

Children under five years have their length and height measured. The recommended measuring board is produced in wood. It is collapsible and produced by a range of suppliers, distributed by UNICEF Copenhagen or can be made locally according to a set design. Some countries in MICS 1 and 2 made their own boards locally. This was the case in the BiH MICS 2000 survey.

Data entry software is used to enter the raw data, check consistency of data from the field and assist with cleaning ready for use. Data analysis software is used to analyze

^a SECA – multinational company with headquarters in Hamburg, manufactures measuring equipment.

data and to generate tables. In MICS 1, there were no guidelines as to the appropriate software to use. A wide range was used by countries including EpiInfo, SPSS, D-Base, Access, Fox-Pro, IMPS and ISSA. At that time, national Statistical offices tended not to use EpiInfo and were more familiar with ISSA (from DHS surveys) and IMPS (from the Bureau of Census work). The evaluation of MICS 1 revealed some of the inconsistencies that arose as a result of the lack of control and support.

For data entry in MICS 2 a more limited approach was taken, and EpiInfo, Imps and ISSA were all customized for use in MICS. Group commercial software licenses were procured by UNICEF HQ and individual licenses distributed to implementing partners. Technical support was provided for all three programmes from HQ, which was time-consuming and did not allow for global “fixes”. During the regional data analysis workshops, the country teams that used ISSA had better and more usable data sets than IMPS and EpiInfo, in that order. MICS 3 used a new windows product called CPro (Census and Survey Processing System) for data entry in all countries. CPro is made by the companies that produced IMPS and ISSA and includes the best elements of both. For MICS 4, CPro version 4.0 is being used.

SPSS has been the main data analysis and tabulation software in MICS. It is powerful for cross tabulation as it can work in three dimensions. SPSS also has a limited module for data entry and this was only for data entry in a few MICS 1 countries. UNICEF HQ prepares SPSS syntax files for all the standard tables, and countries then customize these to fit their specific survey. For MICS 2 versions 10 and 11 and for MICS 3 Version 13 was used for data analysis in all countries. SPSS version 18 will be used for MICS 4.

3.6 Technical assistance

Training has become more systematic over the four rounds of MICS. MICS 1 introduced the concept of regional workshops, with a supportive approach by facilitators, who were mainly from UNICEF New York HQ or one of a small core group of consultants. It also introduced the basic concept of working through national partners and having a supportive UNICEF focal point from the relevant UNICEF country office participating and taking an overall coordination role. MICS 2 developed

this further and gave regional Monitoring and Evaluation (M&E) officers a key role in convening regional workshops. The three workshops were focused on questionnaire design, data entry, production of the preliminary report, and final reporting and dissemination. MICS 3 had four workshops on survey design, data processing, data analysis and report writing, and data archiving and dissemination.

3.7 Analysis of MICS data

After a completely open approach to data analysis in MICS 1, standard tabulation plans were introduced in MICS 2, although only for the household listing and for core modules. This improved the standard of analysis. The disability module, which did not have a standard tabulation plan, was barely analysed. Only 20 of the countries which included this module provided comparable data. MICS 3 had standard tabulation plans for core, additional and optional modules and as a result the standard of analysis was improved.

3.8 Reporting results

MICS 2 introduced templates for the preliminary and final country reports, which greatly increased their quality and readability. In each country, reports were produced in English (available on the UNICEF intranet) and in one or more local languages. A glossary of standard terms was made for MICS 3, with the intention to allow prior agreement at country level of the terminology and introduction of new terms as necessary.

3.9 Resources used

The budget for MICS activities and support managed by UNICEF HQ has always come from UNICEF Regular Resources (RR). There has been additional funding at Country level of RR and Other Resources (OR)^a allocated or raised by UNICEF

^a Regular resources (RR) come from UNICEF core funding and other resources (OR) from a variety of separate and/or earmarked donations.

country offices. In addition, there has been funding in kind from national governments and institutes such as technical assistance, fieldwork staff and office space.

UNICEF HQ Funding was provided in four allocations corresponding with the four MICS survey rounds. In between there was no dedicated MICS funding and the SIS section continued to work on MICS within their regular budget.

For MICS 1, country allocations were not planned in advance. An Executive Directive from the then Executive Director of UNICEF, Carol Bellamy, announced the survey and instructed country offices to allocate funds for MICS in the calendar year out of their own budget, leaving little time to fundraise or reallocate existing funds. ⁽¹⁴¹⁾

For MICS 2, there was more advance warning, and countries knew longer in advance that a MICS would take place. They were not told in advance that they would get funding for the survey. While some funds were eventually allocated from UNICEF HQ to country level, the majority of participating countries raised their own funds.

For MICS 3, countries were notified in advance that they could apply for around \$50,000 each, with more available for those with special needs. There has never been a separate appeal to donors to mobilise funds for MICS although some donors have been supportive of MICS in several countries, for example the United Kingdoms Department for International Development (DFID) and the Canadian International Development Agency (CIDA).

The evaluation of MICS 1 estimated the cost per survey to be 80,000 USD. For MICS 2, country averages were estimated based costs from the MICS 1 evaluation and from the advance budgets submitted by countries before commencing a MICS 2. There was no detailed estimation of cost per survey.^a The total cost of MICS 2 is unknown. The budget for MICS is not totally controlled by UNICEF HQ; it is decentralized to countries and regions. This is in contrast with DHS, which raises, oversees and monitors all aspects of the DHS survey budget via USAID. In estimating average costs per survey, the range in length of survey and sample size is high, so average costs are not very helpful. Further work has been undertaken in MICS 4 to estimate a cost per module or cost per question and so reach a standardized and comparable figure.

^a Detailed estimates were intended in the MICS 2 evaluation, which was planned but then cancelled.

Staff at HQ and RO level were assigned to the survey. Each UNICEF country office also had a survey coordinator, which was usually the M&E officer (if one was stationed there). Other staff at country, RO and HQ also devoted time to the design, consultation, coordination and management of MICS. Consultants were recruited on short-term consultant contracts at UNICEF HQ, RO and CO level.

3.10 Governance, management and partnership

Working relationships have evolved over each of the three MICS series. There have been issues over both ownership and acceptance of data. It was intended from the beginning that the countries themselves would 'own' MICS and so the main locus of organization and decision-making was at the country level. HQ and increasingly ROs have provided support and standard methodology and tools. Decision making over the technical areas of the survey was kept throughout a HQ level, although without a formally convened MICS management or steering committee, decisions were made in consultation between the managers of the MICS surveys and the chiefs of the Strategic Information Section (SIS).

Partnerships have also developed. At country level UNICEF originally worked with MOHs, now the main partnership is with national statistical offices (NSOs) and other UN agencies. Partnerships at the global level, within the UN family and externally with, for example, USAID and DHS/MACRO, have been strengthened via interagency working groups. Decisions affecting specific indicators in MICS are usually made in these groups.

3.11 Data publicity and dissemination

MICS has not had a separate publicity campaign but has been central to many of the global UNICEF reports and launches, and the data has been used in information campaigns with other agencies. MICS 3 saw an improvement data publicity, dissemination and use.

A website to host the MICS survey materials was developed in 1998 and hosted on the UNICEF external website under Child Information System (ChildInfo). The site has developed with each round of MICS.

A principle of MICS from the outset was to produce publicly accessible data. A formal request system by email for access to the centrally held data was established in September 2003, which allows some analysis of those requesting MICS data sets.^a The request format has remained the same and is described below.

Since 2003 researchers have been able to apply to UNICEF HQ via the MICS website to gain access to data sets but no compiled information is available before this date. Between 19 Sept 2003 and 17 November 2005, 580 usernames and passwords were issued. These provided access to all national data sets and are not time-limited. Between 10 and 15 requests were turned down during the period because the query was not relevant, for example people trying to find their relatives in Africa. A review of 100 sequential requests in 2006 showed that the majority were from universities in developed countries, usually students completing a thesis or academic staff undertaking research.^b

The IHSN introduced standards for the archiving and dissemination of international major household surveys and this has changed the archiving environment globally. The standards were applied from MICS 3 onwards.⁽⁹⁴⁾

3.12 Data use

The data generated by MICS periodically challenges official country data, by giving figures that are higher or lower than those collected by the country from routine sources. There may also be differences between the data from MICS and those provided by national authorities for global databases.

One critical area of divergence is the method used to measure maternal mortality. MICS used a differed method to DHS. Maternal mortality figures are underestimated in all countries. Reliable figures require accurate reporting of:

^a This could be evaluated further by review of the entries. However the request date is not standardized, there is no tabular presentation and cannot generate reports by category, so this might not yield much more useful information than that noted in this paper.

^b Personal study by the author.

- The overall numbers of pregnancy (many women may not know they are pregnant until the second trimester)
- the cause of death (women who die of complications of pregnancy may be treated away from the maternity unit and be recorded as dying of renal failure for example)
- awareness of the time factor (as death can occur up to 42 days after termination of the pregnancy)

The introduction of the sisterhood method allows estimate of deaths usually around 10-12 years prior to the event (i.e. death of the baby or infant). The publication of MICS data, which was often several times higher than either government or DHS estimates, has led to a wide debate on the ways in which maternal mortality is measured.

3.13 The presentation of data

As well as collecting data on children and women, UNICEF emphasizes the need for the presentation of data in graphs, tables, maps and charts. This is to help readers who may have varying degrees of technical skills to understand what the data represents, and to highlight changes and trends within the data. This approach is taken with all data, not just that from MICS.

Alongside developing MICS as a method of collecting primary data, UNICEF has also supported efforts to improve the display of this data and this history is relevant here. In the early 1990s, an initiative to centralize and display data in UNICEF's Middle East and North African (MENA) Regional Office led to the creation of a Data Entry, Enhancement and Display System (DEEDS). The purpose of DEEDS was to provide a mechanism for storing/updating statistical information and then presenting it in an easy to understand manner (e.g. as a graph, chart or map). However DEEDS did not extend beyond the MENA region. Eventually it was decided that this type of system fell within the scope of ProMS, UNICEF's programme management system, and should be included in a future release of this system. With the postponement of ProMS II no further action was taken and so the plans were dropped.

At about the same time, the nutrition and child development section, UNICEF India, set about developing a software package similar to DEEDS software. This new system was called *ChildInfo*. In 1995, ChildInfo was chosen as the platform on which to start building a South Asia region-wide database, managed collaboratively between ROSA and country offices. In a second phase, the East Asia and Pacific (EAPRO) and Eastern and Southern Africa (ESARO) regional offices of UNICEF embraced the system. Subsequently, it was adopted by the UNICEF Regional Management Teams and was then rolled out in these regions. There were other software developments over this time. One was *HealthMapper*, developed in the West and Central Africa (WCARO) regional office of UNICEF jointly with WHO. However, though discussed in a joint meeting between WHO and UNICEF in Geneva in 2000, no agreement was reached to develop software jointly. HealthMapper was developed further by WHO. It is now known as Health Atlas and is used and promoted extensively by WHO and UNAIDS^a.

ChildInfo provided a tool for building a comprehensive and up-to-date database on the situation of children and women. It was used by UNICEF offices and key government and civil society counterparts. ChildInfo provided a standardized environment to organize and document statistical data on the situation of children and women in the region, and present and analyse this information through a variety of presentation tools, including tables, graphs and maps. Data could be retrieved and used to monitor progress on reaching goals, including the MDGs, WFFC (World Fit for Children) and Medium Term Strategic Priorities (MTSP). A UNICEF Task Force was convened late in 2000 to present recommendations on the way forward. This led to a decision early in 2001 to conduct an evaluation of ChildInfo. A four-pronged rapid assessment on ChildInfo was initiated and led by UNICEF's Division of Policy and Planning (DPP), the designated owner of ChildInfo. The assessment was carried out jointly by UNICEF's Evaluation Office, Information Technology Division (ITD) and Division of Programme and Planning (DPP).^b

^a Source www.globalatlas.who.int

^b It contained four parts, which include the *Survey on the use of Child Information System (ChildInfo)* aimed at determining the level of usage amongst Country Offices, Country Teams, Governments and other partners. *Institutional assessment*: examining the performance and capacity of Community Systems Foundation (CSF), the organization that created ChildInfo and provides the main support to the

An assessment exercise on ChildInfo, in November 2002, revealed that 44 Country Offices were actively using the software package and another 40 Country Offices were in the process of implementing it and developing their database. It also indicated that a number of UNICEF field offices had effectively used ChildInfo as a tool for storing, retrieving and presenting data on a number of indicators to track progress towards the MDG, WFFC and MTSP targets. In some countries, the tool has been extended for use by UN Country Teams and by partners in government and institutions.

Overall, the findings of the assessment indicated that ChildInfo, with certain modifications, would be an appropriate tool for use by UNICEF and other UN agencies for tracking progress towards the MDGs. The undg Programme Group subsequently endorsed DevInfo, a modified version of ChildInfo.^a DevInfo is now rolled out worldwide, can be used to capture MICS indicators, and has been officially adopted as the UN's development information data display system and for monitoring MDGs by UN Country Teams. An advantage of DevInfo is that it is freeware. As data hosting software it can present data in different ways, but does not generate new data, and is dependant entirely on the data uploaded into it.

An evaluation of DevInfo in 2009, with the author as team leader, found that coverage of DevInfo in MICs and LICs was extensive but that despite officially endorsing it as the main data display system for the UN, the UN itself had not consistently implemented this decision. Alternatives were in use, for example HealthMapper was being promoted in some countries by WHO.⁽³⁰⁾ UNICEF was seen as the main agency implementing and supporting DevInfo. BiH planned to launch a DevInfo database including MICS data from 2000 and 2006, but as of June 2010 had not done so.

In terms of the direct display of the MICS datasets, an important internal step for MICS was the introduction of the MICS compiler in 2009. This is a user-friendly online interface that allows the data to be queried and tables and graphs to be generated

software's implementation and adaptation. *Contractual assessment*: the review of the contractual arrangements, including costs, between UNICEF and CSF. *Technical evaluation of ChildInfo*: focusing on the structure and functioning of the software

^a UNICEF infonet, DevInfo <http://www.intranet.unicef.org/imu/libweb/devinfo.htm#what>

3.14 Concluding observations on the MICS survey tool

At the global level, MICS data, particularly from MICS 2 and 3 onwards, has proved essential for State of the World's Children reports, country reporting on the status of children to the UN and the completion of global indicator data bases. There has been less use of MICS data in national monitoring country. Through each series, the complexity of the survey has increased.

Access to MICS data for research and further analysis is tracked only at the global level; the majority of requests are from undergraduate students and staff in developed country universities and international agencies. Anecdotally, the use of data at country level is patchy but improving. Ownership of MICS 1 and 2 data was an issue in some areas. Some countries disagreed with the data produced where it was less positive than official sources and not all allowed access by others to the data.

The main lesson learned is that UNICEF can and does deliver a global household survey of high quality on a relatively low budget, despite lack of continuity in planning and funding and competing priorities. The data is not maximally used and the survey tool is becoming increasingly complex and time consuming. MICS has given UNICEF credibility in terms of defining global indicators for children; the organization can speak from a point of technical knowledge in indicator measurement and has been able to significantly affect global indicator definitions.

UNICEF has moved from a five-yearly to a three-yearly survey series commencing in 2010 with MICS 4. This raises issues of country office capacity and time, cost and how to manage an operation of this size. Mapping of the rapidly changing external environment is central. MICS offers many opportunities but also some risks and the main one is loss of institutional memory as the country teams and RO advisors change.

The indicators MICS measure are now central to and match the monitoring specifications of progress against WFC goals, UNICEF's Medium Term Strategic Priorities (MTSP's), PRSPs, MDGs and others. The external environment is changing with UN reform, the growth of globally comparable data sets, and the increased drive for results measured by indicators.

Some resulting trends in MICS are:

- MICS is increasing in size and in some ways is becoming 'a victim of its own success' - the number of modules is growing to match the interest areas and data needs of various key interests and processes (international, UNICEF, UN, country level). As with all household survey series it is under increasing pressure from the increasing number of indicators that can or should be included.
- The MICS questionnaire is getting longer and more complicated. The interview time has increased, the statistical analysis is more complex, and the analysis of results provides greater possibilities for analysis of results. MICS3 is also more demanding in terms of fieldwork organization, sampling, customization of questionnaires and so on.
- Compared to other similar international household survey programs, MICS3 tools are still relatively simple – in terms of the length of questionnaires, the way and detail with which indicators are measured, and the options that it provides to participating countries to tailor the questionnaires to their needs, by deleting and choosing not to include modules. International household survey programmes such as DHS, LSMS, WHS use larger questionnaires.
- The survey uses an indirect approach to mortality estimation rather than a birth history approach; the reasons behind this decision are best discussed in detail elsewhere.
- A greater range of age groups has been introduced in the survey. The age range surveyed extends outside UNICEF's 'traditional' group of children and child-bearing women. This enables a more comprehensive and family centred perspective and is noted in the newer areas in MICS 3 such as disability and child discipline. While some of these groups may not have been used in previous MICS, they are target groups of UNICEF.
- There is increasing tension between keeping the original indicators (so allowing comparison over a long time frame), and modifying them to suit newer global indicator development (bringing in more relevant indicators for development in areas such as MDGs). There is also tension between providing globally comparable data and answering questions that countries set themselves.

- MICS is extending beyond the original national and sub-national representative sampling – for example MICS 3 in Serbia and Montenegro oversampled Roma in settlements.
- There are several options for incorporation of the MICS indicators into other national data monitoring processes including other household surveys such as DHS, population censuses and standard of living surveys. At some stage middle-income countries will probably need to ‘graduate’ from MICS towards their own national systems.
- MICS is getting more expensive. Funding sources are increasingly varied and include UNICEF, other UN agencies, governments, and donors.

Part B The BiH MICS 2000 survey

3.15 Overview

This section contains a description of the BiH MICS 2000 survey.^a The author's role in the survey is presented, followed by the survey timelines. The approach that was taken to interviewee consent and the government approval and release of the BiH MICS 2000 survey data is documented. The overall design of the survey is described, focusing on the modifications to the global MICS 2 approach. Particularly relevant design features were related to governance and management, resources, sample size calculations, construction of the sampling frame, questionnaire design, training, fieldwork, data entry and analysis. These sections are expanded from the national survey report. Finally, the specific definitions used and methods of calculation for each of the 32 indicators measured in the BiH MICS 2000 survey that are used in this study are described.^b

3.16 Reasons for conducting the BiH MICS 2000 survey

These were several reasons for conducting the BiH MICS 2000 survey itself. In 2000, five years after the conflict had ended in BiH, there were gaps in key population-based indicators for children and women and the country was overdue on meeting its commitments to report to the UN on progress towards meeting end-decade goals for children. These gaps could potentially be filled using the UNICEF MICS 2 survey tool and so it was locally adapted and implemented.

As previous post-war efforts to conduct national level surveys had failed, the international community was interested in having a model of survey implementation that could provide data at the national level and create a working partnership between

^a Aspects of methodology are also presented in the BiH MICS 2000 survey report, however they are substantially expanded here.

^b This section closely matches the methods in the BiH MICS 2000 survey report, but as the definitions and methods of calculation are central to this study they are reprised here.

the Entity level statistical bodies. This was in line with the overall mission of the UN and EU in BiH to support nation building and further democracy. UNICEF in particular and the UN in general wanted to strengthen local data capacity by emphasizing local ownership and implementation, supplemented by UNICEF guidance and support and the MICS implementation model suited this purpose.

3.17 Role of the author in the BiH MICS 2000 survey

The role of the author of this study was to manage the BiH MICS 2000 survey from initial design through all aspects of the survey implementation through to publication of the final survey report. Her specific contributions were as follows. She designed the survey governance structure and led all political and organizational negotiations required for the survey implementation. As chair of the national survey management committee she was responsible for day-to-day running of the survey, design and monitoring of the contractual oversight, the mobilization and disbursement of funds, and ensuring that targets and goals were met.

The adaptation of the generic global MICS survey tools to suit BiH was led by the author, who also oversaw the design of the sampling approach for the MICS 2000 survey, ensured that the two Entity databases matched and performed quality control checks at all levels of the survey. The author completed the analysis of the national level data set and as first author wrote the final report for the survey,⁽¹³⁵⁾ sections of which are quoted throughout the results chapter of this study.

In **Appendix B** a complete list of all survey personnel and consultants are given, Particular contributions made by individuals to the BiH MICS 2000 survey are recorded in footnotes where relevant, and in the acknowledgements section of this study. Of note were the assistance of the sampling expert (Anthony Turner), the peer support and technical review provided at three regional workshops, and the technical support and guidance of the MICS unit at UNICEF HQ.

3.18 Survey timeline

In 1998, UNICEF embarked on a process of helping countries assess progress for children at end-decade in relation to the *World Summit for Children* goals agreed in

New York, in 1990. An Executive Directive (ExDir) announcing the MICS 2 survey series was issued by Carol Bellamy, then the Executive Director of UNICEF on June 21, 1999.⁽¹⁴²⁾ Following this, individual countries decided if and how they would participate. In BiH, the UNICEF country office internally discussed the project first including the organizational arrangements that could potentially work, given the complex administrative structure of the country. Discussions commenced internally within the UNICEF BiH CO and with national partners who had previously implemented entity-level household surveys and in January 2000 a workplan was formulated by the author.

A series of informal meetings then took place, a project coordinator was identified in each entity and implementing partners selected. Meetings with each implementing partner were held with draft operational plans and a governing structure was designed. Formal contracts were exchanged in April and May 2000 and the specific roles for the entity teams were then finalized. Three regional training and peer review workshops were held for the 10 country teams in the region, in Geneva (twice) and Istanbul in May, June and September respectively.

Fieldwork was completed in July and August 2000. It was anticipated that conducting the MICS survey during the summer months might affect the response rate. In practice it did not, and as we will see later there was an exceptionally high response rates of 98.2% households and 99.2% for children. Likely explanations include the very low availability of pre-school education, few people travelling due to ongoing security concerns, and lack of funds for summer holidays, combined with concerted follow-up by the field teams to obtain anthropometry measurements when children were not present at first interview.

Provisional data sets were available in November 2010 in time for the preparation of the BiH end-decade report.⁽¹⁰⁸⁾ The final survey report was published in April 2001.

3.19 Ethics, consent and public information

There was no formal ethics approval process at either the national or international level for the BiH MICS 2000 survey. There was no requirement, nor was there any recommendation in the MICS 2 survey manual, to seek written consent from participants.

A public information campaign preceded the fieldwork in each entity. The survey was announced on the relevant local radio station. Informants were advised as follows by the interviewer: ‘all the information we obtain will be strictly confidential and your answers will never be identified.’^a If further information was sought, informants were advised that the data files were stored with a coded file number only, so that individuals and households could not be subsequently identified.

Data availability had been an issue in BiH, even with national vital statistics data, and was further complicated by the weakly connected administrative structure and fractured data collection and reporting system. To ensure public access to the survey data sets, official government consent was included in a tripartite Memorandum of Understanding (MOU) signed in advance between the two entity implementing partners and UNICEF. The entity implementing partner in the FBiH was the Public Health Institute on behalf of the Ministry of Health. In the RS, the implementing partner was the Ministry of Health and Social Welfare. This MOU confirmed that the BiH MICS 2000 dataset, when it had been officially authorized, would be freely available to legitimate users on request.

Open access to the datasets was also discussed, confirmed and recorded in the minutes of the first steering committee in each entity. As these two entity Steering committees comprised representatives of the key ministries and institutes, this approach was specifically designed to preempt any data access problems. As the BiH MICS 2000 sample was not representative below entity level, no mechanism was put in place to ensure approval at either Cantonal level in FBiH or in the District of Brcko.

The national level dataset is available online from the ChildInfo MICS 2 website.⁽¹⁴³⁾ On completion of an online registration form, which includes a short description of the purposes to which the data will be used, access is granted to any user by email and they can download the dataset.

^a This was printed in the introduction on page 1 of the questionnaire and read out by the field interviewers on first contact with the household.

3.20 The MIC 2 global methods framework

The global methodology for the MICS 2 survey series was designed to be adapted to meet the particular circumstances and needs of each participating country. Each country had to decide how to construct the survey team and agree on local governance issues, decide which modules to produce and the extent to which the questionnaires and software should be customised, select and train the survey teams using modified and translated training materials, implement the survey, collect and analyse the data and present the findings.

The MICS 2 survey manual and survey tool can be found on the main MICS site at www.childinfo.org.⁽¹⁴⁴⁾ Guidance in this manual was provided on most aspects of the process including the decisions to be made before starting the survey, drafting the questionnaire, designing and selecting the sample, preparing for data collection, conducting the fieldwork, analysing the data and producing the survey report. A set of tools were provided within this manual, and included a draft questionnaire, guidelines for training and for quality control in the field, software for data entry and analysis and an outline report format.

Guidance on survey implementation and peer discussion with other countries in the region also conducting a MICS 2 survey^a was provided at *three regional workshops* held during the survey process. The three regional workshops were organised by the UNICEF HQ MICS team and included external consultants. The topics of the three workshops were 1) questionnaire modification, training and field work 2) data entry and 3) data analysis and report production.

3.21 Modifications to the MICS 2 survey tool

The BiH MICS 2000 survey was designed using two linked entity level teams. These worked to the same timelines and used the same tools. The BiH MICS 2000 survey was designed to produce an officially endorsed national MICS survey report.

^a The peer countries who also attended the three regional workshops were Afghanistan, Albania, Azerbaijan, FYR Macedonia, Federal Republic of Yugoslavia, Georgia, Mongolia, Tajikistan, Turkey and Uzbekistan.

Modifications were made jointly to the global MICS 2 methods and both teams participated in the management committee and attended all three regional workshops.^a How this was achieved and what was actually done is described in the next sections.

3.21.1 The approach taken to reach agreement

From the outset, a **single negotiating text strategy**^b was used to secure the cooperation of both entities. This is a form of mediation that employs the use of a single document, that ties in the often wide-ranging interests of stakeholders in a conflict. 'Parties to the conflict add, subtract and refine the text, which represents a *placeholder agreement* and is intended to be the foundation for a final ratified agreement. However, since all parties must agree to the final document and offensive entries may lead to a cessation of the process, disputants must also be sensitive to how their changes to the text will be perceived by the other parties.'⁽¹⁴⁵⁾

Using a single negotiating text encourages parties to focus on common interests rather than competing ones; it helps disputants shift their attention from grievances and ill feelings of one another toward areas of agreement, mutual recognition of responsibilities and potential solutions. Smith et al (2005) of the International Negotiation Network, describe the process of using a single-text negotiation. They suggest that 'a third party manage the development of a single working document that reflects the issues and interests mutually held by the disputants, in an effort to better dovetail the interests of the parties to expose the areas of agreement.'⁽¹⁴⁶⁾

The single text used for the negotiation comprised the MICS 2 survey tools and any, and all, national modifications were treated as alterations to the single text. UNICEF (and more specifically the author) took the role of third party in the BiH MICS 2000 survey and this role will be described more fully later.

^a An exception was made in the case of BiH to have double the number of participants than other countries at the regional training workshops. This increased the total costs of the process and the additional costs were borne by UNICEF.

^b This approach was first studied by the author in her negotiation analysis classes at the Kennedy School of Government in 1990 as part of a Master's degree in Public Health at Harvard. The specific course included analysis of the multilateral Law of the Sea negotiations in the 1970s and 1980s.

The approach taken created two ‘mirror’ entity teams with separate but linked survey implementation. Each entity was able to produce its own separate dataset and survey report and the two entity datasets could later be combined to produce a single national dataset, thus satisfying both entity calls for a separate report and the internationally required country level report.

At each stage of the negotiations and discussions, the MICS 2 materials were presented and deviations from them were discussed and agreed jointly. Movement to the next stage did not proceed until agreement on the current stage was reached. Within that goal, the needs of the two entities, FBiH and RS, to have a separate entity level report were also addressed.

3.21.2 Governance

The principle of national ownership is a stated emphasis of the MICS approach, and so governance here is discussed first in relation to the country and then in relation to global governance and the control mechanisms in place within UNICEF.

Appendix B details the governance and management structure at the national level, including terms of reference for each committee. Nominally, the BiH State level report was overseen by the BiH Agency for Statistics, however this body made no substantial inputs to the work and acted as an approval body only. A team of three experts, one from each of the constituent political/ethnic groups (Bosnjak, Serbian and Croatian) in the country held a rotating leadership, in a model quite frequently found in the post-Dayton State level structures.^a Different institutional options were investigated (including the office of the Presidency) for the final national endorsement. The BiH Agency for Statistics was politically weak, possessed authority in name only and had no connection to developing policy for health or other services at the national level, nor to any line ministries (all relevant ministries were at entity level or below). However it represented the best available institutional ‘fit’ at the national level and the risk of the BiH Agency for Statistics hindering the work, blocking the survey altogether or

^a This is described in detail in the introduction section. Political or ethnic ‘balance’ was considered first in senior appointments within the government structures at all levels.

withholding final approval was deemed to be low.^a This decision was also supported by UN policy to work with and strengthen the post-Dayton administrative structures established at the national level.

The selection of the survey implementing partner in each entity took into account the complex political and administrative structures within the country, and required extensive consultation by the author in advance. In the FBiH, the Federation Public Health Institute (FBHI) was selected to conduct the survey on behalf of the lead institution, the FBiH Ministry of Health. In RS, the lead institution, the RS Ministry of Health and Social Welfare, directly conducted the survey. The choice of these two implementing partners was a practical one based on their capacity to implement the survey.^b

Each entity established a Steering committee comprising staff from key ministries, other organisations and UNICEF, and chaired by the entity lead ministry. Efforts were made to ensure that the steering committees would not block or disrupt survey implementation. Attention was therefore paid to ensuring that 'constructive' individuals (where possible) were included in the committees^c

Efforts were also made to ensure that the survey team leaders and survey members in each entity were competent and qualified. Given the very low salaries for staff in the public sector, internationally funded projects, programmes and surveys represented considerable financial and professional opportunity. 'Ownership' of such opportunities was usually assumed by senior staff, who then passed the work to selected mid-

^a The previous, failed efforts to conduct national household surveys were usually blocked above Entity level, often through lack of a clearly designated approval body, or disruption by individuals or institutions at the Entity level, usually in the RS, and often citing procedural reasons.

^b At the time, the RS Statistical Office, which had been formed during the war, was deemed too politically unstable and technically weak to undertake the survey as implementing partner. They were included at Steering Committee level in the RS.

^c This is a personal and undocumented note from the author. It was well known at the time that certain individuals in positions of authority were not interested in cross-entity border collaboration of any kind, and others would expect payment for giving approval. Therefore, the author consulted closely with colleagues within the UN, local institutes, ministries, and the two designated Entity survey team leaders to achieve a working solution.

career or junior colleagues, who were often selected on the basis of loyalty or allegiance rather than competence.

The approach taken by the author was to present the BiH MICS 2000 survey as largely a training opportunity for mid-career professionals and one where senior staff should have an oversight role on the steering committees and not a day-to-day role in implementing the survey itself. This broke with the usual practice at the time.^a The author further appealed to national pride by insisting that such mid-career professionals would be able to deliver the first ever survey at the national level. The author further posed an option of engaging a foreign consultancy firm to complete the survey in the event that the entity bodies were unable to create a working structure and that included effective survey teams with technically competent members.^b

At the international level, there was some degree of governance although no formal structure was in place. The UNICEF HQ MICS unit oversaw all of the MICS 2 national surveys. Although UNICEF did not have a formal role in endorsing or approving the survey, they did give guidance on data quality, and on whether the standards of the MICS 3 series overall had been met.^c The importance at the national level of having UNICEF 'approval' of the data was to have an independent sponsorship of the survey approach, and this was useful at times when the local processes were deadlocked or agreement could not be reached.

^a The financial incentives for being a budget holder for international projects were considerable. A source of frustration for international development workers in BiH in 2000 was the control of international project budgets by senior individuals in a position of power, who were then able to further leverage their position by control of these funds. Not all of these senior individuals had the skills required to deliver results on such projects, which led to frustration and failures on both sides.

^b This was the option used in Afghanistan and was proposed for other countries with challenging national structures or circumstances. The author reasoned that engaging a foreign consultancy firm would remove the stream of funding altogether from local control and would also remove an excellent professional training opportunity from talented mid-career professionals in the country who had had few such opportunities over the preceding decade.

^c During each survey round, the UNICEF HQ MICS unit queried one or more of the national surveys and where they deviated substantially from the MICS approach and methodology or had serious data quality problems, the official endorsement of UNICEF was withdrawn.

3.21.3 Management

On a day-to-day level, the BiH MICS 2000 survey was run by a management committee, comprising key members of each entity survey team and UNICEF staff, and this was chaired by the author. The management committee allowed practical liaison between the two entity teams to ensure that the questionnaires were effectively identical and that identical methods were used for training, fieldwork, quality control and data entry. In each entity, there were separate training, fieldwork, data entry and analysis teams, and these were required to mirror each other in their approach.

An important feature of the BiH MICS 2000 survey was the use of staged contracts. The UNICEF BiH country office signed a separate agreement with each entity implementing partner. Payment at each stage was contingent on meeting agreed phased outputs including completed meetings of the steering committee with signed minutes, piloting of the questionnaire, and completed training, fieldwork, data entry, reports, data sets, and analysis. Deadlines for each phase were included in the contract.

These staged contracts were an essential local survey design feature and were central to the success of the governance model and the effective application of a single negotiating text strategy. Prior to this, payments to the entity statistical offices or other implementing partners for surveys had been based on advances for survey costs with no direct linking of payments to outputs. This contractual approach clarified a results-based payment schedule and provided leverage to deliver the survey on time, on budget. It also helped ensure that survey funds were used for the method intended.^a

3.21.4 Resources used

Resources in cash and in kind were obtained from the following sources. UNICEF HQ provided a grant of 80,000 USD, and a direct donation of 200,000 GBP was received from the Department for International Development UK (DFID UK). These funds were used to pay for the survey teams and were disbursed via two contracts, one to each

^a It is not possible to confirm this absolutely, but informal communication by the author with the survey teams confirmed that leakage of funds was less than in other projects.

entity implementing agency. Disbursement was based on outputs to ensure that each step was completed.

The UNICEF country office provided in-kind support with a survey leader (the author) at 50% of her full time equivalent work for a period of ten months. Other staff members were co-opted to assist with the sampling methodology, committee work, survey design and field monitoring.

At the national level, members of the various management and steering committees were unpaid, although unofficially an undisclosed amount of the funds assigned to the survey teams was diverted as ex gratia payments to some individual members of the committees to ensure that the process went smoothly.^a

The use of two separate entity teams necessitated increased costs. There was duplication at each stage of the survey, including for questionnaire design and translation, training, fieldwork, data analysis and entry, survey management and steering committees. The sample size was larger than would otherwise have been needed, as it had to be representative at entity as well as national level. Two survey teams had their expenses covered to attend the three regional workshops. Additional time and financial resources were required to merge the two entity data sets. Three separate reports were produced, one at the national level and two at the entity level. This increased direct expenditure and the use of in kind resources including that of government and UNICEF staff time.

^a The issue of such payments is a complex one. Immediately after the war, many relief efforts, including those of the UN, make ex gratia payments or direct consulting fees to government officials and some officially pay “top up” salaries to government workers. UNICEF’s policy is not to do this, and to phase out any payments made during the emergency period. However, BiH officials had come to expect to be paid for what was seen as UN work and so phasing out payments was difficult. There was also a culture of blatant corruption, which at times also applied to requests for officially produced data. The view of local people was that such requests, and indeed the MICS survey itself, was additional to their normal work and required remuneration. This contrasted with UNICEF and the UN’s view that these surveys were the direct work of the government agencies to enable the country to report on its global agreements and to monitor the health and social status of children and women. Thus, the payment issue could and did distort local ownership. This is explored further in the discussion chapter.

3.21.5 Approach to sampling

An important feature of the national adaptation was the sampling. The **sample** for the BiH MICS 2000 survey was designed to provide statistically valid estimates of the selected indicators at the national level, for urban and rural areas, and for the two entities.^a

Due to political and organisational constraints, the separately administered district of Brcko in the North East corner of the State was not included in the survey. The population of Brcko, estimated at 26,000 in 2000, was too small for the methodology of MICS to be used in a standalone survey. The survey tool did not allow for such a small number to be sampled separately and to produce valid rates for any of the indicators. The complex relationship between Brcko and the two entities (described in the introduction chapter) did not allow the population of Brcko to be included into the sample from either of the two entities. There was no impact statistically on the exclusion of Brcko from the data as the population was excluded from the denominator estimates.

The BiH census of March 1991 was the last population census before war broke out in 1992.^b **Table 10** below gives data from this census and population estimates for 1999, prepared by the two entity level statistical offices. As the best available official data, these were used for the basis of survey planning and sampling estimation for the BiH 2000 survey.

Table 10 The population of Bosnia and Herzegovina in 1991 and 1999

	1991 Census	Population estimate 1999*
Federation of Bosnia and Herzegovina	2,717,868	2,259,902**
Republika Srpska	1,619,165	1,410,727***
Total	4,337,033	3,670,729

^a As noted in the acknowledgements, Anthony ‘Tony’ Turner provided assistance with the sampling approach in this survey.

^b As of September 2010 there has not been a population census of BiH and none are planned.

** Population estimates officially provided in 2000 by the Statistical Offices of FBiH ** and RS*** using projections from 1991 census, adjusted using local measures of migration and displacement and municipal registration data where available. These estimates are acknowledged as being approximate.*

The populations of the two entities pre-war had to be estimated, as these exact boundaries did not exist pre-war. An estimated 2.2 million people from BiH became either refugees (1.2 million) or internally displaced (1 million) during the 1992-1995 war. By the end of the war, 90% of the pre-war Bosnian Serb population had left the area now called the FBiH and over 95% of pre-war Bosnian Croat and Bosnian Muslim inhabitants had left what is now the RS.⁽¹⁴⁷⁾ Population movement continued in the following decade.

The general approach to sampling is described in the MICS 2 survey manual. However the application of this approach was not straightforward in BiH, which had no existing sampling frame, widespread destruction of housing units during the war, and newly drawn internal boundaries.

In order to give results that would be statistically significant at entity level, the required **sample size** was calculated using the least frequent variable selected for the survey, namely the DPT immunization coverage rate.

BiH had low reported birth rates after the war and had not experienced a post war birth 'boom'. Due to the low rates of birth, infant mortality and maternal deaths, neither infant mortality nor maternal mortality were included in the survey.^a The sample size calculation is explained in detail next.

The required sample size for BiH was derived by applying the following equation:^b

$$n = 4 (r) (1-r) (f) (c) / (e^2) (p) (n_h)$$

^a The sample size required would have been four to five times greater than the sample size eventually used.

^b This calculation of sample-size for the BiH MICS 2000 survey is based on Annex VII of the UNICEF MICS 2 Manual.

$n = 4 (0.6) (1-0.6) (1.75) (1.12) / (0.05^2) (0.02) (3.40) = 11.068$, where

n (11.068 – rounded down to **11.000**) is the required sample size (number of households at national level) and is calculated from:

4 is the normal distribution factor required to achieve a 95 percent level of confidence;

r (0.6) is the indicator rate;

f (1.75) is the design effect factor;

c (1.12) is the non-response constant;

e (0.05) is the margin of error to be tolerated;

p (0.02) is the proportion of the target population group (one-year-old children);

n_h (3.40) is the average household size.

Below there is an explanation of the data used to estimate each part of this equation

4 = Normal distribution factor

The distance of the variances on either sides of the mean, so that approximately 95% of the area under the normal distribution curve is enclosed.

r = Key indicator rate

The DPT coverage rate was selected as the key indicator, because DPT immunisation is the least prevalent, and it relates to the smallest target group (children aged up to 12 months). The DPT coverage rate was officially estimated by nationally reported data to the FBiH Public Health Institute to be over 90%. The empirical data, however, indicated that the actual coverage rate may have been much lower, as explained next.

Sarajevo Canton immunisation results showed that 4,590 out of 6,662 (68.9%) children received DPT vaccine in 1999.^a As Sarajevo Canton – compared to the rest of the country – was well served with public health facilities, the immunisation rate for the country was likely to be even lower. A figure of 60% was taken to be representative

^a Data obtained by manually checking the unpublished records.

of the country as a whole for DPT vaccination by age 12 months. It is possible that the real figure might have been even lower.

An alternative method would have been to select BCG coverage. The official FBiH summary data indicated that the coverage rate for Sarajevo Canton was 74.2% in 1999. From the birth rate, it can be calculated that the actual percentage of newborn babies who were immunised may have been as low as 40.4%. The BCG coverage figures, therefore, are less reliable than those for DPT.

As it was important for this survey to take a conservative but realistic estimate for the indicator rates, a figure for r of 60% was used.

f = Sample design effect factor

This is the variance increase factor required to compensate for sample *design* in comparison with a simple random sample.

c = Non-response constant

The non-response constant was reviewed at the pre-testing stage of this survey and in a UNICEF supported surveys on breastfeeding and iodine deficiency in BiH based on MICS methodology. Three percent of households surveyed in the FBiH were non-responders, and 14% in the RS. In the 1999 RS Breastfeeding survey, (sample size 2,800 households), the non-response was found to be 8% of households surveyed. As the MICS sample plan and questionnaires are much more complex, with countrywide coverage, a conservative non-response factor of 12 % was used.

e = Margin of error

A standard statistical margin of error of 5% (or 0.05) was used, as is also recommended by the global MICS methodology. It gives an acceptable confidence interval around estimates from the sample.

n = Average household size

The precise size of the average household in BiH was not known. Available estimates of average household size included:

2.27 in RS (RS MICS pre-testing);

3.37 in RS (RS 1999 UNICEF supported Breastfeeding survey);⁽¹⁴⁸⁾

3.50 in the Federation (Federation MICS pre-testing).

The official demographic trends were quite reliable with respect to this factor, and indicated that the RS 1999 Breastfeeding survey results were likely to be accurate for RS household size. The average household had traditionally been slightly bigger in the geographical area of the FBiH. Therefore, the average household size for the country was estimated to be 3.40.

p = Proportion of the target population

There were no official data on the proportion of one-year-old children in the population. The available estimates included:

1.12% (derived from vital statistics indicators);

1.50% (unofficial estimate of the RS Statistics Institute);

1.70% (results of the RS Breastfeeding survey);

1.42% and 2.82% (BiH MICS 2000 survey pre-testing in the FBiH and RS respectively).

Therefore, a conservative figure of 2% (i.e. $p = 0.02$) was used.

3.21.6 Sampling frame

In developing the **sampling frame**, perhaps the most challenging technical aspect of the survey, several options were explored. The previous census of the Republic of Bosnia and Herzegovina in 1991^a was available and had detailed household listings, but they were no longer useful due to population shifts. Only the census enumeration areas and maps had some value. A population census was carried out in RS in 1996, however there was no equivalent in FBiH and basic demographic data for the FBiH was unavailable. A household database, developed by the Organisation for Security and Cooperation in Europe (OSCE) during the national post-war elections in BiH, was

^a As explained in the introduction chapter, this was the pre-war political structure with the Socialist Federal Republic of Yugoslavia and the geographical boundaries matched the current boundaries of BiH.

examined but found to be substantially incomplete. It was decided to create a new sampling frame using the best available pooled information from a number of sources.

The sources were:

- Results of the 1996 population census in the RS
- Population estimates for 1999 at the municipality level, provided by the statistical institutes of both entities
- Census enumeration areas and maps from the 1991 population census
- Lists of voters, provided by the OSCE
- Results of previous UNICEF supported surveys (1999 breastfeeding surveys in both entities, MICS pre-tests)
- Results of the 1991 BiH population census
- List of inhabited settlements produced by the Republic of BiH Statistical Institute 1998

Stage 1: The geographical area of BiH (with the exception of Brcko district) was selected. The enumeration areas from the 1991 census were taken as the basis for developing the sampling frame. This was updated in the Federation using three additional sources of information: the OSCE voter lists, population estimates from UNHCR and municipality registration data. Additionally, the sampling frame was adjusted in RS using the results of a 1997 census of refugees and displaced people.

The entire geographical area of the survey was then divided into segments using probability proportional to size at the municipality level. Each segment covered approximately 110 households. The segments were then randomly selected and an additional number of alternate (reserve) segments were identified so that in the case of a segment being unusable (for example, empty or mined) an alternate segment could be assigned.

Stage 2: The second stage of sampling involved household listing within each selected segment and then random selection from these household lists for families to be interviewed.

The fieldwork teams travelled to their allocated segments and made a listing of all households in each of the selected segments. To do this, the fieldwork supervisors, with assistance from the Entity statistical institutes, updated the old maps if necessary,

and in some cases made new maps. Segments that were empty of households, had fewer than 80 households, or that were heavily mined, were excluded and an alternate segment selected from the reserve list. A random sample of 20 households was then made from the household listing of each of the segments used.

The previous text describes the sampling plan. During the implementation of the sampling, adjustments were made to the sampling plan and these are described in detail in **Appendix C**.

Finally, it should be noted that some alternative sampling approaches were considered but were not taken. No attempt was made to oversample for particular groups, for example the Roma population who were known to be less likely to live in established households and to have worse health or other outcomes than average. This was regarded as too ambitious a design step for the restricted survey timeline of one year, the technical capacity of the sampling team and the availability of information that could be used to inform the required sampling frame.

3.21.7 Questionnaire structure and modifications

The BiH MICS 2000 questionnaires were based on the MICS 2 model questionnaires.^a Three questionnaires were administered:

1. A **household questionnaire** for each household, which collected information on household members including sex, age, literacy, marital and orphanhood status. The household questionnaire also included education, child labour, and water and sanitation modules.

2. The **questionnaire for women** contained the following modules:

- Child mortality
- Maternal and new-born health
- Contraceptive use
- HIV/AIDS

3. The **questionnaire for children under the age of five** was directed to the mother or carer of the child and included modules on:

^a The can be found on the MICS 2 website.

- Birth registration and early learning
- Care during illness
- Immunisation
- Anthropometry ^a

A summary of all the modifications made is given in **Table 11** below, together with the subsequent consequences for monitoring.

Table 11 BiH modifications to the model MICS 2 Questionnaire, by topic and consequences for monitoring

Action	Reason	Consequence for monitoring	Comments
Removal of topics	Not relevant to BiH (malaria etc.)	None	
Non-inclusion of indicators	Those indicators that were statistically too infrequent for MICS 2 methodology (for example maternal mortality and infant mortality) were excluded	Data gaps not filled	This data is important but the MIC methodology is only useful in countries where the rates are high, otherwise the sample size required becomes very high (see sample size calculation)
Non-inclusion of previously measured indicators	Breastfeeding and iodine deficiency indicators had been measured in 1999 using MICS 2 methods at Entity level.	Used previous survey data from 1999. The BiH MICS 2000 questionnaire was shorter as a result which may have contributed to high survey completion rates	In retrospect it would have been better to include them as it was not possible to produce data at the national level
Addition of one question on sanitation in RS Entity only relating to type of sanitation	Requested by a member of RS survey steering committee; accepted for political rather than scientific reasons	Resulted in the only survey question without identical answer options for both Entities. Had to adjust data entry tools and analysis software.	This caused fewer disturbances than predicted as few people selected this option. The results were combined with another category to allow merging of datasets
Socio-economic (SE)	This module was not	Unable to stratify results	The SE module was not

^a The weight and height of children up to five years of age was measured using portable digital weighing scales measuring to 0.1 kg, with height and length measuring boards made locally according to UNICEF standard specifications.

status not included in household questionnaire	ready at the time of the survey and would have caused delays in survey	by SE status	particularly well developed. Other countries that did use it found related analysis not very helpful. The SE questions have improved in subsequent survey rounds (MICS 3 and MICS 4)
Refugee/displaced status not included as a question	Not included due to local sensitivities (the question of return of housing was sensitive at the time)	Unable to stratify results by refugee/displaced status	This was not used either in the MICS 3 or MICS 4 surveys
Ethnicity/nationality question in household questionnaire	Not included due to local sensitivities	Unable to stratify results by ethnicity which may have had particular consequences for excluded groups such as Roma	Roma population not evenly dispersed through survey areas, also mobile and not formally resident, so separate methods such as super-sampling required to measure their health status

As described in **Table 11** above, the MICS 2 model questionnaire was adjusted to remove several questions. As a result, the BiH MICS 2000 survey measured less indicators than were technically possible using the MICS 2 survey tool.

3.21.8 Translation

The three BiH MICS 2000 questionnaires^a were translated from English into Bosnjak (roman script) and Serbian (roman script).^b The Serbian version was back translated and the survey text was modified further for both entities.^c Some terms in the English questionnaire proved challenging in the local translations, for example around care-seeking behaviour and in the HIV/AIDS section.

^a Household questionnaire, questionnaire for women aged 15 – 49, and the questionnaire for children under the age of five.

^b The political necessity for this cumbersome structure is explained in the introduction chapter under language issues.

^c Back translation is a validation process where a survey is first translated into another language and then translated back into the original language by a different person. The objective is to ensure that the original translation is accurate.

The questionnaires were pre-tested in 100 households in each entity during June 2000. Based on feedback from informants and where translated terms were hard to explain during the interviews, further modifications were made to the translated questionnaires. Attention was paid to those sections during the training of field survey teams.

The final versions of the three questionnaires can be found in **Appendix D** (English) and **Appendix E** (Bosnjak, as used in the FBiH entity).

3.21.9 Training and fieldwork

Of necessity, separate teams were created for each entity. In the FBiH, 10 field teams were formed to collect the data, each comprising field interviewers, one driver and a supervisor. In the RS there were 10 teams, with four or field interviewers, a driver and a supervisor. In each entity, a fieldwork coordinator provided overall supervision.

The field interviewers in each entity were trained for five days and the field supervisors received additional training. The fieldwork began in July 2000 and concluded in September 2000. The survey took place in the school holidays, during a period of very high day time temperatures (up to forty degrees centigrade). This was not the ideal time to complete such a survey but was necessary to avoid winter conditions and to meet the deadline of survey completion by the end of 2000.

3.21.10 Data entry and analysis

Workshops were organised in each Entity using locally modified and translated UNICEF training materials to instruct data entry staff. Data was entered on seven microcomputers in the FBiH and four in RS using the ISSA programme (Integrated System for Survey Analysis) and data was analysed by SPSS. All questionnaires were double-entered and internal consistency checks were performed. Data processing began in August 2000 and finished in October 2000.

Meetings were held during this time to compare the results emerging from the two separate entity teams. A dataset was produced by each entity. The two entity datasets were then combined into a single data set.

3.21.11 Sampling errors

There are several potential sources of error in any household survey. How to measure the sampling error is well understood, but not the non-sampling error, and so confidence intervals in household surveys are usually based solely on sampling error. Building in non-sampling error (for example, measurement error) is not simple. The general assumption used is that the non-sampling error is random and cancels out, although we know that this is not the case in many instances, there is often no suitable way of quantifying the error.

Anthropometric measurement standardization is employed in some surveys, to factor in the inter-observer and technical error of measurement (TEM) and to calculate a reliability coefficient (R). This used to be recommended for most household surveys years ago. For example, 10 assessors measure the same child and they then do the same with about 10 children, to give a reliability coefficient. The problem is that it is very complicated to organize and very difficult to do accurately. It used to be part of the training programme in major household surveys to ensure consistency of measurement, but is rarely done in most settings now and was not included in the MIC methodology. As an illustrative example, the WHO Multicentre Growth Reference Study Group (MGRS) in 2006 had a coefficient of reliability above 95% for anthropometric measurements (such as height and weight), apart from for skin fold measurements, whose R coefficient was 75-93%.⁽¹⁴⁹⁾

In the MICS 2 manual a calculation of standard deviation was proscribed for the anthropometric data but otherwise no systematic measurements of error were described, and as a result confidence intervals were not calculated for any of the indicators in the national surveys. In this study, the BiH MICS dataset has been reanalyzed and error calculations have been made for selected indicators.

3.22 Sample coverage and the characteristics of households and respondents

Information on the sample coverage and the characteristics of the household population and the survey respondents is provided to assist in the interpretation of the survey findings and to serve as a basic check on the sample implementation.

3.22.1 Characteristics of households

Table 12 presents the percentage distribution of households in the sample according to background characteristics.

Table 12 Percentage distribution of households by household size, BiH MICS 2000

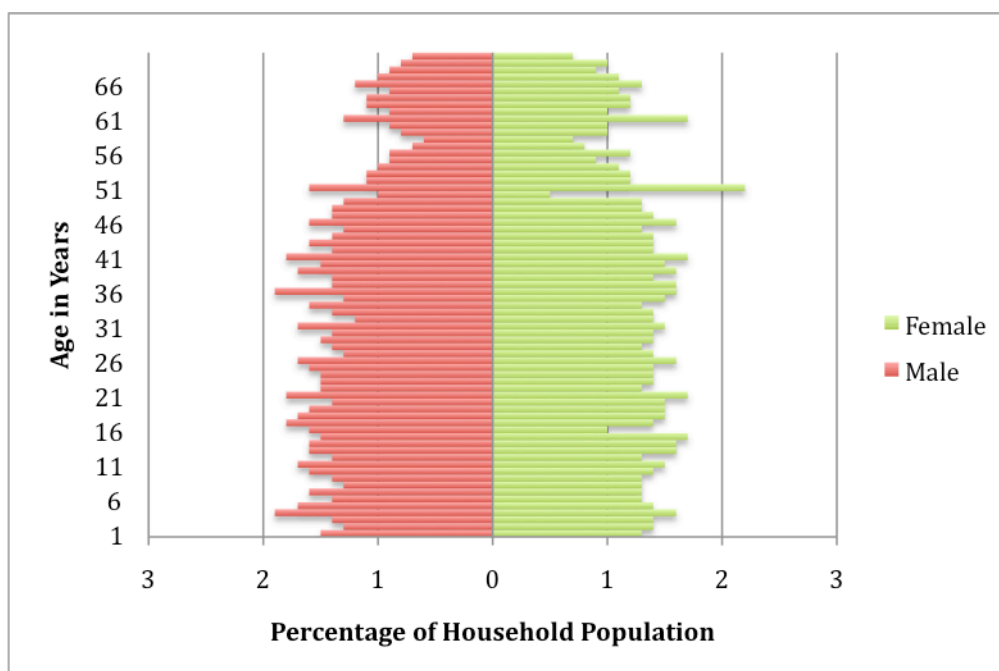
		Federation of BiH		Republika Srpska		Total BiH	
		%	Number	%	Number	%	Number
Urban/Rural	Urban	42.1	2701	36.0	1506	39.9	4207
	Rural	57.6	3667	64.0	2672	60.1	6339
No. of Household members	1	9.9	632	13.0	543	11.1	1175
	2 - 3	40.4	2571	43.3	1810	41.5	4381
	4 - 5	40.6	2585	36.8	1538	39.1	4123
	6+	9.1	580	6.9	287	8.2	867
Total		100.0	6368	100.0	4178	100.0	10546

Sixty percent of the households (6,368) were in FBiH and 40.0% (4,178) were in RS, as set by the sampling plan. Overall, 39.9% of the households (4,207) were urban and 60.1% (6,339) were rural. In the RS, 64.0% of households were rural and in the FBiH rural household comprised 57.6% of the total.

Household size was small. Only 867 households (8.2%) had six or more members. Only 21.2% of the households contained at least one child under five years of age, 44.4% contained at least one child under 15 years and 66.1% percent contained at least one woman aged 15-49 years.

The full tabular data for age distribution is presented in **Table E1** in **Appendix E**. The population pyramid is presented in **Figure 11** below.

Figure 11 Age and sex distribution by household population, BiH MICS 2000



The population pyramid shows a pattern consistent with a slowly growing population, with declining fertility and mortality rates and an aging population.^a There is a constriction in the pyramid between ages of 55 and 60, corresponding to the years of World War Two. The age distribution of the surveyed population does not differ significantly from the estimates for BiH for 2000 published retrospectively by the population division of the UN Department of Economic and Social Affairs (UN DESA), in consultation with BiH statistical authorities.⁽¹⁵⁰⁾ Only 1.4% of the population were children under one year of age, which is in line with the estimates used during the sampling design.

3.22.2 Characteristics of respondents

This section provides background characteristics on the female respondents and children in the survey.

The characteristics of female respondents aged 15-49 years are shown in **Table 13** below.

^a The population pyramid of the BiH MICS 2006 survey shows further narrowing at the base, evidence that the population is experiencing negative growth.

Table 13 Characteristics of women aged 15-49 by background characteristics, BiH MICS 2000

		Federation of BiH		Republika Srpska		Total BiH	
		%	Number	%	Number	%	Number
Area	Urban	40.2	2242	38.9	1224	39.7	3466
	Rural	59.8	3336	61.1	1924	60.3	5260
Age in years	15-19	12.9	719	14.9	470	13.6	1189
	20-24	14.9	829	14.5	458	14.7	1287
	25-29	15.2	848	12.9	407	14.4	1255
	30-34	16.2	904	11.4	359	14.5	1263
	35-39	16.5	920	14.6	460	15.8	1380
	40-44	14.2	792	16.0	504	14.9	1296
	45-49	10.1	566	15.6	490	12.1	1056
Marital status	Currently married/in union	67.5	3767	62.6	1971	65.8	5738
	Formerly married	7.7	430	7.7	243	7.7	673
	Never married	24.8	1381	29.7	934	26.5	2315
Ever given birth	Yes	69.8	3893	65.6	2065	68.3	5958
	No	30.2	1685	34.4	1083	31.7	2768
Woman's education level	None	1.8	103	1.0	31	1.5	134
	Primary	39.5	2203	26.3	829	34.7	3032
	Primary/None	41.3	2306	27.3	860	36.3	3166
	Secondary +	58.7	3272	72.7	2288	63.7	5560
Total		100.0	5578	100.0%	3148	100.0	8726

In the sample, 65.8% of women were married/in union, and 68.3% had given birth at some time. Regarding educational level, 63.7% of women had at least secondary education (58.7% in the FBiH compared to 72.7% in the RS) and 34.7% had only primary education (39.5% in the FBiH and 26.3% in the RS). Very few women reported no or non-traditional education (103 in the FBiH and 31 in the RS). They were therefore merged into the primary education data to give a new category called primary/no education, and this category is used in the rest of the study.

Table 14 shows the characteristics of children under the age of five.

Table 14 Percentage distribution of children under 5 by background characteristics, BiH MICS 2000

		Federation of BiH		Republika Srpska		Total BiH	
		%	Number	%	Number	%	Number
Children 0-5 years		72.6	1903	27.4	718	100.0	2621
Sex	Male	51.0	971	52.4	376	51.4	1347
	Female	49.0	932	47.6	342	48.6	1274
Area	Urban	35.2	670	27.6	198	33.1	868
	Rural	64.8	1233	72.4	520	66.9	1753
Age	< 6 months	9.3	177	9.3	67	9.3	244
	6-11 months	8.1	155	10.4	75	8.8	230
	12-23 months	18.1	344	18.9	136	18.3	480
	24-35 months	18.1	345	18.5	133	18.2	478
	36-47 months	24.1	458	23.5	169	23.9	627
	48-59 months	22.3	424	19.2	138	21.4	562
Mother/care taker's education level	Primary/None	45.7	870	26.3	189	41.0	1074
	Secondary	54.3	1033	73.7	529	59.0	1547
Total		100.0	1903	100.0	718	100.0	2621

Of the 2621 children in the survey under 5 years of age, 51.4% were male and 48.6% were female. On average, 41%% of mothers/caretakers had no or only primary

education (45.7% in FBiH and 26.3% in RS). Note that for children whose mothers did not live in the household, the education of the child's mother/carer was used.

3.23 Indicators measured in the BiH MICS 2000 survey

The indicators measured in the BiH MICS 2000 survey are presented next. First, a summary table is presented. The indicators are then discussed in more detail, grouped in the following domains: education and literacy, water and sanitation, child malnutrition, low birth weight, childhood immunisation, integrated management of childhood illness (IMCI), contraceptive prevalence, prenatal and antenatal care, birth registration, HIV/AIDS, orphanhood and living arrangements, and child labour.

3.23.1 Summary of measured indicators

A total of 32 indicators were reported from the BiH MICS 2000 survey and used in this study. The total number did not include disaggregated by age or sex. For example 'underweight' was considered as a single indicator and not counted separately for underweight females, underweight males, or underweight for different age ranges within 0-5 years.

A summary of the indicator results is given below in **Table 15** below. For easy reference, sections of this table are then repeated by health domain in the narrative that follows, and these are cross-referenced to the set of tables in **Appendix E**. They are presented as in the BiH MICS 2000 survey report, i.e. without confidence intervals. Also, a full listing of the numerators and denominators for each indicator is given in **Appendix F**.

Table 15 Summary results at national and entity level, BiH MICS 2000

No.	Domain	Indicator	Indicator Definition	Total BiH	Entity	
					BiH	RS
1	Education and literacy	Pre-school attendance	Percentage of children aged 36-59 months who are attending some form of organised early childhood education programme	8.7%	9.8%	5.9%
2	Education and literacy	Children reaching grade five in school	Percentage of children entering first grade of primary school who eventually reach grade five	99.60%	99.5%	100%
3	Education and literacy	Net primary school attendance rate	Percentage of children of primary school age attending primary school	94.0%	93.7 %	94.9%
4	Education and literacy	Adult literacy rate (women)	Percentage of women aged 15 years and older who is literate	94.6%	95.0%	94.1%
5	Water and Sanitation	Safe drinking water	Percentage of population who use a safe source of drinking water	97.5%	98.1%	96.5%
6	Water and Sanitation	Sanitary means of excreta disposal	Percentage of population who use a sanitary means of excreta disposal	93.5%	99.5%	83.7%
7	Child malnutrition	Underweight prevalence	Percentage of under fives who weigh too little for their age	4.1%	4.8%	2.1%
8	Child malnutrition	Stunting prevalence	Percentage of under fives who are too short for their age	9.7%	10.0%	8.8%
9	Child malnutrition	Wasting prevalence	Percentage of under fives who are too thin for their height	6.3%	6.1%	6.6%
10	Child malnutrition	Overweight prevalence	Percentage of under fives who are overweight for their height	13.2%	12.2%	16%
11	Low Birth Weight	Birth weight below 2.5 kg.	Percentage of live births where the baby's weight is below 2500 grams	3.8%	2.1%	2%
12	Childhood Immunisation	DPT immunisation coverage	Percentage of children immunised against diptheria, pertussis and tetanus by age one year	84.8%	86.2%	81.7%

13	Childhood Immunisation	Measles immunisation coverage	Percentage of children immunised against measles by age one year	24.6 %	28.3 %	16.7 %
14	Childhood Immunisation	Polio immunisation coverage	Percentage of children immunised against polio by age one year	82.1%	84.1%	76.7%
15	Childhood Immunisation	Tuberculosis immunisation coverage	Percentage of children immunised against tuberculosis by age one year	95.2%	94.6%	96.1%
16	Fully immunized children	Fully immunized children	Percentage of children aged 18 - 29 months fully immunized against DPT (3), measles, OPV (3), and BCG	75.8%	79.6%	66.9%
17	Integrated Management of Childhood Illnesses	Use of Oral Rehydration Therapy (ORT)	Percentage of under - fives who had had diarrhoea in the 2 weeks before the survey and had been treated with oral re -hydration salts or an appropriate household solution	81.6%	79.3%	87.1%
18	Integrated Management of Childhood Illnesses	Home management of diarrhoea	Percentage of under fives who had had diarrhoea in the 2 weeks before the survey and had received increased fluids and continued feeding during the episode	11.1%	9.8%	14.3%
19	Integrated Management of Childhood Illnesses	Care-seeking for acute respiratory infection	Percentage of under fives who had had ARI in the 2 weeks before the survey and were taken to an appropriate health provider	80.1 % ** (n=40)	83.3 % ** (n=30)	70.0 % ** (n=10)
20	Integrated Management of Childhood Illnesses	Home management of illness	Percentage of under fives reported ill during the last 2 weeks who had received increased fluids and had continued feeding	16.1%	16.6%	14.6%
21	Integrated Management of Childhood Illnesses	Seeking medical assistance	Percentage of mothers/caretakers of under fives who know at least 2 signs for seeking medical assistance immediately	67.9%	65.6%	74.0%
22	Contraceptive prevalence	Contraceptive prevalence	Percentage of married women aged 15-49 who are using a method of contraception	47.5%	48.7%	45.1%
23	Prenatal Care and Assistance at Delivery	Prenatal care	Percentage of women aged 15-49 who attended by skilled personnel at least once during pregnancy	99.2%	98.8%	100.0%

24	Prenatal Care and Assistance at Delivery	Assistance at delivery	Percentage of births attended by skilled health personnel	99.6%	100.0%	98.6%
25	Birth Registration	Birth registration	Percentage of under - five children whose births are reported registered	98.4%	98.1%	99.3%
26	HIV/AIDS	Knowledge of preventing HIV/AIDS	Percentage of women who correctly state the 3 main ways of avoiding HIV/AIDS infection	28.3%	26.7%	31.3%
27	HIV/AIDS	Knowledge of misconceptions about HIV/AIDS	Percentage of women who correctly identify a misconception about HIV/AIDS	68.9%	66.4%	73.5%
28	HIV/AIDS	Knowledge of mother to child transmission of HIV/AIDS	Percentage of women who correctly identify means of transmission of HIV/AIDS from mother to child	72.5%	72.5%	72.5%
29	HIV/AIDS	Attitude to people with HIV/AIDS	Percentage of women expressing a discriminatory attitude towards people with HIV/AIDS	24.1%	24.9%	22.6%
30	Orphanhood and living arrangements	Children's living arrangements	Percentage of children aged 0 -14 years in households who are not living with a biological parent	1%	0.50%	1%
31	Orphanhood and living arrangements	Orphans in household (both parents)	Percentage of children aged 0 -14 years in households who are orphans (both parents)	0.1%	0.1%	0.0%
		Orphans in household (one parent)	Percentage of children aged 0 -14 years in households who are orphans (one parent)	4.5%	3.8%	6.1%
32	Child labour	Child labour	Percentage of children aged 5 -14 years who are currently working	17.7%	16.2%	20.9%

* note: very small denominator

3.23.2 Education and literacy

Education and literacy indicators were measured for pre-school education, basic education (primary school) and adult literacy, measured in the BiH MICS 2000 from the age of 15 years onwards.

Pre-school education was defined as the reported attendance at preschool or community childcare with organised learning activities. This was recorded for children

aged between 36 and 59 months, the cut-off point for admission to primary school in BiH. The *percentage of children who entered the first grade of primary school and eventually reached grade five* was calculated. *Primary school attendance* was measured for primary school children aged 6-11 years. To measure *literacy*, household members over the age of 15 years were asked if they could read a newspaper or letter easily or with difficulty. No formal reading test was administered.

Table 16 below summarises the education and literacy indicators measured.

Table 16 Education and literacy indicators, BiH MICS 2000

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
			% C.I.	% C.I.	% C.I.
Education and literacy	Pre-school development	Percentage of children aged 36-59 months who are attending some form of organised early childhood education programme	8.7%	9.8%	5.9%
Education and literacy	Children reaching grade five in school	Percentage of children entering first grade of primary school who eventually reach grade five	99.60%	99.5%	100%
Education and literacy	Net primary school attendance rate	Percentage of children of primary school age attending primary school	93.5%	93.0%	94.6%
Education and literacy	Literacy rate	Percentage of population aged 15 years and older who is literate	98.4%	98.5%	98.1%

(See also **Tables E2 to E5** in **Appendix E**)

Less than one in ten (8.7%) of children aged 36 - 59 months were attending an organised early childhood education programme, such as kindergarten or community childcare with organised learning activities. Slightly more girls were attending than boys (F = 9.5%, M = 8.1%). Children in urban areas were almost three times as likely (15.2%) to attend early learning activities as children in rural areas (5.8%). Children

were more likely to attend when they were older; 6.9% of children aged 36 – 47 months of age attended, and 10.9% at 48 – 59 months of age. The education level of the mother was related to the likelihood that a child will attend an early childhood education programme, since 5.9% of children whose mothers have no or only primary education attended, compared to 11% of children whose mothers have secondary education or above. (See also **Table E2**)

Dropout rates in the first five years of primary school were very low, as 99.2% of children who entered the first grade of primary school eventually reached grade five. There were no urban/rural or Entity disparities in children reaching grade 5. (See also **Table E3**)

Overall, 94.0 children of primary school age (taken as aged 8 – 15) were attending primary school. School attendance was universally high across both entities and in both urban and rural areas. There was no gender difference. There was a drop off at age 15 for both boys (66%) and girls (61%) and some of this is due to children finishing primary school at a younger age and this was gave a drop of around 4 percentage points in the overall total. (See also **Table E4**)

The vast majority (94.6%) of the respondents over the age of 15 years were literate. The literate population as defined by this survey includes those who were able to read a newspaper ‘easily or with difficulty’. There were minor differences between urban areas (97.3%) and rural areas (93.0%). Overall, women were slightly less likely than men to be literate (91.1% to 98.4%). There was a slight drop off in literacy after the age of 65 years for men (to 92.4%) and a more marked drop off for women (to 62.9%). Literacy is lower in older age groups. The percentage literate declines from almost 100% among those aged 15 – 34 years to 76% among the population aged 65 and older. (See also **Table E5**)

As there are many different ways of defining literacy, comparisons with previous literacy measures in the country should be treated with caution, and this is discussed later in the section on education and literacy trend data over time.

3.23.3 Water and sanitation

The two water and sanitation indicators are access to improved drinking water sources and sanitary means of excreta disposal. The households having *access to*

safe drinking water were defined for this survey as those who use any of the following types of water supply: piped water; public tap; bore/hole tube well; protected well; protected spring; or rainwater. The actual quality of the water was not tested.

Sanitary means of excreta disposal included: flush toilets connected to sewage systems or septic tanks; other flush toilets; improved pit latrines; and traditional pit latrines.

Results for the two measured indicators are given in **Table 17** below.

Table 17 Water and sanitation indicators, BiH MICS 2000

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Water and sanitation	Safe drinking water	Percentage of population who use a safe source of drinking water	97.5%	98.1%	96.5%
Water and sanitation	Sanitary means of excreta disposal	Percentage of population who use a sanitary means of excreta disposal	93.5%	99.5%	83.7%

(See also **Tables E6** and **E7** in **Appendix E**)

Overall 97.5% (C.I. 96.7 – 98.4%) of the population had access to safe drinking water. with a small difference between urban areas (99.7% C.I. 99.51 – 100%) and rural areas (96.2% C.I. 94.9 – 97.7%) There were variations across BiH in the source of drinking water between urban and rural areas. In urban areas, 97.2% of households had water piped into their dwellings, but in rural areas this was only 55.4%. Rural households had a range of other water sources including water piped into the yard or plot (13.9%), a protected dug well (8.6%), a protected spring (7.9%) or a tubewell/borehole with a pump (7.6%). (See also **Table E6**)

Overall, 93.5% (C.I. 92.6 – 94.4%) of the population was living in households with sanitary means of excreta disposal. Urban areas slightly more likely to have sanitary means of excreta disposal (99.0% C.I. 98.3% - 99.8%) than rural areas (90.2% C.I. 88.8 - 91.6%). There was also a difference between FBIH (99.5% C.I. 92.6 – 94.5%) and the RS (83.7% C.I. 81.2 – 86.1%) and this is explained by the higher percentage of rural population in the RS survey sample. (See also **Table E7**)

3.23.4 Child malnutrition

The standard or reference population used was the National Center for Health Statistics (NCHS) standard, which was recommended at the time for use by UNICEF and WHO and was being used globally for comparisons in MICS surveys. These 1977 growth charts were developed by the NCHS as a clinical tool for health professionals to determine if the growth of a child is adequate and were adopted and endorsed by WHO for international use.^a The nutritional status indicators in the BiH MICS 2000 are expressed in *standard deviation units* (z-scores) from the mean or average of this reference population.

Children whose weight for age was more than two standard deviations below the median of the reference population were considered *moderately underweight* while those whose weight for age was more than three standard deviations below the median were classified as *severely underweight*.

Children whose height for age was more than two standard deviations below the median of the reference population were considered short for their age and were classified as *moderately stunted*. Children whose height for age was more than three standard deviations below the median were classified as *severely stunted*.

Children whose weight for height was more than two standard deviations below the median of the reference population were classified as *moderately wasted* while those whose weight was more than three standard deviations below the median were *severely wasted*.

Children whose weight for height was more than two standard deviations above the mean were considered *overweight* and more than three standards above the mean were considered to be *obese*. Overweight and obese were not included in any of the reporting or monitoring plans in BiH, but they were measured in the BiH MICS 2000 survey and are included here for completeness and are discussed later.

Children who were not weighed and measured (approximately 1%) and children whose measurements were outside a plausible range were excluded. The birth dates

^a This is discussed further in the introduction chapter

of all the children in the survey were known so all the remaining children were included. The main results for these indicators are given in **Table 18** below.

Table 18 Child nutrition indicators including underweight, stunting, wasting, and overweight, BiH MICS 2000

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Child malnutrition	Underweight prevalence	Percentage of under fives who weigh too little for their age	4.1%	4.8%	2.1%
Child malnutrition	Stunting prevalence	Percentage of under fives who are too short for their age	9.7%	10.0%	8.8%
Child malnutrition	Wasting prevalence	Percentage of under fives who are too thin for their height	6.3%	6.1%	6.6%
Child malnutrition	Overweight prevalence	Percentage of under fives who are overweight for their height	13.2%	12.2%	16%

(See also **Tables E8** and **E9** in **Appendix E**)

In the sample, 4.1% (C.I. 3.2 – 5.0%) of children under the age of five years were underweight for their age. Almost one in ten (9.7% C.I. 8.4 – 11.0%) of children were stunted or too short for their age, and 6.3% (C.I. 5.3 – 7.3%) were underweight for their height.

Children whose mothers had secondary or higher education were slightly less likely to be underweight compared to children of mothers with primary or no education. Children in the FBiH were more likely to be underweight and stunted in comparison to those in the RS, and children in rural areas were more likely to be underweight and stunted than those in urban areas. Children were more likely to be obese if the mothers' education level was secondary or above, if they lived in urban rather than rural areas and if they lived in the RS rather than the FBiH.

3.23.5 Low birth weight

Infants who weighed less than 2500 grams (2.5 kg.) at birth were categorised as low birth weight babies. Since not all infants are weighed at birth and those who are

weighed may be a biased sample of all births, reported birth weight cannot, normally, be used to estimate the prevalence of low birth weight among all children. Therefore, in the MICS 2 methodology, the percentage of babies weighing below 2500 grams at birth is estimated from the weight recorded on the health card or from the mother's recall of the baby's size at birth (that is, very small, smaller than average, average, larger than average, very large).

The approach in the MICS 2 is as follows. First, the two items are cross-tabulated for those children who were weighed at birth to obtain the proportion of babies in each category of size who weighed less than 2500 grams. This proportion is then multiplied by the total number of children falling in the size category to obtain the estimated number of children in each size category who were of low birth weight. The numbers for each size category are summed to obtain the total number of low birth weight children. This number is then divided by the total number of live births to obtain the overall percentage of infants with low birth weight.

However, in BiH MICS 2000, use of mother's recall of relative size at birth was not needed, as actual birth weights in grams were available for all infants in the survey sample. The numbers are shown in **Table 19** below.

Table 19 Birth weight of babies born in previous 12 months, BiH MICS 2000

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Low Birth Weight	Birth weight below 2.5 kg.	Percentage of live births where the baby's weight is below 2500 grams	3.8%	2.1%	2.5%

(See also **Table E10** in **Appendix E**)

Almost 100% of babies whose births were reported in the BiH MICS 2000 were weighed at birth and, in almost all cases there was documentary evidence in the form of written records from health care staff at the time of birth. This is an uncommonly high percentage of babies to be weighed at birth in the MICS survey series.

In BiH, only 3.3% of infants were estimated to weigh less than 2500 grams at birth. This figure should be treated with caution as the numbers of infants in denominator for this

indicator is low (n = 485). In addition, these estimates only refer to children under the age of 5 who were low birth weight babies and who are still alive. The methodology therefore underestimates the numbers of low birth weight babies because some of these babies will have died by the age of five.

3.23.6 Childhood immunisation

In the BiH MICS 2000, mothers were asked to provide vaccination cards for children under the age of five. Field interviewers copied vaccination information from the cards onto the BiH MICS 2000 questionnaire. Mothers/caretakers were also probed to report any vaccinations the child had received that did not appear on the card. Overall, 86.2% of children had vaccination cards. If the child did not have a card, the mother/caretaker was read a short description of each vaccine and asked to recall whether or not the child had received it and, for DPT and Polio, how many times. The vaccination rates were presented using vaccination card only or vaccination card plus mother/caretaker recall.

According to UNICEF and WHO guidelines, a child should receive a BCG vaccination to protect against tuberculosis, three doses of DPT to protect against diphtheria, pertussis and tetanus, three doses of polio vaccine, and a measles vaccination by the age of 12 months. The schedule was slightly different in BiH as the upper age recommendation for measles, mumps and rubella vaccination (MMR) was 18 months. Therefore, the vaccination rates are presented at two time points – 12 months and 18 months.

Table 20 below show the immunization rates at 12 months according to the WHO immunization guidelines, and using the definitions adopted in the end-decade goals monitoring process.

Table 20 Immunisation rates at 12 months, BiH MICS 2000

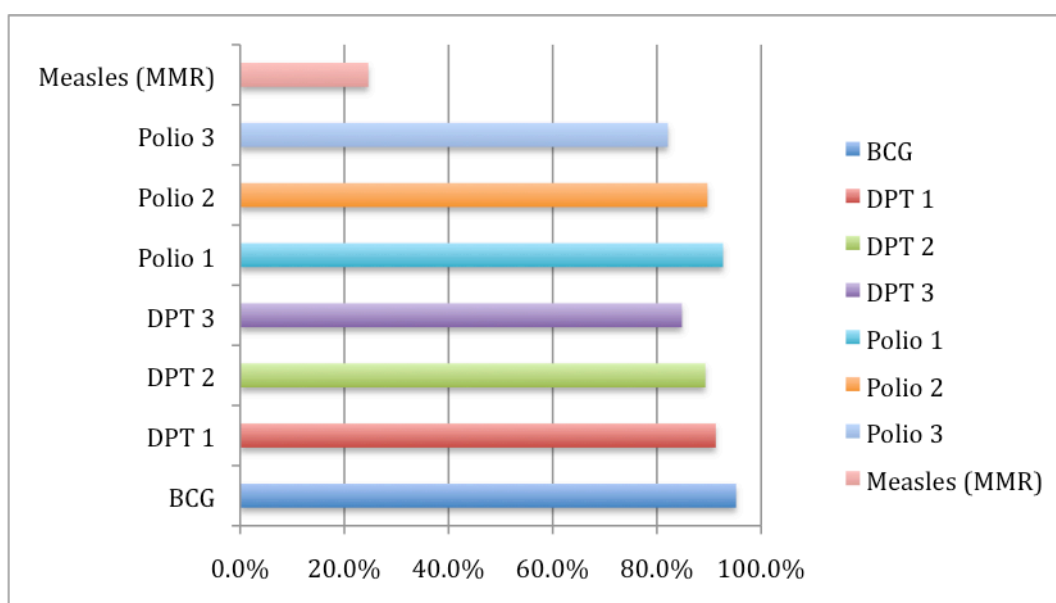
Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Childhood Immunisation	DPT immunisation coverage	Percentage of children immunised against diphtheria, pertussis and tetanus by age one year	84.8%	86.2%	81.7%
Childhood Immunisation	Measles immunisation coverage	Percentage of children immunised against measles by age one year	24.6 %	28.3 %	16.7 %
Childhood Immunisation	Polio immunisation coverage	Percentage of children immunised against polio by age one year	82.1%	84.1%	76.7%
Childhood Immunisation	Tuberculosis immunisation coverage	Percentage of children immunised against tuberculosis by age one year	95.2%	94.6%	96.%

(See also Tables **E11** to **E14** in **Appendix E**)

Table E11 shows the percentage of children aged 12 to 23 months who received each of the vaccinations at any time before the survey (top three lines) and before the first birthday (bottom three lines). The denominator for the table is comprised of children aged 12-23 months (n = 480) so that only children who are old enough to be fully vaccinated are counted. In the top three lines, the numerator includes all children who were vaccinated at any time before the survey according to the vaccination card or the mother's report. In the bottom two lines, only those who were vaccinated before their first birthday are included. For children without vaccination cards, the proportion of vaccinations given before the first birthday is assumed to be the same as for children with vaccination cards.

Calculation of immunisation rates at 12 months from the MICS tables is based on the sum of the percentage of children aged 12 - 23 months vaccinated according to their health card and the percentage of children vaccinated according to their mother's report. This sum is multiplied by the probability of being vaccinated by 12 months of age, to derive the total percentage vaccinated, as shown in **Figure 12** below.

Figure 12 Total percentage of children aged 12-23 months immunised by 12 months of age, BiH MICS 2000

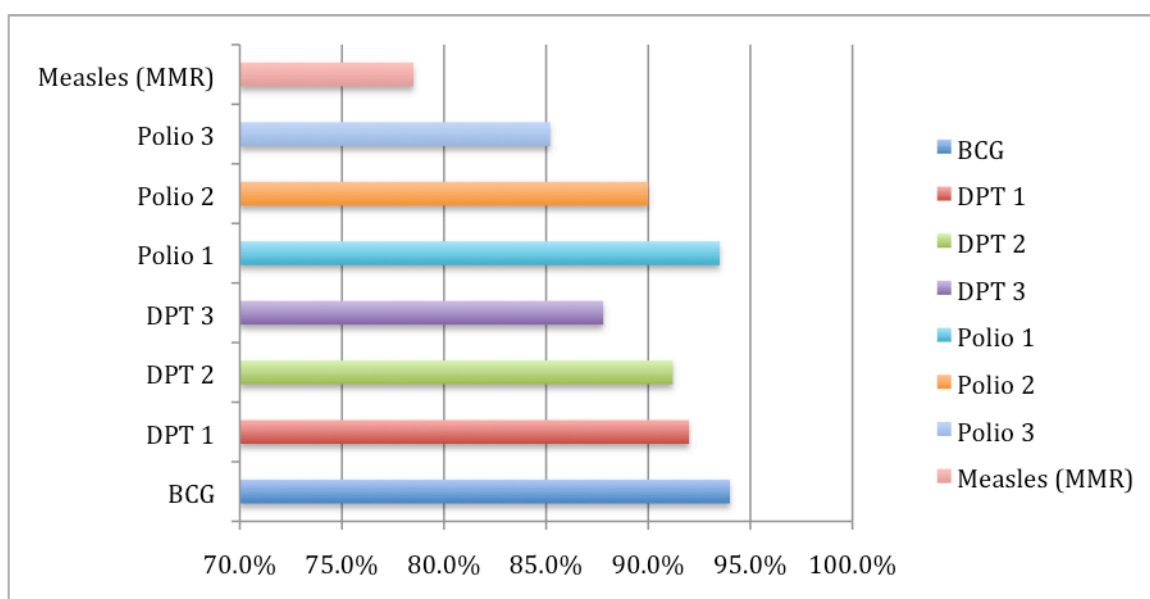


All children aged 12 - 23 months, and who had health cards, received a BCG vaccination by the age of 12 months and 98.7% had received the first dose of DPT. The percentage does not decline for subsequent doses of DPT, 97.8% for the second dose, and 96.6% for the third dose. Similarly, 98.9% of children received the first dose of Polio vaccine by the age of 12 months, 98.1% the second dose and this had only declined to 96.4% by the third dose.^a

Reporting on the coverage for measles vaccine is problematic. Based on the local schedule, by eighteen months 78.5% of children had received the measles vaccine (**Table E12**), but according to the global indicator for measles immunization at 12 months, only 24.6% had been vaccinated (**Table E11**). This is demonstrated in **Figures 13** that follow.

^a The confidence intervals for all of the immunization data can be found in Appendix G.

Figure 13 Total percentage of children aged 18 – 29 months immunised by 18 months of age, BiH MICS 2000



As a result, the percentage of children who had all eight recommended vaccinations and according to the definition of the global indicator are considered ‘fully immunized) by their first birthday is only 18.1% (**Table E11**) However, if the local schedule of measles vaccinations by age 18 months is taken into account, the proportion is 70.0% as shown in **Figure 12**.

In **Table E13**, the percentage of children age 12 - 23 months currently vaccinated against childhood diseases is shown according to background characteristics. Unlike the previous table, the estimates in this table refer to children who received the vaccinations by the time of the survey, even if they did not occur prior to the age of 12 months. A similar table is presented for children aged 18 – 29 months (**Table E14**)

There is no variation between male and female, between urban and rural areas or by mother’s education. .

3.23.7 Integrated management of childhood illness

In the BiH MICS 2000, mothers/caretakers were asked to report whether their child had had diarrhoea in the two weeks prior to the survey. If so, the mother/caretaker was asked a series of questions about what the child had to drink and eat during the episode and whether this was more or less than the child usually ate and drank.

Children with ARI are defined as those who have an illness with a cough accompanied by rapid or difficult breathing, and whose symptoms are due to a chest problem, a problem in the chest and a blocked nose, or whose mother did not know the source of the problem.

Promoting knowledge about when it is appropriate to seek medical assistance for ill children is another important component of the IMCI programme. Mothers/caretakers of children were asked to name all of the signs that would cause them to take a child to a health facility right away. The main indicator results are given in **Table 21** below.

Table 21 Integrated management of childhood illnesses

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Integrated Management of Childhood Illnesses	Use of Oral Rehydration Therapy (ORT)	Percentage of under -fives who had had diarrhoea in the 2 weeks before the survey and had been treated with oral re -hydration salts or an appropriate household solution	81.6%	79.3%	87.1%
Integrated Management of Childhood Illnesses	Home management of diarrhoea	Percentage of under -fives who had had diarrhoea in the 2 weeks before the survey and had received increased fluids and continued feeding during the episode	11.1%	9.8%	14.3%
Integrated Management of Childhood Illnesses	Acute Respiratory Infection	Percentage of under -fives who had had ARI in the 2 weeks before the survey and were taken to an appropriate health provider	80.1 % ** (n=40)	83.3 % ** (n=30)	70.0 % ** (n=10)
Integrated Management of Childhood Illnesses	Home management of illness	Percentage of under -fives reported ill during the last 2 weeks who had received increased fluids and had continued feeding	16.1%	16.6%	14.6%
Integrated Management of Childhood Illnesses	Medical assistance	Percentage of mothers/caretakers of under -fives who know at least 2 signs for seeking medical assistance immediately	67.9%	65.6%	74.0%

(See also Tables **E15** to **E17** in **Appendix E**)

Overall, 8.9 % of children under five years of age had had diarrhoea in the two weeks preceding the survey (**Table E15**). The peak of diarrhoea prevalence occurred in the weaning period, among children aged 6 - 23 months. Given the low prevalence of diarrhoea and the small number of children in this study, comparisons between the different sub-groups cannot be made.^a

Table E15 also shows the percentage of children receiving various types of recommended liquids during episodes of diarrhoea. Since mothers were able to name more than one type of liquid, the percentages do not necessarily add up to 100. One in five children received breast milk while they had diarrhoea. One in five children (19.7%) received gruel and 13.2% received packet ORS. Approximately eight in ten (81.6%) children with diarrhoea received one or more of the recommended home treatments (i.e. were treated with ORS or RHF).

Slightly less than one fifth (17.5%) of children aged 0 – 5 years with diarrhoea in the last two weeks drank more than usual while three fifths drank the same or less (**Table E16**). About three fifths ate somewhat less, the same, or more than usual while two fifths ate much less than usual or none. Overall, only one in ten (11.1%) of children aged 0 – 5 years with diarrhoea received increased fluids and continued eating as recommended.

Table E17 shows the pattern of medical assistance sought for children with acute respiratory infections (ARI). In the MICS questionnaire, children with ARI are defined as those who have an illness with a cough accompanied by rapid or difficult breathing, and whose symptoms are due to a chest problem, a problem in the chest and a blocked nose, or whose mother did not know the source of the problem. Only 40 children (1.5%) had ARIs in the two weeks before the survey, and appropriate medical assistance had been sought in 80 percent of cases. Assistance was most often sought at primary health care centres (40.0%), hospitals (27.5%) and private physicians (20%). However, the definition of ARI is more appropriate for pneumonia and other severe acute lower respiratory infections, and as the survey was carried out in August,

^a The C.I.s can be viewed in Appendix G for indicator 16, use of ORT.

there were only a few ($n = 40$) children in the survey under the age of five years with such symptoms.

There was an assumption prior to the survey that there may have been high rates of ARI and that this may represent a surrogate marker of health service disintegration in BiH. Very few children were reported to have ARIs, perhaps because the survey was conducted in the summer, and therefore no particular conclusions can be drawn from this indicator.

Table E18 presents information on the drinking and eating behaviour of sick children. Almost 19% of children were reported to have had diarrhoea or some other illness in the two weeks preceding the survey. Of these, 26% drank more liquids during the illness and 65 percent continued eating (i.e., ate somewhat less, the same, or more). Overall, only 16% of ill children received increased fluids and continued eating as recommended under the IMCI programme.

Mothers/caretakers of children were asked to name all of the symptoms that would cause them to take a child to a health facility right away. The most common response, given by 94% of mothers, was that they would take their child to a health facility right away if he/she developed a fever (**Table E19**). Over a third (36.3%) said that the child becoming sicker would cause them to take the child to a health facility and 40.4% mentioned difficulty in breathing. Between 11.7% and 40.4% of mothers cited an inability to drink or breast-feed, fast breathing, blood in stools, and drinking poorly as reasons for taking a child to a health facility right away. Overall, 68% of mothers know at least two signs for seeking medical assistance. There is no apparent difference between urban and rural areas or educational level.

3.23.8 Contraceptive prevalence

Women of child-bearing age (15 – 49 years) were asked if they were married or ‘in union’ (in a relationship with a man). They were then asked if they or their partner used any methods of birth control. The following methods of birth control were categorized as ‘modern’: female sterilisation, male sterilisation, oral contraceptive pill, intrauterine device, hormonal implants, male condom, female condom, and diaphragm with or without contraceptive foam or jelly. The following methods were categorized as

‘traditional’: lactational amenorrhoea method (LAM), periodic abstinence, withdrawal or any other method. The results are given in **Table 22** below.

Table 22 Contraceptive prevalence, BiH MICS 2000

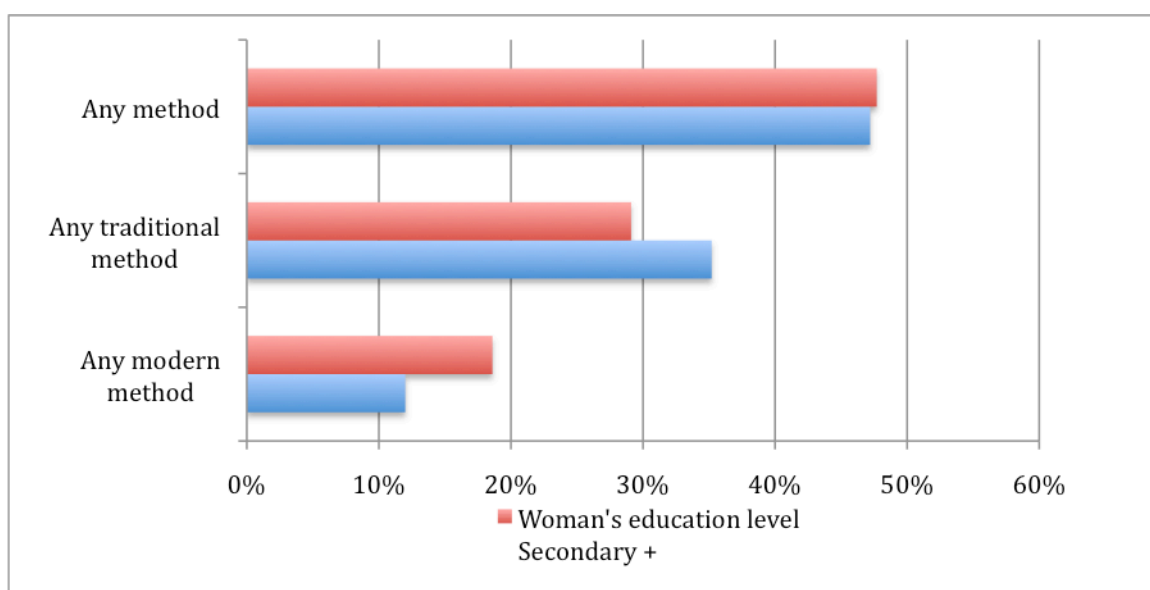
Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Contraceptive prevalence	Contraceptive prevalence	Percentage of married women aged 15-49 who are using a method of contraception	47.5%	48.7%	45.1%

(See also **Table E20** in **Appendix E**)

Current use of contraception was reported by 47.5% of married or in union women (**Table E20**). The most popular method is withdrawal, which is used by just over one in four women (26.9%). The next most popular method is the IUD (full form), used by 7.9% of women. Between 3.1% and 4.5% of women reported using the oral contraceptive pill, periodic abstinence or condoms. Less than one percent use any of the following - female or male sterilisation, diaphragm/foam/jelly or the lactational amenorrhoea method (LAM). Implants and female condoms are not used.

Contraceptive prevalence is slightly higher in urban than in rural areas. Adolescents are less likely to use contraception than older women. **Figure 14** below shows contraceptive use by the educational level of women. Overall, the low figure of modern methods of contraception use is striking.

Figure 14 Percentage of married or in union women who are using a method of contraception by education level, BiH MICS 2000



3.23.9 Antenatal and maternal care

Female respondents who had given birth in the year prior to the B&H MICS 2000 survey were asked whether they had received ante-natal care for the birth and, if so, what type of person provided the care. If the woman saw more than one type of provider, all were recorded in the questionnaire. Skilled assistance at delivery was defined as assistance provided by a doctor, nurse or midwife. The main results are given in **Table 23** below.

Table 23 Antenatal and maternal care, BiH MICS 2000

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Prenatal Care and Assistance at Delivery	Prenatal care	Percentage of women aged 15-49 who attended by skilled personnel at least once during pregnancy	99.2%	98.8%	100.0%
Prenatal Care and Assistance at Delivery	Assistance at delivery	Percentage of births attended by skilled health personnel	99.6%	100.0%	98.6%

(See also **Tables E21** and **E22** in **Appendix E**)

Table E21 presents the percent distribution of women who had given birth in the year prior to the B&H MICS 2000 according to the type of personnel who delivered the ante-natal care. If more than one provider was mentioned by the respondent, she was categorised as having seen the most skilled person she mentioned.

Virtually all women in the survey (99.2%) received some type of prenatal care from skilled personnel (doctor, nurse, midwife). The majority (97.0%) of women who had given birth in the year prior to the survey received ante-natal care from a doctor, 2% from a nurse, and less than one percent from a midwife or traditional birth attendant.

Virtually all births occurring in the year prior to the survey were attended by skilled personnel (**Table E22**). More than one in four babies born in this year were delivered with the assistance of a doctor, the remainder were assisted by a nurse.

3.23.10 Birth registration

The mother/caretaker was asked whether the birth of a child aged 0 – 5 years had been registered or not, and the reasons for any non-registration. The results are shown in **Table 24** below.

Table 24 Birth registration, BiH MICS 2000

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Birth Registration	Birth registration	Percentage of under - five children whose births are reported registered	98.4%	98.1%	99.3%

(See also **Table E23** in **Appendix E**)

The births of almost all children (98.4%) under the age of five years had been registered. There were no variations in birth registration according to sex, age, urban/rural or education of mother categories.

3.23.11 Orphanhood and living arrangements

In the survey, loss of one or both parents was recorded, as were the living arrangements, as in some cases children may have parents but not be living with them and the main results are given in **Table 25** below.

Table 25 Orphanhood and living arrangements, BiH MICS 2000

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Orphanhood and living arrangements	Children's living arrangements	Percentage of children aged 0 -14 years in households who are not living with a biological parent	1%	0.50%	1%
Orphanhood and living arrangements	Orphans in household	Percentage of children aged 0 -14 years in households who are orphans (both parents)	0.1%	0.1%	0.0%
		Percentage of children aged 0 -14 years in households who are orphans (one parent)	4.5	3.8%	6.1%

(See also **Table A24** in **Appendix E**)

Of the children in the survey aged 0-14 years, 92.6% were living with both parents. Only 1.9% were living with their mother only although their father is alive. Very few (0.4%) were living with neither parent although both parents were alive. Overall, children who were not living with a biological parent comprised less than 1 percent and children who have one or both parents dead amount to 4.6% (C.I. 3.9 – 5.4%) of all children aged 0-14 years. Older children are more likely to have one or more parents dead (for aged 10-14 years 7.2%, aged 5-9 years 5.6%, and aged 0-4 years 1%). This is in keeping with the excess mortality in adults during the war period, which would affect only the parents of the older children.

3.23.12 Child labour

‘Domestic work’ was defined as cooking, shopping, cleaning, washing clothes, fetching water, and caring for children. Children who carried out any paid or unpaid work for someone who is not a member of the household, or who did more than four hours of housekeeping chores in the household, or who did other family work were considered to be ‘currently working’. The main results are given in **Table 26** below.

Table 26 Child labour

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
Child Labour	Child labour	Percentage of children aged 5 -14 years who are currently working	17.7%	16.2%	20.9%

(See also **Table E25** in **Appendix E**)

The BiH MICS 2000 survey estimated that only 0.9% of children aged 5-14 years engaged in paid work. About six times as many (5.9%) participated in unpaid work for someone other than a household member (see **Table E25**).

‘Domestic work’ is defined as cooking, shopping, cleaning, washing clothes, fetching water, and caring for children. Slightly more than half (55.3%) of the children did these tasks for less than four hours a day while 0.6% spent more than four hours a day on such tasks. Overall, girls are somewhat more likely than boys, and older children (aged 10-14 years) are more likely than younger children (aged 5-19 years) to do domestic work. Fifteen out of every hundred children (15.1%) were working on the family farm or in the family business.

Children who have carried out any paid or unpaid work for someone who is not a member of the household or who did more than four hours of housekeeping chores in the household or who did other family work are considered to be ‘currently working’. Overall, 17.7% of children were so classified. There was some difference between boys and girls – 19.5% of boys and 15.9% percent of girls were currently working. Rural children were more likely to be working than urban children (22.3% compared to 9.3%). Almost one in four (23.8%) children aged 10-14 years were currently working, but only one in ten (11.0%) of children aged 5-9 years.

3.23.13 HIV/AIDS

Women aged 15 – 49 years participating were read three statements about the means of HIV/AIDS transmission (that HIV/AIDS could be prevented by having only one faithful uninfected partner, using a condom every time, and abstaining from sexual intercourse) and asked to state whether they believed the statements were true. Women were also asked if they had heard of AIDS and whether they believed that a

healthy looking person can be infected (believing that you have to look sick to have HIV/AIDS is a misconception).

To better understand knowledge about mother-to child transmission of HIV/AIDS, women were asked if they knew whether transmission was possible from mother to child and to identify means of transmission (during pregnancy, at delivery and through breast milk).

The survey attempted to measure discriminatory attitudes towards people living with HIV/AIDS. To this end, respondents were asked whether they agreed with two questions. The first asked whether a teacher who has the AIDS virus but is not sick should be allowed to continue teaching in school. The second question asked whether the respondent would buy food from a shopkeeper or food seller whom the respondent knew to be infected with HIV/AIDS.

Finally, a composite indicator called 'sufficient knowledge of HIV/AIDS' was constructed. This was the percentage of women who had 1) heard of AIDS, 2) knew three ways of preventing HIV/AIDS transmission and 3) could correctly identify a misconception about HIV/AIDS.

The summary indicator results are given in **Table 27** below.

Table 27 HIV/AIDS indicators, BIH MICS 2000

Area	Indicator	Indicator Definition	Total BiH	Entity	
				BiH	RS
HIV/AIDS	Knowledge of preventing HIV/AIDS	Percentage of women who correctly state the 3 main ways of avoiding HIV/AIDS infection	28.3%	26.7%	31.3%
HIV/AIDS	Knowledge of misconceptions about HIV/AIDS	Percentage of women who correctly identify a misconception about HIV/AIDS	68.9%	66.4%	73.5%
HIV/AIDS	Knowledge of mother to child transmission	Percentage of women who correctly identify means of transmission of HIV/AIDS from mother to child	72.5%	72.5%	72.5%
HIV/AIDS	Attitude to people with HIV/AIDS	Percentage of women expressing a discriminatory attitude	24.1%	24.9%	22.6%

		towards people with HIV/AIDS			

(See also **Tables E26 to E32** in **Appendix E**)

One of the most important strategies for reducing the rate of HIV/AIDS infection is the promotion of accurate knowledge of how HIV/AIDS is transmitted and how to prevent transmission.

Among women aged 15 - 49 years in BiH, 96.5% had heard of HIV/AIDS (**Table E26**) and it is high in both urban areas (98.0%) and rural areas (95.5%). Women aged 15 – 49 years participating were read three statements about the means of HIV/AIDS transmission and asked to state whether they believed the statements were true. Just over half (51.6%) believed that having only one uninfected sex partner could prevent HIV/AIDS transmission. Half (49.1%) believed that using a condom every time one had sexual intercourse could prevent HIV/AIDS transmission and 39.4% agreed that abstaining from sexual intercourse prevents HIV/AIDS transmission. Knowledge of ALL THREE methods of transmission was only 28.3% (C.I. 26.54 – 30.14%) Data is also presented separately for teenagers aged 15-19 years (**Table E27**), and women aged 20-49 years (**Table E28**).

Table E29 lists misconceptions about HIV/AIDS. Seven in ten (68.9% C.I. 67.5 – 70.3%) of women aged 15 – 49 correctly believed that a healthy looking person can be infected. The range is from 71.9% aged 15 – 19 years to 60.8% aged 45 – 49 years. Only 49.2% of women with primary/no education knew that a healthy looking person could be infected with HIV/AIDS compared with 80.2% of women with secondary school/higher education.

Seven in ten (72.5%) of women in BIH knew that HIV/AIDS can be transmitted from mother to child (**Table E30**). When asked specifically about the mechanisms through which mother to child transmission can take place, 68.9% (C.I. 67.5 – 70.3%) said that transmission during pregnancy was possible, 58.7% said that transmission at delivery was possible, and 53.7% agreed that HIV/AIDS can be transmitted through breast milk. Almost half (47.6%, C.I. 46.0 – 49.17%) of all women aged 15 – 49 years knew all three modes of transmission.

Discriminatory attitudes are reported in **Table A31**. Almost one in four (22.8%) of women aged 15–49 years believe that a teacher with HIV/AIDS should not be allowed to work. This percentage does not vary by entity. Urban women, younger women and those with secondary or higher education appear to be more likely to express this discriminatory attitude than older women, rural women and those with no or primary education. One in ten (11.4%) of women would not buy food from a person infected with HIV/AIDS and this follows the same pattern as the first question. Overall, 24.1% (C.I. 22.7 – 25.5%) of women agree with at least one of the discriminatory statements.

Table A32 summarises information from the previous tables on HIV/AIDS knowledge. The second column shows the percentage of women who know both means of preventing HIV/AIDS transmission – having one faithful uninfected partner and using a condom every time. The third column of the tables shows the percentage of women who correctly identified a misconception about HIV/AIDS transmission – that a healthy looking person cannot be infected. Finally, the fourth column of the table shows the percentage of women who have ‘sufficient knowledge’ of HIV/AIDS transmission. These are women who know both ways of preventing HIV/AIDS transmission and can correctly identify all the misconceptions. Only 25.6% or one in four of all women had sufficient knowledge of HIV/AIDS, and 27.1% of women aged 15-19.

3.24 Report production and launch

The author analysed the national dataset and prepared a draft final national report. This national report was submitted to and officially endorsed by the Agency for Statistics of Bosnia and Herzegovina. An official final BiH report was published in 2000.⁽¹⁴⁹⁾ Each entity produced a separate entity level report,⁽¹⁵¹⁾ however these were not officially endorsed by the BiH Agency for Statistics, nor were they endorsed nor officially released by UNICEF.

3.25 Concluding observations on the BiH MICS 2000 survey

The history and development of MICS shows how it has changed over time and through the three implemented and fourth planned survey series. The survey has become more robust, it measures more indicators and it has now produced a unique

data series in countries where it has been implemented on more than one of the global rounds.

In BiH, MICS surveys were implemented in 2000 and 2006 and a third survey is planned for 2010. This will result in a unique set of data and indicators that measure child and maternal health. The BiH MICS 2000 survey stayed very close to the prescribed design parameters for the second survey series and the reasons for this have been presented. By included error measurements and confidence intervals, no statistical difference has been found in some cases where difference had described before (including in urban rural differences or between age groups)

In the next results chapter, the case study of the BiH MICS 2000 survey is analysed and the main findings are presented.

4 RESULTS

4.1 Structure of the results chapter

The results chapter present the results of the mixed methods applied to the case materials covering the MICS survey series and the BiH MICS 2000 survey.

4.2 Factors influencing the development of MICS

The evolution of the MICS survey tool was described in chapter 3 - case narrative. The purpose of this next section is to present the factors that influenced this evolution and to determine critical points at which they influenced the survey series. They are divided into internal (within UNICEF and the UN) and external factors.

4.2.1 Internal factors

MICS survey tool was developed as a result of UNICEF's mandate to support countries to measure global progress towards the WSC end-decade goals. This arose from the WSC in 1990, at which commitments had been made by signatory countries to report on progress, with no concomitant capacity by many countries to do so. UNICEF had long argued for the need to have better accountability of countries in relation to child and maternal well-being.

The structure of UNICEF, with a technical and coordination statistical team at HQ level and staffed country offices in the majority of low-income and middle-income countries presented an opportunity to implement a national survey programme. The UNICEF model utilized the opportunity provided by CO collaboration with national counterparts, and this was extended to include NSOs for the MICS.^a

A key factor throughout the history of MICS has been leadership by 'champions' within UNICEF. Three successive Executive Directors (Carol Bellamy, Ann Veneman and Anthony Lake) have supported the survey series, and a series of key senior staff at

^a In contrast to the DHS model whereby a donor country (the US via USAID) contracted a for-profit company (currently MACRO) to implement a standalone survey series.

HQ have ensured it was delivered. There have been further champions at the regional and national levels. However, the survey series is not deeply embedded in UNICEF's planning and programmatic guidance materials. ⁽¹²⁴⁾

The survey has developed in stages coinciding with each of the four survey series. It has been internally constrained by 'stop-start' annual funding and a lack of ongoing budget support. The absence of an overarching governance structure with external membership may appear to be a constraint but may also have ensured its survival within the organization. Two external evaluations (of rounds 1 and 3) ⁽¹³⁹⁾ ⁽¹²⁴⁾ influenced the development of the survey approach and provided legitimacy and endorsement of the survey itself.^a

The survey has seen an increase in both the number and range of indicators with each survey round. Within the UN system, efforts to have a more coherent and coordinated UN including via the UN Development Assistance Framework (UNDAF), Joint Programming (JP) and the MDGS have meant that the MICS 3 and MICS 4 measure indicators that are not directly within the mandate of UNICEF. The increased pressure to include a wider range of topics in the MICS tool has been addressed by controlling at UNICEF HQ level the number of indicators that are added and by increasing the number of modules in the survey tool. Some of these have been untried in a global setting, for example the disability module added in MICS 3 produced data that was of very variable quality.^b

Data quality has improved over time, with the data quality in MICS 3 evaluated as comparable to other major household survey series included the 'gold standard' of the DHS. ⁽¹²⁴⁾

4.2.2 External influences

Externally, several factors have influenced the development of MICS. One might argue that the inception of MICS was in response to the external pressures from

^a To date, no other major global household survey has commissioned and publicly reported an external evaluation.

^b Largely attributed to indicator definition and the complexities of measuring disability. Internal communication with Attila Hancioglu, MICS Global Coordinator.

signatory countries to report on end decade goals for the WSC, however there is little evidence of this.^a

The rise over the past 15 years of global programmes to monitor and report on development has fuelled increased demand for indicator data. Donors and other international agencies increasingly seek indicators to better measure the impact of development and emergency assistance. The lack of available data has created a demand for information that the MICS survey can fill, at least in part.

Commencing with MICS 3, the demand for data measuring population disparities has led to technical changes in the survey tool. A socio-economic frame was trialled in MICS 2, refined, and included both MICS 3 and MICS 4. Super-sampling of specific groups has been added, for example for the Roma in MICS 3 in Serbia⁽¹⁵²⁾ Improvements in technology have let to several changes.

The internet heralded a completely new level of access to household survey data, via the MICS website, and more recently the MIC compiler tool which bridges the end-user data interface and allow users to search the data online. Handheld PDAs have been used in some countries for entering data from field work. Presentation of MICS data in online compiled databases and in the electronic media has increased. In parallel MICS data is included in DevInfo and other data presentation tools.

Expectations of indicator harmonization and coordination between international and national stakeholders on indicators development have increased exponentially over the life of the MICS. This has led to the multiplication of coordination mechanisms around indicators and data. The HSN and other coordination mechanisms have set and raised standards for archiving of data which is reflected in the MICS series over time, as they have moved from minimal, and incomplete archiving to more comprehensive archiving of datasets, reports, and survey materials.

The MICS have evolved from a one-size fits all questionnaire in MICS 1 to an increasingly modular and customizable tool. There are also hybrid survey examples, with MICS questions being increasingly included in other household surveys and vice

^a From internal documentation and interviews in preparation for the history of MICS, it emerged that the driving force for MICS was within UNICEF in response to a perceived external need, but not and external demand.

versa. The archiving of meta data and datasets has improved notably from MICS 3 onwards, thanks in part to standards set by the HSN.

The MICS survey tool has to date been focused on the production of data as an end-point, and not on the strengthening of HISs. There is an implicit assumption that the implementation of a high quality household survey will by itself strengthen a national HIS, and to some extent this is true.

The specific adaption of the generic MICS 2 survey tool in BiH 2000 is presented next.

4.3 Adaptations in the BiH MICS 2000

The description of how the MICS 2 survey tool was adapted in BiH was given in the preceding chapter 3 – the case narrative. In this section, the consequences of these modifications are presented, followed by an assessment of whether circumstances dictated compromises in the survey design or implementation and whether that later affected survey results?

4.3.1 Overall design

The governance, management structure and design of the BIH MICSS 2000 survey reflected the fragmented nature of BiH. Parallel survey teams were built and, in effect, two samples were created and two surveys were conducted, with linkages at all stages. The consequences were increased complexity and costs. An opportunity was created to increase data quality by comparing the results obtained by the two entity teams at each step of the survey implementation.

4.3.2 Questionnaire

The questionnaire was barely modified from the MICS 2 model questionnaire. Extensive modifications would have made it difficult if not impossible to combine the two data sets at the end. Irrelevant indicators and modules were dropped and those that could not be measured do to numerator/denominator issues requiring a very large sample size were also omitted. The decision not to include the breast-feeding and iodine-deficiency modules was in hindsight not a useful one. The MICS methodology had been used to measure these indicators in the preceding year at entity level,

however the resulting data could not be combined into single national dataset due to methodological modifications, an important lesson for the main BiH MICS 2000 survey.

A particular compromise was to measure all the indicators that were needed for reporting on UN commitment, even when the value of those indicators was of questionable local use. There was no substantive debate on this point during the survey planning or implementation. This allowed a substantive national report to be submitted to the UN on follow up to the WSC.

The decision to not include any additional questions set by local experts allowed the survey to be completed on time and on budget. The rationale for this was that the capacity locally to define clearly measurable, relevant indicators was weak, the software for data entry and analysis would have required modification to support any changes, and the timeline was too short. However, it did represent a missed opportunity to include, or at least trial, indicators thought to be important and useful locally. This was a definite trade-off, and it set a pattern that has continued in subsequent MICS survey rounds in BiH.^a

The need to complete field work and to meet the deadlines set by the regional training workshops meant that the socio-economic index that trialled in MICS 2 could not be used in BiH. This represented a missed opportunity, although the results of this index in other MICS 2 countries that did use it were somewhat mixed.^b

4.3.3 Human resources and contractual arrangements

Innovations in the BiH MICS 2000 survey included a deliberate strategy to use mid-career professionals rather than the country's more prominent named experts. This enabled the survey to focus on results rather than politics and is likely to have contributed to the survey being completed on time. The strategy also resulted in a pool of mid-career professionals who were trained and experienced in household survey implementation and who subsequently were involved in multiple other national

^a In contrast, some other countries have included additional questions and local modifications to the survey tool.

^b As discussed in MICS 2 evaluation workshops and noted by author.

household surveys. The use of staged, results-based contracts was an administrative innovation at the time in the UNICEF CO and also enabled timelines to be met.

4.3.4 Overall results of the adaptations

Overall, modifications of the MICS 2 survey tool allowed the survey to be implemented (an important result) but also restricted the scope, increased the cost and limited the survey results.

4.4 Data accuracy

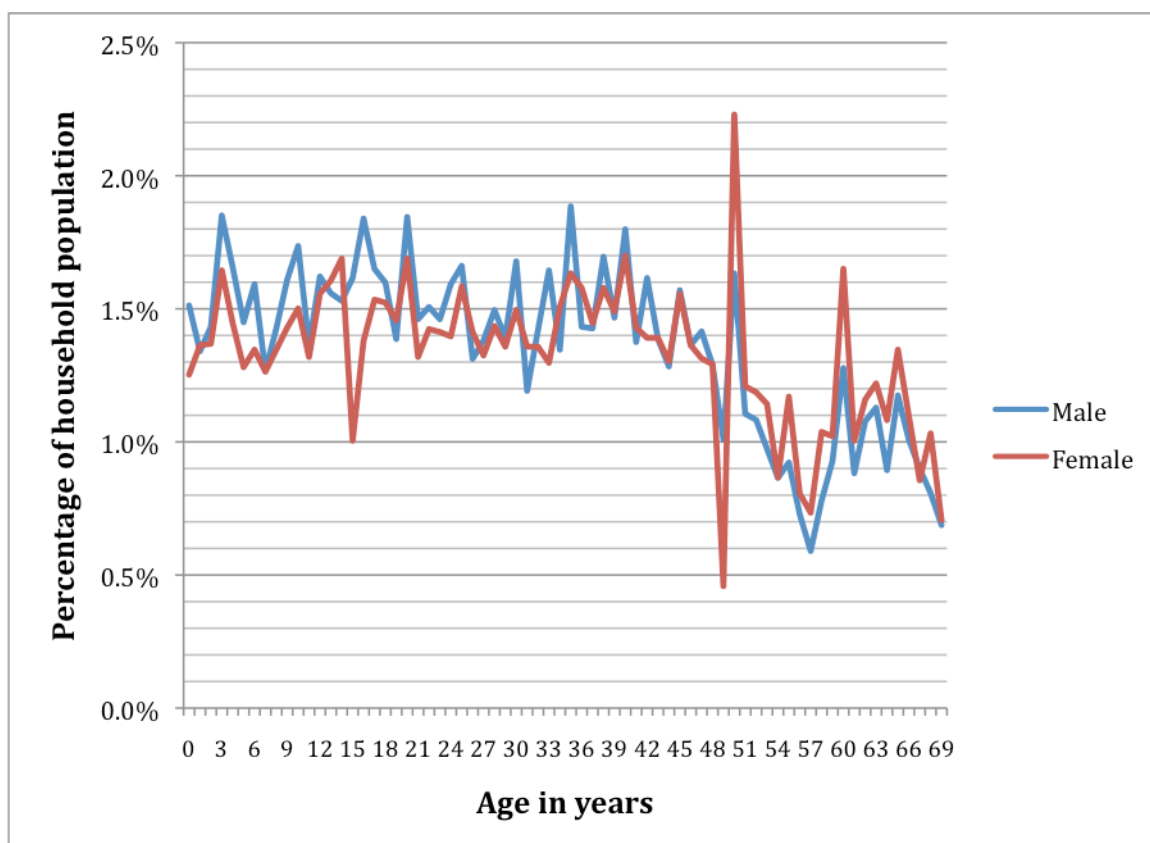
4.4.1 Sampling errors

Sampling errors were estimated for a selection of indicators for households, women and children under five years of age for total national, FBiH/RS, ad urban/rural. They are given in **Appendix X**.

4.4.2 Age distribution

The age distribution of the household population by sex is presented in **Figure 15** below.

Figure 15 Percentage of total age distribution of household population by sex, BiH MICS 2000



The single year age distribution of household members by sex exhibits some distortions centred around the age of 15 for females and the age of two for males. There appears to be some heaping of women around the age of 50 and 60, with perhaps a dearth of women aged 18-19 years. For both sexes, some digit preference is evident for ages ending in 0 and 5, reflecting a tendency to round up to whole numbers.

The percentage of cases missing information on selected questions is shown in **Table 28** below.

Table 28 Percentage of cases missing information for selected questions, BiH MICS 2000

	FBiH % Missing	RS % Missing	Total Number
Level of education (women aged 15 - 49)	0	0	29367
Years of education (women aged 15 - 49)	0	0	29367
Number of hours worked (children aged 5-14)	0	0	357
Complete birth date (children aged 0 – 5)	0	0	2621
Diarrhoea in last 2 weeks (children aged 0 – 5)	0	0	2621
Weight (children aged 0 – 5)	0.8	0.7	2621
Height (children aged 0 – 5)	0.8	0.7	2621

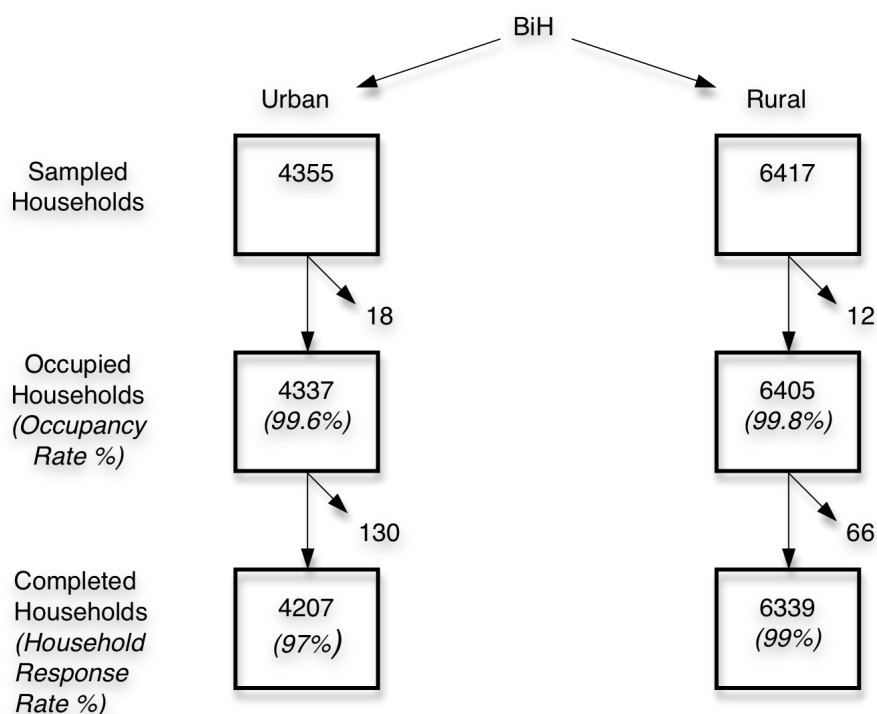
No women failed to give information on their level of education or years of education. All respondents reported a complete birth date for children (month and year). The numbers of children aged 0 – 5 years missing height and weight measurements were very low. Information is missing for 23 children out of the total of 2,621, due to the child refusing to be measured (n=12), or the child being absent (n=11).

By international standards, these numbers of children missing height and weight measurements were very low.

4.4.3 Response rates

The sample was prepared separately in each entity and so the response rates are presented in the figures below by entity, and at the national level. The response rates are shown as a flow chart in **Figure 16** below.

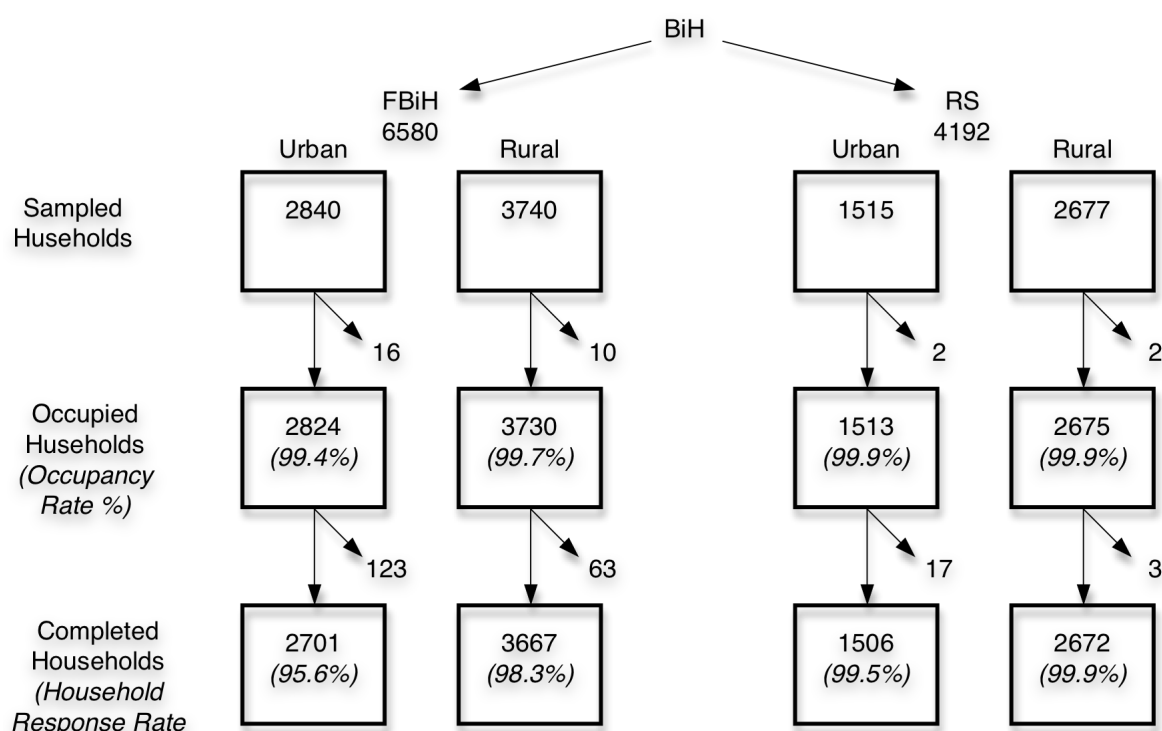
Figure 16 Response rates by urban/rural households, BiH MICS 2000 survey



The response rates are presented by urban and rural households and for the entire national sample. Of the 10,772 households that were sampled in BiH, 10,742 were occupied and 30 were unoccupied, giving an occupancy rate of 99.7%. Only 196 of the occupied households did not participate in the survey, giving a household response rate of 98.2%. We have no information about the households that declined to be interviewed.

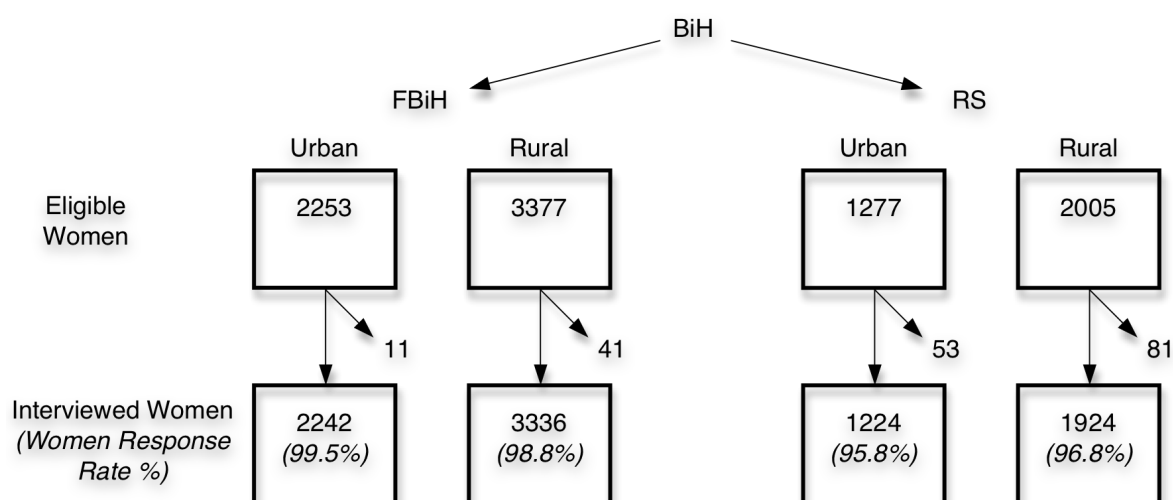
The response rates were uniformly high in each entity and across urban and rural households at entity level as show in **Figure 17** below.

Figure 17 Response rates by entity and by urban/rural households, BiH MICS 2000



From the 10,772 households interviewed in BiH, there were 35,571 (17,453 males and 18,118 females) household members registered. Out of this number, 8,912 were women aged 15 – 49 years and 2,642 were children under the age of five years. The response rates for women are shown below in **Figure 18** below.

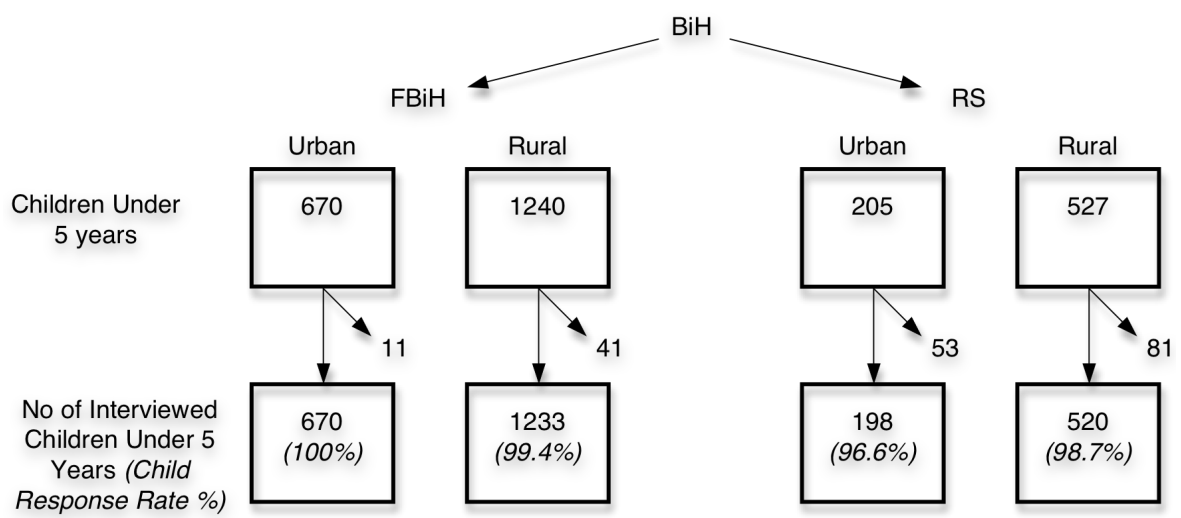
Figure 18 Response rates for urban and rural women in each entity, BiH MICS 2000



In the interviewed households, 8,912 eligible women aged 15-49 years were identified. Of these, 8,726 were successfully interviewed, yielding a response rate for eligible women of 97.9%.

The response rates for children are shown in **Figure 19** below.

Figure 19 Response rates for urban and rural children in each entity, BiH MICS 2000



In the interviewed households, 2,642 children under the age of five years were listed in the household questionnaire. Of these, questionnaires were completed for all but 21 children, i.e. for 2,621 children in total, giving a response rate for eligible children of 99.2%.

4.5 Data gap analysis

The extent of the indicators measured in the BiH MICS 2000 survey is reported in **Table 29** below.

Table 29 Reporting commitments, indicators and extent of coverage by BiH MICS 2000

	WSC (2000)		NPA (2002)		MDG (2003)		MTDS 2004	
	No. of indicators	% of all indicators in the document	No. of indicators	% of all indicators in the document	No. of indicators	% of all indicators in the document	No. of indicators	% of all indicators in the document
Indicators that had no definition and/or could not be measured	0	N/A	6	N/A	94	N/A	0	N/A
Quantified indicators in total	52	100%	65	100%	94	100%	63	100%
Indicators that related specifically to children/mothers	52	11%	65	100%	24	25%	20	32%
Indicators that could be measured using the MICS 2 survey tool	34	65%	43	66%	15	16%	14	22%
Indicators that were actually measured in BiH MICS 2000	32	61%	32	50%	11	12%	11	17%
Indicators for which the only source at the time was the BiH MICS 2000	27	52%	27	41%	9	10%	7	11%

The BiH MICS 2000 survey was the sole source of data on indicators for 52% of the report by BiH on follow up to the WSC and 41% of the National Plan of Action for Children. Both of these were processes were predominantly concerned with children. For the two wider national development processes it was the sole source of data for 10% (MDGs) and 11% (MTDS). These figures would all have been higher if some of the indicators had not been omitted from the BiH MICS 2000 survey (breastfeeding and iodine deficiency) as they had been measured already at Entity level using MICS methodology in 1999.

There was a further gap in that the global MICS 2 methodology was not applicable to all indicators relevant in BiH due to methodological problems (small numerators and or denominators rendering the MICS methods unusable)

4.6 Time series data

Here, the 32 selected indicators from the BiH MICS 2000 survey are compared with the available data from three other time points (1990, 1995 and 2005/6).

The overall availability of the data is presented first, summarizing to what extent time trends can be displayed for the selected indicators. Then each selected indicator is presented in more detail, grouped in topic areas. The sources of the indicator data are noted. There is no single source where all the indicators for 1990 and 1995/6 can be found and when indicators are available, they usually cannot be disaggregated by urban/rural or by entity. Data trends are surprisingly hard to analyse as indicator definitions and disaggregation differ widely between sources. The most useful collection for BiH can be found on the TransMONEE database maintained by UNICEF's Innocenti Research Centre.(137)

The overall availability of comparable data for the 32 selected indicators for the three additional time points 1990, 1995/6, and 2006 is presented in **Table 30** below. This gives an overview of the extent to which the data can be used to measure trends.

Table 30 Comparable data availability by four time points – 1990, 1995/6, 2000 and 2006

Area	Total No. of Selected indicators	No of indicators for which at least some comparable data is available			
		At three additional time points	At two additional time points	At only additional one time point	At no other time points
Education and literacy	4	2	0	2	0
Water and Sanitation	2	0	2	0	0
Child malnutrition	4	0	0	4	0
Low birth weight	1	0	0	1	0
Childhood immunisation	4	4	0	0	0
Integrated management of childhood illness	5	0	0	5	0
Contraceptive prevalence	1	0	0	1	0
Prenatal and antenatal care	2	0	0	2	0
Birth registration	1	0	1		0
Orphanhood and living arrangements	3	0	0	3	0
Child labour	1	0	0	1	0
HIV/AIDS	4	0	0	4	0
Total	32	6	3	23	

Of the 32 indicators, 6 had comparable measurements at three additional time points (i.e a full time series could be obtained), 3 had comparable measurements at only two

additional time points, 23 had comparable measurements at only one additional time point (in most cases this was the second MICS survey) and none were only measured in the BiH MICS 2000 survey and were never measured again.

It can be seen that the extent to which trend data can be constructed is limited. The reasons for a lack of comparable data at these time points for the selected BiH MICS 2000 indicators include:

- Interruption of data collection due to the war, so data for 1995 is missing
- An indicator that was not new but which had not been measured previously in BiH
- An indicator that was measured in the BiH MICS 2000 survey but for which the definition subsequently changed in the BiH MICS 2006 survey and for which no other data source was identified, so there was no comparable data from 2006

More detailed results on time trends by study domain are given below. For each, data availability is discussed first, changes in indicator definition over time are presented, and the data is presented. This section is not intended to be exhaustive, as each domain could be analysed in depth over several pages, but to give some indicative information that provides insight into whether the indicators exist and/or have the potential to show some insights over time.

4.6.1 Education and literacy

Preschool attendance data is not available from 1990 and 1995 as it was not collected in a systematic way. The indicators in the two MICS surveys in BiH (2000 and 2006) are comparable.

Table 31 Preschool attendance in 2000 and 2006 by total, entity and urban/rural

Year	Total BiH	Entity		Urban	Rural
		FBiH	RS		
2000	8.7%	9.8%	5.9%	9.8%	5.9%
2006	6.4%	N/A	N/A	14.3%	2.5%

Between these two time points, UNICEF, other international agencies and the government have supported pre-school education. Anecdotally there have been

reports of pre-school closure in rural areas due to lack of funding, and international support has been stronger in urban areas. The pattern above appears to confirm this.

Regarding the two primary school indicators partial data is available for 1990 and 1995 from the UNESCO database and the MICS indicators from 2000 and 2005 can be compared.

Table 32 below presents the data on children reaching grade five.

Table 32 Percentage of children reaching grade five in 1990, 1995, 2000 and 2006 by total, entity and urban/rural

Year	Total BiH	Entity		Urban	Rural
		FBiH	RS		
1990	N/A	N/A	N/A	N/A	N/A
1995/6	N/A	N/A	N/A	N/A	N/A
2000	99.60%	99.5%	100%	99.0%	99.1%
2006	99.8%	99.7%	100%	100%	99.7%

The figures show almost 100% of children reaching grade five once they are enrolled. They do not reveal, however, if there are delays in completing these five years of schooling.

Attendance at primary school does reveal some interesting changes.

Table 33 Percentage of children of primary school age attending primary school in 1990, 1995, 2000 and 2006 by total, entity and urban/rural

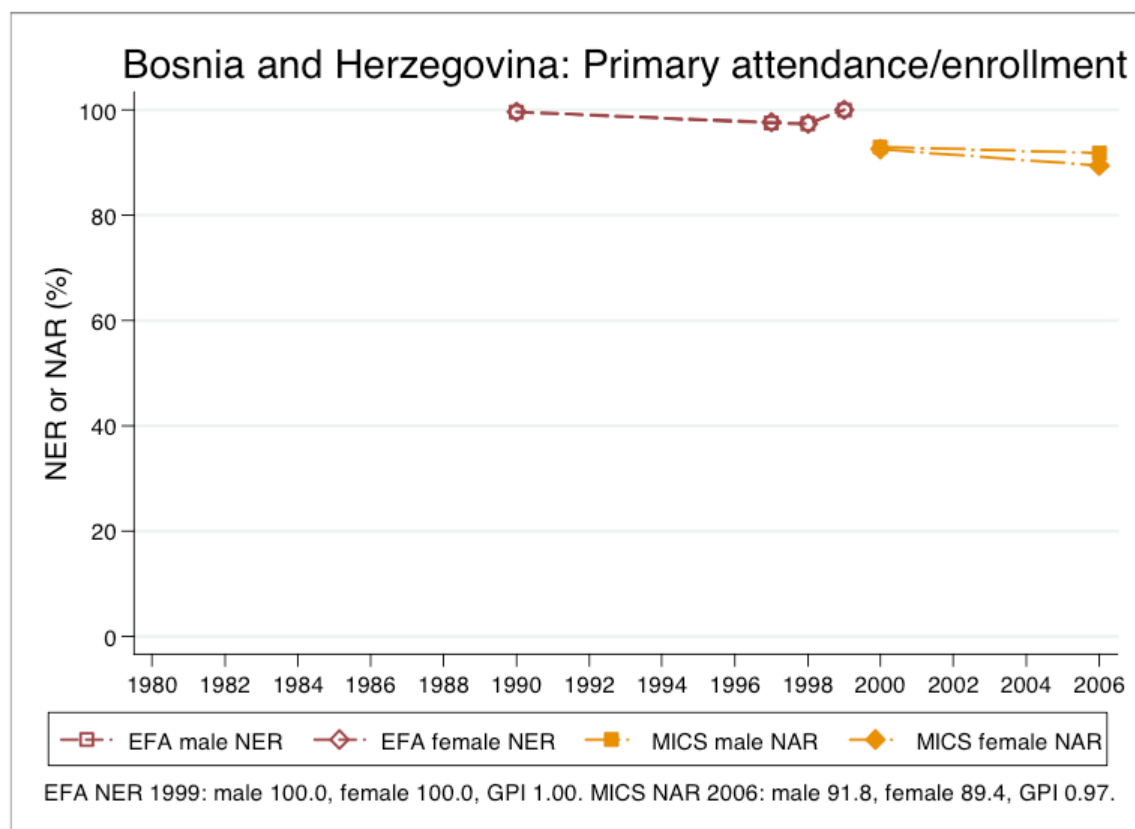
Year	Total BiH	Entity		Urban	Rural
		FBiH	RS		
1990	98.6	N/A	N/A	N/A	N/A
1995/6	N/A	N/A	N/A	N/A	N/A
2000	93.5%	93.0%	94.6%	94.4%	93.9%
2006	98.4%	97.8%	98.8%	98.3%	98.7%

Pre-war, enrollment of children in primary school was reported as almost 100% and in some cases over 100%, in part due to differences in indicator definition, but also due to incentives for over-reporting within the educational system. In 2000, 93.5% (C.I 93.3% - 94.8%) of children of primary school age were attending primary school. School attendance was universally high across both entities and in both rural and urban areas. By 2006, was 98.4% (C.I (97.8 – 99.1%) and this appears to be a small but significant increase from 2000. There have been no gender differences noted between male and female primary school attendance.

A more expanded view of this data is given in **Figure 19** below, created by UNICEF's Statistics and Monitoring Section in 2008.^a This illustrates the lack of gender difference in the data, and demonstrates how an indicator definition change (compare the red and orange trend lines) can distort data trends.

^a The abbreviations refer to Education For All (EFA). Net enrollment Ratio (NER) and Net Attendance Ratio (NAR)

Figure 20 Primary school attendance/enrollment in BiH, 1980 – 2006.



Equivalent data on literacy using the definitions in the BiH MICS 2000 are not available, although they are presented widely in reports and databases. The definitions are too diverse to compare the findings.

4.6.2 Water and sanitation

Pre-war and immediately post war in 1995/6. There is no specific data available on water or sanitation pre-war or immediately post war in 1995/6. However there is comparable data from the two BiH MICS surveys in 2000 and 2006. The data, however, showed little change over time and when confidence intervals are measured any apparent differences over time between urban/rural or entities disappears. For example in 2000, the national figure for access to improved water sources was 97.5% (C.I. 96.7 – 98.4%) and in 2006 this figure was 98.7% (C.I. 95.7 – 98.9%) A similar pattern is shown with sanitation. In 2000, 93.5% (C.I. 92.6 – 94.5%) of the population of BiH was living in households with sanitary means of excreta disposal and in 2006 that figure was 93.0% (C.I. 90.2 – 94.9%)

4.6.3 Child malnutrition

There was no comparable data on the selected indicators from 1990 or 1995. The MICS data from 2000 and 2006 are presented in **Table 34** below:

Table 34 Comparison of 2000 and 2006 BiH MICS anthropometry data for children under 5 years of age

Year	Data source	Underweight	Stunting	Wasting	Overweight
2000	BiH MICS 2000	4.1% (3.2 – 5.0%)	9.7% (8.42 -10.96%)	6.3% (5.3 – 7.3%)	13.2% (11.7 – 14.7%)
2006	BiH MICS 2006	1.5% (0.9– 2.1%)	7.4% N/A	3.2% N/A	20.2% N/A

The table appears to show a change in pattern, with a small reduction in underweight, stunting and wasting and an increase in obesity, and this would be in keeping of the post-war trend of recovery. ^a

4.6.4 Low birth weight

Data is available from 2000 and 2006. In 2000, approximately 3.3% of infants were estimated to weigh less than 2500 grams at birth. In 2006, this figure was 4.5%, however both figures are much lower than might be expected. ^b The data is questionable.

^a To date, C.I. intervals could not be computed on the 2006 stunting, wasting and overweight data due to a fault in the archived files.

^b As an example this figure was 7.8% for UK live births in 2007.

4.6.5 Childhood Immunisation

There is scant comparable immunization data from 1990 and 1996. TransMONEE presents data from Republika Srpska, but the confidence intervals are not known and is incomplete. What does emerge in **Table 35** below is a pattern of surprisingly high reported coverage, given the conflict. Any differences in coverage over time needs to also take into account that two very different methods were used to collect the data, health services reporting for 1990 and 1996, and the MICS household surveys in 2000 and 2006.

Table 35 Available immunization data for 1990, 1996, 2000 and 2006, BiH

Year	Source	DPT Coverage %	Measles coverage %	Polio coverage %	BCG coverage %	Fully immunised children %
1990	TransMONEE database	93.0	DK	94.0	DK	DK
1996	TransMONEE database	82.0	65.0	82.0	DK	DK
2000	BiH MICS 2000	89.6 (87.6 - 91.5)	67.4 (64.2 - 70.5)	85.7 (83.6 - 87.8)	95.2 (93.7 - 96.6)	75.8% (D/K)
2006	BiH MICS 2006	86.2 (82.1 - 90.2)	78.0 (73.5 - 82.5)	86.4 (82.4 - 90.4)	96.5 (94.8 - 98.2)	73.2 (68.3 - 78.1)

The coverage for the measles vaccine was lower than for the other vaccines, primarily due to the local official schedule.

4.6.6 Integrated Management of Childhood Illnesses (IMCI)

There is no comparable data for 1995 and 2006 for any of these indicators and changes in indicators definitions for all of the questions in the MICS surveys between 2000 and 2006. Therefore, although the quantitative indicators are being presented in global databases, the rationale for their comparison is probably incorrect.

4.6.7 Contraceptive prevalence

For 1990 and 1995 no data was available. In 2000, use of contraception was reported by 47.5% (C.I. 44.2 – 48.9%) of married or in union women aged 15 - 49. By 2006, contraceptive was to 35.7% (C.I. 32.1 – 39.3%). The crude numbers for modern methods of contraceptive are 15.7 and 11.2% for 2000 and 2006 respectively. This is a very low number and combined with the low birth rate suggests the use of termination of pregnancy as a method of birth control. The newer indicators measured in the 2006 MICS survey on unmet need for family planning are highly relevant and interesting: only 60.5% of women of childbearing age had their demands satisfied for family planning. However, they have no comparator in the BiH MICS 2000 survey.

4.6.8 Prenatal care and assistance at delivery

Pre-war virtually all women in BiH gave birth in hospital. During the hostilities it was anecdotally reported that the number of births out of hospital rose, as women were unable to get to hospital, however the extent of this is unknown,^a

The data shows

In 2000, virtually all women (97%%) in BiH received antenatal care from skilled personnel (doctor, nurse, midwife). This remained the same at 98.9% in 2006. A doctor, nurse, or midwife were present at almost 100% of births occurring in the year prior to the B&H MICS 2000 survey and this was the same in 2006.

4.6.9 Birth registration

Pre-war birth registration was reportedly almost 100% but based on vital statistics and not a household survey. There is no data from 1996. Anecdotally, birth registration fell during the war years and immediately afterwards, but to what extent is unknown. In 2000, the births of almost all children under five years (98.4% C).I. 97.9 – 99.0% in twere registered. There were no significant variations in birth registration across sex, age, urban/rural or education categories. This remained high at 99.5% (C.I. 99.1 – 100.0%) in 2006.

^a The author's personal experience during the war was women were extremely reluctant to give birth at home.

4.6.10 Orphanhood and living arrangements of children.

There is no comparable data on orphanhood and living arrangements in 1990 and 1995. In 2000, 92.6% percent of children aged 0-14 were living with both parents. Children who were not living with a biological parent comprised less than one percent, and children who had one or both parents dead amounted to 4.7% (C.I. 3.9 - 5.4%) of all children aged 0-14. Almost all dead parents were fathers. The prevalence of orphaned children remained the same in 2006 at 4.5% (C.I. 3.4 – 5.5%), over a decade after the cessation of hostilities.

4.6.11 Child Labour

Comparable data from 1990 and 1995 does not exist. In 2000, 0.9% of children aged 5-14 years engaged in paid work. 5.9% participated in unpaid work for someone other than a household member. By 2006, 5.3%(C.I. 3.5 – 7.1%) were in paid employment. Further data is available within the two MICS surveys on other types of unpaid labour including domestic tasks, such as cooking, fetching water, and caring for other children, but in each of the two surveys hardly any children spent more than four hours a day on such tasks.

4.6.12 HIV/AIDS

There was no known data on HIV awareness pre-war or immediately post war. This is a rapidly changing field, and the data provided by the two MICS surveys is rich and some of the only information available on a population basis. However between the 2000 and the 2006 MICS survey, the questions had totally changed and so there is no data with which to measure trends

4.7 Usefulness of BiH MICS 2000 indicators

The **timeliness** of the indicators was measured by time from measurement to production of data, and noting whether key time points for international and national policy processes were met.

The **relevance** of the indicators was estimated by examination of whether the indicators could show, or were likely to show, changes over time, were useful for

national monitoring, and were relevant within the policy context of BiH as a post-conflict, middle-income country. (i.e. what did the data tell us about what we were trying to measure).

4.7.1 Timeliness

Production of timely data is an important measure of effectiveness in household surveys. The BiH MICS 2000 had a short timeline (less than one calendar year) from inception to publication of results. This is a short turn around time in national household surveys and was short for a MICS 2 national survey. The data was released in enough time to for BiH to submit a national report to the UN on the WSC, one of the main deadlines for the data.

4.7.2 Usefulness of the BiH MICS 2000 indicators

All of the indicators in the BiH MICS 2000 survey were relevant in an international context and represent agreed indicators for international level monitoring. All of the selected in this study were relevant for global reporting, but not all were useful at the national or entity level. All of the indicators measured what they set out to measure, but there is a different question to be addressed – what can they tell us about the areas they set out to measure.

A pattern emerges of the limiting factors to usefulness at national or entity level

- The indicators may be statistically valid at the national or entity level but did not match the level at which decisions are made (for example immunization in the FBiH is a cantonal responsibility)
- The targets for some indicators had already been met, and the related indicators were so high that they do not assist in monitoring (for example the water and sanitation indicators are not relevant for planning purposes)
- The lack of a poverty index meant that some high indicators may be ‘hiding’ quite wide disparities and give an incorrect impression overall, (for example in relation to the very poor, or the Roma population)
- There was no concurrent policy or programme in place (for example in relation to HIV/AIDS awareness)

- The indicator was not relevant for the level of service delivery already in place (for example the indicators for antenatal and maternity case are too simple for the level of service provided and provide information that is of little practical use)

Table 36 below summarises the selected indicators by health domain and give some idea of their ‘usefulness’, i.e. where the indicator has a practical application or meaning in the BiH context, whether they could be used to assess the impact of conflict and the progress of subsequent recovery. An indication of what might be needed next in the BiH context is also given.

Table 36 BIH MICS 20000 indicator domains and their usefulness in BiH

Domain of health	Were they useful in BiH at national /entity level?	Could they be used to assess the impact of conflict or recovery?	What is needed in BiH context?
Education and literacy	Education yes, literacy no	No, as data not available during or immediately after the war	Education needs more specific measurements of educational attainment. A more specific literacy measurement is needed
Water and sanitation	No	No. Indicators not sensitive enough for BiH	More sensitive and specific indicators around geographical areas and water quality
Child malnutrition	Yes	Yes, to some extent	Add in overweight prevalence
Childhood immunisation	Yes	Yes to some extent, they also challenged other data sources	Apart from poverty/ethnicity index, no change needed
Low birth weight	No	No, too long a gap since conflict. No poverty index	No change, but could now be measured from routine vital statistics
Antenatal care and assistance at delivery	Yes	No, indicators not sensitive enough	Different indicators needed
Integrated management of childhood illness	Yes, but ARI numbers were low	No as no data from 1990 and 1995	Questionable area to continue unless IMCI programme is adapted to BiH
Birth registration	Yes	No	Specific surveys of groups such as Roma
Orphanhood and living arrangements	Yes	Yes, showed increased no of children who lost fathers during war years	More relevant would be expand list of living arrangements and institutional care numbers
Child labor	Yes	No as no data from 1990 and 1995	No change
HIV/AIDS	Yes	No as no data from 1990 and 1995	Consistent definitions to be used

Each of these domains is discussed in more detail below:

Education and literacy

The pre-school attendance rate was useful and original data not available from any other sources and showed strikingly low rates of pre-school attendance. The education indicators were also useful as they contrasted with school data which tended to overestimate school attendance and did not measure drop out. Both pre-school and primary school indicators would be more useful if they could be used to show population disparities. What is needed in this setting, where primary school attendance is high, are more qualitative measures of educational achievement.

The literacy measurements are of limited use as the indicator definition has changed over time.

Water and Sanitation

There was extensive structural damage in BiH, combined with neglect during the initial post-war years and significant investment from around 1998 onwards. The two indicators for water and sanitation were not sensitive enough to pick up these changes, nor were they sensitive enough to provide details of black spots, either geographical or population-based. This is partly because pre-war data was not available, however the coverage was known to be high pre-war and the country had a largely piped water supply, especially in urban areas, and no significant urban slums lacking clean water and sanitation, as is the case in many developing countries.

BiH has sanitation problems relating to rubbish disposal (not enough controlled landfills, medical waste and other hazardous waste not correctly disposed off), lack of treatment of pumped sewage, and the Roma and other marginalized and rural populations have minimal or no clean access to water and sanitation. At the national level, BiH had already met MDGs and the national targets set were not useful. The indicators were therefore of limited use although it is not clear if it could be estimated from other sources.

Child malnutrition

Malnutrition was measured in terms of underweight, stunting and wasting of children up to the age of five. The indicators are reliable and robust, however cannot pick up disparities. Also they are limited in age range and monitoring of older children would also be useful.

Obesity in children is an emerging issue in BiH and although measured in the survey it was not reported, nor has it been reported in the 2006 MICS survey in BiH. Obesity is a growing problem in Eastern Europe. The particular growth curve that is used may affect the rates of obesity reported in a population. Monasta et al analysed the prevalence of overweight and obesity in Czech girls at five years of age using 2001 data from the Czech republic. The International Obesity Task Force (IOTF) reference gave a prevalence of overweight at 15.3% compared to 3.4% using the WHO standard. ⁽¹⁵³⁾ These discrepancies are due to the choice of cut-offs and to the different criteria used to select the sample for the two references. This underlines that the challenge of interpreting growth and weigh data, and also the problems that may arise in comparing data from two different time points with associated different references, or between countries.

Low birth weight

This is one of the weaker indicators in terms of methodology. It is more robust than in other countries as almost all babies are weighed in BiH and the evidence (either from a written record or maternal recall of birth weight) is high, in contrast to many other developing countries. However it is likely to be an underestimate. Hospital records, if properly collected and analysed, would provide a more accurate measurement, given that almost all births are in hospital and almost all babies are weighed.

Childhood immunisation

This data was useful as it contrasted with local sources which gave higher estimates and which rely on registered children only. The data has been very useful in challenging reported data from official sources, however the lack of a socio-economic index and the lack of statistical significance at cantonal level limits use in helping guide implementation of the immunization programmes. A particular issue is that the measles immunization schedule did not match WHO/UNICEF guidelines (the local

schedule is up to 18 months whereas 12 months is recommended and is also the denominator for the global measles target. This explains the low rate of measles and completed immunizations at 12 months.

Integrated management of childhood illnesses

The data are difficult to interpret as both the numerators and the denominators are low. There have been concerns, including in a 2003 evaluation of IMCI in neighbouring Serbia, that the IMCI programme could be better adapted for use in middle income countries where childhood mortality and morbidity may have a different pattern. In such countries there may need to be more emphasis on reduction of childhood injuries, perinatal mortality (in particular neonatal deaths), and sudden infant death syndrome, plus work to address child protection issues, obesity, and iron deficiency anaemia.⁽¹⁵⁴⁾

Contraceptive prevalence

This gave the first national and population based estimates of contraceptive use and showed strikingly low rates of modern contraceptive use. This, combined with the persistently low birthrate in BiH in the post-war decade, raises questions about whether termination of pregnancies are very high. There is no accurate, officially reported data on termination of pregnancy in BiH for any year from 1990 to date, nor are there any ad hoc surveys.

Termination of pregnancy is still regulated by the Law of 7 October 1977 passed by the former republic of Bosnia and Herzegovina to implement article 191 of the Federal Constitution of the former Yugoslavia of 21 February 1974, which proclaims that 'it is a human right to decide on the birth of children'. Termination of pregnancy is allowed on request during the first 10 weeks of pregnancy. The intervention must be performed in a hospital or other authorized health-care facility. If the woman is a minor, approval of her parents or guardian is required, unless she is 16 years of age or over and earns her own living.

After the first 10 weeks of pregnancy, special authorization by a commission, composed of a gynaecologist/obstetrician, a general physician or a specialist in internal medicine, and a social worker or psychologist, is required. In practice, the commissions rarely turn down a request for termination, and there is little social stigma attached. The history of rape associated with so-called 'ethnic cleansing' during the war left the population (with the exception of some traditional catholic communities particularly in rural areas) and the health profession sympathetic to women seeking termination of pregnancy.

Increasingly, termination of pregnancy is carried out in private clinics who rarely report their statistics, and so the overall number of terminations is unknown, but considered to be high and rising, and to be particularly common among adolescents.^a

There is no evidence of selective termination based on gender, as can be seen in other populations, as there is no unexplained male to female ratio in children. MICS 3 and MICS 4 expanded the range of reproductive health questions in the survey tool.

^a Personal correspondence with gynaecologists practicing in Sarajevo post-conflict

Antenatal care and assistance at delivery

The indicators for antenatal care and assistance at delivery are not sensitive enough to show changes over time in BiH. Indicative is the goal 11 defined in 2002 for the National Plan of Action for Children in BiH 'Availability of antenatal care, healthcare during delivery and referral institutions for high risk pregnancies and urgent obstetric conditions to all pregnant women', which cannot be measured using the MICS indicators. The level of care already in place exceeds the global targets. Goal 13 proposes reducing the proportion of women who have sideropenic anaemia by one third compared to 1990 levels, however there is no source of information for this indicator and it is not one that was measured in either the BiH MICS 2000 or the BiH MICS 2006.⁽¹⁰⁹⁾ Thus this area is not well addressed by MICS in BiH and different indicators are needed.

Birth Registration

With almost complete birth registration, and without a change in local practices or a reduction in the current considerable incentives to register birth, this indicator is not specific enough for national or entity level monitoring. To further improve birth registration levels, attention needs to be paid to minority or ethnic groups who fail to register their children.

Orphanhood and living arrangements

The survey threw some light on this important topic and the indicators are not measured elsewhere. There is no particular indicator substitute here that would be more useful.

Child labour

The first national estimates of child labour were measured using MICS and showed quite low rates. They were useful, although there may be ways of exploring other sources for this data. The indicators and the survey methodology will not highlight the small population of children that do work excessive hours.

HIV/AIDS

The useful information obtained was overshadowed by the lack of comparable data due to indicator changes. The results therefore presented a useful snapshot in time rather than a consistent set of indicators that could show trends over time.

What was not measured?

The indicators that were measured have now been discussed in some detail, including their definition, methodology, validity, comparability over time and usefulness in the context of BiH. They represent only a small and selective group of potential indicators that might be included in a HIS, and so the next section addresses the issue of what the overall effects of the BiH MICS survey was on the HIS.

4.8 Strengthening of the BiH health information system

This section examines the effects of the BiH MICS 2000 on the overall HIS in relation to resources (including on policies, financial and human resources), indicators, data sources, data management, information products and data dissemination.

4.8.1 HIS resources

The goal of a HIS is often narrowly defined as the production of good-quality data. However, the ultimate goal is more than this – it is to produce relevant information that health system stakeholders can use for making transparent and evidence-based decisions for health system interventions.⁽⁵⁵⁾

MICS does not have an explicitly stated objective to strengthen HISs. UNICEF ‘assists countries in collecting and analyzing data in order to fill data gaps for monitoring the situation of children and women through its international household survey initiative the MICS.’^a In addition, UNICEF notes that ‘there is also an urgent need to improve overall data systems at the national level so they may more reliably report robust and timely data that can be used for informing public health decisions’ but appears to view

^a Source: MICS website http://www.unicef.org/statistics/index_24302.html, also cited in the introduction of MICS official documents and reports.

this as a closely connected but not integrated task with that of the MICS, in some cases operationalised at the country level.^a

The two main objectives of the BiH MICS 2000 survey were to 'provide up-to-date information for assessing the situation of children and women in BiH at the end of the decade (2000) and to furnish the data needed for monitoring progress towards the goals established at the WSC and as a basis for further action.' The study examines these two areas, but in addition looks at the wider contribution to strengthening the HIS.

4.8.2 Data sources

The full range of HIS data sources includes censuses, civil registration, population surveys, individual records, service records, and resource records.

The BiH MICS 2000 falls into the category of population survey. This governance model used paved the way for subsequent national household surveys. **Table 36** below was constructed from the database of national household surveys maintained by the International Household Survey Network (IHSN).

^a UNICEF COs implement national programmes via a Country Programme of Cooperation, signed each 3 – 5 years with national authorities. Within that there may be more specific initiatives aimed strengthening the HIS. UNICEF also oversees DevInfo.

Table 37 National Household Surveys in BiH 1961 - 2009

Year	Title of National Household Survey
1961	Population and Household Census
1971	Population and Household Census
1981	Population and Household Census
1991	Population and Household Census
1997	<i>Assessment of the Cash Benefit Programme in the FBiH^a</i>
2000	MICS 2 2000 - Household survey of Children and Women
2001	Social Assessment for Road Management and Safety
2001	Living Standards Survey
2002	World Health Survey
2002	Living Standards Measurement Survey
2002	Enterprise Survey
2002	Business Environment and Enterprise Performance Survey
2003	Living Standards Measurement Survey
2004	Living Standards Survey
2004	BiH Household Budget Survey
2005	Enterprise Survey
2006	MICS 3 2006 - Household Survey of Children and Women
2006	Labour Force Survey
2007	Household Budget Survey
2007	Labour Force Survey
2008	Labour Force Survey

^a A WB led Assessment of the Cash benefit survey in 1997 (marked in italics) is included in the IHSN catalogue (marked in italics) but was not in fact a national level survey as it was conducted only at Entity level in the FBiH.

After the Yugoslav Census in 1991, which included the republic of Bosnia and Herzegovina, there was no further national level census until the BiH MICS 2000. A similar structure was used for each survey after the BiH MICS 2000, including separate survey teams in each entity and an overarching endorsement mechanism at the state level. Of note are that all of these are internationally supported household surveys.

BiH has not yet moved to a self-sustaining, nationally driven household survey programme. It is hard to see how it might, as the national level policy and administrative structures remain weak. As of 2009 there is no coordinated effort to shift measurement of the MICS indicators to other data sources.

4.8.3 Information products

The survey results in one national and two entity level survey reports. These contained a basic description of the methodology and sampling, examples of the questionnaires and the main results tables. The reports did not analyse the data in any depth. The data set for the combined national report is archived on the MICS repository held by UNICEF. The data sets from the separate entity level reports are not readily available in BiH, nor held at global level.

4.8.4 Data dissemination and use

The national and entity level report had a limited paper circulation. The indicators have been used in multiple national and international reports and have been cited in international publications. When international databases are cited, the primary source of data i.e. MICS is not always mentioned. MICS indicators cannot yet be presented via a national DevInfo database as one does not yet exist.^a

^a Since 2005 there have been municipal level DevInfo databases used for local planning purposes in some locations and development of a national level BiH DevInfo database commenced in late 2010.

4.9 Conclusions of results chapter

The results show that the BiH MICS 20000 survey was adapted to the local environment in BiH and key indicators for children and women were measured at both the national and entity level.

Data gaps on child health in four national monitoring and reporting processes were filled by the survey and between 11% and 52% of them would not have been filled without the survey. The measurement of WSC and NPA indicators were the most closely met by the BiH MICS 2000 survey, which is not surprising as these were processes targeting children. Time series data was produced for only some of child health and child rights indicators selected.

5 DISCUSSION

5.1 Structure of chapter

In this chapter, specific lessons learned from the case study for the future development of the HIS system and the future role of the MICS survey in BiH are presented and discussed. These are followed by more general lessons learned from the case study which may be useful for informing the implementation of MICS and its relationship to the development of HISs in other post-conflict and resource-poor countries. These lessons learned are derived from the findings in the previous chapter.

At the end of this chapter, the strengths and limitations of the study are described. The chapter ends with a discussion of the implications for future research.

5.2 Lessons learned for BiH

The relevant research question for this section is:

- What lessons can be learned and conclusions drawn for the future development of the HIS system and the future role of the MICS survey in BiH?

5.2.1 Linking the BiH MICS 2000 survey with the HIS

To date, the HIS in BiH has not been formally assessed, and so there is no baseline with which to compare to global standards. However there are a number of issues that are well known^a and which are common to most HIS in developing countries. These have been drawn from the HMN assessment tool⁽⁵⁵⁾ and are:

- The legal and policy framework for the national HIS is outdated and poorly implemented.

^a They concerns are well-known to the author and have frequently arisen during discussions with local colleagues in BiH in relation to health policy and to the HIS.

- The HIS is quite fragmented between different health programmes and directorates, and between the MoH and the NSO.^a
- Insufficient feedback is provided to those who collect data and submit reports.
- Many health information officers at sub-national level are not well qualified for the tasks they are asked to carry out.
- Investments are needed in ICT.
- As a top priority, statistics from multiple sources should be pulled together into an integrated data 'warehouse'.

A key observation is that the BiH MICS 2000 survey was implemented without any prior assessment of the overall HIS in the country and it was implemented as a standalone project that aimed primarily to fill data gaps. A further policy vacuum was the lack of any overarching health policy at either the national or the entity level. Extensive international aid funding tended to be channeled via delineated projects rather than address systematic problems or weaknesses within the new country of BiH.

The UNICEF CO related to the statistical offices in each entity as partners, but primarily as sources of data or implementing partners for MICS or other projects. Further, the UNICEF CO did not see their role as one of building a functioning HIS in the country. So although data of good quality was collected by the BiH MICS 2000 survey, data gaps were filled, and staff capacity was built, the opportunity to identify and build more strategic cross-linkages that would strengthen the HIS was not identified. This opportunity was also missed for the 2006 MICS survey and the planned 2011 MICS survey, both of which been approached as data collection exercises.

Currently, BiH is still politically unstable, economically weak and socially fragile. Unemployment stands at over 40% and economic and political bankruptcy fuel desire for partition. In this context, perhaps the best that can be hoped for is to strengthen

^a In BiH there is the added complexity of MoHs at three different levels within the country, and one national and two entity statistics offices.

the HIS at entity level and to build technical capacity in staff and collaboration between disparate institutional and professional groups.

5.2.2 Approaches to reaching consensus

A particular approach to reaching consensus around the BiH MICS 2000 survey was used, and it was effective when efforts to implement other national surveys had failed. To complete a household survey in such challenging circumstances, consensus must be reached.

Before 2000, there was little effective institutional collaboration of any kind between entity and state level institutions in relation to data. The UN often used the strategy of ‘shuttle’ diplomacy.^a While this worked in extracting whatever data was available, it had not been successful in getting agreement for a national level survey. The approach used for the BiH MICS 2000 survey was to gain consensus using the survey model as a single negotiated text and to use separate local teams in each entity. All national surveys since then have adopted the same approach and governance model. This approach was effective in that it ensured survey implementation. However the approach constrained expert inputs at the local level.

If UNICEF and/or national partners wish to adapt the MICS process in future, for example by adding additional local indicators, adjusting the overall indicator package for MICS (for example to suit middle-income countries), or to debate transition towards gathering indicators from local sources, then approaches that engage with local experts in constructive and creative dialogue will be required. This would require moving away from a single negotiated text model which focuses on ensuring the ‘goal’ is met and the survey implemented and towards another model of engagement between UNICEF and the national authorities. A more inclusive approach might be more useful in the longer term, but it might be at the expense of meeting international reporting commitments.

^a The term was first used to describe the efforts by US Secretary of State Henry Kissinger to end the Yom Kippur hostilities in 1973. ‘Shuttle diplomacy’ is the action of an outside party in serving as an intermediary between (or among) principals in a dispute, without direct principal-to-principal contact. Usually the outside party travels between the principals. It is required when one, or both, of the principals refuses to recognize or meet with the other.

In terms of process, an approach that has proved useful in other settings is the DELPHI consensus process.⁽¹⁵⁵⁾ In this formalized method, an expert panel responds to a successive series of questionnaires with the aim of achieving a consensus on key principles or proposals.^a The Delphi method is a structured communication technique, originally developed as a systematic, interactive forecasting method which relies on a panel of experts. The Delphi approach has been used for example by the EUROPERISTAT network,⁽¹⁵⁶⁾ to reach agreement on indicators of perinatal health in selected European countries and produce the 2004 European Perinatal Health Report.⁽¹⁵⁷⁾

5.2.3 The role of the international community

Moving beyond a dialogue that focuses on implementation of the MICS and other agency specific household surveys as useful but separate projects, three opportunities present. They lie within the operational structure of UN engagement, the aspirations of BiH to enter the EU, and local changes driven by the need and demand for a functioning HIS and information that can be used at sub-national levels.

The first opportunity lies within way in which UNICEF and the UN collaborates with national partners. The process is as follows. A framework for UNICEF country programmes is provided by an agreed country programme of cooperation, which sets out the overall plan and programme directions over a period of 3 – 5 years and which is formally development and planned with the government. Within that framework, an annual plan of action is prepared and signed with the government. The framework for UN programmes at the national level is the UN Development Assistance Framework, the UNDAF. This creates a wider framework within which more than one international or UN agencies can formally pool efforts.

^a The name derives from the oracle of Delphi. The experts answer questionnaires in two or more rounds. After each round, a facilitator provides an anonymous summary of the experts' forecasts from the previous round as well as the reasons they provided for their judgments. Thus, experts are encouraged to revise their earlier answers in light of the replies of other members of their panel. It is believed that during this process the range of the answers will decrease and the group will converge towards the "correct" answer. Finally, the process is stopped after a pre-defined stop criterion (e.g. number of rounds, achievement of consensus, stability of results) and the mean or median scores of the final rounds determine the results.

A wider approach to using MICS as an opportunity to strengthen HIS is possible, but is beyond the remit of WHO and would need to be presented in the UNDAF, an implemented in partnership with WHO, key ministries and the statistical offices. The UNDAF of 2005 – 2008 set out a monitoring framework and cross-sectoral indicators, but made no statement about strengthening overall the national systems that are to collect this data.⁽¹⁵⁸⁾ A two year gap, bringing the UN's planning process in line with that of the government, was followed by the country's second UNDAF covering 2010 – 2014.⁽¹⁵⁹⁾ This lists, as the first of four priorities for agency action, the 'promotion of evidence-based policy making through **supporting the national capacities for data collection and analysis**, with particular emphasis on economic and social disadvantage, and the impact of political and economic reforms on social exclusion.'

However, on closer examination the planned activities for data collection are piecemeal and include the first post-war national census, internationally led household surveys (DHS, MICS and LSMA), and gender-based training for statisticians. There are several references to integrating decision-making with evidence, and also plans to (finally) launch a DevInfo database which would present data from disparate sources in one place. However, the statistical institutions and services that will provide such evidence and structural weaknesses in this system are not addressed in a systematic way.

A second opportunity lies with the country's aspirations towards EU membership. Two development strategies have been prepared by the BiH Directorate of Economic Planning (DEP). These cover the period 2008-2013. The Country Development Strategy (CDS) and the Social Inclusion Strategy (SIS)⁽¹⁶⁰⁾ both build on the previous country strategy paper outlining EC support in 2002 – 2006.⁽¹⁶¹⁾ Both the CDS and the SIS are clearly framed within the policy context of EU membership and EU priorities for preparation of candidates, however there is no stated support or intention to review HIS or the wider statistical services, rather an expectation that they will produce a widening range of indicators and monitoring data. There is an assumption within the documents that specific areas will draw more inline with EU standards and this could be the starting point to review core HIS indicators and data sources. The EU has a set of data collection requirements that are necessary as part of the accession process. This means that the correct direction that UNICEF leadership should take in future is

to help the country measure EU indicators. However there is little sign yet of this happening.^a

The third opportunity lies in smaller initiatives within national resources and institutions. Given that the country barely functions at the national level, the HIS needs to be built at entity level and the disparate parts of it built from the ground up. The demand for data by the international community and donors will drive some degree of change, and depending on the perspective taken, build, distort or obscure the policy landscape. Concurrent local initiatives, (for example an upgrade of the Banja Luka hospital data reporting system in 2008) also occur.

5.2.4 Capacity building

Considerable doubts expressed by both the local and international partners about whether the survey could be completed given the lack of expertise in household surveys at the national level. This proved unfounded, and the team that completed the MICS survey has formed a strong technical resource for subsequent surveys, albeit divided along entity lines.

5.2.5 Graduation from MICS

One day BiH should ‘graduate’ from the MICS survey series, and obtain the needed data for international reporting and monitoring from other sources. Neighbouring countries have already done this.

Table 37 below shows which of the countries of the former Yugoslavia have completed a MICS survey, and have completed the four national monitoring processes analysed in this study. The date of the first report for each of the national monitoring processes is given.

^a Personal observation of the author.

Table 38 Countries of former Yugoslavia, MICS and human development monitoring 1995 – 2010

	Bosnia and Herzegovina	Croatia	FYR Macedonia	Montenegro	Serbia	Slovenia
MICS 1	No	1995	No	1996 (as SFRY) ⁽¹⁶²⁾	MICS 1	No
MICS 2	2000 ⁽¹³⁵⁾	No	No	2000 (as FRY) ⁽¹⁶³⁾	MICS 2	No
MICS 3	2006 ⁽¹⁶⁴⁾	No	2005	2005/2006 ⁽¹⁶⁵⁾	2005/2006 ⁽¹⁵²⁾	No
MICS 4	2011	No	2011	2011	2010	No
UNICEF country office	1992 - present	1991 - present	1993 - present	1992 (with Serbia) 2007 - present	1992 - present	No
End-decade report on WSC Goals	2000 ⁽¹⁰⁸⁾	2000 ⁽¹⁶⁶⁾	2000 ⁽¹⁶⁷⁾	2000 (as FRY) ⁽¹⁶⁸⁾		2000 ⁽¹⁶⁹⁾
National Plan of Action for Children	2002 ⁽¹⁰⁹⁾	1998 ⁽¹⁷⁰⁾	2006 ⁽¹⁷¹⁾	1998 (as FRY) ⁽¹⁷²⁾		2003 ⁽¹⁷³⁾
MDG	2003 ⁽¹¹⁰⁾	2004 ⁽¹⁷⁴⁾	2009 ⁽¹⁷⁵⁾	2004 ⁽¹⁷⁶⁾	2004 ⁽¹⁷⁷⁾	2004 ⁽¹⁷⁸⁾
PRSP	2004 ⁽¹¹¹⁾	None	2010 ⁽¹⁷⁹⁾	2004 (as S&M) ⁽¹⁸⁰⁾		None
EU Status	Cannot apply until OHR closed – predicted 2011	Candidate status since 2005. Accession in process, membership expected 2011	Candidate status since 2005. Assessment completed	Candidate status since 2010	Stabilisation and Association Agreement signed in 2007. Not yet a candidate	Member since January 1, 2007

Some patterns emerge. The countries with UNICEF COs undertake MICS surveys. Slovenia, which has never had a UNICEF CO, has never completed a MICS survey and has Croatia completed only one MICS, and then stopped after the CO reduced

activities and then closed.^a All of the countries submitted end-decade reports, regardless of whether MICS data was available. It can be argued that the quality of these reports varies, for example the Croatian report on follow up to the WSC was mainly narrative and did not report on each of the goals and targets in the WSC in comparison to the BiH report which provided detailed statistics, largely derived from the BiH MICS 2000 survey. Therefore, while it is true to conclude that the BiH end-decade report could have been submitted without the BiH MICS 2000 data, it would likely have been a largely 'content free' exercise.

Regarding the other three monitoring processes, all countries participated with the exception of the PRSP, which Croatia and Slovenia did not join. The PRSP is a WM/IMF driven exercise promoted for use in developing countries and both Slovenia and Croatia have vigorously rejected this epithet since independence, preferring to be seen as Western European countries. PRSP aside, the other three monitoring processes were completed. One might conclude then that although the MICS survey provides useful indicators for reporting on these processes, they are not dependant on it and countries can find other ways to produce the required data, or else they omit reporting on some of the indicators that are in the MICS survey tool and that cannot be measured locally. Herein lies a question that BiH and the international community should address – does it really need to continue with the MICS, and if so, for how long?

5.2.6 Results of the indicators

The BiH MICS 2000 household survey set out to produce the first post-conflict national level health and social indicators for women and children in BiH. The indicators measured were those that were already within the global MICS 2 survey tool and no extra local indicators were added.^b Some indicators in the global MICS 2 survey tool were deleted as they were not relevant to BiH, or they could not be

^a Both Slovenia and Croatia has UNICEF National Committees, which are advocacy and fund-raising organizations found in developed countries. The other countries in this group have UNICEF country offices which deliver development and assistance programmes. MICS surveys are overseen by the technical staff in these offices.

^b This was a possibility at the outset and one that was exercised to a limited extent by other countries in the MICS 2 survey round.

measured using the tool as the numbers were too small. These exclusions were methodologically correct. However some were excluded because they had been measured at entity level in the previous year, in retrospect the wrong decision. This applied to the breast-feeding and iodine-deficiency questions in the full MICS survey and as a result it has proven difficult to find comparable data on these areas.

The lesson here is that the local teams are quite capable technically of conducting household survey and producing data that is of good quality. However their capacity to identify the most suitable local indicators has not been tested.

5.2.7 Disaggregation of data

National-level household survey data often shows little effect unless you can disaggregate it. A small measured effect in a national indicator can actually represent a huge one if the data is disaggregated. Documenting health inequities is the first step to addressing them, yet as Hanfield (2008) notes, overall global health initiatives have paid insufficient attention to health inequities, and equity sensitive targets are needed.⁽¹⁸¹⁾ To measure health status in specific population groups requires disaggregated data related to social inequalities. Household surveys may not produce statistically robust data at the different sub-national levels that can be used to formulate health policy and decision-making; such decision-making may take place at the local, city, country, or regional level.

The BIH MICS 2000 survey produced data that was valid at national and entity levels, but not at the lower cantonal or district levels. This was not well understood by users of the survey data. The Brcko District Authorities felt that their population had been unfairly excluded from the survey and did not understand the statistical ‘niceties’ of data validity. Further, the fragmentation of the FBiH entity into cantons, and the administrative structure with Ministries of Health, Education and Social affairs at this cantonal level meant that there were calls for the data to be reported by each canton. UNICEF did not agree to do this in the main survey report, but the crude data was added as an Annex to the FBiH entity report with caveats that only crude numbers (and not rates) should be used. In some cases this was ignored and local authorities unofficially constructed their own invalid rates and used them in cantonal reports.

The data could be disaggregated by urban/rural, sex and age, but it could not be disaggregated by socio-economic, ethnic or refugee status. A decision was made not to include ethnic or refugee/displaced indicators in the survey. This was a political decision based within the context of BiH in 2000 and it did limit the data that was measured.

A poverty index was being developed at the time of the survey implementation; this was not applied due to time constraints. The poverty index trialed was not entirely successful in the MICS 2 countries where it was used. As the opportunity to trial it in BiH was missed and it is not possible to tell in retrospect if this would have been useful or not. As there was no formal evaluation of the MICS 2 series, (in contrast to the external evaluations of both MICS 1 and MICS 3), it is not possible to make conclusions on this point.

Subsequent MICS surveys in BiH have produced indicators that can be disaggregated to a greater degree, however the issues are not yet fully resolved and the MICS tool may not be sensitive enough to allow disaggregation for all indicators due to the low numerators for some of the indicators it measures.^a

5.2.8 Indicators over time

A wider question is what the data tells us about the subjects being measured. General indicator patterns showed were minimal but when any small differences are detected, they are largely what were expected i.e. they showed decreases over time and an improvement post war. Some indicators did not recover to pre-war levels, and this is in keeping with both the post-war recovery phase, during which some health services had not returned to pre-war levels and a possible tendency to over report on some indicators pre-war. Urban/rural differences were rarely elicited. In most cases, there was no gender difference, which is an important finding.

The lack of a poverty index means that disparities within the data cannot be examined and in fact, this might have shown a profound difference. The longer term impacts of the conflict and the effects of post-war economic transition are likely to have been

^a For example, in measuring indicators relating to acute respiratory infection, the denominator of children under the age of 5 and the numerator of children who have symptoms of an ARI in the two weeks preceding the survey are too low to be statistically significant if disaggregated.

higher in the poor and in certain ethnic groupings. The non-settled Roma community would not have been included in this data. Therefore, as measured in 2000, these indicators are not sensitive enough to detect changes in BiH. The survey tool has improved somewhat over time.

Indicators can be used to compare progress over time within and between countries towards internationally agreed goals and standards. However, if indicator definitions change over time the results may no longer be comparable, and this is one of the inherent challenges in international health indicators. Currently there is no single location where the indicator definitions over the 4 MICS series can be compared. This would be a useful piece of work to complete.

The indicator results from MICS, other global household surveys and national reports are listed over time for each country in multiple global databases, however only rounded figures are presented with no reference to confidence intervals (where they can be calculated) and data is presented in graphical format as line or bar charts. Quite complex calculations are required to establish validity for trends. Examining trends over time for data from a single data source (in this case MICS) is shown in this study to be complex; the complexity increases when data from different sources is compared.

The Institute for Health Metrics in Washington have observed that data on country specific indicators of health outcomes are inconsistent across databases from different sources such as WB, UNICEF and WHO. Examining data for under-five child mortality in 2000 and 2003, it was noted that ‘the levels of uncertainty in the data is such that no single trajectory for progress is evident ... and the use of country clusters was proposed in further study of changes over time.’⁽¹⁸²⁾

5.2.9 Relevance of indicators at international and national levels

It was tacitly expected at the outset that the BiH MICS 2000 survey would produce indicators and data of use and relevance to national planning purposes, although it was not explicitly a condition of inclusion in the survey that they should be. It can be concluded that not all of the indicators measured in the BiH survey were relevant nationally. They were all relevant as country level indicators to report to the UN on the

WSC other monitoring frameworks, but their usefulness at the national level is questionable in some cases.

There is an inherent tension between sub-national, national and international data needs and the MICS survey tool cannot be expected to fulfill requirements at all these levels. A lesson learned from BiH is that it would be useful to at least have this debate at the outset of each MICS survey round.

5.2.10 What is not measured?

There are indicators in the MICS global survey tool that could not be measured in BiH due to low numerators and/or denominators for the calculation of rates in the interviewed sample.

Two examples are perinatal and maternal mortality. Data can be found by compiling information from vital statistics and hospital reports. In a retrospective study, Z. Fatusic et al analysed perinatal and maternal mortality in the pre-war period (1988-1991), the war period (1992-1995) and the post-war period (1996-2003). They also analysed the number of deliveries, the perinatal and maternal mortality rates and their causes. There was 'a range of 3,337 to 6,912 deliveries per year, with a decreased number in the war period.

During the war period and immediately after the war, the perinatal mortality rate increased to 20.9-26.3% (average 24.28%). After the war, the rate decreased to 8.01% in 2003 ($p < 0.05$). Maternal mortality before the war was 39/100,000 deliveries; during the war, it increased to 65/100,000 and after the war it decreased to 12/100,000 deliveries ($p < 0.05$). The increase in maternal mortality during the war was because of an increased number of uterine ruptures, sepsis and bleeding due to shell injury of pregnant women.⁽¹⁸³⁾ This is useful data but it has not been incorporated into national mortality reporting figures and remains in the preserve of academia.

Clearly, MICS can only produce a limited set of data and meet few of the data needs and demands in the countries. This strengthens the argument that in parallel to implementing MICS efforts should be made to build a system that will actively plan for and seek out other ways of measuring needed data.

5.3 Lessons learned for other resource-poor, post-conflict countries

The relevant research question is:

- What lessons can be learned and conclusions be drawn and lessons learned in relation to the development of HISs in other post-conflict and resource-poor countries?

There is a growing awareness, as noted in the 2009 evaluation of the HMN, that 'health information systems are, by definition, not stand-alone, ... but must be integrated into operational health and governmental systems in each country, so no health information technical support agency can itself deliver a satisfactory solution in isolation. It must work through partnership with national and international players.'⁽¹⁸⁴⁾ Further, the HMN notes that 'HISs must be enduring and stable (though evolving), and so unlike the goals of some topic-specific programmes there is no end point, but there must be strong national integration and commitment, even in the face of acute resource shortages for care and prevention delivery.'

Some aspects of this are discussed next.

5.3.1 National ownership

The BiH MICS 2000 governance structure at the national level was effective in getting the survey implemented. The single negotiated text approach with UNICEF (and the author) playing the role of third party ensured that the survey was completed and met deadlines. Further the government signed off on the process and officially endorsed and used the data for international reporting. However there was a governance dilemma – did the entities simply follow instructions?

A particular emphasis in the MICS survey series is that of 'national ownership.' The OECD describe this as the 'effective exercise of a government's authority over development policies and activities, including those that rely entirely or partially on external resources. For governments, this means articulating the national development agenda and establishing authoritative policies and strategies.' OECD also advises that 'for [aid] donors, it means aligning their programmes on government policies and building on government systems and processes to manage and coordinate aid rather than creating parallel systems to meet donor requirements.'⁽¹⁸⁴⁾

In partnerships between, for example, WHO and other organizations, everyone sees being in as better than being out. Therefore, people stay in because they get some of what they want. In partnership, if there are winners and losers, the partnership ends. Nowell (2009) in a study of 48 interorganisational collaboratives (i.e. coalitions, partnerships and coordinating councils) noted that ‘cooperative stakeholder relationships were the strongest predictor of systems change outcomes. However, for coordination outcomes, stakeholder relationships were overshadowed in importance by the leadership and decision making capacity of the collaborative.’⁽¹⁸⁵⁾

Within all partnerships, some partners have more power than others. In a fragile country, international bodies wield more power than they might if the state and may in fact become decision-making bodies.^a In a weak state, the partner who holds the budget (in this case UNICEF) effectively wields power over national institutions who do not. In relation to MICS, the partnership between UNICEF and the national authorities may be unequal. A political analysis guide to the MICS negotiation process might be useful.

The specific approach described for implementing a household survey in BiH when two formerly warring parties were involved in a fractured and semi-functioning state may not be applicable to all such situations. Each country setting can be quite specific. This study is therefore useful as an example rather than a rule. However, there are elements of UNICEF generated approach that has been applied across the board such as single document negotiating strategy etc. that could broadly be applied within other conflict-determined negotiating frameworks.

5.3.2 Local capacity building

Central to all efforts for data collection, even in unstable settings, is the way in which local capacity can be built for future such work. Without this, any data collection exercise or survey becomes a one off project, and when the need for data arises again there is little institutional memory left to take it forward. So although in some extreme cases there is a need to employ an external short term team to ensure the work completed, the preferred and more sustainable approach is to strengthen local

^a As presented in the introduction chapter, where one extreme view is that BiH was in effect and international protectorate.

data collections systems and build more long term local capacity. This is discussed next.

An intention inherent in the MICS model is to build local capacity to conduct such surveys. The survey was completed with minimal assistance of external, non-BiH advisors (one for sampling) and with an emphasis on training local teams. The subsequent MICS 3 survey in 2006 was more detailed and comprehensive and was carried out by the same local teams who had conducted the first MICS survey, demonstrating that they had built skills that helped improve their survey capacity. The local teams were also instrumental in most of the other household surveys that were completed in the following decade in BiH.

This cohort are an invaluable resource, yet the opportunity is not taken within the MICS programme to introduce the MICS survey team to broader principles. Nor are policy makers included in the decision-making process until the very end, the data dissemination stage. AbouZahr et al. from the HMN (2007, note a fourfold framework to help the transition from data to policy. They note that ‘good practices include: (1) reconciling statistics from different sources; (2) fostering communication and transparency, including reaching out to the media for dissemination; (3) promoting country ownership of data and statistical analyses; and (4) addressing conflicts of interest, including those arising when workers responsible for attainment of health goals are also charged with measurement and monitoring of progress.’

In relation to building better links between the MICS, HISs and policy making at the national level, these principles could be addressed within the MICS survey process and a wider range of partners included throughout.

5.3.3 MICS as a nation-building tool

It can be argued that MICS and other household surveys may contribute to nation-building and may strengthen democracy, by introducing collaborate processes and providing publicly available data.^a The 2009 Human Security Report has captured some of these ideas, and further notes that quantitative research can give profound

^a On the basis that in non-democratic regimes access to population-based data may be limited and data distorted.

insights into conflict and be enriched by mixed methods analysis.⁽¹⁸⁶⁾ The 'WHO 'Health as a bridge for peace' approach, which appears to have lost ground recently lists three associated approaches.

'First, are the advocacy and education programs that seek to inform publics and governments about the true human costs of war. Enhancing public knowledge about warfare is seen here as contributing to conflict prevention.

Second, is the idea that trust generated by negotiating health interventions in conflict zones—typically to immunize children—can create enough confidence between enemies to jump-start negotiations that can eventually lead to peace settlements. From this perspective, interventions by health professionals can become stepping-stones to peace.

Third, is the belief that, where official state policy improves the health outcomes of ordinary citizens in post conflict settings, this will enhance the legitimacy of the governments concerned and thus decrease the risks of wars restarting.'⁽¹⁸⁷⁾

Therefore in fragile states the process of conducting global household surveys such as MICS may have a potentially broader role and function than in countries that are stable and developed. Furthermore, public access to and demand for data is increasing. This has been fuelled by several factors. These include the implementation of human rights oriented legislation, demand from various sectors of the population to know this data, normative standards set by the UN and other bodies which promote public access to data, and the increasing use of data interfaces that will allow online data to be searched and queried.^a

By promoting access to population data, household surveys such as MICS can be seen as a democratizing force, especially in countries where access to population-based data was previously limited. This aspect of household survey implementation is under-recognised.

^a Examples include the recently launched MICS compiler, which will allow searching of the survey datasets online and production of tables from it and the DHS equivalent. These all allow data to be manipulated and presented much more easily.

5.3.4 Measuring global goals and targets

There is a general issue regarding measuring goals and targets. A country that is trying to get their measured output above a certain target will experience the following: as soon as a particular phenomenon is measured it is distorted, in a process commonly referred to as 'gaming the systems.' The relationship between the accounting system and the methods used will eventually break down. Goodhart's Law, a generalized social sciences expression of the more well-known and economic specific Lucas critique, can encapsulate this.

The original 1975 formulation by Charles Goodhart was that 'any observed statistical regularity will tend to collapse once pressure is placed upon it for control purposes.'^a Danielson proposed an alternative formulation in 2002 and formally labeled as a corollary of Goodhart's law 'A risk model breaks down when used for regulatory purposes.' The implications are that there is evidence that targets can be useful. There is also evidence that they get less useful over time. Any tool is under mined by its own use. In relation to global targets, there is evidence that this happens over time, as the MDGs are revisited. The BiH experience shows that tools such as the MDGs develop and evolve over time and the 'goalposts' of goals and target can change.

There may be a bigger concern. Attaran (2005) asked if it is 'wise to elevate the MDGs to the pedestal where they now sit? Could it be, despite an appearance of firm targets, deadlines, and focused urgency, that the MDGs are actually imprecise and possibly ineffective agents for development progress?'⁽¹⁸⁸⁾ He further argues that what makes the MDGs attractive is their concreteness, however the data may not exist to measure them. Attaran observes that household surveys are serviceable but crude tools and that some of the questions that are asked can be so technical that no lay person can answer them accurately.

^a The original statement of Goodhart's law can be found in one of two papers delivered by Charles to a conference in July 1975 at the Reserve Bank of Australia (RBA), Goodhart (1975a, b). The original papers were reproduced in Volume I of Papers in Monetary Economics, Reserve Bank of Australia, 1975 under the titles 'Monetary Relationships: A View from Threadneedle Street' and 'Problems of Monetary Management: The UK Experience'. Goodhart's Law has been influential in monetary policy design - monetary targets are out and inflation targets are in.

As can be seen from this study, the BiH MICS 2000 did contribute to filling the data gaps in the MDGs and three other national monitoring processes. The question remains though about whether the indicators were useful or not. Some criticize the MDG more broadly, calling them non-comprehensive, generic and most importantly highly apolitical. A central finding of this study that there is a real danger in using national level population indicators to measure child and maternal health, in this spirit it is also misleading to use the global MDGs to define and measure local progress. Getting around the thorny issue of whether the MDGs can be measured or not, countries are now adapting the 'benchmarks' to suit national contexts i.e. changing the targets and in some cases the indicators.

It is clear that, development progress is especially hard to achieve in so-called fragile states or contexts, however as Vernon et al (2010) have stated 'MDGs are not being used simply as an aspirational and inspirational tool. Ironically, a set of goals chosen partly based on the data that were available, and partly based on what would be acceptable to heads of state with very diverse political views and interests, has by default become the main international public definition of development, which it was never intended to be.'⁽¹⁸⁹⁾

5.3.5 Ethical approval and consent

This area of household survey methodology is evolving, and in the direction of more rather than less consent. Ethical issues in population-based surveys include informed safety, informed consent, confidentiality, and reporting findings of testing. The use of biomarkers in population-based surveys has led to a call for a review of the ethical standards under which surveys are conducted in less-developed nations.'⁽¹⁹⁰⁾

Currently for MICS surveys, ethical approval is not required, and only verbal consent is sought. Nor is there any requirement for interviewers to sign a confidentiality agreement. In MICS 1 and 2, no written consent was obtained. In MICS 3, blood samples were taken in some countries, including in Georgia, Kazakhstan and Laos. From the Georgia and Laos questionnaires, only verbal consent was sought. In Kazakhstan, the blood sampling was part of another data collection activity so consent was not part of the MICS data collection process. In MICS 4, a particular example was that of the Central African Republic where blood samples were taken and there was

emphasis on getting consent. There were separate instructions/text for those aged less than 18, and a signature of the interviewer was required in the questionnaire.

Multi-topic general household surveys increasingly seek informed consent from respondents in order to gain additional data, through direct measurements, by collecting biomedical samples, and by linkages with administrative records. The supplementary data yield substantial research benefits, but the process of seeking informed consent raises a number of issues. The first is that attempts to gain consent – which are likely to bring issues of privacy and confidentiality into the minds of respondents – may lead to higher rates of item non-response and also, in a longitudinal survey, to future sample drop-out.

A second issue is whether respondents who provide consent (and for whom the supplementary data are available) are sufficiently representative of the sampled population: do consent procedures introduce a form of selection or ‘consent bias’, compromising external validity? Analysis of these issues has been largely confined to medical and epidemiological studies; there are few studies of consent patterns in multi-topic or non-health surveys (as we discuss below). However, one might expect consent patterns to differ between types of study. For example, a respondent may perceive that health-focused studies are likely to provide greater benefits to him or her personally, by contrast with requests for data linkage for non-health purposes for which the expected benefits to consent are more diffuse.” ⁽¹⁹¹⁾

When it comes ensuring that governments allow the MICS datasets to be openly accessible, there is a practical system of government sign-off in place. In some cases, governments may disagree with the data produced, or the quality control check at UNICEF HQ clashes with the implementing partners perspective, and this can hold up data release.

The more challenging question remains that of individual consent. A concern is that a risk-averse approach to consent may make the whole survey, already long, even more complicated. The implementation of global standards in resource poor settings has created feedback and frequently challenges interpretation of those standards.⁽¹⁹²⁾ However developing countries must have their own sustainable institutional frameworks to discuss, develop, and implement ethical protection systems which are morally sound and nationally relevant.⁽¹⁹³⁾

5.3.6 MICS in conflict and post conflict settings

The MICS methodology has been applied in only a few countries that were in conflict, or ten years or less post-conflict. These are listed for each of the MICS survey rounds.

Table 39 MICS surveys in conflict and post-conflict countries

MICS 1 (1995)	MICS 2 (1999/2001)	MICS 3 (2005/2006)
Afghanistan	Afghanistan	Bosnia and Herzegovina
Angola	Angola	Central African Republic
Croatia	Bosnia and Herzegovina	Cote d'Ivoire
Palestine	Iraq	FYR Macedonia
		Iraq
		Sierre Leone
		Somalia

Of the countries of the former Yugoslavia, Croatia completed only one MICS in the first series (1995) and then did not elect to do another one. FYR Macedonia did not complete a MICS in either the first (1995) or second series (2000) but engaged with series 3 (2006). The reasons for these decisions appear to have been due to the size, interest and capacity of the UNICEF country office at the time. In the case of Croatia, there may have been a wish on behalf of national authorities to differentiate the country from the former-Yugoslavia group and to 'graduate' to developed country data collection systems and status.

As well as standalone MICS surveys, MICS modules or questions have also been incorporated into other household surveys conducted in countries that were either in conflict or post-conflict. Information on this is available for the MICS 3 survey series:

(124)

Angola 2008 Inquérito Integrado Sobre o Bem-estar da População (IBEP)

Occupied Palestinian Territory 2006 Palestinian Family Health Survey

Sudan 2006 Sudan Household Health Survey (SHHS)

In the above countries, implementation was adjusted to take into account the particular circumstances of the country, however there is only minimal documentation of this in official survey reports, which follow a centrally produced and recommended template. There is no particular guidance available for MICS survey implementation that is specifically adjusted to conflict and post conflict settings. Overall, published literature on the MICS itself is relatively weak, thus this thesis can help clarify what the particular challenges are in such settings and what approaches can work.

This case study is set in a post-conflict country. There are particular challenges to collecting population level data in post conflict countries and specific strategies may need to be put in place to ensure success. These need to take into account the following. There may be a fragmented and unstable governance structure. Corruption may be rife and channeling funds difficult. National and sub-national boundaries may have altered causing problems in developing a relevant sampling frame, data records are often missing, experienced personnel may have migrated or died and there may be a lack of equipment, funding and other resources needed to carry out a major household survey. There is likely to be a knowledge gap regarding newly emerging indicators, as the country's survey experts have been professionally isolated during the conflict. There may be security issues with mines and unexploded ordinance. There may also be particular sensitivities around ethnic and other divisions and the political and organizational structure of the country that may affect survey implementation.

The decision-making around a national survey or census is complex. Many countries have a regular programme of population censuses and a range of household surveys that are planned routinely, so the trigger to start will be set well in advance. For low or middle-income countries, the triggers are more likely to be external and prompted by international agencies or agendas.

In most cases, there are multiple factors. Three illustrative cases in countries that were in conflict or recently post conflict are briefly described next. The first two are MICS surveys and the third concerns a national census.

1. Afghanistan has a long history of conflict. After the collapse of the Soviet Union, the government was overthrown by an alliance of local mujahidin and the Taliban, an alliance of religious scholars and former mujahedeen, came to power, taking control of

95% of the territory by 2000. Following the September 11th 2001 attacks on the US, the US and allies invaded Afghanistan, and civil war is ongoing. By 2000, with minimal data available on the situation of children and women, there was strong international pressure to complete a MICS survey. This was initiated in 1999 and eventually implemented in 2003.⁽¹⁹⁴⁾ The Statistical Office of the interim government oversaw the survey but intense technical support and several external consultants were required due to a lack of local capacity.

The security situation and access denials meant that only a few locations in Afghanistan were visited. These comprised only about 1% of all areas and hence should not affect the overall data. The nomadic population known as "*Kuchi*" were not included, as commonly happens in household surveys. The sampling frame had a number of missing villages due to loss of census documents over so many years: the last census was in 1979. This loss was estimated as 10% of all villages spread all over the country. The resulting data showed that women and children were among the poorest in the world and had some of the worst health indicators.

2. Iraq is another country where international influence was the main trigger for a MICS. Ad hoc surveys, such as the Harvard School of Public Health assessment of child mortality between 1985 and 1991, which extrapolated a three-fold increase in mortality of children under five years of age due to the Gulf war and UN sanctions, had provided important information on the state of children's health. However there was only weak and incomplete population-based data from routine sources. In comparison, the BHI MICS 2000 survey was also a UN initiated and funded exercise.⁽¹⁹⁵⁾

3. Liberia endured two civil wars between 1989 and 2003 and then gradually regained some stability and peace. Conflict destroyed most of Liberia's 1984 census data before it could be analyzed and most of the country's existing records and databanks. Conflict prevented a census in 1994 and 2004. Only scanty data with limited geographical coverage was available by 2007. The impetus for the 2008 national census came largely from goodwill from the newly elected Democratic Government of President Ellen Johnson-Sirleaf,⁽¹⁹⁶⁾; in addition the country was sufficiently stable to consider a national census, funding was available from international donors and there was national and international demand for indicators to measure the impact of assistance programmes.

Drawing from this study and the cases above, the following triggers are proposed

- The level of conflict must have fallen so that the security risk for fieldwork should be minimal or able to be reduced (for example by avoiding certain areas without compromising the representativeness of the data).
- The election or emergence of either a stable government that supports such a national survey, or a level of international control and governance that will 'shepherd' the survey through.
- The time for a particular survey round may have arrived (MICS is 3-yearly, other surveys may not be cyclical).
- A particular national or international leader may take on the project as a personal mission or interest.
- In all cases there is likely to be encouragement (combined with offers of support and funding) from the international community to conduct a household survey to fill data gaps.

5.3.7 Middle - income countries

Middle income and transition countries often fall between two stools and have particular characteristics that do not fit neatly into either 'developed' or 'less developed', including in relation to their data needs. In the case of countries in Eastern Europe, the Balkans or post Soviet bloc, national capacity to conduct surveys may be relatively high but outdated and not adjusted to the newer circumstances brought about by the transition of the economic and organization of services in the country.

Child health can also be adversely affected by social and economic transition; this was a particular feature in Eastern bloc countries and in the countries of former Yugoslavia. A particular set of changes took place in Eastern Europe and the Soviet block with the fall of communism in the eighties and nineties. Children were disproportionately affected by economic transition as the former socialist health, education and welfare systems, which tended to protect and support children, collapsed. They had been crippled by shortages, corruption and a lack of reform. Traditional family ties also weakened. In Eastern Europe in the nineties, living standards of households with young children are believed to have fallen substantially

over the reform period in comparison to other households.⁽¹⁹⁷⁾ A World Bank (WB) study of poverty between 1993 and 1998 in six countries of the former Soviet Union noted the decline in income, but also issues of vulnerability, social isolation and powerlessness, had increased. The study concluded that analysis of these issues as well as the identification of the appropriate means of measurement might have major implications for developing policies that can overcome cultural and institutional barriers to poverty reduction.⁽⁵⁴⁾ The exact nature of these changes varied from country to country but the overall patterns were similar.

Countries that are undergoing political, economic and social change face specific issues in relation to their population data collection systems and data needs. Boerma (2007) notes that 'the preoccupation with MDGs does not take into account the rapid health transition, which implies that health statistics should systematically include a much wider array of health issues from acute infectious diseases to chronic non-communicable diseases and injuries, disaggregated by socioeconomic position.'⁽¹⁹⁸⁾ While global household surveys overseen by the development community are primarily aimed at low-income countries, conducting these surveys in countries that are middle income may be only marginal useful or relevant. Boerma further notes that it is time to 'accelerate the production and use of accurate, complete, and timely health statistics for decision-making by investing in country health information systems that should be based on an efficient and effective mix of standardised methods of data collection and analysis that meet country and international needs.'

Middle-income countries have more resources than the poorest or less-developed countries, and in general, their child health indicators are better.^a However, middle income countries in transition may experience a reversal of health indicators. In Europe, several countries are undergoing economic transition from planned central economies following the breakup of socialist blocks including the Russian Federation and countries of Former Yugoslavia. These can experience extensive social changes including the formal dismantling or de facto breakdown in health, education and social protection systems and changes in employment rights such as a reduction or removal

^a This is a generalization that does not hold entirely true, for example the US despite being the economically wealthiest country in the world does not have the best child health indicators and lags far behind many poorer countries.

of maternity rights for employed women, the introduction of co-payments for child health services, or the privatization of state-funded nursery schools. ⁽¹⁹⁹⁾

The centrally planned economies had influential and centrally controlled statistical collection systems, often with clear delineation of roles and responsibilities for the collection of different kinds of data. Economic and political changes in most cases also led to disruptions in data collection systems; these may have undergone transition and reform. Newer data needs requiring cross-sectoral data collection and analysis pose particular challenges to the data systems that existed in Eastern Europe and the Soviet block. These tended to be sectoral, rigid and required reform to adapt to new circumstances and challenges.

Middle income countries can fall between the gap, neither fully developed (but aspiring to be so) nor an LDC (and not willing to be seen as such). For these countries, it may not always be clear which types of data or which national indicators are the most relevant. There may also be resistance to admitting that both the quality of measured indicators and capacity to measure them may have deteriorated during the period of transition. Old habits regarding data can take some time to reform. Some centrally planned economies inflated national (and other) level indicators, obscuring the true patterns in the country, thus there may be an issue over accepting new figures, or in endorsing an open and transparent process to data.^a

Countries in transition also face newly emerging issues including migration, new disease patterns, changes in birth rates and a new awareness of the need to measure ethnic and other disparities. This can all deeply challenge what may already be fragile national data collection systems. As noted earlier, there is a specific issue for countries such as BiH that aspire to EU accession; they need to take into consideration EU standards and processes.

^a The author witnessed the head of a national statistical office in a country that was formerly part of the Russian Federation, claiming that the response rate in a MICS survey in 2000 had been 100%. This was an unlikely if not impossible result, suggesting that recommended methods of quality control and checking of reported response rates had either been ignored or the response rates directly falsified.

5.4 Strengths of the study

The study design was based around the first national household survey in BiH five years after a conflict had ended. Although the survey had been reported, a wider assessment of the contribution and relevance of the survey had not been made.

5.4.1 Going back to original objectives

The study examined the original objectives of the BiH MICS 2000 survey, which were to fill data gaps that existed in BiH five years after the conflict had ended, and explored in some detail the wider context of the country at that time and placed the survey in the context of child health and indicator definition and the national HIS. The survey itself was conducted and reported but these basic questions had not been addressed.

5.4.2 Documenting the process

The study defined the process used to successfully modify the global MICS survey tool and implement the survey. This clarified the approach taken and was a useful framework to understand the decisions made and the consequences of those decisions and how they constrained the survey implementation.

5.4.3 Defining data gaps and extent to which they were filled

The usual way of looking at monitoring programmes is that indicators are defined and then measured. This reversed the analytical framework and looked at the measured indicators and explored where they were used and how they had influenced the setting of the goals and targets in the first place.

5.4.4 Comparison of data across time

A household survey is usually seen as a standalone piece of work and is reported as such. Globally comparable indicators are reported usually by topic area over time but not gathered together. The study explored how data from a single methodology can be compared over time and demonstrated challenges in this.

5.4.5 Policy context

The study set the data in the policy context, which in the case of BiH is that of a post-conflict, middle-income country in Europe. It explored the strengths and weaknesses of both the indicators used and the data collected in that context. The health indicators in the MICS survey are those that are particularly relevant to low-income countries. The policy context for BiH is European. The country, as all the countries of the Former Yugoslavia, aspires to membership of the European Union. Thus the study exposed weaknesses in the logic of the survey inception.

5.5 Limitations of the study

This was a mixed methods case study. The main limitations are that it was a retrospective study, the data analysis was largely descriptive, the application of the model used may not be applicable to all post-conflict settings and the full use and application of the data was not completely explored. These are discussed in more detail below.

5.5.1 Alternative study designs

As a retrospective study, conducted after the BiH MICS 2000 survey had been completed, the findings are both informed by time and also distorted by time. An alternative and perhaps more useful approach would have been action-based research conducted in parallel to the design and implementation of the survey itself.

Not all of the uses of the data from the BiH MICS 2000 survey were fully explored and there may be wider uses and significance of this data. These might include the following: the transfer of knowledge gained in this particular survey to other settings by the staff involved; learning effects on those who were engaged that then translated into policy and services decisions; a positive (or negative) effect on the informants who were asked specific questions in relation to primarily their children, but also in relation to issues such as HIV/AIDS and contraception; and the wider impact on entity level government bodies who were able to observe an effective way of working between their sister agencies. These were not documented, but might have been explored fully if an action-based research approach had been taken at the time.

5.5.2 Further statistical analysis

A limitation of the MICS survey tool is the lack of guidance on how to compare indicators within national surveys and between national surveys using standard statistical tests. The indicators are a mixture of single (for example (primary school attendance rates) and combined measures (for example women of childbearing age who score positively on more than one measure in the survey). Kohen et al (2007) addressed the complexities of conceptualizing childhood health problems using survey data and applied a range of methods to compare different data sources. As the MICS survey series now totals four rounds and is moving to three-yearly rounds, this kind of analysis would be useful, as would tools to compare between MICS and other household survey data.

5.5.3 Evolution of the MICS survey tool

Since the BiH MICS 2000 survey was completed, the MICS survey tool has evolved, and some of the issues noted around data archiving, documentation, error calculations, and the disaggregation of data by socio-economic status have been addressed in the third and fourth round of MICS.

5.6 Implications for future research

There is scope to review and improve the mixed methods case methodology utilized in this study, and to develop a theoretical framework around this could be applied by others. It would be useful to conduct further mixed methods case studies in different national settings and regions of MICS. Another approach would be to trial action-based research for one or more of the MICS 4 national surveys that will be implemented in 2011. An external evaluation of the MICS 4 series is under consideration for 2011, and it may be possible to include either case-based studies of action-based research into this. In this way, the evaluation could be informed by such research.

In relation to the MICS survey, the interface between the survey tool and the data needs of middle-income countries requires further exploration. This could be directed towards two areas. The first area would encompass delineation of the MICS indicators that have a direct practical application at the national level and sub-national level and

examining ways in which they can be made more useful and relevant (for example by creating separate modules or questions for middle-income settings). The second area would be to investigate, using practical examples and theoretical modeling, how and when a middle-income country can 'graduate' from MICS towards more sustainable local sources of data. It could be based on both quantitative research (for example modeling at what rates the indicators cannot detect trends over time) and qualitative research (for example a resilience and capacity study of the national HIS). Such research could then inform guidance for middle-income countries on how to commence transition away from MICS more effectively.

With the increasing number of completed national household surveys in developing countries, improvements in online data archiving, and better technology that allows users to search for, query and compare online data sets, household survey data are becoming more accessible for researchers. It will be increasingly easy to cross-reference data from different countries or to investigate a particular survey in depth. The major global household survey series, including MICS, are lagging in the provision of guidance and tools that would help researchers from developing countries use the datasets now available and they should consider strengthening this area of their work.

It is becoming easier to view and present health indicators across time from the MICS and other household surveys, as they are listed on many international databases. However going beyond the simple presentation of indicators numbers is more complex and incorporating confidence intervals and other measures of data validity is challenging. In part this is because such information is missing from indicators databases and in part because the meta-data and/or methodology is either topic-specific (for example only relate to immunisation indicators), partial (for example only relates to one survey series and cannot be used to compare indicators from different survey series) or absent. To enable researchers to fully utilize this rich mine of data, and policy makers to better understand its strengths and limitations, these issues need to be investigated..

The use of technology in conducting fieldwork for household surveys, including for MICS, is increasing. Recent innovations in remote devices including mobile phones and PDAs have led to survey technology including EpiSurveyor, a PDA-based data collection project that is based on the EPIINFO software, freeware that has been

developed by the Centers for Disease Control (CDC) in the US. Further research in this area would be useful.

6 CONCLUSIONS

6.1 Structure of chapter

This final chapter summarises what this study adds, presents some insight into what the author has learned in the process and ends with some overall conclusions.

6.1.1 What this study adds

This study presents the first written history of the evolution and development of the MICS survey series as a case narrative. This brings together the internal (to UNICEF and the UN) and external factors that have influenced the evolution of MICS. It contributes a new interpretation of the already known MICS material, which comprises survey tools, national survey reports and datasets, and a limited body of academic publications on the MICS survey itself. This case narrative will be used as a background paper for the forthcoming global MICS conference that will be held in 2011.

This study is also the first known academic case history of a national MICS survey.^a It utilizes mixed methods to present a critical analysis of the BiH MICS 2000 survey process and examine the validity and usefulness at the national level of indicators measured by the survey. This is new approach, one that adds to knowledge about the MICS survey.

There are practical applications of this work. The lessons learned from this case study are directly relevant to policy and practice in BiH. It is clear the country should soon graduate from the MICS survey series. A MICS survey, the third for BiH is planned for 2011, but to date the issue of including EU level indicators has not been addressed. This study may prompt UNICEF and the national and entity NSOs and ministries to examine this issue. The lessons learned may also be applied to other post-conflict and resource poor settings. One way this may happen is by using the findings to stimulate

^a As known to the author and the MICS global team. Descriptions of country MICS surveys have been included in the two evaluations of the first and third rounds of MICS.

discussion at UNICEF HQ level within the MICS steering group and within wider international household survey settings on the issues raised.

6.1.2 What I have learned

The BiH MICS 2000 survey was a flawed process that was better than the alternative, which was not to conduct the survey at all.

My understanding has moved beyond the concept of 'good' or 'bad' data. Even the weakest data can be useful for some purposes.

Despite having worked on MICS for the past 10 years in a range of settings and role, this study revealed aspects of the survey that I had not appreciated before. I had not realized how complex the seemingly simple task of constructing time trends would be, how the lack of thought about relevance in middle income countries has revealed weaknesses in the survey tool, and how necessary it will be to consider MICS within the context of a national HIS if there is ever to be true national 'ownership' of the survey/

Doing an MD has allowed me to explore the boundaries between policy/practice and academic approaches and to see how they might be better connected. The study allowed me to explore the Interface between the rigorous and principled on one side and the pragmatic on the other.

6.1.3 Overall conclusions

The power and financial influence of the international community in BiH has encouraged an atmosphere of dependency, passivity and even resistance when it comes to governance. This can be seen at all levels from the political to the practical and is reflected in the story of the MICS survey. The underlying problem is that country is still structured around the Dayton Agreement, which has resulted in a dysfunctional political system, weak institutions and the enduring threat of crime and corruption. The brain drain of young and educated people has been significant and the war damage has only partly been repaired.

Just as it is hard to envision how the country govern successfully without an international presence, it is also difficult to see how an autonomous and fully

functional HIS can be developed. Dayton created a deeply decentralized form of governance dominated by two artificial and largely autonomous entities, the FBiH and the RS. The country has multiple parliaments, more than 100 ministries and an equally fragmented HIS. A transformation is needed in BiH from what they are currently measuring with MICS to what would be more useful – this requires a transitional process, but there appears to be no stakeholder currently taking that role.

The UNICEF MICS is a remarkable achievement and has resulted in significant filling of data gaps for measuring internationally set goals and targets. It is a major source of data for the MDGs at both international and national levels. This data drives global advocacy and planning for children and women. The usefulness at the national level is less consistent, but has improved as the survey tools become more sophisticated and menu-driven and the quality of the data has improved. What is less clear is how this important survey series can enhance HIS in a more sustainable way. Little attention has been paid to this. In part, it is because UNICEF, as the sponsoring agency, has its own limitations in terms of resources, staffing and time and, more importantly, mandate. There is a clash – UNICEF is not the lead agency for HIS as this role is clearly taken under the wing of WHO.

Further, UNICEF is already technically stretched by the MICS surveys, which are now moving from five to three yearly. As the surveys become more complex, the ability of the UNICEF COs to support them is reduced. By enhancing the dedicated staff at HQ and regional level and developing more direct working relationships with SO and better tools, the survey appears to be able to deliver high quality results. The gold standard household survey programme in contrast is the DHS, which operates with a dedicated survey team on a commercial basis. Overall, I am more enamoured with the UNICEF model, and I see greater potential within this MICS model to link directly with policy makers. Despite the improvements in data dissemination and data presentation, I am very concerned at the lack of attention to the wide structural issues that is revealed in this study. I am also acutely aware of my own role in missing this opportunity.

Despite much discussion of local ownership, the MICS survey still requires UNICEF and donor funding in all countries where it has been implemented. Although inexpensive for the data produced, the survey is not cheap and so it is likely to stay a financial child of the international development industry in the foreseeable future. This

makes it all the more important that a thoughtful analysis of the MICS process. This may indeed happen in 2011, as the survey is sufficiently robust to stand scrutiny. The MICS are now established and well regarded. The brave steps of twice commissioning and publicizing an external evaluation have been taken and the survey did not collapse as a result.

The MICS produces quantitative data, endorsed by governments and (the vast majority) conducted by NSOs. Producing national level data that puts a country high up on the list of MDG success stories can be dangerous. The high indicator levels measured in BiH for the general population mask the catastrophically low indicators for Roma children. Thankfully, in subsequent MICS surveys, the Roma have been separately sampled, and the disparities are clear. There are other hidden groups within the population.

The MICS data should be challenged. Other surveys, in depth case studies and qualitative data can add colour and depth to the figures. The international community relies heavily on quantitative data to 'tell the truth.' However, national level household surveys can only reveal so much and may present an unrealistic picture. Will the major donors, the WB and the UN start accepting data generated by civil society research institutes to fill gaps in official government statistics?

When it comes to HISs, there is a need to broaden them to include data from non-government sources and to find ways to include qualitative data. Given the current dearth of quantitative data in many low-income and some middle-income countries it is understandable to focus global and national efforts on measuring the basics, however time and resources should concurrently be paid to thinking widely about information and different data sources.

When it comes to use of information for health policy, the 'black box theory' applies. Policy-makers and practitioners rarely care about the source or limitations of the data, to them, numbers are numbers. It is therefore incumbent on those who do collect and present data to find better ways of stating their limitations and recording them.

The MICS surveys derive quantitative population indicators from summary data of individuals and households. They are based on the premise that such data is useful, relevant and can be used as a basis for policy making. The broad interest in and use

of measures of population health in the policy arena demonstrates the recognition of their value at the practical level.

Working in a separate but not unrelated related field, that of psychology and human behavior, Henrich et al (2010), in their challenging and original work, condemn the quest for human universals by psychologists claiming to speak of human nature, claiming that they are basing their theories on a small and highly selective group of human outliers.⁽²⁰⁰⁾ The authors noted that ‘behavioural scientists routinely publish broad claims about human psychology and behaviours in the world’s top journals based on samples drawn entirely from Westernised, Educated people from Industrialised, Rich, and Democratic (WEIRD) societies.’ The domains the researchers reviewed include visual perception, fairness, cooperation, spatial reasoning, categorization and inferential induction, moral reasoning, reasoning styles, self-concepts and related motivations, and the heritability of IQ.⁽¹⁹¹⁾ These are not standard, as had been previously assumed.

I wonder are we committing the same error in our enthusiasm for collecting population-based data on health indicators, and especially by collecting them via household surveys? We know that the ways in which questions are interpreted can be culturally dependant. This may especially apply to questions about knowledge, attitudes and practices. But It may also be that the intrinsic logic of household surveys is WEIRD.

While pondering these conceptual issues, I am drawn back to my starting point. The BiH MICS 2000 survey was implemented and reported, and threw some light on important aspects of population and child health about which little was known. This study will contribute in some small measure to the growing understanding of how best to collect, manage, and use population based data for policy.

Development workers are faced with challenges every day – to do the best with limited and imperfect tools in less than equal power settings, or do nothing. In the end, it is usually better when faced with darkness to light a candle.

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Appendix A: Glossary of Terms

Refugee	A person forced to leave his/her own country and to move abroad due to war, civil unrest, natural disasters, etc.
Administrative data	The set of activities involved in the collection, processing, storage and dissemination of statistical data from one or more administrative sources. It is the equivalent of a survey but with the source of data being administrative records rather than direct contact with respondents.
Antenatal care	Medical care for women during pregnancy.
Antenatal care coverage	An indicator of access and use of health care during pregnancy. It is defined by WHO as 'the percentage of women who used antenatal care provided by skilled health personnel for reasons related to pregnancy at least once during pregnancy, as a percentage of live births in a given time period.'
Anthropometry	The measurement of weight and height. This was performed using easily portable digital weighing scales measuring to 0.1 kg and locally made height and length measuring boards made according to UNICEF standard specifications.
Birth rate	The number of births per year divided by the total population.
Birth registration	The official recording of the birth of a child, with a document, the birth certificate, issued.
Census	If every unit of the population is included in a survey sample, the survey may be described as a full coverage survey or census.
Child	A child is considered in many societies to be a human being between the stages of birth and puberty. The UN Convention on the Rights of the Child (CRC) assumes a longer timeline and defines a child as 'a human being below the age of 18 years unless under the law applicable to the child, majority is attained earlier'.
Civil registration systems	Civil registration systems include registration of birth, death and cause of death. Vital statistics are most effectively generated by comprehensive civil registration.
Clean drinking water	This can be measured approximately by using data regarding the source of the water or directly by testing of water quality. Important additional measures are access to water, time spent collecting water and water-related tasks by gender of the collectors.
Cluster	In the BiH MICS 2000 survey, cluster refers to a group of 20

	households obtained from the sampling process.
Contraception	Prevention of pregnancy through the use of devices or practices in sexual intercourse. Traditional methods are related to cultural or religious beliefs and vary in different parts of the world. In BiH, the most common traditional method is withdrawal. Modern methods used include contraceptive pills, IUD, condoms and injections.
Contraceptive prevalence	The proportion of women (aged 15-49) who are using any form of modern contraception.
Determinants of health	The factors that contribute in aggregate to health status in an individual or populations. Commonly considered determinants are: income, education level, living environment, personal behavior, health care access, genetics and social/cultural issues. Health care and individual behaviour seem to be less important than societal factors. The factors that have the strongest effect on health are generally rooted in society's economic and social relationships and are often referred to as the social determinants of health . Such determinants are shaped by the distribution of money, power and resources at local, national and global, levels, which are themselves influenced by policy choices of local and national governments.
Enumeration Area	BiH was officially divided into geographical sections known as enumeration areas for the purposes of the last demographic survey, and these have been used for this survey.
Family planning	Conscious control over pregnancy and family size through the use of contraceptives.
Health	The many definitions of health include <i>cultural definitions</i> (health as a standard of physical and mental well being appropriate to a particular society), <i>normative definitions</i> (health as a fixed level or an ideal physical and mental state) and <i>functional definitions</i> (health as a state of being necessary to perform certain physical and mental activities).
Health disparity	A statistically significant difference in a health indicator between groups that persists over time.
Health indicators	Measures that indicate the state of health of persons in a defined population. Examples include measures of birth or death, disability, quality of life, self-assessed health, happiness and well-being that cover a group of people and not just one individual.
Health inequities	The unfair and avoidable differences in health status seen within and between countries and groups of people.
Health Information	A combination of health statistics from various sources, used to derive information about health status, health care, provision

System	and use of services and health impact
Household	A small group of persons who share the same living accommodation.
Improved sanitation facilities	Defined in terms of the types of technology and levels of services that are more likely to be sanitary than unimproved technologies. Improved sanitation includes connection to public sewers or septic systems, pour-flush latrines, simple pit latrines and ventilated improved pit latrines.
Improved drinking water sources	Defined in terms of the types of technology and levels of services that are more likely to provide safe water than unimproved technologies. Improved water sources include household connections, public standpipes, boreholes, protected dug wells, protected springs, and rainwater collections.
Infant mortality	The probability of dying before the first birthday, per thousand live births.
Internally displaced person	Persons forced to leave their established place of residence and move somewhere else within the boundaries of their home country, usually due to war, civil unrest, natural disasters, etc.
Literacy	In this survey, literacy is defined as a reported ability to read a newspaper, easily or with difficulty.
Majority	Majority is a legal definition and is the chronological age when a minor ceases to legally be considered a child and assumes control over their persons, actions and decisions, thereby terminating the legal control and responsibility of their parents or guardian over them.
Maternal mortality	Maternal deaths due to pregnancy, birth or the puerperium.
MICS 2000 Indicator	An indicator is something that you can measure, for example birth registration or attendance at school, that can give you useful information about levels of achievement of a set goal or target. The MICS survey measures a globally defined set of indicators.
Morbidity	Illness; health status below the social norm.
Mortality	Deaths due to a particular cause.
National Health Accounts	The NHA is a tool designed to assist policy-makers in their efforts to understand their health systems and to improve health system performance. NHA constitute a systematic, comprehensive and consistent monitoring of resource flows in a country's health system for a given period and reflect the main functions of health care financing: resource mobilization & allocation, pooling and insurance, purchasing of care and the distribution of benefits. They address a basic set of questions:

	• Where do the resources come from? • Where do the resources go? • What kinds of services and goods do they purchase? • Who provides what services? • What inputs are used for providing services? • Whom do they benefit?^a
Obese	A child who weighs too much for his or her height. Overweight or obese is defined as more than 2 or 3 standard deviations, respectively, above the mean weight for height of the reference population.
Orphanhood	The status of children, both of whose biological parents have died. A second category recorded is children, one of whose biological parents have died.
Population health	The health outcomes of a group of individuals, including the distribution of such outcomes within the group.
Public health	Public health aims to improve the health of the entire population and to reduce health inequities among population groups. This is in contrast to the field of medicine, which largely focuses on the health of individuals.
Rural	As defined in this survey, it refers to areas officially classified as rural, based on the last census in Bosnia and Herzegovina in 1991, plus some areas assessed by field workers on appearance to be so classified.
Sanitation	The hygienic means of promoting health through prevention of human contact with the hazards of wastes. This thesis uses a narrower definition related to the management of human faeces at the household level, usually referred to as basic sanitation.
Segment	An area or section, defined for the purpose of the MICS 2000 survey as a part of an enumeration area from the last census (1991).
Sentinel surveillance	The collection and analysis of data by designated institutions selected for their geographic location, medical or public health specialty, and ability to accurately diagnose and report high quality data.
Stunted	A child who is too short for his or her age. Moderate or severe stunting is defined as more than 2 or 3 standard deviations, respectively, below the median height for age of the reference population.

^a Source: WHO

Survey	An investigation about the characteristics of a given population by means of collecting data from a sample of that population and estimating their characteristics through the systematic use of statistical methodology.
Survey module	Modules are sets of questions that relate to a common topic area, such as immunisation, child registration or contraceptive use in the B&H MICS 2000 survey.
Underweight	A general measure of malnutrition. Moderate or severe underweight is defined as more than 2 or 3 standard deviations, respectively, below the median weight for age of the reference population.
Unimproved sanitation	Includes service or bucket latrines (where excreta is manually removed), public latrines and open latrines.
Unimproved water sources	Unprotected wells, unprotected springs, vendor-provided water, bottled water (unless water for other uses is available from an improved source) and tanker truck-provided water.
Wasted	A child who weighs too little for his or her height. Moderate or severe wasting is defined as more than 2 or 3 standard deviations, respectively, below the mean weight for height of the reference population.
Women of child-bearing age	Females between the age of 15 and 49 years of age.

Appendix B Survey personnel

Bosnia and Herzegovina

The personnel involved in the BiH MICS 2000 Survey, together with the various committees and their terms of reference.

Survey Report

Report preparation, analysis of data, writing and editing:
Dr Mary E Black, UNICEF Bosnia and Herzegovina

Validation of data: Ms Slavka Popovic, Member of the Management Board of the Agency for Statistics of Bosnia and Herzegovina

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Translator (Local language): Ms Svetlana Pavicic

Survey Management Committee

The Management Committee met at monthly intervals and consisted of selected members of the entity survey teams, UNICEF staff and other survey members co-opted as necessary. The main function of the management committee was to ensure that the project was well coordinated between the two survey teams and that urgent management or technical issues are addressed.

Chair: Dr. Mary E Black UNICEF

Members:

Dr Stevan Bajic, Data Processing Co-ordinator, RS
Dr Selena Bajraktarevic, UNICEF, Health Programme Officer
Mr David Baker, UNICEF, Assistant Representative and Head of Country Office
Mr Mladen Cavajuga, UNICEF, Operation Officer
Prof. Vaso Dragovic, UNICEF Sampling Consultant
Dr Alma Gusinac-Skopo, Data Processing Co-ordinator, FB&H
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Dr Sanja Mandic, UNICEF, Project Assistant
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Mr Zoran Prskalo, Data Processing Manager, FB&H
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Dr Osman Slipicevic, Survey Co-ordinator
Dr Alma Gusinac-Skopo, Data entry Co-ordinator
Dr Irena Jokic, Field work Co-ordinator
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Steering Committee

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Durdevic Zdenka	Moraca Jelena	Vuletic Marija
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Data editor

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Finance Assistant Radmila Štrbac

Terms of reference for Entity Survey Coordinating Teams and Entity Steering Committees

Entity Survey Coordinating Teams worked closely together to ensure that methodology and data analysis were the same in each entity and that the single report could be produced, and:

- Ensured the survey was completed according to plan
- Oversaw all aspects of the survey
- Assigned responsibilities of key staff

Ensured recruitment of adequate staff at all stages of the survey
Authorised narrative and financial reports

Each entity team had **Entity Coordination and Technical Staff** who:

- Prepared the sampling frame according to MICS methodology
- Produced actual list of clusters including their geographical locations and produced a final listing of households (This was in addition to a sampling consultant with extensive experience in sampling)
- Modified and translated tools for local use (tasks shared between two entities)
- Trained field staff together with the sampling consultant
- Oversaw field work and ensured that procedures were followed and the data collected is consistent and of good quality
- Ensured training of data entry staff
- Oversaw data entry and ensured quality of data
- Produced tables of results
- Prepared draft final reports

Entity Steering Committees included representatives of the relevant entity institutions, the entity survey teams, UNICEF and others. The terms of reference of the Steering Committee in each entity were to:

- Guide planning and implementation;
- Ensure that the project is in line with data needs and Government reporting requirements and;
- Ensure that the data arising from B&H MICS 2000 would be officially accepted and used.

Appendix C: Sampling implementation

According to the Sampling Plan, a total of 545 segments were to be selected for the whole territory of BiH, 329 in the FBiH and 216 in the RS. The recommended urban: rural ratio was 40%: 60% for the FBiH and 37%: 63% in RS.

The sample plan prescribed 20 households in each cluster, to be chosen from the list of 110 households in each segment. In both Entities, some problems were encountered in the implementation of the Sampling Plan.

In the FBiH, the sample plan predicted a cluster size of 10 households in 18 municipalities, which was contrary to the recommended cluster size in MICS 2 of 20 households. In order to have the same number of segments and the recommended urban: rural ratio in the segmentation, as well as the recommended cluster size of twenty households, the cluster size was expanded from 10 households to 20 households in these municipalities. The number of selected segments was the same as that dictated by the Sampling Plan (i.e. 329), but the number of listed households in urban and rural areas was slightly changed, to give a final urban: rural ratio of 43%: 57%.

In the RS, the Sampling Plan called for the selection of certain numbers of half-clusters (10 households) and clusters (20 households). Some mistakes were made in the selection process so that one less half-cluster was selected in urban areas (10 households) and one and a half more clusters (30 households) were selected in rural areas, than dictated by the Sampling Plan. The final urban: rural ratio of interviewed households was 36%: 64%.

During the fieldwork, 24 segments could not be used (13 in FB&H; 11 in RS), because they were empty or in a minefield. Reserve segments were used instead.

The total number of sampled households was 10,772, out of which 10,742 were occupied. Of these households, 10,546 were interviewed (6368 in FB&H; 4178 in RS). Of these interviewed households, 4207 (39.89%) were urban households and 6339 (60.11%) were rural households.

Table of selected segments

		Urban		Rural		Total	Total
Type of Segment		No.	%	No.	%	No.	%
Bosnia and Herzegovina	First use	212	38.90	309	56.70	521	95.60
	Reserve	0	0	24	4.40	24	4.40
Total		212	38.90	333	61.10	545	100

Table of interviewed families

		Urban		Rural		Total	Total
Type of Segment		No.	%	No.	%	No.	%
Republica Srpska	First use	4207	39.89	5859	55.56	10066	95.45
	Reserve	0	0	480	4.55	480	4.55
Total		4207	39.89	6339	60.11	10546	100

BiH

MUNICIPALITY	Estimated Population 1999	Segments total	Urban Segments	Rural segments	Select segment	Households in the sample	Urban	Rural
BIHAC	59,35	159	88	71	9	180	100	80
BANOVICI	28,384	76	19	57	4	80	20	60
BOSANSKA KRUPA	28,343	76	19	57	4	80	20	60
BOSANSKI PETROVAC	6,788	18	6	12	1	20	0	20

BUSOVACA + DOBRETICI	14,691	39	13	26	2	40	10	30
BREZA	13,651	37	9	28	2	40	10	30
BUGOJNO	32,729	88	35	53	5	100	40	60
BUZIM	17,468	47	-	47	3	60	0	60
CAZIN	59,473	159	32	127	9	180	40	140
CENTAR	66,044	177	172	5	10	200	200	0
CAPLJINA	19,199	51	10	41	3	60	20	40
CELIC	15,228	40	-	40	2	40	0	40
CITLUK	16,241	43	11	32	2	40	10	30
DOBOJ-ISTOK	10,073	27	-	27	1	20	0	20
DOBOJ-JUG	4,627	12	-	12	1	20	0	20
DOMALJEVAC SAMAC	4,978	13	-	13	1	20	0	20
DONJI VAKUF	13,120	35	9	26	2	40	10	30
DRVAR + BOS. GRAHOVO	19,256	51	16	35	3	60	20	40
FOJNICA	10,462	28	7	21	1	20	0	20
GORAZDE + FOCA + PALE	34,865	93	37	56	5	100	40	60
GORNJI VAKUF	19,510	52	10	42	3	60	10	50

GRACANICA	52,440	140	18	122	8	160	20	140
GRADACAC	46,137	123	18	105	7	140	20	120
GRUDE	13,380	36	9	27	2	40	10	30
HADZICI	19,401	52	17	35	3	60	20	40
ILIDZA + TRNOVO	45,240	121	104	17	7	140	120	20
ILIJAS	14,471	39	9	30	2	40	10	30
JBLANICA	13,046	35	8	27	2	40	10	30
JAJCE	18,910	51	17	34	3	60	20	40
KAKANJ	43,276	116	38	78	6	120	40	80
KALESIJA	33,983	91	4	87	5	100	0	100
KISELJAK	20,442	55	9	46	3	60	10	50
KLADANJ	15,485	41	10	31	2	40	10	30
KLJUC	15,524	42	10	32	2	40	10	30
KONJIC	29,533	79	20	59	4	80	20	60
KREŠEVO	6,131	16	3	13	1	20	0	20
LIVNO + KUPRES	36,031	96	18	78	5	100	20	80
LUKOVAC	51,098	137	39	98	7	140	40	100

LJUBIŠKI	22,345	60	10	50	3	60	10	50
MAGLAJ	22,979	61	10	51	3	60	10	50
MOSTAR	103,751	277	166	111	15	300	180	120
NEUM + RAVNO	6,686	18	7	11	1	20	20	0
NOVI GRAD	110,086	294	294	-	16	320	320	0
NOVI TRAVNIK	24,543	66	16	50	4	80	20	60
NOVO SARAJEVO	69,436	186	177	9	10	200	200	0
ODZAK	16.020	43	9	34	2	40	10	30
OLOVO	12,754	34	8	26	2	40	10	30
ORAŠJE	22,470	60	10	50	3	60	10	50
POSUŠJE	15,973	43	11	32	2	40	10	30
PROZOR	16,992	45	11	34	2	40	10	30
SANSKI MOST	61,967	166	55	111	9	180	60	120
SAPNA	13,991	37	-	37	2	40	0	40
SREBRENİK	41,196	110	18	92	6	120	20	100
STARI GRAD	37,396	100	96	4	5	100	100	0
STOLAC	9,627	26	8	18	1	20	0	20

ŠIROKI BRIJEG	29,530	79	19	60	4	80	20	60
TEOČAK	6,712	18	0	18	1	20	0	20
TEŠANJ	47,329	127	18	109	7	140	20	120
TOMISLAVGRAD	28,144	75	19	56	4	80	20	60
TRAVNIK	50,314	135	38	97	7	140	40	100
TUZLA	134,879	361	217	144	20	400	240	160
USORA	5,906	16	-	16	1	20	0	20
VAREŠ	10,184	27	12	15	2	40	20	20
VELIKA KLADUŠA	48,572	130	19	111	7	140	20	120
VISOKO	39,591	106	35	71	6	120	40	80
VITEZ	20,318	54	18	36	3	60	20	40
VOGOŠĆA	18,799	50	22	28	3	60	20	40
ZAVIDOVIĆI	37,653	101	34	67	6	120	40	80
ZENICA	127,563	341	180	161	19	380	200	180
ŽEPČE	26,278	70	18	52	4	80	20	60
ŽIVINICE	50,898	136	19	117	7	140	20	120
TOTAL	2.259,902	6,043	2,418	3,625	329	6,580	2,660	3,320

REPUBLIKA SRPSKA

MUNICIPALITY	Estimated population in 1999	Segments total	Urban segments	Rural segments	Select segments	Households in the sample	Urban	Rural
BANJA LUKA	224,594	601	437	164	33	660	480	180
BIJELJINA	108,273	290	109	181	16	320	120	200
BILEĆA	12,236	33	19	14	2	0	20	20
BRATUNAC	20,013	54	18	36	3	0	20	40
ČAJNIĆE	4,539	12	4	8	1	20	0	20
ČELINAC	17,502	47	12	35	3	0	20	40
DERVENTA	39,110	105	35	70	6	120	40	80
DOBOJ	79,158	212	53	159	12	240	60	180
GACKO	10,261	27	11	16	2*	20	10	10
GRADIŠKA	61,322	164	55	109	9	180	60	120
HAN PIJESAK	4,891	13	4	9	1	20	0	20
KALINOVIK	4,774	13	4	9	1	20	0	20
KNEŽEVO	12,171	33	8	25	3*	40	10	30
KOTOR VAROŠ	17,255	46	7	39	4*	60	10	50
KOZRSKA DUBICA	34,412	92	37	55	5	100	40	60
LAKTAŠI	40,369	108	18	90	6	120	20	100
LOPARE	16,987	45	2	73	3	60	0	60

LJUBINJE * BERKOVIĆI	6,970	19	10	9	2*	20	10	10
MILIĆI	9,995	27	-	27	1	20	0	20
MODRIČA	28,045	75	23	52	4	80	20	60
MRKONJIĆ GRAD + JEZERO	17,860	48	15	33	3	60	20	40
NEVESINJE+ S. MOSTAR	19,242	51	14	37	3	60	20	40
NOVI GRAD + KRUPA NA UNI	31,427	84	24	60	5	100	40	60
OSMACI	4,688	13	-	13	1	20	0	20
PALE + S. STARI GRAD	30,028	80	36	44	4	80	40	40
PELAGIĆEVO	5,235	14	-	14	1	20	0	20
PETROVO	11,866	32	14	18	2	40	20	20
PRIJEDOR + S. SANSKI MOST	96,530	258	80	178	14	280	100	18
PRNJAVOR	49,770	133	23	110	7	140	40	100
RIBNIK + PETROVAC + S. DRVAR	8,300	22	-	22	1	20	0	20
ROGATICA	13,148	35	14	21	2	40	20	20
RUDO	9,211	25	5	20	1	20	0	20
S. NOVO SARAJEVO + TRNOVO	10,936	29	10	19	2*	20	10	10
SOKOLAC	17,397	47	18	29	3	60	20	40
SRBAC	24,773	66	9	57	4	80	20	60

SRBINJE + S. GORAŽDE	26,003	70	23	47	4	80	20	60
SREBRENICA + SKELANI	17,713	47	6	41	3	60	20	40
SRPSKA ILIDZA	16,707	45	-	45	2	40	0	40
SRPSKA KOSTAJNICA	7,723	21	-	21	1	20	0	20
SRPSKI BROD	14,616	39	16	23	2	40	20	20
ŠAMAC+VUK OSAVLJA + ORAŠJE	27,997	75	13	62	4	80	20	60
ŠEKOVIĆI	9,947	27	5	22	1	20	0	20
ŠIPOVO +SRPSKI KUPRES	8,648	23	8	15	1	20	0	20
TESLIĆ	45,483	122	18	104	7	140	20	120
TREBINJE	31,061	83	59	24	5	100	80	20
UGLJEVIK	16,695	45	5	40	3*	40	10	30
VIŠEGRAD	18,559	50	16	34	3	60	20	40
VLASENICA	20,001	53	12	41	3	60	20	40
ZVORNIK	46,283	124	22	102	7	140	20	120
TOTAL	1.410,272	3,777	1,331	2,446	216*	4,200	1,540	2,660

MUNICIPALITY	Estimated population 1999	Segments total	Urban segments	Rural segments	Select segments	Households in the sample	Urban	Rural
Federation	2.259,902	6,043	2,418	3,625	329	6,580	2,660	3,320
Republika Srpska	1.410,272	3,777	1,331	2,446	216*	4,200	1,540	2,660
Bosnia and Herzegovina*	3.670,174	9,820	3,749	6,071	539	10,780	4,200	6,580

* Brčko District not included

Appendix D: MICS 2000 survey questionnaire (English)

HOUSEHOLD QUESTIONNAIRE

WE ARE FROM THE PUBLIC HEALTH INSTITUTE OF THE FEDERATION OF BOSNIA AND HERZEGOVINA ON BEHALF OF THE FEDERATION MINISTRY OF HEALTH / THE REPUBLIKA SRPSKA MINISTRY OF HEALTH AND SOCIAL WELFARE. WE ARE WORKING ON A PROJECT CONCERNED WITH FAMILY HEALTH AND EDUCATION. I WOULD LIKE TO TALK TO YOU ABOUT THIS. THE INTERVIEW WILL TAKE ABOUT 45 MINUTES. ALL THE INFORMATION WE OBTAIN WILL REMAIN STRICTLY CONFIDENTIAL AND YOUR ANSWERS WILL NEVER BE IDENTIFIED. DURING THIS TIME I WOULD LIKE TO SPEAK WITH ALL MOTHERS OR OTHERS WHO TAKE CARE OF CHILDREN IN THE HOUSEHOLD.

MAY I START NOW? *If permission is given, begin the interview.*

HOUSEHOLD INFORMATION PANEL	
1. Cluster number: _____	2. Household number: _____
3. Day/Month/Year of interview: _____ / _____ / _____	4. Interviewer number: _____
5. Name of head of household: _____	
6. Area: 1. Urban.....1 2. Rural.....2	7. Geographical Area
10. Result of HH interview: Completed..... 1 Refused 2 Not at home..... 3 HH not found/destroyed..... 4 Other (specify) 5	
11. No. of women eligible for interview: _____	12. No. of women interviews completed: _____
13. No. of children under age 5: _____	14. No. of child interviews completed: _____
15. Data entry clerk: _____	16. Total number of household members _____
Interviewer/supervisor notes: Use this space to record notes about the interview with this household, such as call-back times, incomplete individual interview forms, number of attempts to re-visit, etc.	

Cluster no. _____ Household no. _____

HOUSEHOLD LISTING FORM

FIRST, PLEASE TELL ME THE NAME OF EACH PERSON WHO USUALLY LIVES HERE, STARTING WITH THE HEAD OF THE HH.
(Use survey definition of HH member). List the first name in line 01. List adult HH members first, then list children. Then ask: ARE THERE ANY OTHERS WHO LIVE HERE, EVEN IF THEY ARE NOT AT HOME NOW? (THESE MAY INCLUDE CHILDREN IN SCHOOL OR AT WORK). If yes, complete listing. Then, ask and record answers to questions as described in Instructions for Interviewers.
Add a continuation sheet if there is not enough room on this page. Tack here if continuation sheet used ☐

			Eligible for:		For persons age 15 or over ask Qs. 8 and 9		For children under age 15 years ask Qs. 10-13						
			WOMEN'S MODULES	CHILD LABOUR MODULE	CHILD HEALTH MODULES	8. CAN HE/SHE READ A LETTER OR NEWSPAPER EASILY, WITH DIFFICULTY OR NOT AT ALL?	9. WHAT IS THE MARITAL STATUS OF (name)? 1 CURRENTLY MARRIED/ 2 WIDOWED 3 DIVORCED 4 SEPARATED 5 NEVER MARRIED	10. IS (name's) NATURAL MOTHER ALIVE?	11. If alive: DOES (name's) NATURAL MOTHER LIVE IN THIS HOUSE- HOLD?	12. IS (name's) NATURAL FATHER ALIVE?	13. If alive: DOES (name's) NATURAL FATHER LIVE IN THIS HOUSE- HOLD?		
1.	Line no.	2. Name	3. Is (name) MALE OR FEMALE?	4. How old is (name)? HOW OLD WAS (name) ON HIS/HER LAST BIRTHDAY? Record in completed years 99=NK*	5. Circle Line no. if woman is age 15-49	6. For each child age 5-14: WHO IS THE MOTHER OR PRIMARY CARER OF THIS CHILD? Record Line no. of mother/carer	7. For each child under 5: WHO IS THE MOTHER OR PRIMARY CARER OF THIS CHILD? Record Line no. of mother/carer	8.	9.	10.	11.	12.	13.
LINE		NAME	M F	AGE	15-49	MOTHER	MOTHER	E D N NK	M W D S N	Y N NK	Y N	Y N NK	Y N
01			1 2	---	01	---	---	1 2 3 9	1 2 3 4 5	1 2 9	1 2	1 2 9	1 2
02			1 2	---	02	---	---	1 2 3 9	1 2 3 4 5	1 2 9	1 2	1 2 9	1 2
03			1 2	---	03	---	---	1 2 3 9	1 2 3 4 5	1 2 9	1 2	1 2 9	1 2
04			1 2	---	04	---	---	1 2 3 9	1 2 3 4 5	1 2 9	1 2	1 2 9	1 2
05			1 2	---	05	---	---	1 2 3 9	1 2 3 4 5	1 2 9	1 2	1 2 9	1 2
06			1 2	---	06	---	---	1 2 3 9	1 2 3 4 5	1 2 9	1 2	1 2 9	1 2
07			1 2	---	07	---	---	1 2 3 9	1 2 3 4 5	1 2 9	1 2	1 2 9	1 2
ARE THERE ANY OTHER CHILDREN LIVING HERE - EVEN IF THEY ARE NOT MEMBERS OF YOUR FAMILY OR DO NOT HAVE PARENTS LIVING IN THIS HOUSEHOLD?													
INCLUDING CHILDREN AT WORK OR AT SCHOOL? If yes, insert child's name and complete form.													
* See instructions: to be used only for elderly household members (code meaning "do not know/over age 50").													

Cluster no. _____ Household no. _____

EDUCATION MODULE

If interview takes place between two school years, use alternative wording found in Appendix One.

For persons age 5 or over ask Qs. 15 and 16

For children age 5 through 18 years, continue on asking Qs. 17-22

14. Line no.	15. Has (name) ever attended school?	16. What is the highest level of school (name) attended? What is the highest grade (name) completed at this level?	18. During the school year 1999/2000, did (name) attend school at any time?	19. Since last (day of the week), how many days did (name) attend school?	20. Which level and grade is/was (name) attending?	21. Did (name) attend school in the school year 1998/99?	22. Which level and grade did (name) attend in the school year 1998/99?
	1 YES 2 NO NEXT LINE	1. PRESCHOOL 2. PRIMARY 3. SECONDARY 4. HIGHER 5. HIGH 6. NON-STANDARD CURRICULUM 9 NK GRADE: 99 NK If less than 1 grade, enter 00.	1 YES 2 NO → Q.21	Insert 88 (school year ended)	LEVEL: 1 PRESCHOOL 2 PRIMARY 3 SECONDARY 4 NON-STANDARD CURRICULUM 9 NK GRADE: 99 NK	LEVEL: 1 PRESCHOOL 2 PRIMARY 3 SECONDARY 4 NON-STANDARD CURRICULUM 9 NK GRADE: 99 NK	
LINE	Y NO	LEVEL GRADE	YES NO	DAYS	LEVEL GRADE	Y N K	LEVEL GRADE
01	1 2 → NEXT LINE	1 2 3 4 5 6 9	1 2	—	1 2 3 4 9	1 2 9	1 2 3 4 9
02	1 2 → NEXT LINE	1 2 3 4 5 6 9	1 2	—	1 2 3 4 9	1 2 9	1 2 3 4 9
03	1 2 → NEXT LINE	1 2 3 4 5 6 9	1 2	—	1 2 3 4 9	1 2 9	1 2 3 4 9
04	1 2 → NEXT LINE	1 2 3 4 5 6 9	1 2	—	1 2 3 4 9	1 2 9	1 2 3 4 9
05	1 2 → NEXT LINE	1 2 3 4 5 6 9	1 2	—	1 2 3 4 9	1 2 9	1 2 3 4 9
06	1 2 → NEXT LINE	1 2 3 4 5 6 9	1 2	—	1 2 3 4 9	1 2 9	1 2 3 4 9
07	1 2 → NEXT LINE	1 2 3 4 5 6 9	1 2	—	1 2 3 4 9	1 2 9	1 2 3 4 9

Now for each woman age 15-49 years, write her name and line number at the top of each page in the Women's Questionnaire.
For each child under age 5, write his/her name and line number AND the line number of his/her mother or caretaker at the top of each page in the Children's Questionnaire.
You should now have a separate questionnaire for each eligible woman and child in the household.

When all children in the age range have been covered, GO TO WATER AND SANITATION MODULE ⇨

Cluster no. _____ Household no. _____

WATER AND SANITATION MODULE

This module is to be administered once for each household visited.

Record only one response for each question.

If more than one response is given, record the most usual source or facility.

1. WHAT IS THE MAIN SOURCE OF DRINKING WATER FOR MEMBERS OF YOUR HOUSEHOLD?	Piped into dwelling 01 Piped into yard or plot 02 Public tap 03 Tube well/bore hole with pump 04 Protected dug well 05 Protected spring 06 Rainwater collection 07 Bottled water 08 Unprotected dug well 09 Unprotected spring 10 Pond, river or stream 11 Tanker-truck, vendor 12 Other (specify) 13 No answer or NK 99	
2. HOW LONG DOES IT TAKE TO GO THERE, GET WATER, AND COME BACK?	No. of minutes Waer on premises 888 NK 999	
3. WHAT KIND OF TOILET FACILITY DOES YOUR HOUSEHOLD USE?	Flush to sewage system or septic tank 1 Pour flush latrine (water seal type) 2 Improved pit latrine (e.g., VIP) 3 Traditional pit latrine 4 Open pit 5 Bucket 6 Other (specify) 7 No facilities or bush or field 98	98⇨Q.5
4. IS THIS FACILITY LOCATED WITHIN YOUR DWELLING, OR YARD OR COMPOUND?	Yes, in dwelling/yard/compound 1 No, outside dwelling/yard/compound 2 NK 9	
5. WHAT HAPPENS WITH THE STOOLS OF YOUNG CHILDREN (0-3 YEARS) WHEN THEY DO NOT USE THE LATRINE OR TOILET FACILITY?	Children always use toilet or latrine 1 Thrown into toilet or latrine 2 Thrown outside the yard 3 Buried in the yard 4 Not disposed of or left on the ground 5 Other (specify) 6 No young children in household 98	

GO TO NEXT MODULE ⇨

Cluster no. Household no. Woman line no.

WOMEN'S INFORMATION PANEL		
<i>This module is to be administered to all women age 15 through 49 (see column 5 of HH listing). Fill in one form for each eligible woman.</i>		
1. Woman's line number (from HH listing).	Line number	
2. Woman's name.	Name	
3A. IN WHAT MONTH AND YEAR WERE YOU BORN?	Date of birth Month/Year / NK date of birth 999999	NK ⇒ 3B
Or:	Or:	
3B. HOW OLD WERE YOU AT YOUR LAST BIRTHDAY?	Age (in completed years).....	

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Cluster no. _____ Household no. _____ Woman line no. _____

CHILD MORTALITY MODULE

This module is to be administered to all women age 15-49.

All questions refer only to LIVE births.

Follow instructions as provided in training. See Instructions for Interviewers.

10. JUST TO MAKE SURE THAT I HAVE THIS RIGHT,
YOU HAVE HAD IN TOTAL (total number)
BIRTHS DURING YOUR LIFE. IS THIS CORRECT?

☐ Yes ⇒ Go to Q.11

☐ No ⇒ Check responses and make corrections before proceeding to Q.11

11. OF THESE (total number) BIRTHS YOU HAVE HAD,
WHEN DID YOU DELIVER THE LAST ONE (EVEN IF HE
OR SHE HAS DIED)?

Date of last birth

Day/Month/Year ____/____/____

Did the woman's last birth occur within the last year, that is, since July 1999?

☐ Yes, live birth in last year. ⇒ GO TO MATERNAL AND NEWBORN HEALTH MODULE

☐ No live birth in last year. ⇒ GO TO CONTRACEPTIVE USE MODULE

Cluster no. _____ Household no. _____ Woman line no. _____

MATERNAL AND NEWBORN HEALTH MODULE

This module is to be administered to all women with a live birth in the year preceding date of interview.

2. DID YOU SEE ANYONE FOR ANTENATAL CARE FOR THIS PREGNANCY ? <i>If yes: WHOM DID YOU SEE? ANYONE ELSE?</i> <i>Probe for the type of person seen and circle all answers given.</i>	Health professional: Doctor 1 Nurse/midwife 2 Auxiliary midwife 3 Other person Traditional birth attendant 4 Other (specify) 6 No one 0	
3. WHO ASSISTED WITH THE DELIVERY OF YOUR LAST CHILD (or name)? ANYONE ELSE? <i>Probe for the type of person assisting and circle all answers given.</i>	Health professional: Doctor 1 Nurse/midwife 2 Auxiliary midwife 3 Other person Traditional birth attendant 4 Relative/friend 5 Other (specify) 6 No one 0	
5. WAS (name) WEIGHED AT BIRTH?	Yes 1 No 2 NK 9	
6. HOW MUCH DID (name) WEIGH? <i>Record weight from health card, if available.</i>	From card 1 (grams) __, ____ From recall 2 (grams) __, ____ NK 99999	

GO TO NEXT MODULE ⇒

Cluster no. _____ Household no. _____ Woman line no. _____

CONTRACEPTIVE USE MODULE

Ask Q.1 for all women age 15-49 and then follow the skip instruction carefully.

Questions on pregnancy and contraception are to be asked only of women who are currently married or in union.

1. ARE YOU CURRENTLY MARRIED OR LIVING WITH A MAN?	Yes 1 No, widowed, divorced, separated 2 No, never married 3	2 ⇒ NEXT MODULE 3 ⇒ NEXT MODULE
2. NOW I AM GOING TO CHANGE TOPICS. I WOULD LIKE TO TALK WITH YOU ABOUT ANOTHER SUBJECT – FAMILY PLANNING – AND YOUR REPRODUCTIVE HEALTH. I KNOW THIS IS A DIFFICULT SUBJECT TO TALK ABOUT, BUT IT IS IMPORTANT THAT WE OBTAIN THIS INFORMATION. OF COURSE, ALL THE INFORMATION YOU SUPPLY WILL REMAIN STRICTLY CONFIDENTIAL. YOU WILL NEVER BE IDENTIFIED WITH THE ANSWERS TO THESE QUESTIONS. ARE YOU PREGNANT NOW?	Yes, currently pregnant 1 No 2 Unsure or NK 3	1 ⇒ NEXT MODULE
3. SOME COUPLES USE VARIOUS WAYS OR METHODS TO DELAY OR AVOID A PREGNANCY . ARE YOU CURRENTLY DOING SOMETHING OR USING ANY METHOD TO DELAY OR AVOID GETTING PREGNANT?	Yes 1 No 2	
3.A. CAN YOU TELL ME FOR WHICH CONTRACEPTIVE METHOD YOU KNOW? <i>Do not prompt.</i> <i>If more than one method is mentioned, circle each one.</i>	Female sterilization 01 Male sterilization 02 Pill 03 IUD 04 Injections 05 Implants 06 Condom 07 Female condom 08 Diaphragm 09 Foam/jelly 10 Lactational amenorrhoea method (LAM) 11 Periodic abstinence 12 Withdrawal 13 Other (specify) 14	
4. WHICH METHOD ARE YOU USING? <i>Ask this question only if women's answer to question number 3 is "yes".</i> <i>Do not prompt.</i> <i>If more than one method is mentioned, circle each one.</i>	Female sterilization 01 Male sterilization 02 Pill 03 IUD 04 Injections 05 Implants 06 Condom 07 Female condom 08 Diaphragm 09 Foam/jelly 10 Lactational amenorrhoea method (LAM) 11 Periodic abstinence 12 Withdrawal 13 Other (specify)	

GO TO NEXT MODULE ⇒

HIV/AIDS MODULE

This module is to be administered to all women age 15-49.

See Instructions for Interviewers for further discussion of these questions.

1. NOW I WOULD LIKE TO TALK WITH YOU ABOUT WHAT YOU KNOW ABOUT SERIOUS ILLNESS, IN PARTICULAR, ABOUT HIV AND AIDS. HAVE YOU EVER HEARD OF THE VIRUS HIV OR AN ILLNESS CALLED AIDS?	Yes 1 No 2	2⇒Q.18
2. IS THERE ANYTHING A PERSON CAN DO TO AVOID GETTING HIV, THE VIRUS THAT CAUSES AIDS?	Yes 1 No 2 NK 9	2⇒Q.8 9⇒Q.8
3. NOW I WILL READ SOME QUESTIONS ABOUT HOW PEOPLE CAN PROTECT THEMSELVES FROM THE AIDS VIRUS. THESE QUESTIONS INCLUDE ISSUES RELATED TO SEXUALITY WHICH SOME PEOPLE MIGHT FIND DIFFICULT TO ANSWER. HOWEVER, YOUR ANSWERS ARE VERY IMPORTANT TO HELP UNDERSTAND THE NEEDS OF PEOPLE IN BOSNIA AND HERZEGOVINA . AGAIN, THIS INFORMATION IS ALL COMPLETELY PRIVATE AND ANONYMOUS. PLEASE ANSWER YES OR NO TO EACH QUESTION. CAN PEOPLE PROTECT THEMSELVES FROM GETTING INFECTED WITH THE AIDS VIRUS BY HAVING ONE UNINFECTED SEX PARTNER WHO ALSO HAS NO OTHER PARTNERS?	Yes 1 No 2 NK 9	
5. CAN PEOPLE PROTECT THEMSELVES FROM THE AIDS VIRUS BY USING A CONDOM CORRECTLY EVERY TIME THEY HAVE SEX?	Yes 1 No 2 NK 9	
7. CAN PEOPLE PROTECT THEMSELVES FROM GETTING INFECTED WITH THE AIDS VIRUS BY NOT HAVING SEX AT ALL?	Yes 1 No 2 NK 9	
8. IS IT POSSIBLE FOR A HEALTHY -LOOKING PERSON TO HAVE THE AIDS VIRUS?	Yes 1 No 2 NK 9	

9. CAN THE AIDS VIRUS BE TRANSMITTED FROM A MOTHER TO A CHILD?	Yes 1	
10. CAN THE AIDS VIRUS BE TRANSMITTED FROM A MOTHER TO A CHILD DURING PREGNANCY ?	Yes 1 No 2 NK 9	
11. CAN THE AIDS VIRUS BE TRANSMITTED FROM A MOTHER TO A CHILD AT DELIVERY ?	Yes 1 No 2 NK 9	
12. CAN THE AIDS VIRUS BE TRANSMITTED FROM A MOTHER TO A CHILD THROUGH BREAST MILK?	Yes 1 No 2 NK 9	
13. IF A TEACHER HAS THE AIDS VIRUS BUT IS NOT SICK, SHOULD HE OR SHE BE ALLOWED TO CONTINUE TEACHING IN SCHOOL?	Yes 1 No 2 NK 9	
14. IF YOU KNEW THAT A SHOPKEEPER OR FOOD SELLER HAD AIDS OR THE VIRUS THAT CAUSES IT, WOULD YOU BUY FOOD FROM HIM OR HER?	Yes 1 No 2 NK 9	
18. Is the woman a carer of any children under five years of age? ☐ Yes. ⇒ GO TO QUESTIONNAIRE FOR CHILDREN UNDER FIVE and administer one questionnaire for each child under five for whom she is the carer. ☐ No. ⇒ CONTINUE WITH Q.19		
19. Does another eligible woman reside in the household? ☐ Yes. ⇒ End the current interview by thanking the woman for her cooperation and GO TO QUESTIONNAIRE FOR INDIVIDUAL WOMEN to administer the questionnaire to the next eligible woman. ☐ No. ⇒ End the interview with this woman by thanking her for her cooperation. Gather together all questionnaires for this household and tally the number of interviews completed on the cover page.		

QUESTIONNAIRE FOR CHILDREN UNDER FIVE

This questionnaire is to be administered to all women who care for a child that lives with them and is under the age of 5 years (see Q.4 of the HH listing).

A separate form should be used for each eligible child.

Questions should be administered to the mother or carer of the eligible child (see Q.7 of the HH listing).

Fill in the line number of each child, the line number of the child's mother or carer,

and the household and cluster numbers in the space at the top of each page.

BIRTH REGISTRATION AND EARLY LEARNING MODULE		
1. Child's name.	Name _____	
2. Child's age (copy from Q.4 of HH listing).	Age (in completed years)..... _____	
3. NOW I WOULD LIKE TO ASK YOU SOME QUESTIONS ABOUT THE HEALTH OF EACH CHILD UNDER THE AGE OF 5 IN YOUR CARE, WHO LIVES WITH YOU NOW. NOW I WANT TO ASK YOU ABOUT (name). IN WHAT MONTH AND YEAR WAS (name) BORN? <i>Probe:</i> WHAT IS HIS/HER BIRTHDAY? <i>If the mother knows the exact birth date, also enter the day; otherwise, enter 99 for day.</i>	Date of birth Day/Month/Year..... ____/____/____	
4. DOES (name) HAVE A BIRTH CERTIFICATE? MAY I SEE IT? <i>If certificate is presented, verify reported birth date.</i> <i>If no birth certificate is presented, try to verify date using another document (health card, etc.).</i> <i>Correct stated age, if necessary.</i>	Yes, seen.....1 Yes, not seen 2 No 3 NK 9	1⇒Q.8 9⇒Q.7
5. If no birth certificate is shown, ask: HAS (name's) BIRTH BEEN REGISTERED?	Yes 1 No 2 NK 9	1⇒Q.8 9⇒Q.7
6. WHY IS (name's) BIRTH NOT REGISTERED?	Costs too much 1 Must travel too far.....2 Did not know it should be registered 3 Late, and did not want to pay fine 4 Does not know where to register 5 Other (specify).....6 NK 9	
7. DO YOU KNOW HOW TO REGISTER YOUR CHILD'S BIRTH?	Yes 1 No 2 No answer.....8	
8. Check age. If child is 3 years old or more, ask: DOES (name) ATTEND ANY ORGANIZED LEARNING OR EARLY CHILDHOOD EDUCATION PROGRAMME, SUCH AS A PRIVATE OR GOVERNMENT FACILITY, INCLUDING KINDERGARTEN OR COMMUNITY CHILD CARE?	Yes 1 No 2 NK 9	2⇒NEXT MODULE 9⇒NEXT MODULE
9. WITHIN THE LAST SEVEN DAYS, ABOUT HOW MANY HOURS DID (name) ATTEND?	Number of hours _____	

GO TO NEXT MODULE ⇒

CARE OF ILLNESS MODULE		
1. HAS (name) HAD DIARRHOEA IN THE LAST TWO WEEKS, THAT IS, SINCE (day of the week) OF THE WEEK BEFORE LAST? <i>Diarrhoea is determined as perceived by mother or carer, or as three or more loose or watery stools per day, or blood in stool.</i>	Yes 1 No 2 NK 9	1⇒Q.3
2. IN THE LAST TWO WEEKS, HAS (name) HAD ANY OTHER ILLNESS, SUCH AS COUGH OR FEVER, OR ANY OTHER HEALTH PROBLEM?	Yes 1 No 2 NK 9	1⇒Q.4 2⇒Q.11 9⇒Q.11
3. DURING THIS LAST EPISODE OF DIARRHOEA, DID (name) DRINK ANY OF THE FOLLOWING:	Y N NK A. Breast milk.....1 2 9 B. Gruel 1 2 9 C. yogurt drink, fruit juice without sugar 1 2 9 D. ORS packet 1 2 9 E. Other milk or formula.....1 2 9 F. Water with feeding.....1 2 9 G. Water alone.....1 2 9 H. (coca cola, fruit juice with sugar).....1 2 9 I. Nothing 1 2 9	1⇒Q.5
4. DURING (name's) ILLNESS, DID HE/SHE DRINK MUCH LESS, ABOUT THE SAME, OR MORE THAN USUAL?	Much less or none 1 About the same (or somewhat less)..... 2 More..... 3 NK 9	
5. DURING (name's) ILLNESS, DID HE/SHE EAT LESS, ABOUT THE SAME, OR MORE FOOD THAN USUAL? <i>If "less", probe: MUCH LESS OR A LITTLE LESS?</i>	None 1 Much less 2 Somewhat less..... 3 About the same 4 More..... 5 NK 9	
6. HAS (name) HAD AN ILLNESS WITH A COUGH AT ANY TIME IN THE LAST TWO WEEKS, THAT IS, SINCE (day of the week) OF THE WEEK BEFORE LAST?	Yes 1 No 2 NK 9	2⇒Q.11 9⇒Q.11

7. WHEN (<i>name</i>) HAD AN ILLNESS WITH A COUGH, DID HE/SHE BREATHE FASTER THAN USUAL WITH SHORT, QUICK BREATHS OR HAVE DIFFICULTY BREATHING?	Yes 1 No 2 NK 9	2⇒Q.11 9⇒Q.11
8. WERE THE SYMPTOMS DUE TO A PROBLEM IN THE CHEST OR A BLOCKED NOSE?	Blocked nose 1 Problem in chest 2 Both 3 Other (<i>specify</i>) 4 NK 9	1⇒Q.11 4⇒Q.11
9. DID YOU SEEK ADVICE OR TREATMENT FOR THE ILLNESS OUTSIDE THE HOME?	Yes 1 No 2 NK 9	2⇒Q.11 9⇒Q.11
10. FROM WHERE DID YOU SEEK CARE? ANYWHERE ELSE? <i>Circle all providers mentioned, but do NOT prompt with any suggestions.</i>	Hospital 01 Health centre 02 Dispensary 03 Village health worker 04 MCH clinic 05 Mobile/outreach clinic 06 Private physician 07 Traditional healer 08 Pharmacy or drug seller 09 Relative or friend 10 Other (<i>specify</i>) 11	
<i>Ask this question (Q.11) only once for each carer.</i> 11. SOMETIMES CHILDREN HAVE SEVERE ILLNESSES AND SHOULD BE TAKEN IMMEDIATELY TO A HEALTH FACILITY. WHAT TYPES OF SYMPTOMS WOULD CAUSE YOU TO TAKE YOUR CHILD TO A HEALTH FACILITY RIGHT AWAY? <i>Keep asking for more signs or symptoms until the carer cannot recall any additional symptoms. Circle all symptoms mentioned, but do NOT prompt with any suggestions.</i>	Child not able to drink or breastfeed 01 Child becomes sicker 02 Child develops a fever 03 Child has fast breathing 04 Child has difficult breathing 05 Child has blood in stool 06 Child is drinking poorly 07 Other (<i>specify</i>) 08 Other (<i>specify</i>) 09 Other (<i>specify</i>) 10	

GO TO NEXT MODULE ⇒

Cluster no. _____ Household no. _____ Carer line no. _____ Child line no. _____

IMMUNIZATION MODULE									
If an immunization card is available, copy the dates in Qs.2-5 for each type of immunization recorded on the card. Qs.7-15 are for recording vaccinations that are not recorded on the card. Qs.7-15 will only be asked when a card is not available.									
1. IS THERE A VACCINATION RECORD FOR (name)?				Yes, seen 1 Yes, not seen 2 No 3				2⇒Q.7 3⇒Q.7	
(a) Copy dates of all vaccinations from the card. (b) Write '44' in day column if card shows that vaccination was given but no date recorded.				Date of Immunization					
				DAY		MONTH		YEAR	
2. BCG		BCG							
3B. OPV1		OPV1							
3C. OPV2		OPV2							
3D. OPV3		OPV3							
4A. DPT1		DPT1							
4B. DPT2		DPT2							
4C. DPT3		DPT3							
5. MMR (MEASLES, MUMPS, RUBELLA)									
6. IN ADDITION TO THE VACCINATIONS SHOWN ON THIS CARD, DID (name) RECEIVE ANY OTHER VACCINATIONS - INCLUDING VACCINATIONS RECEIVED IN A NATIONAL IMMUNIZATION DAY?				Yes 1 (Probe for vaccinations and write '66' in the corresponding day column on Q. 2 to Q. 5.) No 2 NK 9				1⇒Q.15 2⇒Q.15 9⇒Q.15	
Record 'Yes' only if respondent mentions BCG, OPV 0-3, DPT 1-3, and/or MMR vaccine(s). Go to Q.15 after you finish.									
7. HAS (name) EVER RECEIVED ANY VACCINATIONS TO PREVENT HIM/HER FROM GETTING DISEASES, INCLUDING VACCINATIONS RECEIVED IN A NATIONAL IMMUNIZATION DAY CAMPAIGN?				Yes 1 No 2 NK 9				2⇒Q.15 9⇒Q.15	
8. HAS (name) EVER BEEN GIVEN A BCG VACCINATION AGAINST TUBERCULOSIS - THAT IS, AN INJECTION IN THE LEFT SHOULDER THAT CAUSED A SCAR?				Yes 1 No 2 NK 9					

9. HAS (<i>name</i>) EVER BEEN GIVEN ANY "VACCINATION DROPS IN THE MOUTH" TO PROTECT HIM/HER FROM GETTING DISEASES – THAT IS, POLIO?	Yes 1 No 2 NK 9	2⇒Q.12 9⇒Q.12
10. HOW OLD WAS HE/SHE WHEN THE FIRST DOSE WAS GIVEN – JUST AFTER BIRTH OR LATER?	Just after birth..... 1 Later..... 2	
11. HOW MANY TIMES HAS HE/SHE BEEN GIVEN THESE DROPS?	No. of times	
12. HAS (<i>name</i>) EVER BEEN GIVEN "VACCINATION INJECTIONS" – THAT IS, AN INJECTION IN THE THIGH OR BUTTOCKS – TO PREVENT HIM/HER FROM GETTING TETANUS, WHOOPING COUGH, DIPHTHERIA ? (SOMETIMES GIVEN AT THE SAME TIME AS POLIO)	Yes 1 No 2 NK 9	2⇒Q.14 9⇒Q.14
13. HOW MANY TIMES?	No. of times	
14. HAS (<i>name</i>) EVER BEEN GIVEN "VACCINATION INJECTIONS" – THAT IS, A SHOT IN THE ARM AT THE AGE OF 9 MONTHS OR OLDER - TO PREVENT HIM/HER FROM GETTING MEASLES, RUBEOLA AND PAROTITIS	Yes 1 No 2 NK 9	
15. PLEASE TELL ME IF (<i>name</i>) HAS PARTICIPATED IN ANY OF THE FOLLOWING IMMUNIZATION CAMPAIGNS: CAMPAIGN A: (POLIO) 1997 CAMPAIGN B: (POLIO) 1998 CAMPAIGN C: (POLIO) 2000	Y N NK Campaign A 1 2 9 Campaign B 1 2 9 Campaign C 1 2 9	

GO TO NEXT MODULE ⇒

Cluster no. _____ Household no. _____ Carer line no. _____

ANTHROPOMETRY MODULE		
<i>After questionnaires for all children are complete, the measurer weighs and measures each child. Record weight and length/height below, taking care to record the measurements on the correct questionnaire for each child. Check the child's name and line number on the HH listing before recording measurements.</i>		
1. Child's weight.	Kilograms (kg).....	
2. Child's length or height. <i>Check age of child:</i> ☐ Child under 2 years old. ⇒ Measure length (lying down). ☐ Child age 2 or more years. ⇒ Measure height (standing up).	Length (cm) Lying down 1 Height (cm) Standing up 2	
3. Measurer's identification code.	Measurer code	
4. Result.	Measured 1 Not present 2 Refused..... 3 Other (specify) 4	
5. Is there another child in the household who is eligible for measurement? ☐ Yes. ⇒ Record measurements for next child. ☐ No. ⇒ End the interview with this household by thanking all participants for their cooperation. Gather together all questionnaires for this household and check that identification numbers are at the top of each page. Tally on the Household Information Panel the number of interviews completed.		

Appendix E: Results tables

Table E 1 Age distribution of household population by sex, BIH MICS 200

Sex					Sex				
Age	Male		Female		Age	Male		Female	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
0	264	1.5	227	1.3	30	293	1.7	271	1.5
1	234	1.3	247	1.4	31	208	1.2	246	1.4
2	250	1.4	248	1.4	32	248	1.4	246	1.4
3	323	1.9	298	1.6	33	287	1.6	235	1.3
4	289	1.7	262	1.4	34	235	1.3	273	1.5
5	253	1.4	232	1.3	35	329	1.9	296	1.6
6	278	1.6	244	1.3	36	250	1.4	286	1.6
7	221	1.3	229	1.3	37	249	1.4	262	1.4
8	249	1.4	244	1.3	38	296	1.7	286	1.6
9	281	1.6	259	1.4	39	256	1.5	270	1.5
10	303	1.7	272	1.5	40	314	1.8	308	1.7
11	238	1.4	239	1.3	41	240	1.4	259	1.4
12	283	1.6	282	1.6	42	282	1.6	252	1.4
13	272	1.6	291	1.6	43	242	1.4	252	1.4
14	267	1.5	306	1.7	44	224	1.3	236	1.3
15	282	1.6	182	1	45	274	1.6	282	1.6
16	321	1.8	250	1.4	46	238	1.4	247	1.4
17	288	1.7	278	1.5	47	247	1.4	238	1.3
18	279	1.6	276	1.5	48	225	1.3	234	1.3
19	242	1.4	264	1.5	49	176	1	83	0.5
20	322	1.8	306	1.7	50	285	1.6	404	2.2
21	255	1.5	239	1.3	51	193	1.1	219	1.2
22	263	1.5	258	1.4	52	189	1.1	215	1.2
23	255	1.5	256	1.4	53	170	1	207	1.1
24	278	1.6	253	1.4	54	151	0.9	157	0.9
25	290	1.7	287	1.6	55	161	0.9	212	1.2
26	229	1.3	256	1.4	56	127	0.7	146	0.8
27	241	1.4	240	1.3	57	103	0.6	133	0.7
28	261	1.5	260	1.4	58	136	0.8	188	1
29	243	1.4	246	1.4	59	162	0.9	185	1

Sex					Sex				
Age	Male		Female		Age	Male		Female	
	Number	Percent	Number	Percent		Number	Percent	Number	Percent
60	223	1.3	299	1.7	Missing/DK	8	0	8	0
61	154	0.9	182	1	Total	17453	100	18118	100
62	188	1.1	210	1.2					
63	197	1.1	221	1.2					
64	156	0.9	196	1.1					
65	205	1.2	244	1.3					
66	176	1	199	1.1					
67	157	0.9	155	0.9					
68	141	0.8	187	1					
69	120	0.7	128	0.7					

Table E 2 Percentage of children aged 36-59 months who are attending some form of organised early childhood education programme, BiH MICS 2000

		Attending programme (%)	Number of children
Sex	Male	8.1	620
	Female	9.5	569
Entity	Federation of BiH	9.8	882
	Republika Srpska	5.9	307
Area	Urban	15.2	376
	Rural	5.8	813
Age	36-47 months	6.9	627
	48-59 months	10.9	562
Mother's education level	Primary/None	5.9	524
	Secondary	11.0	665
Total		8.7	1189

Table E 3 Percentage of children entering first grade of primary school who eventually reach grade 5, BiH MICS 2000

		Percent in grade 1 reaching grade 2 (%)	Percent in grade 2 reaching grade 3 (%)	Percent in grade 3 reaching grade 4 (%)	Percent in grade 4 reaching grade 5 (%)	Percent who reach grade 5 of those who enter grade 1 (%)
Sex	Male	100.0	100.0	99.6	99.6	99.2
	Female	99.2	100.0	99.6	100.0	98.8
Entity	Federation of BiH	99.5	100.0	99.4	99.7	98.6
	Republika Srpska	100.0	100.0	100.0	100.0	100.0
Area	Urban	99.5	100.0	99.4	100.0	99.0
	Rural	99.7	100.0	99.7	99.7	99.1
Total		99.6	100.0	99.6	99.8	99.0

Table E 4 Percentage of children of primary school age attending primary school, BiH MICS 2000

		Sex						Total	
		Male			Female				
		Attending primary school							
		%	Number	%	Number	%	Number		
Entity	Federation of BiH	93.0	1474	94.3	1413	93.7	2887		
	Republika Srpska	94.6	701	95.2	662	94.9	1363		
Area	Urban	93.6	785	95.2	744	94.4	1529		
	Rural	93.5	1390	94.3	1331	93.9	2721		
Age	8	96.8	249	95.5	244	96.1	493		
	9	97.9	281	96.9	259	97.4	540		
	10	98.7	303	99.6	272	99.1	575		
	11	98.3	238	98.7	239	98.5	477		
	12	98.9	283	99.3	282	99.1	565		
	13	98.2	272	99.7	291	98.9	563		
	14	94.4	267	95.1	306	94.8	573		
Total	15	66.0	282	61.0	182	64.0	464		
		93.5	2175	94.6	2075	94.0	4250		

Table E 5 Percentage of the population aged 15 years and older that is literate, BiH MICS 2000

		Sex						Total		
		Male			Female					
		Literate (%)	Not known (%)	Number	Literate (%)	Not known (%)	Number	Literate (%)	Not known (%)	Number
Entity	Federation of BiH	98.5	1.0	8 136	91.5	5.3	8503	95.0	3.2	16639
	Republika Srpska	98.1	0.2	5 304	90.5	0.6	5 727	94.1	0.4	11 031
Area	Urban	99.2	0.3	4 920	95.6	1.8	5 622	97.3	1.1	10 542
	Rural	97.9	0.9	8 520	88.2	4.5	8 608	93.0	2.7	17 128
Age	15-24	99.6	0.2	2 785	99.7	0.2	2 562	99.6	0.2	5 347
	25-34	99.8	0.1	2 535	99.6	0.4	2 560	99.7	0.2	5 095
	35-44	99.4	0.3	2 682	99.1	0.3	2 707	99.3	0.3	5 389
	45-54	99.3	0.3	2 148	95.2	2.1	2 286	97.2	1.2	4 434
	55-64	97.3	1.1	1 607	84.0	6.7	1 972	89.9	4.2	3 579
	65+	92.4	3.0	1 683	62.9	13.4	2 143	75.8	8.8	3 826
Total		98.4	0.7	13 440	91.1	3.4	14 230	94.6	2.1	27 670

Table E 6 Percentage of the population using improved drinking water sources, BiH MICS 2000

Main source of water																
	Piped into dwelling %	Piped into yard or plot %	Public tap %	Tubewell/ borehole with pump %	Protected dug well %	Protected spring %	Rain-water collection %	Bottled water %	Unprotected dug well %	Unprotected spring %	Pond, river or stream %	Tanker truck vendor %	Other %	Total %	Total with safe drinking water %	Number of persons
Federation of BiH	85.4	3.0	1.8	0.7	4.1	2.8	0.2	0.1	0.2	0.6	0	0.9	0.1	100.0	98.1	22152
Entity Republika Srpska	47.0	18.8	2.0	11.6	7.9	9.1	0.2	0	0.9	2.0	0.2	0	0.4	100.0	96.5	13419
Area Urban	97.2	0.6	0.6	0.2	0.4	0.6	0	0.1	0	0.1	0	0	0.1	100.0	99.7	13263
Rural	55.4	13.9	2.5	7.6	8.6	7.9	0.3	0	0.8	1.8	0.1	0.9	0.2	100.0	96.2	22308
Total	70.9	9.0	1.8	4.8	5.6	5.2	0.2	0	0.5	1.1	0.1	0.5	0.2	100.0	97.5	35571

Table E 7 Percentage of the population using sanitary means of excreta disposal, BiH MICS 2000

Kind of toilet facility												
		Flush to sewage system or septic tank %	Pour flush latrine (water seal type) %	Improved pit latrine (VIP) %	Traditional pit latrine %	Open pit %	Bucket %	Other %	No facilities, bush, field %	Total %	Total with sanitary means of excreta disposal %	Number of persons
Entity	Federation of BiH	84.5	4.4	7.1	3.4	.4	0	0.1	0	100.0	99.5	22152
	Republika Srpska	78.3	2.5	0.6	2.2	16.2	0	0	0.1	100.0	83.7	13419
Area	Urban	97.3	1.0	0.5	0.3	0.9	0	0	0	100.0	99.0	13263
	Rural	73.2	5.3	7.2	4.5	9.6	0	0.1	0.1	100.0	90.2	22308
Total		82.2	3.7	4.7	2.9	6.4	0	0.1	0.1	100.0	93.5	35571

Table E 8 Percentage of under-five children who are severely or moderately undernourished, BiH MICS 2000

Sex	Male	Weight for age: +2 SD	Weight for age: +3 SD	Height for age: +2 SD	Height for age: +3 SD	Weight for height: +2 SD	Weight for height: +3 SD	Number of children
	Female	%	%	%	%	%	%	
Entity	Federation of BiH	9.4	2.7	12.8	3.9	11.8	4.3	1323
	Republika Srpska	10.6	3.4	13.4	5.5	14.7	5.4	1246
Area	Urban	8.9	2.5	11.7	4.2	12.2	4.6	1887
	Rural	13.2	4.5	16.9	6.2	16.0	5.4	682
	< 6 months	11.4	3.9	15.9	5.9	14.1	6.3	854
	6-11 months	9.3	2.6	11.7	4.1	12.8	4.1	1715
	12-23 months	3.7	1.2	9.5	3.7	8.7	4.6	241
	24-35 months	12.2	2.3	16.7	6.8	15.8	7.7	221
	36-47 months	14.5	4.3	14.0	7.4	19.1	6.8	470
Mother's education level	48-59 months	8.5	3.2	16.2	4.9	10.0	2.4	468
	Primary/None	6.5	1.8	10.2	2.8	1.4	3.1	617
	Secondary	13.2	4.3	12.9	4.0	14.9	6.2	552
		8.1	2.6	11.2	3.1	11.4	4.2	1053
	Total	11.3	3.4	14.4	5.8	14.4	5.3	1516
		10.0	3.0	13.1	4.7	13.2	4.8	2569

Table E 9 Percentage of under-five children who are overweight or obese, BiH MICS 2000

		Weight for height: +2 SD	Weight for height: +3 SD	Number of children
Sex	Male	11.8	4.3	1323
	Female	14.7	5.4	1246
Entity	Federation of B&H	12.2	4.6	1887
	Republika Srpska	16.0	5.4	682
Area	Urban	14.1	6.3	854
	Rural	12.8	4.1	1715
Age	< 6 months	8.7	4.6	241
	6-11 months	15.8	7.7	221
	12-23 months	19.1	6.8	470
	24-35 months	10.0	2.4	468
	36-47 months	10.4	3.1	617
	48-59 months	14.9	6.2	552
Mother's education level	Primary/None	11.4	4.2	1053
	Secondary	14.4	5.3	1516
Total		13.2	4.8	2569

Table E 10 Birth weight, BiH MICS 200

Birth weight							
		<2500	2500+	DK/ Missing	Not weighted at birth	Total	Number
Entity	Federation of B&H	3.8	90.6	5.0	.6	100.0	340
	Republika Srpska	2.1	93.8	3.4	.7	100.0	145
Area	Urban	2.3	96.0	.6	1.1	100.0	174
	Rural	3.9	89.1	6.8	.3	100.0	311
Woman's education level	Primary/None	3.7	89.0	6.7	.6	100.0	164
	Secondary +	3.1	92.8	3.4	.6	100.0	321
Total		3.3	91.5	4.5	.6	100.0	485

Table E 11 Percentage of children age 12-23 months immunised against childhood diseases at any time before the survey and before the first birthday

Vaccinated at any time according to:	BCG	DPT 1	DPT 2	DPT 3	Polio 1	Polio 2	Polio 3	Measles (MMR)	All	None
Vaccination card	78.3	77.9	77.1	75.2	78.1	77.3	75.6	53.5	52.9	3.8
Mother's report	16.9	14.6	14.2	12.5	15.6	14.2	9.6	10.8	6.9	96.3
Either	95.2	92.5	91.3	87.7	93.8	91.5	85.2	64.4	59.8	100
Vaccinated by 12 months of age among those who have cards	100	98.7	97.8	96.6	98.9	98.1	96.4	38.2	30.3	0
Total Percent Vaccinated by 12 months	95.2	91.3	89.3	84.8	92.7	89.7	82.1	24.6	18.1	0

Table E 12 Percentage of children before 18 months months immunised against childhood diseases at any time before the survey and before the first birthday

Vaccinated at any time according to:	BCG %	DPT 1 %	DPT 2 %	DPT 3 %	Polio 1 %	Polio 2 %	Polio 3 %	Measles (MMR) %	All	None
Vaccination card	78.2	78	78.2	76.8	78.4	78	77	70.2	68	4.6
Mother's report	15.7	14	13.9	11.9	15.3	12	9.1	11.7	7	95.4
Either	94	92	92.1	88.7	93.8	90	86.1	81.9	75	100
Vaccinated by 12 months of age among those who have cards	100	99	99	98.9	99.7	99	98.9	95.8	92	0
Total Percent Vaccinated by 12 months	94	92	91.2	87.8	93.5	90	85.2	78.5	69	0

Table E 13 Percentage of children age 12-23 months currently vaccinated against childhood diseases, BiH, MICS 2000

		BCG %	DPT 1 %	DPT 2 %	DPT 3 %	Polio 1 %	Polio 2 %	Polio 3 %	Measles	All	None	% with health card	Number of children
Sex	Male	94.8	93.5	90.9	86.1	93.9	90.9	83.0	63.5	58.3	3.5	79.1	230
	Female	95.6	91.6	91.6	89.2	93.6	92.0	87.2	65.2	61.2	4.0	79.2	250
Entity	Federation of BiH	95.1	92.7	91.3	88.4	94.5	92.2	86.6	70.1	66.0	3.5	80.2	344
	Republika Srpska	95.6	91.9	91.2	86.0	91.9	89.7	81.6	50.0	44.1	4.4	76.5	136
Area	Urban	97.5	91.8	91.1	89.2	93.7	92.4	88.6	66.5	63.9	2.5	79.7	158
	Rural	94.1	92.9	91.3	87.0	93.8	91.0	83.5	63.4	57.8	4.3	78.9	322
Mother's education level	Primary/ None	93.8	92.6	90.9	86.9	95.5	92.0	84.1	65.3	60.8	4.0	82.4	176
	Secondary	96.1	92.4	91.4	88.2	92.8	91.1	85.9	63.8	59.2	3.6	77.3	304
Total		95.2	92.5	91.3	87.7	93.8	91.5	85.2	64.4	59.8	3.8	79.2	480

Table E 14 Percentage of children age 18-29 months currently vaccinated against childhood diseases, BiH MICS 2000

		BCG %	DPT 1 %	DPT 2 %	DPT 3 %	Pollo 1 %	Pollo 2 %	Pollo 3 %	Measles %	All %	None %	% with health card	Number of children
Sex	Male	94.9	93.6	92.7	89.3	94.4	91.0	85.5	82.1	75.2	3.4	79.1	234
	Female	93.1	92.0	91.6	88.2	93.1	90.8	86.6	81.7	76.3	5.7	79.8	262
Entity	Federation of BiH	92.8	91.7	91.4	88.8	93.1	91.1	87.1	86.2	79.6	5.2	80.2	348
	Republika Srpska	96.6	95.3	93.9	88.5	95.3	90.5	83.8	71.6	66.9	3.4	77.7	148
Area	Urban	95.7	92.0	92.0	88.3	93.2	91.4	87.0	82.7	77.2	3.7	79.0	162
	Rural	93.1	93.1	92.2	88.9	94.0	90.7	85.6	81.4	75.1	5.1	79.6	334
Mother's education level	Primary/ None	89.1	89.6	88.6	84.5	90.7	87.6	82.4	79.8	72.5	7.8	80.3	193
	Secondary	97.0	94.7	94.4	91.4	95.7	93.1	88.4	83.2	77.9	2.6	78.9	303
Total		94.0	92.7	92.1	88.7	93.8	90.9	86.1	81.9	75.8	4.6	79.4	496

Table E 15 Percentage of under-five children with diarrhoea in the last two weeks and treatment with ORS or ORT, BiH MIC200

		Had diarrhoea in last two weeks %	Number of children under 5 %	Breast milk %	Gruel %	Local acceptable %	ORS packet %	Other milk or infant formula %	Water with feeding %	Any recommended treatment %	No treatment %	Number of children with diarrhoea %
Sex	Male	9.6	1347	23.3	18.6	20.9	15.5	27.9	33.3	81.4	18.6	129
	Female	8.2	1274	19.0	21.0	17.1	10.5	27.6	34.3	81.9	18.1	105
Entity	Federation of BiH	8.6	1903	23.8	12.8	11.6	13.4	29.3	31.1	79.3	20.7	164
	Republika Srpska	9.7	718	15.7	35.7	37.1	12.9	24.3	40.0	87.1	12.9	70
Area	Urban	9.2	868	25.0	21.3	20.0	17.5	27.5	31.3	86.3	13.8	80
	Rural	8.8	1753	19.5	18.8	18.8	11.0	27.9	35.1	79.2	20.8	154
Age	< 6 months	8.2	244	80.0	10.0	5.0	5.0	15.0	25.0	95.0	5.0	20
	6-11 months	12.6	230	51.7	10.3	10.3	17.2	27.6	31.0	82.8	17.2	29
	12-23 months	12.3	480	22.0	18.6	18.6	8.5	44.1	33.9	86.4	13.6	59
	24-35 months	8.4	478	2.5	35.0	22.5	22.5	27.5	30.0	80.0	20.0	40
	36-47 months	7.2	627	6.7	20.0	17.8	11.1	22.2	42.2	82.2	17.8	45
	48-59 months	7.3	562	4.9	17.1	31.7	14.6	17.1	34.1	68.3	31.7	41
Mother's education level	Primary/None	8.1	1074	20.7	20.7	17.2	9.2	29.9	33.3	81.6	18.4	87
	Secondary	9.5	1547	21.8	19.0	2.4	15.6	26.5	34.0	81.6	18.4	147
Total		8.9	2621	21.4	19.7	19.2	13.2	27.8	33.8	81.6	18.4	234

Table E 16 Percentage of under-five children with diarrhoea in the last two weeks who took increased fluids and continued to feed during the episode, BiH MICS 2000

	Had diarrhoea in last two weeks %	Number of children under 5	Drinking during diarrhoea %			Total %	Eating during diarrhoea			Total %	Received increased fluids and continued eating	Number of children with diarrhoea
			More	Same/ Less	Missing/ DK		somewhat less/same/ more	Much less/ none	Missing/DK			
Sex	Male	1347	20.9	56.6	22.5	100.0	62.0	37.2	.8	100.0	12.4	129
	Female	1274	13.3	66.7	20.0	100.0	62.9	36.2	1.0	100.0	9.5	105
Entity	Federation of BiH	1903	15.9	56.7	27.4	100.0	62.2	36.6	1.2	100.0	9.8	164
Area	Republika Srpska	718	21.4	71.4	7.1	100.0	62.9	37.1	0	100.0	14.3	70
	Urban	868	18.8	60.0	21.3	100.0	58.8	40.0	1.3	100.0	11.3	80
Age	Rural	1753	16.9	61.7	21.4	100.0	64.3	35.1	.6	100.0	11.0	154
	< 6 months	244	10.0	65.0	25.0	100.0	70.0	30.0	0	100.0	10.0	20
Age	6-11 months	230	17.2	51.7	31.0	100.0	86.2	13.8	0	100.0	10.3	29
	12-23 months	480	23.7	59.3	16.9	100.0	54.2	45.8	0	100.0	15.3	59
	24-35 months	478	22.5	60.0	17.5	100.0	60.0	40.0	0	100.0	12.5	40
	36-47 months	627	15.6	66.7	17.8	100.0	60.0	40.0	0	100.0	13.3	45
Mother's education level	48-59 months	562	9.8	63.4	26.8	100.0	58.5	36.6	4.9	100.0	2.4	41
	Primary/ None	1074	16.1	62.1	21.8	100.0	64.4	35.6	0	100.0	12.6	87
Total	Secondary	1547	18.4	60.5	21.1	100.0	61.2	37.4	1.4	100.0	10.2	147
		2621	17.5	61.1	21.4	100.0	62.4	36.8	0.9	100.0	11.1	234

Table E 17 Percentage of under-five children with acute respiratory infection in the last two weeks and treatment by health providers, BiH MICS 2000

		Had acute respiratory infection	Number of children under 5	Hospital	Dispensary	Private physician	Traditional healer	Other	Any appropriate provider	Number of children with ARI
Sex	Male	1.8	1347	20.8	50.0	20.8	.0	12.5	79.2	24
	Female	1.3	1274	37.5	25.0	18.8	.0	6.3	81.3	16
Entity	Federation of B&H	1.6	1903	26.7	46.7	20.0	.0	6.7	83.3	30
	Republika Srpska	1.4	718	30.0	20.0	20.0	.0	20.0	70.0	10
Area	Urban	.9	868	25.0	50.0	25.0	.0	25.0	100.0	8
	Rural	1.8	1753	28.1	37.5	18.8	.0	6.3	75.0	32
Age	< 6 months	.4	244	.0	100.0	100.0	.0	.0	100.0	1
	6-11 months	1.3	230	33.3	33.3	.0	.0	.0	66.7	3
	12-23 months	2.1	480	30.0	10.0	20.0	.0	10.0	60.0	10
	24-35 months	.0	478	.	.	.	.	.	.	0
	36-47 months	3.0	627	26.3	52.6	26.3	.0	5.3	94.7	19
Mother's education level	48-59 months	1.2	562	28.6	42.9	.0	.0	28.6	71.4	7
	Primary/None	2.2	1074	37.5	37.5	8.3	.0	8.3	79.2	24
	Secondary	1.0	1547	12.5	43.8	37.5	.0	12.5	81.3	16
Total		1.5	2621	27.5	40.0	20.0	.0	10.0	80.0	40

Table E 18 Percentage of under-five children with diarrhoea in the last two weeks and treatment with ORS or ORT, BiH MICS 2000

		Had diarrhoea in last two weeks %	Number of children under 5 %	Breast milk %	Gruel %	Local acceptable %	ORS packet %	Other milk or infant formula %	Water with feeding %	Any recommended treatment %	No treatment %	Number of children with diarrhoea %
Sex	Male	9.6	1347	23.3	18.6	20.9	15.5	27.9	33.3	81.4	18.6	129
	Female	8.2	1274	19.0	21.0	17.1	10.5	27.6	34.3	81.9	18.1	105
Entity	Federation of BiH	8.6	1903	23.8	12.8	11.6	13.4	29.3	31.1	79.3	20.7	164
Area	Republika Srpska	9.7	718	15.7	35.7	37.1	12.9	24.3	40.0	87.1	12.9	70
	Urban	9.2	868	25.0	21.3	20.0	17.5	27.5	31.3	86.3	13.8	80
	Rural	8.8	1753	19.5	18.8	18.8	11.0	27.9	35.1	79.2	20.8	154
Age	< 6 months	8.2	244	80.0	10.0	5.0	5.0	15.0	25.0	95.0	5.0	20
	6-11 months	12.6	230	51.7	10.3	10.3	17.2	27.6	31.0	82.8	17.2	29
	12-23 months	12.3	480	22.0	18.6	18.6	8.5	44.1	33.9	86.4	13.6	59
	24-35 months	8.4	478	2.5	35.0	22.5	22.5	27.5	30.0	80.0	20.0	40
	36-47 months	7.2	627	6.7	20.0	17.8	11.1	22.2	42.2	82.2	17.8	45
	48-59 months	7.3	562	4.9	17.1	31.7	14.6	17.1	34.1	68.3	31.7	41
Mother's education level	Primary/None	8.1	1074	20.7	20.7	17.2	9.2	29.9	33.3	81.6	18.4	87
	Secondary	9.5	1547	21.8	19.0	2.4	15.6	26.5	34.0	81.6	18.4	147
Total		8.9	2621	21.4	19.7	19.2	13.2	27.8	33.8	81.6	18.4	234

**Table E 19 Percentage of caretakers of children 0-59 months who know at least 2 signs for seeking care immediately, BiH
MICS 2000**

		Not able to drink/ breastfeed	Becomes sicker	Develops a fever	Has fast breathing	Has difficult breathing	Has blood in stool	Is drinking poorly	Knows at least two signs	Number of caretakers
Entity	Federation of B&H	26.3	36.8	95.3	31.6	40.6	34.0	12.9	65.6	1903
	Republika Srpska	15.7	34.8	88.6	36.5	40.0	45.0	8.4	74.0	718
Area	Urban	22.2	35.1	95.6	31.5	42.4	38.7	13.4	69.8	868
	Rural	24.0	36.9	92.4	33.7	39.5	36.2	10.8	66.9	1753
Mother's education level	Primary/None	23.5	34.9	93.7	34.7	38.2	34.8	11.9	63.9	1074
	Secondary	23.3	37.2	93.3	31.7	42.0	38.5	11.5	70.7	1547
Total		23.4	36.3	93.5	33.0	40.4	37.0	11.7	67.9	2621

Table E 20 Percentage of married or in union women aged 15–49 who are using (or whose partner is using a contraceptive method, BiH MICS 2000

	Current method %														Total	Any modern method %	Any traditional method %	Any method %	Number of currently married
	No method	Female sterilization	Male sterilization	Pill	IUD	Implants	Condom	Female condom	Diaphragm/foam/jelly	LAM	Periodic abstinence	Withdrawal	Other						
Entity	Federation of BiH	51.3	0.2	0.1	5.1	7.3	0	2.9	0.1	0.1	0.8	5.1	26.9	0.1	100.0	15.7	32.9	48.7	3767
	Republika Srpska	54.9	0.1	0	3.2	8.9	0	3.3	0	0.2	0.1	2.2	26.8	0.3	100.0	15.7	29.4	45.1	1971
Area	Urban	54.4	0.1	0	5.0	9.6	0	4.0	0	0.1	0.3	3.3	23.0	0	100.0	18.9	26.7	45.6	2099
	Rural	51.5	0.1	0.1	4.2	6.8	0	2.5	0.1	0.1	0.7	4.6	29.1	0.2	100.0	13.9	34.6	48.5	3639
Age	15-19	68.1	0	0	2.9	.0	0	4.3	0	0	2.9	1.4	20.3	0	100.0	7.2	24.6	31.9	69
	20-24	60.3	0	0	3.2	4.1	0	3.6	0	0	2.4	1.0	25.4	0	100.0	10.8	28.8	39.7	590
	25-49	51.4	0.1	0	4.6	8.4	0	3.0	0	0.1	0.3	4.5	27.2	0.2	100.0	16.4	32.2	48.6	5079
Woman's education level	Primary/None	52.8	0	0.1	3.3	6.8	0	1.6	0	0.1	0.5	3.9	30.6	0.2	100.0	12.0	35.2	47.2	2459
	Secondary +	52.3	0.2	0	5.3	8.7	0	4.1	0	0.2	0.5	4.3	24.1	0.1	100.0	18.6	29.1	47.7	3279
Total		52.5	0.1	0	4.5	7.9	0	3.1	0	0.1	0.5	4.1	26.9	0.2	100.0	15.7	31.7	47.5	5738

Table E 21 Percent distribution of women aged 15-49 with a birth in the last year by type of personnel delivering antenatal care, BiH MICS 2000

	Person delivering antenatal care							Total	Any skilled personnel	Number of women
	Doctor %	Nurse/ Midwife %	Auxiliary midwife %	Traditional birth attendant (%)	Other/ missing %	No antenatal care received (%)				
Entity	Federation of BiH	95.9	2.6	0.3	0.3	0.6	0.3	100.0	98.8	340
	Republika Srpska	9.3	0.7	0	0	0	0	100.0	100.0	145
Area	Urban	96.6	2.9	0	0	0.6	0	100.0	99.4	174
	Rural	97.1	1.6	0.3	0.3	0.3	0.3	100.0	99.0	311
Woman's education level	Primary/None	95.1	3.0	0.6	0.6	0.6	0	100.0	98.8	164
	Secondary +	97.8	1.6	0	0	0.3	0.3	100.0	99.4	321
Total		96.9	2.1	0.2	0.2	0.4	0.2	100.0	99.2	485

Table E 22 Percent distribution of women aged 15-49 with a birth in the last year by type of personnel assisting at delivery, BiH MICS 2000

Person assisting at delivery								Total %	Any skilled personnel %	Number of women
	Doctor %	Nurse/ Midwife (%)	Auxiliary midwife (%)	Relative/ Friend (%)	Other/ Missing (%)					
Entity	Federation of BiH	85.6	13.8	0.6	0	0	100.0	100.0	340	
	Republika Srpska	80.7	17.2	0.7	0.7	0.7	100.0	98.6	145	
Area	Urban	85.6	13.2	0.6	0	0.6	100.0	99.4	174	
	Rural	83.3	15.8	0.6	0.3	0	100.0	99.7	311	
Woman's education level	Primary/None	78.0	20.1	0.6	0.6	0.6	100.0	98.8	164	
	Secondary +	87.2	12.1	0.6	0	0	100.0	100.0	321	
Total		84.1	14.8	0.6	0.2	0.2	100.0	99.6	485	

Table E 23 Percent distribution of children aged 0-59 months by whether birth is registered and reasons for non-registration, BiH MICS 2000

		Registration status							Total	Number of children
		Birth registered %	DK if birth registered %	Must travel too far %	Didn't know it should be registered %	Doesn't know where to register %	Other %	DK or Missing %		
Sex	Male	98.7	0.3	0.2	0	0.1	0.4	0.2	100.0	1347
	Female	98.1	0.4	0.2	0.2	0.2	0.5	0.2	100.0	1274
Entity	Federation of BiH	98.1	0.4	0.3	0.2	0.3	0.5	0.3	100.0	1903
	Republika Srpska	99.3	0.1	0	0	0	0.6	0	100.0	718
Area	Urban	97.9	0.6	0.2	0.1	0.1	0.9	0.1	100.0	868
	Rural	98.6	0.2	0.2	0.1	0.2	0.3	0.3	100.0	1753
Age	< 6 months	92.6	0.4	0.4	0.8	0.8	3.3	1.6	100.0	244
	6-11 months	99.1	0	0.4	0	0.4	0	0	100.0	230
	12-23 months	98.3	0.6	0.2	0	0.2	0.4	0.2	100.0	480
	24-35 months	98.7	0.4	0.2	0	0.2	0.4	0	100.0	478
	36-47 months	99.5	0.3	0.2	0	0	0	0	100.0	627
Mother's education level	48-59 months	99.1	0.2	0.2	0.2	0	0.2	0.2	100.0	562
	Primary/None	97.2	0.6	0.4	0.2	0.4	1.0	0.3	100.0	1074
	Secondary	99.2	0.2	0.1	0.1	0.1	0.1	0.2	100.0	1547
Total		98.4	0.3	0.2	0.1	0.2	0.5	0.2	100.0	2621

Table E 24 Percentage of children 0-14 years of age in households not living with a biological parent, BiH MICS 2000

Living arrangement																
		Living with both parents	Living with neither: only	Living with neither: only	Living with neither: both are	Living with mother only:	Living with mother only:	Living with father only:	Living with father only:	Living with mother only:	Living with father only:	Impossible to determine	Total	Not living with a biological parent	One or both parents dead	Number of children
Sex	Male	92.8	0.1	0.1	0.4	0	1.7	4.1	0.3	0.3	0.3	0.1	100.0	0.6	4.7	4005
	Female	92.3	0.1	0.1	0.4	0.1	2.1	3.9	0.3	0.3	0.3	0.4	100.0	0.6	4.5	3880
Entity	Federation of BiH	93.9	0.1	0.1	0.3	0.1	1.4	3.5	0.3	0.3	0.3	0.2	100.0	0.5	3.9	5499
	Republika Srpska	89.5	0.1	0.2	0.7	0	3.0	5.3	0.4	0.5	0.5	0.3	100.0	1.0	6.1	2386
Area	Urban	91.0	0	0.1	0.3	0	3.0	4.9	0.1	0.2	0.2	0.3	100.0	0.5	5.3	2718
	Rural	93.4	0.1	0.1	0.5	0.1	1.3	3.6	0.5	0.4	0.4	0.2	100.0	0.7	4.2	5167
Age	0-4 years	97.2	0	0	0.2	0	1.5	.8	0.1	0.2	0.2	0.1	100.0	0.2	1.0	2642
	5-9 years	91.4	0.2	0.1	0.5	0	1.8	4.9	0.3	0.4	0.4	0.3	100.0	0.8	5.6	2490
	10-14 years	89.1	0	0.2	0.5	0.1	2.3	6.3	0.6	0.5	0.5	0.3	100.0	0.9	7.2	2753
Total		92.6	0.1	0.1	0.4	0.1	1.9	4.0	0.3	0.3	0.3	0.2	100.0	0.6	4.6	7885

Table E 25 Percentage of children 5-14 years of age who are currently working, BiH MICS 2000

		Family work (farm or business)	Paid work %	Unpaid work %	Domestic work: < 4 hours/day %	Domestic work: 4 or more hours/day (%)	Currently working %	Number of children
Sex	Male	17.1	1.1	6.0	48.8	0.5	19.5	2645
	Female	13.2	0.7	5.9	61.9	0.7	15.9	2598
Entity	Federation of BiH	13.2	1.0	7.0	56.8	0.6	16.2	3589
	Republika Srpska	19.4	0.6	3.7	52.1	0.5	20.9	1654
Area	Urban	6.7	0.7	4.0	60.2	0.1	9.3	1843
	Rural	19.1	1.0	7.0	52.6	0.8	22.3	3400
Age	5-9 years	9.1	0.4	4.0	43.1	0.2	11.0	2490
	10-14 years	20.6	1.3	7.7	66.3	0.9	23.8	2753
Total		15.1	0.9	5.9	55.3	0.6	17.7	5243

Table E 26 Percentage of women aged 15-49 who know the main ways of preventing HIV transmission, BiH MICS 2000

	Heard of AIDS %	Have only one faithful uninfected sex partner %	Using a condom every time %	Abstaining from sex %	Knows all three ways %	Knows at least one way %	Doesn't know any way %	Number of women
Entity	Federation of BiH	47.6	46.6	37.6	26.7	59.3	40.7	5578
	Republika Srpska	58.7	53.3	42.7	31.3	68.6	31.4	3148
Area	Urban	60.0	59.5	44.9	33.5	73.2	26.8	3466
	Rural	46.0	42.2	35.8	24.9	55.7	44.3	5260
Age	15-19	53.2	50.3	41.4	29.9	65.6	34.4	1189
	20-24	57.2	55.1	42.9	33.3	68.1	31.9	1287
	25-29	53.5	51.6	41.5	29.9	65.2	34.8	1255
	30-34	53.4	50.1	39.4	28.5	62.9	37.1	1263
	35-39	49.2	47.6	37.3	26.4	60.9	39.1	1380
	40-44	49.6	46.1	38.5	26.2	61.0	39.0	1296
	45-49	44.0	41.6	34.3	23.6	53.5	46.5	1056
	Primary/None	35.2	31.1	28.7	18.4	43.7	56.3	3166
Woman's education level	Secondary +	60.9	59.3	45.5	34.0	73.4	26.6	5560
	Total	51.6	49.1	39.4	28.3	62.6	37.4	8726

Table E 27 Percentage of women aged 15-19 who know the main ways of preventing HIV/AIDS transmission, BiH MICS 2000

		Heard of AIDS	Have only one faithful uninfected sexual partner	Using a condom every time	Abstaining from sexual intercourse	Knows all three ways	Knows at least one way	Does not know any way	Number of women
Entity	Federation of B&H	96.5	47.7	45.6	38.1	26.9	60.0	40.0	723
	Republika Srpska	98.9	61.8	58.0	46.0	34.6	73.8	26.2	468
Area	Urban	98.7	61.6	62.5	49.6	37.5	76.9	23.1	464
	Rural	96.7	48.0	42.9	35.9	25.2	58.2	41.8	727
Age	15	96.5	39.0	35.5	33.7	18.0	53.5	46.5	172
	16	98.8	53.7	46.3	46.3	32.0	66.0	34.0	244
	17	96.9	51.6	50.8	38.8	28.3	65.1	34.9	258
	18	98.5	58.6	57.8	42.2	30.4	71.9	28.1	263
	19	96.5	59.1	57.1	42.9	37.4	66.9	33.1	254
Woman's education level	Primary/None	91.7	38.5	33.3	28.2	19.4	46.4	53.6	252
	Secondary +	99.0	57.3	55.2	44.7	32.8	70.6	29.4	939
Total		97.5	53.3	50.5	41.2	30.0	65.5	34.5	1191

Table E 28 Percentage of women aged 20-49 who know the main ways of preventing HIV/AIDS transmission, BiH MICS 2000

		Heard of AIDS	Have only one faithful uninfected sexual partner	Using a condom every time	Knows two ways	Knows one way	Does not know any way	Number of women
Entity	Federation of B&H	95.6	47.6	46.8	38.2	56.2	43.8	4855
	Republika Srpska	97.8	58.1	52.5	45.7	65.0	35.0	2680
Area	Urban	97.9	59.8	59.0	49.4	69.4	30.6	3002
	Rural	95.3	45.7	42.1	35.2	52.6	47.4	4533
Age	20-24	97.0	57.3	55.1	46.5	65.9	34.1	1289
	25-29	97.4	53.5	51.6	42.9	62.3	37.7	1253
	30-34	97.5	53.4	50.1	43.5	60.1	39.9	1263
	35-39	96.7	49.2	47.6	39.3	57.5	42.5	1380
	40-44	95.5	49.5	46.0	37.5	58.0	42.0	1294
	45-49	93.4	44.0	41.6	34.8	50.9	49.1	1056
Woman's education level	Primary/None	92.9	34.9	31.0	25.4	40.5	59.5	2914
	Secondary +	98.5	61.7	60.1	50.6	71.2	28.8	4621
Total		96.3	51.3	48.8	40.8	59.3	40.7	7535

Table E 29 Percentage of women aged 15-49 who correctly identify misconceptions about HIV/AIDS, BiH MICS 2000

		Heard of AIDS %	A healthy looking person can be infected %	Knows at least one misconception %	Doesn't correctly identify any misconception %	Number of women
Entity	Federation of BiH	95.7	66.4	66.4	33.6	5578
	Republika Srpska	97.9	73.5	73.5	26.5	3148
Area	Urban	98.0	78.9	78.9	21.1	3466
	Rural	95.5	62.4	62.4	37.6	5260
Age	15-19	97.4	71.9	71.9	28.1	1189
	20-24	97.0	75.4	75.4	24.6	1287
	25-29	97.4	74.3	74.3	25.7	1255
	30-34	97.5	69.1	69.1	30.9	1263
	35-39	96.7	67.1	67.1	32.9	1380
	40-44	95.5	63.1	63.1	36.9	1296
	45-49	93.4	60.8	60.8	39.2	1056
Woman's education level	Primary/None	92.8	49.2	49.2	50.8	3166
	Secondary +	98.6	80.2	80.2	19.8	5560
Total		96.5	68.9	68.9	31.1	8726

Table E 30 Percentage of women aged 15-49 who correctly identify means of HIV transmission from mother to child, BiH MICS 2000

	Know AIDS can be transmitted from mother to child %	Transmission during pregnancy possible %	Transmission at delivery possible %	Transmission through breastmilk possible %	Knows all three %	Did not know any specific way %	Number of women
Entity	Federation of BiH	68.2	57.9	53.3	47.1	29.7	5578
	Republika Srpska	67.3	60.2	54.4	48.4	30.1	3148
Area	Urban	77.9	66.5	59.3	53.1	20.3	3466
	Rural	61.3	53.6	50.0	44.0	36.2	5260
	15-19	63.7	53.6	49.7	43.2	33.7	1189
	20-24	71.4	62.0	55.4	49.0	26.5	1287
	25-29	72.1	62.8	56.5	49.9	25.6	1255
	30-34	71.2	60.3	57.3	50.7	27.2	1263
	35-39	68.6	59.1	53.4	47.5	29.3	1380
	40-44	64.0	56.5	52.9	46.7	33.2	1296
	45-49	63.4	56.1	49.9	45.6	34.7	1056
Woman's education level	Primary/None	55.0	47.7	45.8	40.0	42.5	3166
	Secondary +	75.3	65.0	58.2	51.9	22.7	5560
Total	72.5	67.9	58.7	53.7	47.6	29.9	8726

Table E 31 Percentage of women aged 15-49 who express a discriminatory attitude towards people with HIV/AIDS, BiH MICS 2000

		Believe that a teacher with HIV should not be allowed to work %	Would not buy food from a person with HIV/AIDS %	Agree with at least one discriminatory statement %	Agree with neither discriminatory statement %	Number of women %
Entity	Federation of BiH	23.4	13.1	24.9	75.1	5578
	Republika Srpska	21.7	8.4	22.6	77.4	3148
Area	Urban	31.5	15.1	32.5	67.5	3466
	Rural	17.0	9.0	18.6	81.4	5260
Age	15-19	27.8	13.6	29.2	70.8	1189
	20-24	28.2	15.7	30.3	69.7	1287
	25-29	26.3	12.4	27.7	72.3	1255
	30-34	23.2	10.8	24.1	75.9	1263
	35-39	19.4	9.6	2.4	79.6	1380
	40-44	17.7	9.4	19.1	80.9	1296
Woman's education level	45-49	16.5	8.0	17.3	82.7	1056
	Primary/None	11.9	6.7	13.3	86.7	3166
	Secondary +	29.0	14.1	30.3	69.7	5560
Total		22.8	11.4	24.1	75.9	8726

Table E 32 Percentage of women aged 15-49 who have sufficient knowledge of HIV/AIDS transmission, BiH MICS 2000

		Heard of AIDS %	Know 3 ways to prevent HIV transmission %	Correctly identify 3 misconceptions about HIV transmission %	Have sufficient knowledge %	Number of women
Entity	Federation of BiH	95.7	26.7	66.4	24.2	5578
	Republika Srpska	97.9	31.3	73.5	28.1	3148
Area	Urban	98.0	33.5	78.9	31.5	3466
	Rural	95.5	24.9	62.4	21.7	5260
Age	15-19	97.4	29.9	71.9	27.1	1189
	20-24	97.0	33.3	75.4	3.4	1287
	25-29	97.4	29.9	74.3	27.7	1255
	30-34	97.5	28.5	69.1	26.0	1263
	35-39	96.7	26.4	67.1	23.0	1380
	40-44	95.5	26.2	63.1	22.8	1296
Woman's education level	45-49	93.4	23.6	60.8	21.7	1056
	Primary/None	92.8	18.4	49.2	15.7	3166
	Secondary +	98.6	34.0	80.2	31.2	5560
Total		96.5	28.3	68.9	25.6	8726

Appendix F: Numerators and denominators for BiH

MICS 2000 indicators

Study No.	MICS 2006 No.	Health Domain	Indicator	Numerator	Denominator	Are the BiH MICS 2000 and 2006 indicators comparable?
1	52	Education and literacy	Pre-school attendance	Number of children aged 36-59 months who are attending some form of organised early childhood education programme	Total number of children aged 35-59 months surveyed	YES
2	57	Education and literacy	Children reaching grade five in school	Proportion of children entering first grade of primary school that eventually reach grade five	Surveyed children entering first year of primary school	YES
3	55	Education and literacy	Net primary school attendance rate	Number of children of primary school age (8 - 15 years) that are currently attending primary school	Total number of children of primary school age (8-15 years) surveyed	YES
4	60	Education and literacy	Adult literacy rate	Adults aged 15 and older who are reported as being able to read a newspaper 'easily' or 'with difficulty'	Adults aged 15 years and older surveyed	NO as different definitions
5	11	Water and Sanitation	Safe drinking water	Number of household members living in households using 'improved source of drinking water'	Number of household members surveyed	YES. Minor definition changes that do not affect results
6	12	Water and Sanitation	Sanitary means of excreta disposal	Number of household members using 'improved sanitation facilities'	Number of household members surveyed	YES. Minor definition changes that do not affect results
7	6	Child malnutrition	Underweight prevalence	Number of children under age five that fall below minus two standard deviations from the median weight for age of the NCHS/WHO standard (moderate and severe); number the falls below minus three standard deviations (severe)	Total number of children under age five weighed and measured	YES

8	7	Child malnutrition	Stunting prevalence	Number of children under age five that fall below minus two standard deviations from the median height for age of the NCHS/WHO standard (moderate and severe); number the falls below minus three standard deviations (severe)	Total number of children under age five weighed and measured	YES
9	8	Child malnutrition	Wasting prevalence	Number of children under age five that fall below minus two standard deviations from the median weight for height of the NCHS/WHO standard (moderate and severe); number the falls below minus three standard deviations (severe)	Total number of children under age five weighed and measured	YES
10		Child malnutrition	Overweight prevalence	Number of children under age five that lie above two standard deviations from the median weight for height of the NCHS/WHO standard (overweight); number that lie above three standard deviations (severe)	Total number of children under age five weighed and measured	YES
11	9	Low Birth Weight	Birth weight below 2.5 kg.	Number of live births in the year preceding the survey to weigh less than 2,500 grams	Total number of live births in the year preceding the survey	NO as different definitions, and wider issues with indicator reliability
12	27	Childhood Immunisation	DPT immunisation coverage for DPT	Number of children aged 0 - 23 months receiving 3 doses of DPT vaccine before their first birthday	Total number of children aged 12 - 23 months surveyed	YES
13	28	Childhood Immunisation	Measles immunisation coverage	Number of children aged 0 - 23 months receiving measles vaccine before their first birthday	Total number of children aged 12 - 23 months surveyed	YES

14	26	Childhood Immunisation	Polio immunisation coverage	Number of children aged 0 - 23 months receiving 3 doses of OPV vaccine before their first birthday	Total number of children aged 12 - 23 months surveyed	YES
15	25	Childhood Immunisation	Tuberculosis immunisation coverage	Number of children aged 0 - 23 months receiving BCG vaccine before their first birthday	Total number of children aged 12 - 23 months surveyed	YES
16	31	Childhood Immunisation	Fully immunised children	Number of children aged 0 - 23 months receiving DPT (3), measles, OPV (3), and BCG vaccine before their first birthday	Total number of children aged 12 - 23 months surveyed	YES
17	34	Integrated Management of Childhood Illnesses	Use of Oral Rehydration Therapy (ORT)	Number of children aged 0 - 59 months with diarrhoea in the previous 2 weeks that received oral rehydration salts and/or and appropriate household solution	Total number of children aged 0 - 59 months with diarrhoea in the previous 2 weeks	YES
18	35	Integrated Management of Childhood Illnesses	Home management of diarrhoea	Number of children aged 0 - 59 months with diarrhoea in the past 2 weeks that received oral rehydration salts and/or and appropriate household solution	Total number of children aged 0 - 59 months with diarrhoea in the previous 2 weeks	YES
19	-	Integrated Management of Childhood Illnesses	Care-seeking for acute respiratory infection (ARI)	Number of children aged 0 - 59 months that symptoms of an ARI in the previous two weeks that were taken to an appropriate health provider	Total number of children aged 0 - 59 months with symptoms of an ARI in the previous 2 weeks	NO as numerator definition changed, also numerators are very low
20	-	Integrated Management of Childhood Illnesses	Home management of illness	Number of children aged 0 - 59 months reported ill during the previous 2 weeks who had received increased fluids and had continued feeding	Total number of children aged 0 - 59 months reported ill in the previous 2 weeks	NO as indicator not measured in MICS 2006

21	-	Integrated Management of Childhood Illnesses	Seeking medical assistance	Number of mothers/caretakers of under fives who know at least 2 signs for seeking medical assistance immediately	Total number of mothers/caretakers of children aged 0 - 59 months surveyed	NO as indicator not measured in MICS 2006
22	21	Contraceptive prevalence	Contraceptive prevalence	Number of women currently married or in union aged 15 - 49 years that are using (or whose partner is using) a contraceptive method (either traditional or modern)	Total number of women aged 15 - 49 years that are currently married or in union	YES
23	44	Prenatal Care and Assistance at Delivery	Prenatal care	Number of women aged 15 - 49 with a live birth in the year preceding the survey who were attended by skilled personnel at least once during pregnancy	Total number of women aged 15 - 49 with a live birth in the year preceding the survey	YES, although in 2006 a births in the past two years are the denominator
24	4	Prenatal Care and Assistance at Delivery	Assistance at delivery	Number of women aged 15-49 years with a live birth in the year preceding the survey that were attended during childbirth by skilled personnel	Total number of women surveyed aged 15-49 year with a live birth in the year preceding the survey	YES, although in 2006 a births in the past two years are the denominator
25	62	Birth Registration	Birth registration	Number of children aged 0 - 59 months whose births are reported registered	Total number of children aged 0 - 59 months surveyed	YES
26	N/A	HIV/AIDS	Knowledge of preventing HIV/AIDS	Number of women aged 15 - 49 who correctly state the 3 main ways of avoiding HIV/AIDS infection	Total number of women aged 15 - 49 years surveyed	None of the HIV indicators are the same
27	N/A	HIV/AIDS	Knowledge of misconceptions about HIV/AIDS	Number of women aged 15 - 49 who correctly identify a misconception about HIV/AIDS	Total number of women aged 15 - 49 years surveyed	None of the HIV indicators are the same
28	N/A	HIV/AIDS	Knowledge of mother to child transmission	Number of women aged 15 - 49 who correctly identify means of transmission of HIV/AIDS from mother to child	Total number of women aged 15 - 49 years surveyed	None of the HIV indicators are the same

29	N/A	HIV/AIDS	Attitude to people with HIV/AIDS	Number of women aged 15 - 49 expressing a discriminatory attitude towards people with HIV/AIDS	Total number of women aged 15 - 49 years surveyed	None of the HIV indicators are the same
30	78	Orphanhood and living arrangements	Children's living arrangements	Number of children aged 0 - 14 years in households who are not living with a biological parent	Total number of children aged 0 - 14 years surveyed	NO as different age range (0-17) used in 2007
31	75	Orphanhood and living arrangements	Orphans in household (both parents)	Number of children aged 0 - 14 years in households who are orphans (both parents)	Total number of children aged 0 - 14 years surveyed	NO as different age range (0-17) used in 2007
			Orphans in household (one parent)	Number of children aged 0 - 14 years in households who are orphans (one parent)	Total number of children aged 0 - 14 years surveyed	NO as different age range (0-17) used in 2007
32	71	Child labour	Child labour	Number of children aged 5 - 14 years who are currently involved in child labour	Total number of children aged 5 - 14 years surveyed	YES, although minor changes in labour definition

Appendix G: Sampling errors BiH MICS 2000

BIH									
No.	Indicator	Value (r)	Standard Error (se)	Coefficient of Variant (se/r)	Design Effect (deff)	Square root of Design Effect (deff)	Numb er (n)	Confidence limits	
								r - 2se	r + 2se
1	Pre-school attendance	0.0892	0.00984	0.110	1.3890	1.1786	1166	0.0698	0.1086
3	Net primary school attendance rate	0.9405	0.00362	0.00385	0.99330	0.99665	4250	0.9333	0.9476
4	Literacy rate	0.9462	0.00188	0.002	1.9298	1.3892	27686	0.9425	0.9499
5	Safe drinking water	0.9757	0.00446	0.005	8.8351	2.9724	10546	0.9669	0.9844
6	Sanitary means of excreta disposal	0.9353	0.00471	0.005	3.8564	1.9638	10546	0.9260	0.9445
7	Underweight prevalence	0.0409	0.00445	0.109	1.2980	1.1393	2569	0.0321	0.0496
8	Stunting prevalence	0.0969	0.00644	0.066	1.2176	1.1034	2569	0.0842	0.1096
9	Wasting prevalence	0.0627	0.00513	0.082	1.1523	1.0734	2569	0.0526	0.0728
10	Overweight prevalence	0.1320	0.00755	0.057	1.2765	1.1298	2569	0.1171	0.1468
12	DPT immunization coverage	0.8957	0.00975	0.011	0.4775	0.6910	470	0.8763	0.9151
13	Measles immunization coverage	0.6737	0.01601	0.024	0.5495	0.7413	472	0.6419	0.7056
14	Polio immunization coverage	0.8571	0.01065	0.012	0.4403	0.6635	476	0.8360	0.8783
15	Tuberculosis immunization coverage	0.9518	0.00722	0.008	0.5407	0.7353	477	0.9374	0.9661
17	Use of Oral Rehydration Therapy (ORT)	0.8162	0.01745	0.021	0.4729	0.6877	234	0.7807	0.8518
19	Care-seeking for acute respiratory infection (ARI)	0.8000	0.02000	0.025	0.0975	0.3123	40	0.5459	1.0541
23	Prenatal care	0.9918	0.00355	0.004	0.7442	0.8627	485	0.9847	0.9988
24	Assistance at delivery	0.9959	0.00207	0.002	0.5061	0.7114	485	0.9918	1.0000
25	Birth registration	0.9840	0.00264	0.003	1.1582	1.0762	2621	0.9788	0.9892
26	Knowledge of preventing HIV/AIDS	0.2834	0.00913	0.032	3.5784	1.8917	8726	0.2654	0.3014
27	Knowledge of misconceptions about HIV/AIDS	0.6894	0.00715	0.010	2.0838	1.4435	8726	0.6754	0.7035
28	Knowledge of mother to child transmission of HIV/AIDS	0.4759	0.00801	0.017	2.2462	1.4987	8726	0.4602	0.4917
29	Attitude to people with HIV/AIDS	0.2410	0.00725	0.030	2.5093	1.5841	8726	0.2267	0.2553
30	Children's living arrangements	0.0061	0.00106	0.174	1.4653	1.2105	7885	0.0040	0.0082
31	Prevalence of children with both parents dead	0.0005	0.00025	0.499	0.9978	0.9989	7885	0.0000	0.0010
31	Prevalence of children with at least one parent dead	0.0465	0.00374	0.080	2.4909	1.5783	7885	0.0392	0.0539

FBIH

No.	Indicator	Value (r)	Standard Error (se)	Coefficient of Variant (se/r)	Design Effect (deff)	Square root of Design Effect ($\sqrt{deff}$)	Numb er (n)	Confidence limits	
								$r - 2se$	$r + 2se$
1	Pre-school attendance	0.0985	0.01253	0.127	1.5424	1.2419	873	0.0737	0.1233
3	Net primary school attendance rate	0.9366	0.00458	0.005	1.0193	1.0096	2887	0.9276	0.9457
4	Literacy rate	0.9493	0.00244	0.003	2.0590	1.4349	16653	0.9445	0.9541
5	Safe drinking water	0.9819	0.00516	0.005	9.5321	3.0874	6368	0.9717	0.9921
6	Sanitary means of excreta disposal	0.9949	0.00157	0.002	3.1379	1.7714	6368	0.9918	0.9981
7	Underweight prevalence	0.0482	0.00562	0.117	1.2980	1.1393	1887	0.0371	0.0593
8	Stunting prevalence	0.1002	0.00809	0.081	1.3686	1.1699	1887	0.0842	0.1161
9	Wasting prevalence	0.0615	0.00607	0.099	1.2039	1.0972	1887	0.0495	0.0735
10	Overweight prevalence	0.1219	0.00865	0.071	1.3180	1.1480	1887	0.1048	0.1390
12	DPT immunization coverage	0.9009	0.01118	0.012	0.4646	0.6816	333	0.8785	0.9233
13	Measles immunization coverage	0.7313	0.01902	0.026	0.6152	0.7843	335	0.6933	0.7694
14	Polio immunization coverage	0.8694	0.01199	0.014	0.4252	0.6521	337	0.8455	0.8934
15	Tuberculosis immunization coverage	0.9496	0.00930	0.010	0.6061	0.7785	337	0.9310	0.9682
17	Use of Oral Rehydration Therapy (ORT)	0.7927	0.02303	0.029	0.5263	0.7254	164	0.7452	0.8401
19	Care-seeking for acute respiratory infection (ARI)	0.8333	0.02778	0.033	0.1611	0.4014	30	0.4804	1.1863
23	Prenatal care	0.9882	0.00505	0.005	0.7423	0.8616	340	0.9781	0.9983
24	Assistance at delivery	1.0000	0.00000	0.000	.	.	340	1.0000	1.0000
25	Birth registration	0.9806	0.00347	0.004	1.1985	1.0948	1903	0.9737	0.9874
26	Knowledge of preventing HIV/AIDS	0.2668	0.01107	0.042	3.4951	1.8695	5578	0.2449	0.2886
27	Knowledge of misconceptions about HIV/AIDS	0.6637	0.00898	0.014	2.0167	1.4201	5578	0.6459	0.6814
28	Knowledge of mother to child transmission of HIV/AIDS	0.4713	0.00992	0.021	2.2040	1.4846	5578	0.4517	0.4909
29	Attitude to people with HIV/AIDS	0.2492	0.00939	0.038	2.6287	1.6213	5578	0.2307	0.2677
30	Children's living arrangements	0.0045	0.00101	0.223	1.2516	1.1187	5499	0.0025	0.0066
31	Prevalence of children with both parents dead	0.0005	0.00031	0.576	0.9957	0.9979	5499	-0.0001	0.0012
31	Prevalence of children with at least one parent dead	0.0400	0.00427	0.107	2.6122	1.6162	5499	0.0316	0.0484

RS

No.	Indicator	Value (r)	Standard Error (se)	Coefficient of Variant (se/r)	Design Effect (deff)	Square root of Design Effect (rdeff)	Number (n)	Confidence limits	
								r - 2se	r + 2se
1	Pre-school attendance	0.0614	0.01149	0.187	0.6687	0.8177	293	0.0384	0.0844
3	Net primary school attendance rate	0.9486	0.00579	0.00611	0.93814	0.96857	1363	0.9372	0.9601
4	Literacy rate	0.9414	0.00296	0.003	1.7576	1.3258	11033	0.9356	0.9473
5	Safe drinking water	0.9654	0.00818	0.008	8.3732	2.8936	4178	0.9492	0.9816
6	Sanitary means of excreta disposal	0.8367	0.01226	0.015	4.5952	2.1437	4178	0.8124	0.8610
7	Underweight prevalence	0.0205	0.00609	0.297	1.2565	1.1209	682	0.0084	0.0326
8	Stunting prevalence	0.0880	0.00932	0.106	0.7374	0.8587	682	0.0694	0.1065
9	Wasting prevalence	0.0660	0.00963	0.146	1.0255	1.0127	682	0.0468	0.0851
10	Overweight prevalence	0.1598	0.01540	0.096	1.2035	1.0970	682	0.1292	0.1904
12	DPT immunization coverage	0.8832	0.01944	0.022	0.4981	0.7058	137	0.8430	0.9234
13	Measles immunization coverage	0.5328	0.02667	0.050	0.3885	0.6233	137	0.4777	0.5880
14	Polio immunization coverage	0.8273	0.02180	0.026	0.4589	0.6775	139	0.7822	0.8724
15	Tuberculosis immunization coverage	0.9571	0.01020	0.011	0.3524	0.5937	140	0.9360	0.9782
17	Use of Oral Rehydration Therapy (ORT)	0.8714	0.02180	0.025	0.2926	0.5409	70	0.8199	0.9230
19	Care-seeking for acute respiratory infection (ARI)	0.7000	0.00000	0.000	0.0000	0.0000	10	0.7000	0.7000
23	Prenatal care	1.0000	0.00000	0.000	.	.	145	1.0000	1.0000
24	Assistance at delivery	0.9862	0.00700	0.007	0.5190	0.7204	145	0.9718	1.0006
25	Birth registration	0.9930	0.00276	0.003	0.7894	0.8885	718	0.9876	0.9985
26	Knowledge of preventing HIV/AIDS	0.3129	0.01582	0.051	3.6631	1.9139	3148	0.2815	0.3443
27	Knowledge of misconceptions about HIV/AIDS	0.7351	0.01155	0.016	2.1563	1.4684	3148	0.7122	0.7580
28	Knowledge of mother to child transmission of HIV/AIDS	0.4841	0.01356	0.028	2.3178	1.5224	3148	0.4572	0.5110
29	Attitude to people with HIV/AIDS	0.2265	0.01134	0.050	2.3101	1.5199	3148	0.2040	0.2490
30	Children's living arrangements	0.0096	0.00260	0.270	1.6865	1.2986	2386	0.0045	0.0148
31	Prevalence of children with both parents dead	0.0004	0.00042	1.001	1.0023	1.0012	2386	-0.0004	0.0013
31	Prevalence of children with at least one parent dead	0.0616	0.00741	0.120	2.2671	1.5057	2386	0.0469	0.0763

URBAN

No.	Indicator	Value (r)	Standard Error (se)	Coefficient of Variant (se/r)	Design Effect (deff)	Square root of Design Effect (sqrt.deff)	Numb er (n)	Confidence limits	
								r - 2se	r + 2se
1	Pre-school attendance	0.1528	0.01662	0.109	0.7937	0.8909	373	0.1196	0.1860
3	Net primary school attendance rate	0.9438	0.00602	0.00638	1.04349	1.02151	1529	0.9318	0.9557
4	Literacy rate	0.9728	0.00209	0.002	1.7387	1.3186	10545	0.9686	0.9769
5	Safe drinking water	0.9976	0.00123	0.001	2.6443	1.6261	4207	0.9951	1.0000
6	Sanitary means of excreta disposal	0.9904	0.00390	0.004	6.7528	2.5986	4207	0.9827	0.9982
7	Underweight prevalence	0.0363	0.00778	0.214	1.4774	1.2155	854	0.0208	0.0518
8	Stunting prevalence	0.0913	0.01167	0.128	1.3995	1.1830	854	0.0681	0.1145
9	Wasting prevalence	0.0667	0.00979	0.147	1.3124	1.1456	854	0.0473	0.0862
10	Overweight prevalence	0.1405	0.01423	0.101	1.4294	1.1956	854	0.1122	0.1688
12	DPT immunization coverage	0.9097	0.01763	0.019	0.5824	0.7631	155	0.8733	0.9461
13	Measles immunization coverage	0.6923	0.02523	0.036	0.4630	0.6804	156	0.6402	0.7444
14	Polio immunization coverage	0.8910	0.01718	0.019	0.4712	0.6864	156	0.8556	0.9265
15	Tuberculosis immunization coverage	0.9682	0.01257	0.013	0.7999	0.8944	157	0.9422	0.9941
17	Use of Oral Rehydration Therapy (ORT)	0.8625	0.03436	0.040	0.7867	0.8869	80	0.7869	0.9381
19	Care-seeking for acute respiratory infection (ARI)	1.0000	0.00000	0.000	.	.	8	1.0000	1.0000
23	Prenatal care	0.9943	0.00572	0.006	0.9893	0.9946	174	0.9825	1.0060
24	Assistance at delivery	0.9943	0.00016	0.000	0.0008	0.0276	174	0.9939	0.9946
25	Birth registration	0.9793	0.00542	0.006	1.2549	1.1202	868	0.9685	0.9900
26	Knowledge of preventing HIV/AIDS	0.3353	0.01703	0.051	4.5118	2.1241	3466	0.3015	0.3690
27	Knowledge of misconceptions about HIV/AIDS	0.7894	0.01061	0.013	2.3453	1.5314	3466	0.7684	0.8104
28	Knowledge of mother to child transmission of HIV/AIDS	0.5312	0.01240	0.023	2.1403	1.4630	3466	0.5066	0.5557
29	Attitude to people with HIV/AIDS	0.3246	0.01436	0.044	3.2583	1.8051	3466	0.2961	0.3530
30	Children's living arrangements	0.0048	0.00153	0.320	1.3362	1.1559	2718	0.0018	0.0078
31	Prevalence of children with both parents dead	0.0004	0.00037	0.996	0.9920	0.9960	2718	-0.0004	0.0011
31	Prevalence of children with at least one parent dead	0.0548	0.00698	0.127	2.5511	1.5972	2718	0.0410	0.0686

RURAL

No.	Indicator	Value (r)	Standard Error (se)	Coefficient of Variant (se/r)	Design Effect (deff)	Square root of Design Effect (deff)	Numb er (n)	Confidence limits	
								r - 2se	r + 2se
1	Pre-school attendance	0.0593	0.01204	0.203	2.0589	1.4349	793	0.0354	0.0831
3	Net primary school attendance rate	0.9386	0.00453	0.00482	0.96780	0.98377	2721	0.9297	0.9476
4	Literacy rate	0.9298	0.00276	0.003	1.9986	1.4137	17141	0.9244	0.9353
5	Safe drinking water	0.9626	0.00708	0.007	8.8170	2.9693	6339	0.9486	0.9766
6	Sanitary means of excreta disposal	0.9025	0.00718	0.008	3.7114	1.9265	6339	0.8883	0.9166
7	Underweight prevalence	0.0431	0.00544	0.126	1.2265	1.1075	1715	0.0324	0.0539
8	Stunting prevalence	0.0997	0.00770	0.077	1.1333	1.0646	1715	0.0845	0.1149
9	Wasting prevalence	0.0606	0.00595	0.098	1.0637	1.0314	1715	0.0489	0.0724
10	Overweight prevalence	0.1277	0.00879	0.069	1.1890	1.0904	1715	0.1103	0.1451
12	DPT immunization coverage	0.8889	0.01169	0.013	0.4343	0.6590	315	0.8655	0.9123
13	Measles immunization coverage	0.6646	0.02043	0.031	0.5899	0.7681	316	0.6236	0.7055
14	Polio immunization coverage	0.8406	0.01348	0.016	0.4330	0.6580	320	0.8136	0.8676
15	Tuberculosis immunization coverage	0.9438	0.00886	0.009	0.4715	0.6866	320	0.9260	0.9615
17	Use of Oral Rehydration Therapy (ORT)	0.7922	0.01980	0.025	0.3643	0.6036	154	0.7510	0.8334
19	Care-seeking for acute respiratory infection (ARI)	0.7500	0.02344	0.031	0.0908	0.3014	32	0.4522	1.0478
23	Prenatal care	0.9904	0.00451	0.005	0.6609	0.8130	311	0.9813	0.9994
24	Assistance at delivery	0.9968	0.00323	0.003	1.0074	1.0037	311	0.9903	1.0032
25	Birth registration	0.9863	0.00290	0.003	1.0942	1.0461	1753	0.9806	0.9920
26	Knowledge of preventing HIV/AIDS	0.2492	0.01003	0.040	2.8283	1.6818	5260	0.2294	0.2690
27	Knowledge of misconceptions about HIV/AIDS	0.6236	0.00953	0.015	2.0362	1.4270	5260	0.6047	0.6424
28	Knowledge of mother to child transmission of HIV/AIDS	0.4395	0.01038	0.024	2.2982	1.5160	5260	0.4191	0.4600
29	Attitude to people with HIV/AIDS	0.1859	0.00766	0.041	2.0405	1.4285	5260	0.1708	0.2011
30	Children's living arrangements	0.0068	0.00140	0.207	1.5098	1.2287	5167	0.0040	0.0095
31	Prevalence of children with both parents dead	0.0006	0.00034	0.577	1.0007	1.0004	5167	-0.0001	0.0012
31	Prevalence of children with at least one parent dead	0.0422	0.00439	0.104	2.4681	1.5710	5167	0.0335	0.0509