Co-ordinator Dr John Dinsmore, of Trinity College Dublin's Centre for Practice and Healthcare Innovation, discusses the Horizon 2020-funded project ProACT (Integrated Technology Systems for ProACTive Patient Centred Care)

ProACTive healthcare

ProACT is a 42-month project aiming to develop and evaluate an ecosystem to integrate a wide variety of new and existing technologies to improve and advance home-based, integrated care for older adults with multimorbidity (specifically chronic heart failure (CHF), diabetes and chronic obstructive pulmonary disease (COPD), as well as mild cognitive impairment and early-stage dementia). Funded by Horizon 2020, the project is led by Trinity College Dublin's Centre for Practice and Healthcare Innovation (CPHI) and comprises a further 11 partners, among them IBM Research, Philips and the European Association of Service providers for Persons with Disabilities (EASPD).

Dr John Dinsmore

© Mark Monahan

Background

The origins of the project began four years ago with the establishment of the CPHI within the School of Nursing and Midwifery at Trinity College Dublin. The centre's main focus is practice-driven healthcare innovation in both hospitals and primary care, but health innovation lead and deputy director Dr John Dinsmore's own area of interest lies in the development of technologies to support people with chronic conditions who want to remain living in the community as they get older. "How do we develop technologies to monitor those conditions and feed back that data to all the relevant stakeholders involved in the patient's support and care? How can we take information collected at home and provide that to GPs, formal and informal caregivers, pharmacists etc. in a way that actually allows the patient to better self-manage their condition outside care settings?"

Empowering patient self-management can relieve pressure on already overstretched health systems

The answer, he believes, is ProACT, which was inspired by two key trends:

1) The EU population is ageing. The proportion of the population aged over 65 is rapidly expanding, and roughly two thirds of people over 65 are living with two or more chronic conditions. How can they be better supported?; and

2) Digital technology use is on the up. What role can the internet of things (IoT), Big Data etc. play in this changing demographic? How can the right technologies be provided to the right people at home to help them manage their conditions, and what platforms are needed to provide the necessary support?

Tied into these trends is the rise in the consumerisation of healthcare. "People are dissatisfied with some of the standards of care that they're receiving," explains Dinsmore, "and so they're looking to buy applications and learn online about how to manage their conditions.

"We're at a point now in history where Big Data, cloud and cognitive learning capabilities are becoming very well advanced. The question is: how can we take these technology approaches and make them patient-centric?"

ProACT's answer is to develop an open cloud infrastructure, InterACT, which will analyse patient-collected health data and allow SMEs to build into that data in order to develop new, agile applications – both clinical and social care-based – to treat things as and when they are discovered.

Technology challenges

An important part of the project will be its proof of concept trials in Ireland and Belgium, which will make use of 'living lab' facilities to ensure the co-design of ProACT technologies and will see national health services, 120 older adults with multimorbidity, and formal and informal support networks equipped with clinical status information, therapies and activity tools. A

© Juhan Sonin

© Paul Sharp

European feasibility study will be carried out alongside them in Italy to assess the technologies' commercial potential and barriers to their rollout across the member states.

Dinsmore is confident that the targeted age group will have no trouble using the technology; what's more of a concern is whether they continue to engage with it: "In the next five or ten years, the over-65 generation coming through will be well-versed users of smartphones and tablets. So the challenge isn't so much using the technology – it's sustaining that use and actually inspiring behaviour change.

"ProACT's main trial is 12 months. One of our fears is that, three months in, people will stop using the technology because the novelty's worn off, or they're just not interacting with the data, or we're giving them too much information to track or digest properly and asking too much of their time.

"How, then, can we make sure that older adults digest the data we provide and actually act on it? How can we take behaviour change and make it effective – make people adapt the way they behave over a long enough period of time so it becomes habit?

Speakers at the ProACT launch event (left to right): IBM's Barry O'Brien, ASP Città di Bologna's Dr Gianluca Borghi, Philips Research UK's Sybo Dijkstra, TCD's Professor Mary McCarron, Dinsmore, Minister of State for Mental Health and Older People Helen McEntee, T.D., and TCD's Dr Patrick Prendergast

"Being prepared to adapt the technology will be key, as will making sure that we get the timing right in terms of when we provide the data and how long we ask people to spend interacting with the system to ensure they get the most benefit."

Empowering patient self-management

After all, the main aim of ProACT is to help Europe's 50 million multimorbid patients proactively self-manage their conditions. Central to this are three strands: increasing activity and social connectedness; improving symptom management; and enhancing quality of life and wellbeing, both physical and psychological.

"Take medication management as an example," says Dinsmore. "It's very important that people are taking the right medicine at the right time and aren't over or misusing them. It's quite common for over 65-year-olds managing a lot of conditions to be taking a lot of different medication, which comes at a huge cost to the health services providing it. By developing a new medicine adherence or management application we can not only help to improve patient quality of life, but can also reduce the negative effects of this polypharmacy."

In turn, ProACT will help to offset the EU's annual €700bn cost of chronic disease management and relieve some of the pressures on its increasingly unsustainable health services. "We're moving towards the more social integration of care and also a greater understanding of the needs of people who want to live at home and to use technology to support that – and, really, we have no other choice," Dinsmore argues. "As people continue to live longer with more conditions, the demands on health systems and services will continue to increase, and the current healthcare model isn't equipped to deal with that."

This is because EU health systems are focused on single disease frameworks of treatment and care, he explains (i.e. they care for one disease at a time), and only respond to a negative health event or episode as and when it happens. "What the EU is weak on is understanding multimorbidity care pathways, particularly for over 65-year-olds. There aren't really any clear-cut pathways for how somebody with multiple conditions navigates a health system or to help them understand where best to go for care." Illustrating that is the fact that the UK's National Institute for Health and Care Excellence (NICE) will be working on guidelines on multimorbidity in September – for the first time.

From reactive to proactive

It's this reactive, single disease-focused system of care that Dinsmore hopes ProACT will help to move away from. "We'd like to see healthcare develop from a system that's traditionally driven by physicians' expertise to one that's collaborative and consultative – personalised rather than 'one size fits all' treatment; decentralised, community-based care rather than centralised, hospital-based care; patient-centred services rather than provider-centric services.

"We'd also like to see healthcare become more analytics-driven, which will mean empowering patients and trusting them to use data appropriately to help manage their condition and make informed decisions about who they want to support them. If there are minor exacerbations that they can manage at home, then let's give them the knowledge base to do that rather than contacting their GP or going to A&E.

"To do that, we aim to use devices, the Cloud and Big Data to provide bidirectional data between the person at home and the hospital and make it more organised. At the moment, the flow of data in healthcare is very unidirectional and unstructured.

"We'd also like to see digital technology, and the use of it, become less fragmented. Hospital systems and organisations have different records, data storage, treatment outcomes, reimbursement models etc., and the health apps that are out there use different cloud services, different structures, and different methods of collecting, storing and transferring data as well. None of these systems are really talking to each other, and

© PhotoLizM

A medication adherence or management application could help to reduce the negative effects of polypharmacy in terms of both quality of life and healthcare costs

the result is that we are losing out. ProACT has a very consolidated approach that might be adopted to challenge that fragmentation."

Next steps

Looking to the future, Dinsmore says a key challenge will be "working out how models of reimbursement and payment structures for the delivery of services at home will be shaped by this new system of care". Another area to explore, once the systems are in place, is expanding the scope of the project to include older adults with conditions other than CHF, COPD and diabetes, as well as younger patients with these and other diseases.

ProACT only kicked off in January but Dinsmore is already hopeful that it could one day make a real difference to healthcare delivery, healthcare costs and, most importantly, the millions of people in Europe living with multiple chronic conditions – moving the EU one step closer to its aim of truly (pro)active and healthy ageing.

———— HORIZON 2020 ————

Dr John Dinsmore
Health Innovation Lead and
Deputy Director
TCD – Centre for Practice and
Healthcare Innovation
Project Co-ordinator
ProACT

www.tcd.ie/cphi
http://proact2020.eu

Home Instead clients and ProACT Research Panel members Brendan Gallagher and Canice Hayes with McEntee

© Paul Sharp