Impact case study (REF3b)

Institution: Imperial College London
Unit of Assessment: 19 Business and management studies
Title of case study: Promoting remote care to achieve effective healthcare at affordable cost

1. Summary of the impact (indicative maximum 100 words)

Although essential for coping with escalating health and social care demands, adoption of 'remote care' – telecare and telehealth – has been slow. Professor Barlow's research group provided evidence to establish how remote care can be sustainably and efficiently embedded into healthcare. They then helped design and evaluate the Department of Health's Whole System Demonstrators, the world's largest trial of remote care. As a consequence, the government launched the 3 Million Lives programme in January 2012, with an estimated potential net benefit to the NHS of £450m over the next 5 years. Research taken up by the Audit Commission and TSB/DTI has further influenced UK remote care policy by developing the evidence base and evaluating gaps in basic research.

2. Underpinning research (indicative maximum 500 words)

Remote care uses ICT to support delivery of care services in people's homes. Despite numerous trials around the world, uptake has been slow. Barlow's research analyses why this is, and what can be done. It focuses on strategic decision-making, and how organisational and economic factors influence adoption and diffusion; and evaluates the impact on health and social care systems. Combining in-depth qualitative research (generating insights into challenges in planning and implementing remote care) and simulation modelling (capturing system-wide impacts), his group engaged closely with the policy process, health services, and industry. The group won over £10m in competitive research funding, of which over £2m was specifically for remote care research [8-11]. This helped the Department of Health (DH) to create the right environment to support uptake of remote care; and for industry, NHS, and other stakeholders to implement remote care at scale (see section 4 for full details).

Building on an EPSRC funded project (2003-2006) [8], Barlow's group at Imperial developed a programme of research designed to address the barriers to scaling-up remote care and its potential impact. Key research projects were:

1. The role of evidence in remote care adoption decisions (2006-2008), supported by EPSRC via the Health and Care Infrastructure Research and Innovation Centre (HaCIRIC), a £7.2m programme grant for four universities, led by Imperial [9]. This subsequently led to an invitation by the DH to systematically review the evidence base for remote care [A];
2. The Whole System Demonstrators (WSD) programme (2008-2012), supported by the DH [10]. Along with partner universities, Barlow's group was invited to design and conduct the largest study ever undertaken on the impact of remote care. As well as research programme design, the group was responsible for one of the five research themes, focusing on the organisational and supply chain aspects of remote care implementation [1-4]. This globally high-profile project now underpins UK government policy;
3. Several projects on modelling the potential impact of remote care on selected populations (frail elderly, stroke, heart failure), supported by EPSRC / HaCIRIC and the DH [6-7]. This led to an invitation by DH to help produce a report on remote care business cases in 2005.

As a consequence of this programme, the group was invited by government and regulatory bodies to support policy development, including:
- A 2004 report for the Audit Commission on remote care implementation challenges (*Implementing Telehealthcare: Strategic Analysis and Guidelines for Policy Makers and Providers*);
- A roadmapping exercise in 2007 for the DTI and Technology Strategy Board to support its Assisted Living Innovation Platform, which identified key science and technology areas in need

of research for the next generation of remote care (*Department of Trade and Industry Assisted Living Roadmapping exercise: Workshop Report*);

- A review in 2008 for Ofcom of the implications of remote care, which identified that changes to the UK wireless spectrum allocation were not needed immediately (*Health Technology Scenarios and Implications for Spectrum*).

Research duration: 2003-2012. The research was conducted at Imperial College throughout.

Principal research staff & dates of Imperial service:
- Professor James Barlow (Imperial College Business School, 2003 – present);
- Dr Jane Hendy (Research Fellow, 2006-2011);
- Dr Theti Chrysanthaki (Research Associate, 2007-12);
- Dr Steffen Bayer (Research Fellow, 2003 - present);
- Dr Richard Curry (Industrial Fellow, 2003-2006).

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3. References to the research (indicative maximum of six references)

Key peer reviewed papers

[1] Chrysanthaki T et al. (2013) '*Stimulating whole system redesign: lessons from an organisational analysis of the Whole System Demonstrator Programme*', *Journal of Health Service Research & Policy* 18(Suppl. 1) 47–55.

[2] Cartwright M et al. (2013) '*Effect of telehealth on quality of life and psychological outcomes over 12 months (Whole Systems Demonstrator telehealth questionnaire study): nested study of patient reported outcomes in a pragmatic, cluster randomised controlled trial*', *BMJ* 346,f653

[3] Hendy, J. et al. (2012) '*An organisational analysis of the implementation of telecare and telehealth: the whole systems demonstrator*', *BMC Health Services Research,* 2012, 12:403

[4] Sanders C et al (2012) '*Exploring barriers to participation and adoption of telehealth and telecare within the Whole System Demonstrator trial: a qualitative study*', *BMC Health Services Research* 12, 220

[5] Hendy J, Barlow J (2012) '*The role of the organizational champion in achieving health system change*', *Social Science and Medicine* 74, 348-355.

[6] Bayer S, Petsoulas C, Cox B, Honeyman A, Barlow J (2010) '*Facilitating stroke care planning through simulation modelling*', *Health Informatics* 16, 129-143.

[7] Bayer S, Barlow J, Curry R (2007) '*Assessing the impact of a care innovation: telecare*', *System Dynamics Review* 23, 61-80. Subsequent DH report available at http://webarchive.nationalarchives.gov.uk/20130107105354/http://www.dh.gov.uk/prod_cons um_dh/groups/dh_digitalassets/@dh/@en/documents/digitalasset/dh_4115665.pdf

Main grants:

[8] Prof. James Barlow, EPSRC, 2003-2006, *Supporting Independence. New Products, New Practices, New Communities*. £696,000 (GR/S29058/01);

[9] Prof. James Barlow, EPSRC, 2006-2011, *Health and Care Infrastructure Research and Innovation Centre*. £7.2m total (phase 1, of which £233,000 for remote care project (EPSRC Grant Ref: EP/D039614/1);

[10] Prof. James Barlow (PI, Prof Stanton Newman, UCL), Department Health, 2008-2011, *A Comprehensive Evaluation of the Implementation and Impact of Telecare and Telehealth across Health and Social Care – the Whole System Demonstrator (WSD) Project*. Total £2.2m of which £481,000 for Imperial College London work (DH Grant Ref: 51001NM);

[11] Prof. James Barlow (PI, Dr Benita Cox Imperial College London), Department of Health, 2006-2007, Modelling the impact of service innovation in chronic disease management. Stroke Care. £110,000 (DH Ref: 0200056).

Research excellence is attested both by the calibre of journals in which the work is published, and by the very considerable sequential peer-reviewed competitive research funding – two successive grants from EPSRC [8-9] and two from the DH [10-11].

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4. Details of the impact (indicative maximum 750 words)

The Barlow Group's work bridged the gap between academic research, pragmatic policy, and industry guidance. Its emphasis on translating impact shaped the climate for adoption of remote care. The reach was considerable, embracing policy makers and health service supply chains within the UK and internationally. Its significance is attested by the importance of the problem (ageing and healthcare innovation are first order issues for public policy and industry), by the scale of engagement (from substantial funding to deep, long-term interactions with DH, NHS, and private providers), and by repeated invitations to contribute to solving the next set of policy challenges (the Group helped support the launch of the *next* major UK government initiative on remote care: the 3 Million Lives programme, see below).

Impact on policy

Through the initial EPSRC projects (2003-2006) [8], Audit Commission report and modelling activity described in section 2, which assessed organisational and economic challenges for mainstreaming remote care, and subsequent work on the evidence base for remote care, a close relationship with DH and other bodies (e.g. the Care Services Improvement Partnership, CSIP) developed. This had an early impact on policy via invitations to Barlow to chair a DH review on the quality of the evidence base for remote care [A], extensive citation by the Wanless Commission on long term care [B], and citation by Liam Byrne, then Parliamentary Under Secretary of State for Care Services in launching a new national initiative for telecare [C].

The Group's reputation and its work highlighting the need for a major effort to improve the evidence base subsequently led to working with DH to design and conduct the WSD research programme (2008-12). Globally, this remains the largest trial of remote care technologies, and it has shaped development of national remote care policy. WSD addressed limitations of the remote care evidence base and will stimulate adoption across the UK by showing what works and with what benefit. This has already delivered: initial research findings were announced on 5 December 2011 by the Prime Minister and Secretary of State for Health at the launch of the next major government initiative on remote care, the '3 Million Lives' programme [D]. At this lauch event, the Prime Minister said:

> "Just look at our approach to telehealth - telemedicine - getting new technology into patients' homes so they can be monitored remotely. We've done a trial [WSD], it's been a huge success and now we're on a drive to roll this out nationwide with an aim to improve three million lives over the next five years with this technology. Now this will make an extraordinary difference to people … And it's not just a good healthcare story; it's going to put us miles ahead of other countries commercially too as part of our plan to make our NHS a driver of innovation in UK life sciences." [E]

This has an estimated net benefit to the NHS of £450m over the next five years (*The Times*, 6 December 2011: this represents the difference between the £750m cost of installing the trial systems and the NHS's estimate of a £1.2bn saving over the five-year period) [F]. The beneficiaries therefore are both the patients receiving care that could not otherwise have been afforded by the NHS, and taxpayers who would otherwise have had to find an extra £450m. Either way, this attests considerable reach and materiality.

Recommendations on the need to reform the NHS tariff to support remote care from the WSD evaluation and from our previous work were taken up in the key government report, *Innovation, Health and Wealth* [G] in the current framework for Commissioning for Quality and Innovation [H]. Again, the beneficiaries are both patients and taxpayers depending on the funding assumption made.

Impact on industry

The DTI / TSB roadmapping exercise supported the launch of 38 industry-led projects worth £47.1m. The review also recommended more research on social and business aspects of remote care which subsequently led to a £10m TSB / DH / ESRC research call [I], with several projects now underway. By integrating the industry into research and subsequent delivery, the beneficiaries will be both patients and care providers.

Partnerships with industry (Tunstall, Philips, BT, Docobo, Legrand, Orange) have altered industry thinking. For example, after collaboration on our EPSRC project [8] Tunstall - the market leader in the UK and in other countries - revised its installation and supply procedures, and incorporated lessons learned into its Telecare Training Tool and some of its sensors. The company affirms that its subsequent involvement in the WSD helped validate its business approach to remote care [J].

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5. Sources to corroborate the impact (indicative maximum of 10 references)

[A] DH / CSIP (2006) *Building an evidence base for successful telecare implementation – updated report of the Evidence Working Group of the Telecare Policy Collaborative* (archived link available here). See also *eHealth Insider, 10/8/2007* (archived link available here);

[B] Wanless, D. (2006) *Securing Good Care for Older People: Taking a Long-Term View and Telecare for Older People*. King's Fund (archived link available here);

[C] "Our policy on telecare has been developed following consultation with a very very wide range of stakeholders. This included the large numbers of people who have freely given of their time, knowledge and expertise to be involved in the Telecare Policy Collaborative. We just couldn't have done it without you. I'd like to take this opportunity to personally thank all those involved in the collaborative for their role in developing and moving this policy forward." Speech by Parliamentary Under Secretary of State for Care Services, 19 July 2005: The Gift of Peace of Mind (archived link available here);

[D] 3 Million Lives project (archived link available here);

[E] See https://www.gov.uk/government/speeches/pm-speech-on-life-sciences-and-opening-up-the-nhs (archived link available here). See also Department of Health (2011) *Whole Systems Demonstrator – Headline Findings* (archived link available here);

[F] Chris Smyth and Mark Henderson, 'Health monitors to be installed in millions of homes', *The Times,* 6 December 2011 (archived link available here);

[G] Department of Health (2011) *Innovation, Health and Wealth. Accelerating Adoption and Diffusion in the NHS*, p.20 (archived link available here);

[H] Commissioning for Quality and Innovation (CQUIN) Guidance (2013/14), p.6 (archived link available here);

[I] TSB (June 2010) *Assisted living: Economic & Business Models and Social & Behavioural Studies. Competition for funding*, p.3 (archived link available here);

[J] http://www.tunstallwsd.co.uk/resources/news/telehealth-strongly-validated-by-first-results-from-whole-system-demonstrator (archived link available here).