

Implementing a National Scottish Digital Health & Wellbeing Service at Scale: A Qualitative Study of Stakeholders' Views

Ruth Agbakoba^a, Marilyn McGee-Lennon^b, Matt-Mouley Bouamrane^b, Nicholas Watson^a, Frances Mair^a

^a Institute of Health & Wellbeing, University of Glasgow, Scotland, UK

^b School of Computing & Information Science, Strathclyde University, Scotland, UK

Abstract

Digital technologies are being used as part of international efforts to revolutionize healthcare in order to meet increasing demands such as the rising burden of chronic disease and ageing populations. In Scotland there is a government push towards a national service (Living It Up) as a single point of reference where citizens can access information, products and services to support their health and wellbeing. The aim of the study is to examine implementation issues including the challenges or facilitators which can help to sustain this intervention. We gathered data in three ways: a) participant observation to gain an understanding of LiU (N=16); b) in-depth interviews (N=21) with stakeholders involved in the process; and c) analysis of documentary evidence about the progress of the implementation (N=45). Barriers included the need to "work at risk" due to delays in financing, inadequate infrastructure and skill-set deficiencies, whilst facilitators included trusted relationships, champions and a push towards normalisation. The findings suggest that a Scottish ehealth service is achievable but identifies key considerations for future large scale initiatives.

Keywords:

eHealth; Chronic Disease; Wellness Programs; Implementation

Introduction

Population ageing in the 21st century is a major issue with the World Health Organisation (WHO) forecasting that the number of people aged 60+ around the world is set to reach 2 billion by 2050 [1]. This represents the fastest growing age group anywhere in the world. While, this can be seen as a cause for celebration, ageing is changing the shape of society and therefore introduces enormous challenges, particularly in relation to the provision of health and social care services to a population with increasingly complex needs. A consequence of this demographic shift is the increased prevalence of non-communicable diseases (NCD) associated with ageing; also known as chronic diseases. Each year NCDs are the cause of 36 million deaths; in Scotland 60% of all deaths are attributable to a chronic condition and they account for 80% of all general practice consultations [2,3,4]. This has major implications for primary care provision within the United Kingdom (UK) as 90% of all patients' interaction within the National Health Service (NHS) 'starts and ends in primary care'[5]. Current models of care are unsustainable, costly and inadequate. There is a need for innovative approaches and solutions which can meet the demands of a fragmented system. The Scottish government aim to be at the forefront of innovation in becoming a "world class digital nation by 2020"

with policy intending to help people to live longer and healthier lives at home or in a homely setting using digital technologies as an enabler [6]. The focus within primary care is on prevention, supported self-management and patient-centred holistic care. Healthcare is a lucrative and expanding market and the call to revolutionize it using digital technology has been seen as a key driver in creating innovation. However one of the most critical issues impeding previous efforts has been the gap between what we know can optimise health and wellbeing to what actually gets implemented in everyday practice. This has been referred to as a 'translational gap' where the normalisation of an intervention commonly fails [7]. The purpose of this study is to report on the mid-point views of stakeholders' on the factors which can promote or inhibit successful implementation of a large-scale digital health and wellbeing programme (Living It Up) across Scotland.

Materials and Methods

Participant Recruitment & Data Collection

In order to gain a wide range of perspectives and obtain a holistic picture of the implementation journey we contacted via email a purposive sample of stakeholders (N=16), representing local, national and international organisations. This sample spanned six sectors (industry, health and social care, housing, education, voluntary and statutory), all working together as a collaborative consortium within the Living It Up (LiU) project. Qualitative studies of stakeholders views are important to understand factors which affect implementations on the ground, for example a study on EHRs in Sweden identified discrepancies between the views of professionals and consumers which affected EHR utility and uptake of a national system designed to improve health provision [8].

Data Collection

Ethical approval for this study was obtained from the University of Glasgow, College of Medicine, Veterinary and Life Sciences Ethics Committee (2000130029). We collected and triangulated multiple sources of data through: a) prolonged participant observation; b) semi-structured interviews; and c) collection of a wide range of documentary evidence. Participant observation in this study involved two components: 1) observing monthly stakeholder meetings and 2) collecting data from quarterly meetings held between stakeholders (key informants) and researchers which served a primary purpose of capturing the changing face and shape of a digital health and wellbeing service which started as a 'blank

canvas'. These translated to a total of N=16 participant observation sessions over a period of 14 months (October 2012 to December 2013) and approximately 62 hours of interaction. Secondly, we conducted a total of N=21 semi-structured interviews (January to July 2014) which helped us identify and understand the barriers and facilitators to implementation. In order to capture both breadth and depth within the study we collected both a longitudinal and cross-sectional dataset. The longitudinal data included follow-up interviews conducted with N=6 participants (project managers) at baseline and mid-point (after 6 months). N=1 project manager resigned after 6 months and therefore we were not able to carry out their interview and this was not part of our final dataset. The cross-sectional dataset included mid-point interviews with N=10 participants that were service and technical partners involved in high-level strategic decision making. The interview questions were informed by Normalisation Process Theory (NPT) [9] and each interview lasted approximately 60 mins. All interviews were transcribed verbatim and coded in addition the research team undertook 'data coding clinics' where coding was discussed and agreed to ensure consistency and validity of the coding framework. Lastly, we collected N=45 multiple sources of documentary evidence such as Quarterly Progress Reports, Service Specifications, Alignment Interviews, Recruitment Reports and Evaluation Updates that were synthesised in order to capture and map out the implementation journey and to create a 'thick description' of the project over time. These methods maximized our ability to grasp the subjective behaviours of a multi-stakeholder environment.

Data Analysis

Each transcript was subject to theory-led qualitative analysis with reference being made to the Ritchie & Spencer (1994) thematic framework for data interpretation (familiarization; identifying a thematic framework; indexing; charting, mapping and interpretation)[10]. NPT was used as the theoretical framework underpinning our study as it is widely advocated and cited as a robust explanatory framework which captures the 'work' of implementing, embedding and integrating new technologies or services into routine practice [11]. The framework makes reference to four key domains namely: Coherence, Cognitive Participation, Collective Action and Reflexive Monitoring. The first domain looks at the 'sense-making' work that people do individually or collectively in order to develop a shared understanding of a new intervention. The second domain reflects on the 'relational' work that people do to encourage people to engage, buy-in and sustain a new intervention. The third domain simply refers to the 'operational work' that people do and what needs to be done to ensure that the new intervention works in a real-life setting. The final domain looks at the 'appraisal' work that people do to assess and understand the impact of a new intervention. We mapped our thematic findings to NPT in order to help us understand our data. The analytical process as a whole was facilitated using QRS Nvivo® Version 10.0.

Results

The Makeup a Scottish Digital Health & Wellbeing Service

Living It Up (LiU) is part of a £37 million UK-wide project titled Delivering Assisted Living Lifestyles at Scale (dallas). The aim of dallas is to demonstrate how innovative

technologies and services can be used for 'preventative care to promote independent living and improve peoples lifestyles' between June 2012 and May 2015 [12]. LiU is a digital platform (www.livingitup.org.uk) accessible via various modes of familiar technology, which aims to impact 55,000 people aged 50+ approximately 10% of the total Scottish population to improve their quality of life and independent living. The project targets 5 specific geographical locations namely; West Lothian, Moray, Highlands & Islands, Forth Valley and the Western Isles capturing a mix of urban, rural and remote rural areas. LiU has been hailed as a 'national ground breaking service' by government representatives. It aims to help the citizens of Scotland find local, trusted and personalised information on services which can support health and wellbeing [13]. The platform was developed using a co-design approach with intended users (members of the general public), creatives, technology designers and over 30 organisations (Figure 1). The LiU deployment is being led by the Scottish Centre for Telehealth and Telecare (SCTT) and NHS 24 which are government bodies' established with a purpose of facilitating the shift towards how health and social care services are provided, perceived and consumed.

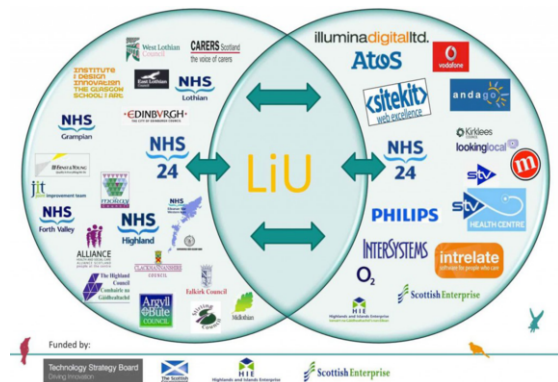


Figure 1 –International Stakeholders for Living It Up

LiU is a platform that provides consumers with access to four key services: Connect, Discover, Flourish and Shine. The first being a service which supports *digital participation* among communities in providing a means for people to remain 'connected' with their friends and family as well as an opportunity to up-skill and learn how to go about using technology. This service enables users to remain 'connected' to their care-giver via Cisco Jabber Client video conferencing (VC) suite. The second service 'Discover' is based on *asset mapping* national and local information about organisations, services, activities and groups which consumers may find useful in meeting their needs. This service is powered by a national database called ALISS (A Local Information System for Scotland). This provides a personalised search and collaboration tool for users and enables organisations themselves to use it for sign-posting [13]. Users also have the ability to 'rate' services in an open format and share recommendations.

Flourish provides a suite of interactive tools to support people in *self-managing* their chronic condition. This includes approved health information and advice, text messaging alerts and remote-monitoring services to help support people with conditions such as Heart Failure (HF). The final service 'Shine' centres on community *capacity building*. It is advertised as the 'front door' to LiU. This service taps into the value of the contribution that citizens can make to society.

The service provides a 'profiling tool' which enables people to identify, nurture and refine their individual skills and experience in a way to 'give back' to their local community. This approach is being used to help contribute to improved wellbeing and stronger, more connected communities. Users of LiU can access the entire platform free of charge and there is an opportunity to become a member which will present them with a personalised dashboard. The final aspect of this platform is the 'Innovation Zone' which provides a space for enterprise where companies can advertise new solutions, apps or products which require testing or exposure ultimately fostering wealth creation [13].

Implementation Barriers

Working at Risk

This section provides an overview of the key mid-point themes that emerged as barriers during the national deployment of the LiU platform. A challenge amongst stakeholders in the beginning was to identify an agreed approach and direction. Due to the ambitious nature of the programme it was deemed important to engage with a wide range of different types of stakeholders. However, as this collaborative consortium combined a large number of organisations (local, national and international) from various backgrounds and with varying expertise, this introduced a degree of tension when voicing opinions, settling agreements and making decisions. This, coupled with the use of a co-design approach prolonged the design phases a great deal. For example, it was anticipated that a 'soft launch' of LiU would be live by March 2013 but in reality this occurred in November 2013 this attests to the scale of delay. Further to this, there were contractual difficulties which distorted the traditional tendering process and in order for stakeholders to proceed with their involvement in the project they usually had to 'work at risk' and obtain a letter of intent in relation to delayed financial payments. *"There was a huge bureaucratic delay in getting the thing set up and a contract out... The project was officially meant to start in June...you know, as a delivery partner, we did not get a contract until the following January. So, you know, we worked at risk. You know... to try and be a good partner but, you know, for a business that's not satisfactory and that means that you can't commit all the resources you would like to when you don't know if you're going to get a contract". "So, there's a slow start but what made it worse... was it took far too long to decide what LiU would be, you know...Our job was delivery of the requirement. Now, it took probably a year to decide on what the requirement was"*[LiU11]. *"LiU works in quarters. The financial approval process is so far off the pace of the work process that it's not only late it's almost at the end of the process...There's two things you can do as a supplier, one is you can say I'm not moving until I get approval...or else you can proceed at what's called...working at risk. I'd say it's uncommon"*[LiU20]

No Complete End-to-End Testing Environment

LiU aims to provide consumers with an integrated seamless journey of care. There was a consensus amongst stakeholders that delivering this vision was a complex process. Some partners worked in 'silos' within their organisations and concentrated on a particular piece of work which meant that difficulties were only recognised when that piece of work became integrated within the wider programme. This impacted the implementation process because there was no complete end to end testing environment across the entire programme. *"So basically what happens is a supplier, a*

technical partner is used to the principle of building something and then they put it into their test environment and test it. Right...now the problem is until you have interlinked them you don't know they are going to work. So supplier A could build product 1 and test it but when it goes live it might not work because of something that supplier B has running on their website...now it would cost a lot of money to build a complete end to end test environment"[LiU20].

Inadequate Infrastructure – Challenging Boundaries

In some cases, the ability to deliver the innovation meant that transformational re-modelling of the current care model was required. This meant that LiU was being impeded in some aspects as current infrastructure was not suitable to adopt some elements of the platform. *"I think we're certainly ahead of the game. Looking at international markets and speaking to our counterparts in the UK I think this is very much a pioneering project. ...We've actually moved to a kind of model that's maybe five years ahead of its time"*. [LiU06]

Educating Stakeholders

In a multi-stakeholder environment, the need for all LiU consortium members to have a shared sense of understanding required a level of learning. It was clear that some stakeholders required more 'training' than others which slowed down the implementation process as well as the concept of innovation as a whole. *"There was a lack of understanding of digital technology and what it can do now. A lot of the people were not familiar with the use of digital technology and, you know, on the service side, the people that were designing the services did not themselves use this type of technology, so they were not pushing the boundaries"* [LiU11]

Designed for Local vs. International

This national platform aims to become Scotland's premier source for health and wellbeing; and stakeholders wanted to become a beacon for other countries but faced a challenge in identifying how to go about that. Several issues emerged in identifying the customer and market which led to concerns that the consortium might be taking too myopic a standpoint. *"The requirements were gathered from people in Scotland. Now, the market is not people in Scotland. The market is outside Scotland...for LiU to be commercialised...to become a product or service that people will buy...it needs to meet the needs of people outside Scotland. The current users are in Scotland but the future users are not in Scotland..."* *"A big assumption was made that what suits Scottish people in the Scottish context will suit a world market and I think that's wrong". "There's a fundamental mismatch. [LiU11].*

Implementation Facilitators

Trusted Customer – Supplier Relationship

This section provides an overview of the key mid-point themes that emerged as positive enablers, or facilitators during the deployment of the LiU platform. The first being that over the course of the implementation, stakeholders developed a professional but friendly bond which changed the usual dynamics of the customer-supplier relationship. This introduced new ways of working in which representatives from sectors such as housing, healthcare and voluntary indicated that it helped drive the implementation forward. *"Normally that relationship is one of customer-supplier, and the public service has a very thorough obligation to treat all private organisations equally. You know, no favours, no special conditions and that's fine when you're trying to buy...you know...it's a plaster. It's just a question of who*

makes the cheapest plaster that passes the requirements". "But it's not a good way of handling things when you want to do innovation, because with innovation you need trust, you need a relationship, you need the ability to be able to say, in a trusted way from one side, this is what we want, and the other side says, well this is what, at the moment what I can deliver, but maybe I can move towards that over the next six months. And that's the only way that you can do joint innovation. And that's basically what Dallas has delivered..." "We've moved from a customer-supplier relationship to a more of a partner relationship. And I think that's absolutely essential to solving some of these problems that we have in using technology to provide health care". "So I don't want to just be the telehealth guy. I'd hope we can be broader than that..." "I'd hope we don't go back to customer-supplier". [LiU08]

Iterative User Feedback Shapes Development

Consumers have a crucial role as a stakeholder within the consortium as they are continuously consulted throughout the life cycle of the project in various ways both online and offline; and this provided an opportunity for grass-root level engagement and innovation to occur such as personalisation of health and wellbeing services. *"Sometimes they'll be giving the feedback on a one-to-one basis at workshop events and that goes through...we consolidate that...to shape the development of LiU. If they go through the digital portal then...that goes directly to support office who then again push that out ...and see if things can be improved"*[LiU05]

Local Champions Driving Implementation

A key facilitator has been the establishment of local champions who are people that live in the target communities that either a) have a vested interest in co-designing LiU or b) have identified the value of LiU as part of their daily lives. They have been identified as a key driving force in creating awareness and encouraging regular people to buy-in to LiU. *What I've done is I've been very lucky and I've got a great group, a core group of local community champions, who are basically... in a way, I'm leaving it to them, because I think it sells it better if it's coming from actual users. So we've got one guy who's writing a regular blog about living with long-term conditions, you know, he gives practical advice based on his own experiences, and that's been very popular with people, given it a human edge, if you like.* [LiU07]

Product Ownership & Business Opportunities

It was largely agreed by small and medium-sized businesses (SMBs) that working on a large national collaborative project such as LiU created new business opportunities and ventures. This helped to provide a platform in which the vision of wealth creation and innovation could be achieved. More importantly stakeholders were identified as product owners in different elements of LiU and therefore this enabled them to showcase this work as well as a 'collection' of individual works within their respective organisations; an opportunity that they may not have had without being part of LiU. *"As a company we've had great benefit from being a part of this project because it has allowed us to establish a position in the individual health market and you know, we're working for Living It Up, we're working for all the Dallas projects. So, we're not restricted to Living It Up, although that's given us opportunity"* [LiU11]

Push Towards Sustainability and Normalisation

The push towards scaling LiU and making it sustainable far beyond the official end date of 2015 has positively influenced the implementation process. Stakeholders themselves are

thinking long term but more importantly in 'real-terms' as to how LiU can be integrated into daily practices. This is a key overall positive factor in ensuring that the project as a whole is a success. *"We're going to run some workshops, actually, just to see how health and care professionals can implement if there's some of the tools. I mean, not all of them, but we're going to have just some of the tools that are relevant to them and their clients or their service users. So we will be kind of running workshops in all of the areas just on how we can do that, and actually just get them to implement it in as part of their daily working"* [LiU_15]

Discussion & Conclusion

This study explored the views, knowledge and understanding of stakeholder personnel and organisations involved in the deployment of an on-going national digital health and wellbeing project at scale in Scotland. The results of the study show that obtaining stakeholders views on factors affecting the implementation process provides valuable insights which can help to inform its future development in becoming a sustainable service for Scottish citizens. A limitation of our work is the lack of data from end-users of the LiU services and the fact that we are describing a deployment still "in process", however a strength of this study has been the use of the NPT framework in capturing the 'work of implementation' as well as providing a basis for learning and critical reflection in understanding the valuable lessons that have been learned throughout this journey of implementation. The use of the NPT framework has helped us to highlight barriers and facilitators and we apply it here in order to interpret and synthesise our findings.

Coherence

This domain refers to the 'sense-making' work that people do individually or collectively in order to develop a shared understanding of a new intervention. It is clear that there was some difficulty experienced by stakeholders in developing a shared direction of travel due to several factors such as the number of stakeholders involved in the process, identifying requirements to match future need and having to 'work at risk'. Although facilitators such as the creation of 'trusted' relationships and the move towards embedding this intervention into everyday practice has helped to overcome this barrier. It seems that these risks were necessary when implementing a project which is at the forefront of innovation. Recent research has confirmed that having good existing relationships or links between senior management or strategic level players helps to improve communication among implementers as well as securing long lasting change [14]. Our findings within this domain clearly demonstrate the need to understand organisational cultures as a key ingredient and basis for any innovative digital health and wellbeing project.

Cognitive Participation

This domain refers to the 'relational' work that people do to encourage people to engage, buy-in and sustain a new intervention. A key barrier that needed to be addressed was lack of knowledge/skill-set deficiencies and the need to educate, upskill and train stakeholders in digital technologies as it was clear that not all stakeholders had the same level of understanding. This finding unearthed a link between the 'Collective Action' domain and the 'Cognitive Participation' domain due to the fact that this process was required to take place before stakeholders actually engaged with LiU in order for them to go on to endorse or promote it themselves. Local champions however helped to overcome the barriers that

stakeholders faced by not concentrating on the technology but on personalising the benefits to demonstrate to potential users how this product can help them in their daily lives. Previous research in Australia has shown that use of clinical champions can play a critical role in helping to promote uptake and sustainability of telehealth; with the authors pointing out that it is more important to get the service model right rather than the technology itself [15]. This is key as there is a lack of evidence in relation to participation and engagement within the field of ehealth and wellness [16].

Collective Action

The third domain refers to the ‘operational work’ that people do and what specifically needs to be done to ensure that a new intervention works in a real-life setting. Barriers which affected the practical application of LiU included inadequate infrastructure, constraints on resources (including finances) and limited testing environments which are key findings that align with available evidence from the United States of America [17]. In Scotland there remains a challenge in delivering services to people living in remote locations which compounds the existing burden on the system. The need for adequate infrastructure and resources to support digitally enabled self-care has been recognised and the Scottish Government have recently launched a national programme to enhance the current broadband and fibre optic capabilities.

Reflexive Monitoring

The final domain looks at the ‘appraisal’ work that people do to assess and understand the impact of a new intervention. A challenge was designing to meet all needs but positive themes such as the creation of business opportunities and iterative user feedback emerged as key facilitators in assessing the impact of LiU. Particular focus on the latter finding is significant as it illustrates the value of input from Scottish citizens in dictating their own care and becoming ‘active’ recipients with increased choice about how and where they receive services as opposed to the traditional passive role that is played. There is a considerable amount of value from capturing the process and journey of implementation at scale. Lessons that have emerged as key learning points include the need for flexible and trusted working environments to support multi-sector working partnerships and the need for policy to support innovative business models. This report highlights difficulties faced in delivering new digital health and wellbeing services at scale and the need for further research to help understand implementation issues in order to a) bridge the ‘translational gap’ and b) inform future ehealth policy and practice.

Acknowledgments

We would like to thank the Scottish Government and Innovate UK (Technology Strategy Board) who are sponsoring the Living It Up project and the Medical Research Council UK who are funding our research.

References

- [1] World Health Organisation. WHO | 10 facts on ageing and the life course [Internet]. 2014 [cited 08 November 2014]. Available from: <http://www.who.int/features/factfiles/ageing/en/>
- [2] World Health Organisation. WHO | Noncommunicable diseases [Internet]. 2014 [cited 11 November 2014]. Available from: <http://www.who.int/mediacentre/factsheets/fs355/en/>

- [3] Scotland.gov.uk. Long Term Conditions [Internet]. 2014 [cited 11 November 2014]. Available from: <http://www.scotland.gov.uk/Topics/Health/Services/Long-Term-Conditions>
- [4] Barnett K, Mercer SW, Norbury M, Watt G, Wyke S, Guthrie B. Epidemiology of multimorbidity and implications for health care, research, and medical education: a cross-sectional study. *Lancet*. 2012 Jul 7;380(9836):37-43
- [5] Transforming primary care in London. NHS England (London Region)/Primary Care Transformation Programme. 2013.
- [6] Digital Participation A National Framework for Local Action [Internet]. Scottish Government; 2014 [cited 15 November 2014]. Available from: <http://www.scotland.gov.uk/Resource/0044/00448804.pdf>
- [7] Morrison D, Mair F. Telehealth in practice: using Normalisation Process Theory to bridge the translational gap. *Primary Care Respiratory Journal*. 2011;20(4):351.
- [8] Lehnborn EC, McLachlan AJ, Brien JA. A qualitative study of Swedes' opinions about shared electronic health records. *Stud Health Technol Inform*. 2013;192:3-7
- [9] May C, Finch T. Implementation, embedding, and integration: an outline of normalization process theory. *Sociology* 2009;43:535-54
- [10] Ritchie J, Lewis J. Qualitative Research Practice: A Guide for Social Science Students and Researchers. London, England: Sage Publications; 2014.
- [11] McEvoy, Ballini L, Maltoni S, O'Donnell CA, Mair FS, MacFarlane A. A qualitative systematic review of studies using the Normalisation Process Theory to research implementation processes. *Implementation Science* 2013, 9 (2).
- [12] McGee-Lennon, M.; Bouamrane, M-M.; Barry, S., Grieve, E.; Latina, D.; Watson, N.; O'Donnell, K.; Wyke, S.; Brewster, S.; Briggs, A.; Finch, T.; Mair, F. Evaluating the Delivery of Assisted Living Lifestyles at Scale (dallas). Proceedings of HCI 2012 - People & Computers XXVI, The 26th BCS Conference on Human Computer Interaction, Birmingham, UK, Sept. 2012
- [13] Living It Up Progress Report [Internet]. NHS 24; 2014 [cited 5 December 2014]. Available from: <http://www.nhs24.com/aboutus/nhs24board/agendasandpapers/2014/april/>
- [14] Ling T, Brereton L, Conklin A, Newbould J, Roland M. Barriers and facilitators to integrating care: experiences from the English Integrated Care Pilots. *International Journal of Integrated Care* 2012;12:e129.
- [15] Wade VA, Elliott, JA and Hiller JE. Clinician acceptance is the key factor for sustainable telehealth services. *Qualitative Health Research* 2014; 5: 682-694
- [16] Mair, F., May, C., O'Donnell, C., Finch, T., Sullivan, F., Murray, E. (2012). Factors that promote or inhibit the implementation of e-health systems: An explanatory systematic review. *Bulletin World Health Organisation*, 90(5), 357-364.
- [17] Goroll AH, Simon SR, Tripathi M, et al. Community-wide implementation of health information technology: the Massachusetts eHealth Collaborative experience. *J Am Med Inform Assoc* 2009 Jan-Feb;16(1):132-9.

Address for correspondence

Ruth Agbakoba, 124 Observatory Road, G12 9LX, Scotland, U.K.
Email: r.agbakoba.1@research.gla.ac.uk