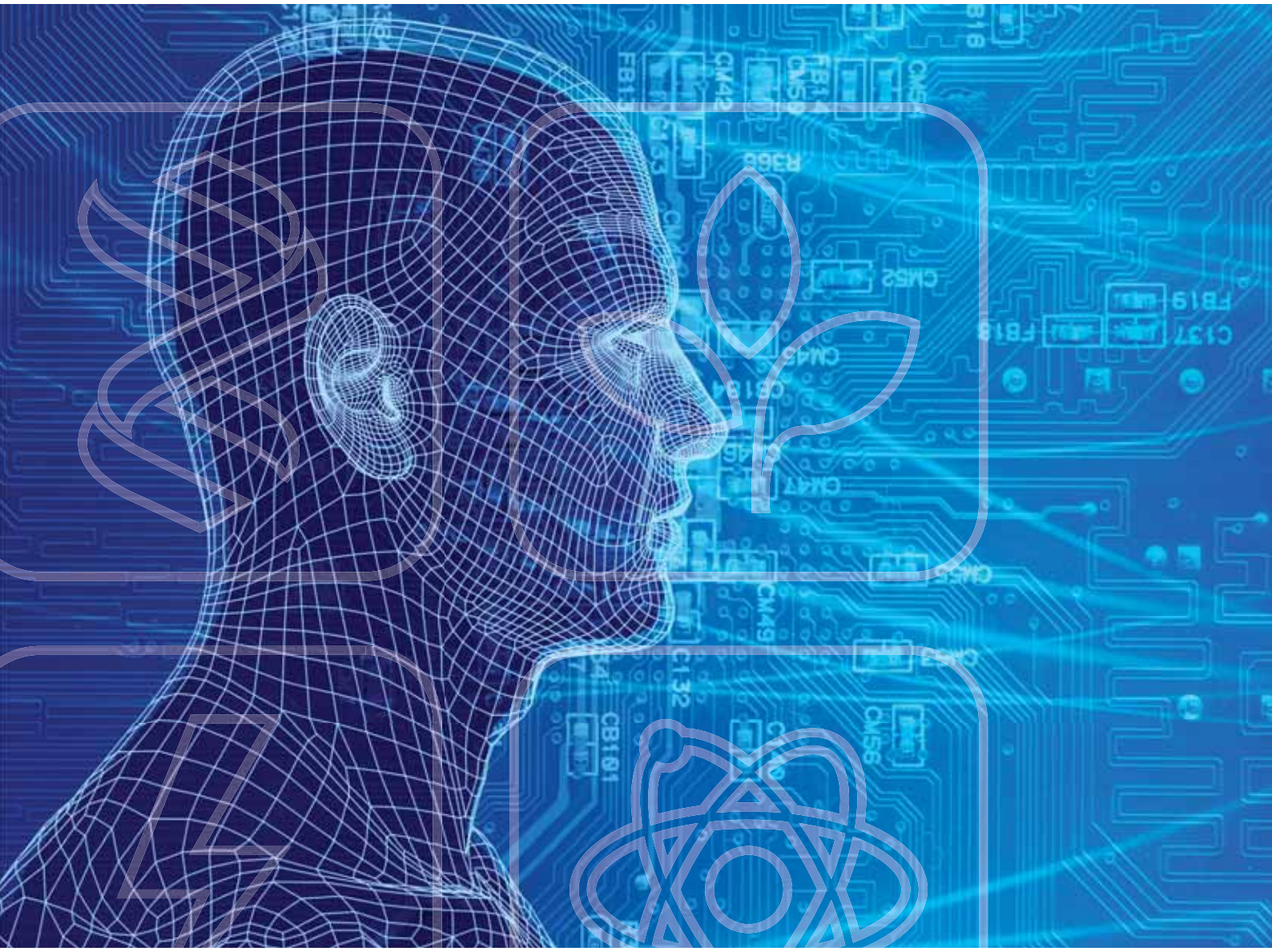
scottish science advisory council

Telehealthcare: Time for Action

SSAC One-Day Forum on Telehealthcare Technologies for Assisted Living



SCIENCE AND ENGINEERING DELIVERING THE FUTURE

Informatics Forum, University of Edinburgh – 27 October, 2009

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1. INTRODUCTION

Carers Scotland has reported that 60% of the population will become a carer at some point in their lives, looking after an ill, frail or disabled family member, friend or partner.[1]

Advances in healthcare and in standards of living more generally have resulted in people living longer, however the number who suffer with long-term debilitating conditions as they grow older is also increasing, resulting in greater demands on the health and social care systems.

The demographics of Scotland are predicted to change markedly between 2008 and 2033.[2] The number of people of pensionable age is projected to rise from 1.02m in 2008 to 1.07m in 2018 (an increase of 6%). It is then projected to rise more rapidly, reaching 1.34m in 2033 (an increase of around 31% compared to 2008).

The number of people aged 75 and over is projected to increase by around 23% from 0.39m in 2008 to 0.48m in 2018. It is then projected to continue rising, reaching 0.72m in 2033 – an increase of 84% over the 25 year period.

Alzheimer Scotland predict that the number of people with dementia in Scotland will double within the next 25 years,[3] a stark example of the effect of demographic change on society.

In 2007/8, Scotland spent about £4.5bn on health and social care for people aged over 65. Nearly two thirds of this spend was in hospitals or care homes. Emergency admissions to hospital alone accounted for one third of the total spend – about £1.4bn.[4]

Projecting these costs forward on the basis of demographic change would see the costs rise by over £1bn by 2016 (a 22% rise) and by £3.5bn by 2031 (a 74% rise).

1 http://www.carersscotland.org/Aboutus/AboutCarersScotland/TenfactsaboutcaringinScotland
2 *Projected Population of Scotland (2008-based)*, GROS, 2009
3 About Dementia: some facts and figures, Alzheimer Scotland, 2009
4 http://www.jitscotland.org,uk

The level of investment which will be required to match Scotland's anticipated demographic expansion based on current service models is neither feasible nor sustainable. The current economic downturn provides a further significant challenge to the Scottish Government in relation to how it will meet the future health and social care needs of its population, when levels of public spending are decreasing.

New and innovative approaches are required to address these challenges. An ageing population provides interesting opportunities for business and industry, especially in relation to the provision of goods and services to meet health, lifestyle and social care demands. The UK Government has recently published a discussion paper to consider the economic opportunities and challenges of an ageing nation, including the opportunities for business.[5] The topic of technologies for assisted living is central to this agenda, as well as to promoting and supporting independent living in individuals of all ages who have long-term health conditions.

Scotland's businesses must be well-positioned to respond to these challenges and opportunities through the development of advanced technologies and novel means of service delivery to promote independent living and social care. These hi-tech businesses would be underpinned by Scotland's internationally excellent research capability across a range of disciplines which can support high risk innovation and help fill in the capability gaps.

The Scottish Government has an important role to play in stimulating activity in the assisted living arena for example through stimulating smart procurement of innovative technologies and solutions, and by facilitating the setting of interoperability standards for new technologies.

Recognising these issues, the Scottish Science Advisory Council (SSAC) believes that there are huge challenges facing Scotland in caring for its ageing population and that there are huge opportunities for Scotland in meeting these challenges with technologies for assisted living and for companies in Scotland to capitalise on the developing telehealthcare market. The SSAC recognises that there is a need for all parties involved – including industry, researchers, government, practitioners and service providers – to work together more effectively to drive this agenda forward in Scotland with the aim of opening up new opportunities for all.

5 *Is business ready for an ageing nation?*, Department for Business, Innovation and Skills, 2010

To address this issue, the SSAC organised a one-day forum on technologies for assisted living, bringing the key stakeholders together in Edinburgh on 27 October, 2009, with the following aims:

- **Highlight current activity across academia, industry and government**
- **Make connections across these communities**
- **Identify the current and future needs of the sector**
- **Identify and highlight leading-edge technologies**
- **Agree a forward agenda and common vision of where we want to go over the next 10 years**
- **Identify the structures that need to be put in place to achieve this vision**
- **Develop a clear view of the roles and responsibilities of each of the key sectors in achieving the vision**
- **Act as a launch pad for activities that would move this agenda forward, e.g. smart procurement of novel technologies and establishing interoperability standards.**

Professor Stuart Monro, said in his welcome address that the SSAC wanted to "light the blue touch-paper," bringing different disciplines and organisations together – academics, government and business – to "make connections" and come up with concrete proposals for the future of telehealthcare.

The forum brought into focus a number of issues. This report and the challenges presented, to the Scottish Government and others, is based on the discussions held during the day – and the collective experience of the participants.

The Workshop Programme can be found at Annex A, with a list of all participants at Annex B. Membership of the Scottish Science Advisory Council is at Annex C.

2. EXECUTIVE SUMMARY AND KEY CHALLENGES

Telehealthcare: Time for Action

"If Telehealthcare is a 'no-brainer,' why is there no action?"

This one-day forum on "Telehealthcare Technologies for Assisted Living" brought together stakeholders from every sector in Scotland and beyond, and the overwhelming conclusion was that now is the time for action.

THC will play a key role in delivering health and social services in many countries throughout the world in the 21st century. It will deliver better care for all, using technology to integrate services more cost-effectively and efficiently, and gradually become part of everyday life.

The benefits of THC are clear. Mature technologies exist, though further research and development will be required for more advanced, sophisticated and usable facilities. Most participants agree it's time for Scotland to make it an integral part of our care system, setting up the infrastructure needed to deliver THC nationwide, training carers, health and care workers, and educating THC users and the general public. THC is ready for implementation right now, to complement existing health-care services – and Scotland can make it happen now.

The 5-step action plan that emerged from the forum focused on the following:

1 articulate a **vision** for THC in Scotland

2 provide the **leadership** required to implement a THC strategy for Scotland and set up the **infrastructure** needed to deliver THC

3 establish **technology standards** and innovative **procurement policies**

4 take the **initiative** in THC research and development, establishing Scotland as an **internationally-recognised centre of excellence** for technology provision and as a **testbed** for THC, especially in rural and remote areas of Scotland.

5 implement a **nationwide THC solution** as an integral part of NHS Scotland

THC is the logical next step in care. A number of THC projects have already been successfully demonstrated and implemented in parts of Scotland (and elsewhere), and these may be used as exemplars, but the time has come to develop a national strategy and turn the vision into reality.

THE VISION

THC should be seen as an intelligent, proactive, integrated and holistic solution for health care and social care, available to everyone.

Intelligent: THC services deliver an intelligent solution for users as well as for carers and health care professionals. THC is not science fiction or something that will happen in the future but a proven solution with clear benefits in terms of costs and quality of service. Health-care professionals and carers should also regard THC as an intelligent layer of extra support – e.g. providing easy access to a pool of specialists who monitor nationwide data – rather than a threat to their careers or an attempt to cut levels of staffing.

Proactive: THC has a key role to play in preventative and anticipatory care, not simply addressing the needs of the sick, disabled and the elderly but helping healthy people stay that way by assisting them to monitor their own health. THC activities could also play a key role in stimulating and creating business opportunities for technology companies in Scotland, with an opportunity to engage the entire supply chain through technologies and service provision. These technologies would supply not only Scottish needs, but also feed into major international markets. This area is a major economic growth sector worldwide and Scotland's companies must be well-positioned to take advantage of the opportunities, to demonstrate technology leadership, employment opportunities and economic impact.

The introduction of novel technologies can also feed into setting and creating new research directions, e.g. by providing data for innovative research projects which could for example, be linked to Scotland's excellent medical records. As part of a long-term national strategy, new housing should also be "THC-ready."

Integrated: THC addresses a very broad spectrum of needs and can be integrated into the existing infrastructure as just another "tool" in the toolkit – albeit a very intelligent tool.

Holistic: As well as being used for acute care, THC can be used to address the complete needs of all individuals and empower its users by making them much more aware of their health and their environment, and the impact of lifestyle choices. THC should also be seen as helping to integrate health and social care provision, using THC services and technologies as an enabler.

Available to everyone: THC is currently used to deliver a range of services across Scotland but has also been associated with high-tech medical devices for the elderly, sick and disabled, enabling them to stay at home longer and avoid going into institutional care. Supporting independent living is a major aspect of THC and would lead to significant savings (e.g. hospital beds), but in the future, THC will be used for preventative care as well as acute care, and become ubiquitous – as easy to use and familiar as watches or mobile phones, televisions or microwave ovens. THC could also facilitate more social interaction rather than isolate people, via user networks. It will also be important to emphasise "access for all" and make clear how people can access the services. THC also has the additional benefits of providing efficient health and care solutions to rural and remote areas which is a key consideration in terms of providing Scotland-wide coverage.

Promoting THC will require a major cultural or "mindset" change in the general public as well as the professions, but inviting all stakeholders to develop a shared vision of THC, and communicating this vision to the whole population, would help to remove many of the barriers to implementation. It would also help to change public attitudes and expectations, motivating service providers as well as researchers and solutions providers – incentivising everyone to maximise "buy-in." One of the "barriers" is that existing technology is not interoperable, making each solution expensive and stand-alone. This inhibits SME involvement.

CHALLENGE 1: The Scottish Government should develop an agreed vision for THC in Scotland as part of a strategic drive to expand THC nationwide.

LEADERSHIP

The consensus at the Forum was that leadership is needed to ensure that THC becomes reality – and that leadership can only come from government.

In concrete terms, the Forum recommends setting up a **THC organisation** (or "working group") to develop the strategy for THC and oversee nationwide implementation, with a management team supported by specialists in:

- science & technology
- policy
- education
- marketing
- service delivery

The first job of the THC organisation would be to articulate a **vision** for THC in Scotland, then develop a **strategy** for implementation, looking 5-10 years ahead. It was strongly felt that this strategy should also include mechanisms to provide good information and advice to implementers, professionals across the healthcare spectrum and informal carers, as well as end users.

The strategy would cover technology, infrastructure, education and marketing. A working group of all the stakeholders should develop this "roadmap," coordinated by government and the new THC body.

One major challenge would be to ensure "**connectivity**" among the different stakeholders, recognising that THC is unique in the way that it brings together disciplines in many diverse fields – including government (at national and local levels), industry, housing, health and social care authorities, health-care professionals and academic researchers, as well as users and the large population of unpaid carers. All these key stakeholders should be able to influence strategy and implementation, while also being careful to manage potential conflicts of interest.

Another priority would be **education** and **marketing**. We would need to train and motivate carers, health-care professionals, social workers and nursing and medical students, to ensure that current and future professionals have an adequate understanding of THC. It would also be useful to promote THC among care professionals as an enabler and an effort-saver, rather than as a threat to jobs or standards of care – which may involve providing incentives and establishing norms. At the same time, we need to educate the general public and make everyone aware of the benefits of THC, via web sites, the media, roadshows, etc. Together, this will help to bring about a "cultural" change, with THC seen as a natural and highly useful service which will soon be part of everyday life.

With the vision and the strategy agreed, and the THC organisation in place, the policy makers would be able to develop the **infrastructure** needed to deliver THC nationwide – via existing organisations like NHS24, housing associations and community health (and care) partnerships or via completely new specialist channels. It would also be important to engage all key stakeholders to establish an effective network for THC which avoids duplication of effort and also enjoys wide support.

CHALLENGE 2: The Scottish Government should set up a THC Organisation which will work collaboratively with government and other key stakeholders to develop a vision and strategy for THC. The THC Organisation should then comprehensively develop the infrastructure needed to implement THC nationwide.

TECHNOLOGY & PROCUREMENT

Even though technology has been described as "only 10% of THC," it is critical to its success. And even though there may be some disagreement on details such as which technologies or applications are better than others, there is widespread agreement on the overarching benefits of THC technology.

Delegates also widely agreed that to make progress in THC, **standards and interoperability** must be a priority. The main task would be to create a regulatory and procurement framework that ensures standardisation and interoperability of THC equipment and support procedures. For example, we need to agree standards and formulate housing policies for a THC infrastructure that enables sensors, alarms and support aids, etc., to be readily installed into buildings, so that these devices work together seamlessly – e.g. exchange information. Since a similar infrastructure will also be needed to optimise energy use, it would be best if a single infrastructure could meet both requirements. Note that this infrastructure presupposes digital inclusion, e.g., universal broadband access.

Agreement on standards would both enhance the uptake of THC technologies – by keeping costs down and making it easier for users to obtain their own equipment – and allow Scottish SMEs to provide particular devices to plug into the larger framework. It is imperative that a move is made towards an interoperable model. The promotion of open systems would be welcomed by both the SMEs working in this field along with service buyers, who would then have increased choice and access to a more competitive marketplace. Such standards need international agreement (there is already a de facto standard), but the Scottish Government could take an international lead here by ratifying and promoting this standard, for example by insisting on it as part of smart procurement.

The strategy would also predict and advise what **technologies** will be available and which will prove most useful on what time-scales, and identify the stakeholders responsible for ensuring that the roadmap is realised in a timely fashion. It will also be important to establish the effectiveness of different THC technologies, particularly with regard to cost, support, acceptance and training, evaluating systems, services and processes not just from technological but also social, scientific and economic perspectives.

CHALLENGE 3: The THC Organisation should set up a working group, involving a range of stakeholders (including those outside Scotland), to establish THC standards and procurement policies for Scotland.

SCOTLAND THE TESTBED

THC is an opportunity, not just a challenge. Scotland is a small country, with a good mix of rural and urban populations plus a good communications infrastructure, (but broadband availability in some rural areas is currently patchy, so it is essential that the ambitions of the Digital Britain[6] initiative are realised to rectify this problem), and consolidated patient records. We also have a good track record in invention and could become the world's "laboratory" for THC – in the process stimulating home-grown industry, interoperability standards and research and development.

This would not only lead to improvements in healthcare for everyone in Scotland but also help to establish Scotland as an international leader in THC. It would mean inviting industrial and academic researchers to participate and share the results, taking advantage of Scotland's diverse geographical and demographic conditions, as well as our consolidated medical records.

Delegates also agreed that we need to review the incentive mechanisms for THC researchers to ensure their work is more effectively applied to practice and offers value for money (e.g. by avoiding duplication). Another major theme was the need to adopt a more collaborative approach to research, embracing academia and industry as well as practitioners working in the health and care environment.

Scotland has 14 universities with teaching and research related to medicine, nursing and health studies, along with informatics and engineering. Many of these organisations are working together to innovate for the emerging assisted living market sector. Scotland's success in wellness research, development and commercialisation continues to this day in collaborative ventures with SMEs and other industry partners, thus attracting interest and investment from across the globe.

Other concerns were the need to create a funding framework in which academics are rewarded for applied research in THC, and for working with companies to turn research ideas into products, the need to identify research challenges and feed these ideas into academic research, and the need to identify engineering challenges and feed these ideas into company developments.

6 Digital Britain: http://www.culture.gov.uk/what_we_do/broadcasting/5631.aspx/

Specific funding arrangements for researchers to develop and commercialise solutions for this market sector would enhance their focus on innovative THC technologies. This would promote collaborative working, which would be responsive to industry drivers and timescales which is not happening at the present time.

CHALLENGE 4: The THC Organisation should engage with academia and industry to establish Scotland as a THC testbed, with the emphasis on gaining mutual benefits from collaborative projects – setting the pace not just in research but in practice.

THC FOR ALL

The final step would be to implement a **nationwide THC network** as an integral part of health and social care services. Once THC is established in the public mind and among professionals as an everyday activity which makes our lives better, extending it more widely will be easier.

To support this drive, we would also promote the use of THC technologies as a solution for everyone, regardless of health, capabilities or age. At the same time, we will need to fit solutions to people rather than adopt a "one-size-fits-all" approach, recognising that the market is diverse – i.e. it ranges from elderly people in care homes to young mothers in rural environments.

CHALLENGE 5: The THC Organisation should work collaboratively with the Scottish Government, local authorities and health boards and other stakeholders to ensure that THC is available to everyone and part of everyday life.

"We need to change the whole health-care system – not just telehealthcare."

3. THE WORKSHOP – PRESENTATIONS

i. Keynote Address

Nicola Sturgeon MSP, Deputy First Minister and Cabinet Secretary for Health and Wellbeing

An Ambitious Vision for Telehealthcare in Scotland

Ms Sturgeon said that science has a great deal to offer in the development of evidence-based policy, and that telehealthcare is an excellent example of this. She advocated a close examination of the challenges and opportunities presented by telehealthcare within Scotland's health and care system through better connections between academia, industry, service providers and government. Collaboration among different groups to pool knowledge, expertise and skills would be crucial in making "the kind of step-change that our demographics require."

Acknowledging that a great deal of progress has already been made, Ms Sturgeon drew attention to better life expectancy and better survival rates from illness and injury, as well as better-trained people. Some of the major challenges ahead, she added – such as an ageing population, increased service user expectations, rising costs and a reduced pool of care workers, could also act as powerful motivators for change, particularly set against the background of the current economic climate. Dealing with these challenges would mean that "we can't go on doing things the way we've always done them", and would entail finding "creative and innovative approaches to keeping people healthier and more independent in their own homes for longer and out of hospitals and care homes."

While there was already "clear and compelling evidence" that telehealthcare could play an increasingly important role in planning for the future, Ms Sturgeon took the view that its "almost limitless" benefits – to sick, disabled and older people, as well as unpaid carers – have also been undersold. So it would be important, she explained, to maximise the benefits and the impact of telehealthcare, through the diverse range of geographical, technological and social networks prevalent in Scotland. The evidence so far showed, she added, that concerns about technology acting as a barrier to face to face contact were largely outweighed by these benefits.

We have a choice, Ms Sturgeon said, between either carrying on the development of telehealthcare in a fragmented way, or adopting a more "joined-up," integrated and organised approach to drive the agenda forward. That was why this workshop presented such a timely opportunity to bring into play the "smart and innovative" strengths of Scotland's scientific, technological and engineering communities to promote an emboldened, more ambitious and integrated approach to telehealthcare solutions – not only helping to deliver economic benefits but also improve the collective quality of life of Scotland's people.

The Cabinet Secretary concluded by expressing strong support for a step change in telehealthcare services in Scotland – moving from small-scale and isolated development, to a shared vision encompassing creative solutions and harnessing input from all sectors to address the demographic issues and challenges facing us all.

Her clear message was that technology *can* transform lives and that it should become an established part of "an ambitious and shared agenda for Scotland."

ii. Introduction

Professor Gordon Peterkin, Director of Kithstone Consulting

Fantastic Voyage

The workshop facilitator, Professor Gordon Peterkin, stressed the importance of making connections and grasping the opportunities for telehealthcare. We need to be innovative and come up with creative suggestions to take things forward, he said. He also said it would be useful to identify the barriers as well as the short, medium and long-term objectives.

He then set the scene for the day by reminding the audience how quickly things can change from science fiction to reality – using the example of the film *Fantastic Voyage*, in which a tiny submarine is injected into a patient to cure him, and pointing out how that is now becoming possible thanks to nanotechnology. He also cautioned that as well as "blockbuster" products we can also have "lemons," and said that "policy makers must think about our background when we introduce new technologies."

"What are the drivers?" he then asked. We are going through a financial crisis, but this may be an opportunity if telehealthcare can make health care more affordable and help to solve some of our long-term problems.

According to Professor Peterkin, there are several factors to keep in mind:

- we should use our scarce resources more effectively and maximise our local strengths
- we should think about the energy problem – looking for hi-tech and low energy solutions
- we may be a small country but we also have the ability to punch above our weight
- we have a good track record in invention
- we have policies pointing in the right direction

Finally, Professor Peterkin asked if telehealthcare meant a revolution in healthcare and said that it was more a case of "catching the wave" – skilling up and moving the agenda forward.

iii. Research Overview

Professor Ken Turner, Computing Science and Mathematics, University of Stirling (with Professor Alan Bundy, School of Informatics, University of Edinburgh)

Evidence of Progress

Research in telehealthcare is unusual because it is a broad, interdisciplinary field embracing computing science, electronic engineering, healthcare, psychology, sociology, economics, architecture and policy makers. The primary thrust of research is to design acceptable and useful technology, including interfaces (e.g. speech recognition), specialised devices (e.g. vital signs monitors), sensors, sensor networks and service platforms. These are for use in people's homes and elsewhere, keeping in mind care models and the economic and policy aspects.

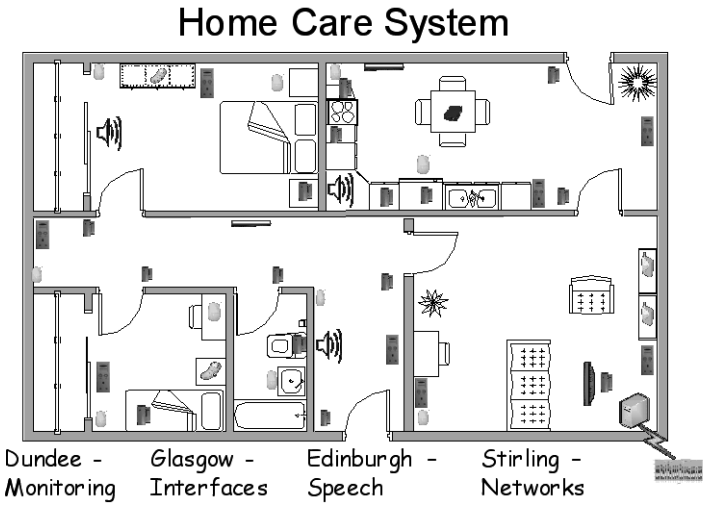
Academic researchers are always coming up with new and exciting ideas, "unfettered by commercial restraints," Professor Turner said. It can be years before research becomes a commercial reality, but Scotland has a compact and close-knit research community which industry and government can tap into, with research already funded and beginning to create the basis of future solutions. The universities in Scotland are keen to develop, exploit and apply new research, he continued, with Aberdeen, Dundee, Edinburgh, Glasgow, Glasgow Caledonian, St Andrews and Stirling as examples of universities with relevant research. As an example of current research, he cited the MATCH (Mobilising Advanced Technologies for Care at Home) Project[7] (home-care technology) and the Multi Memo Home Project (multimodal reminders).

MATCH is developing an integrated home care system, including lifestyle monitoring which gathers data on behaviour and activities (University of Dundee), novel interfaces which use touch, gesture, audio and even smell (University of Glasgow), speech and dialogue (University of Edinburgh), and networks for controlling devices in the home (University of Stirling).

CIRCA[8] (Computer Interactive Reminiscence and Conversation Aid) is designed to help with short-term memory by leveraging long-term memory. Developed at the University of St Andrews, it is now being commercialised by Dementia Life.

Finally, Professor Turner identified some barriers and opportunities for telehealthcare, including the need for more usable and effective research results, more funding for interdisciplinary projects, and a need for understanding the research innovations required in practice. Academics perform good research, he explained, but it can be hard to extend this to real-life use. Another problem is that academics in the UK are not funded to participate in the European AAL Programme.[9] The opportunities include academic-industry partnerships, joint projects and the need to gather evidence of the effectiveness of telehealthcare solutions. The evidence is building up already and there are plenty of pilots – "more pilots than British Airways," – but we need to take the next step.

7 http://www.cs.stir.ac.uk/~kjt/research/match/main/main.html
8 http://www.computing.dundee.ac.uk/projects/circa/
9 http://www.aal-europe.eu/



The Home Care System being jointly developed by the Universities of Dundee, Edinburgh, Glasgow and Stirling [adapted from a diagram by A. McBryan, University of Glasgow]

Q&A

Q: How can users obtain knowledge about this area, and is information available to consumers?

A: There are many databases and workshops which promulgate knowledge, – but nothing specifically for consumers. The Fast UK web site (www.fastuk.org) is a source of information about assistive technologies in general, including research projects. [Organisations such as the Telecare Services Association (www.telecare.org.uk), the Joint Improvement Team (www.jitscotland.org.uk), and the Assisted Living Innovation Platform (www.alip-healthtechktn.com) publish information about assisted living.]

Q: Is there a database of research on assisted living?

A: the SRIS (Scottish Research Information System) was designed to publicise research in Scotland, but this database appears to have been discontinued. [The European programme on Ambient Assisted Living describes relevant research in Europe (www.aal-europe.eu).]

iv. Government Overview

Graeme Dickson, Director of Primary and Community Care, Scottish Government

Unsustainable Demographic Realities

In a challenging perspective, Graeme Dickson focused on some of the inherent difficulties facing all of us which accompany the demographic shift towards an increasingly ageing population. The stark reality, he warned, is that if we don't change our approach to care in general and take advantage of new technologies like telehealthcare, not only will we add to our financial woes but also stretch our human resources.

Those demographics paint an alarming picture, with a "grey tsunami" beginning to gather momentum. In 2007/8, Scotland spent £4.5bn on health care for people aged 65+, including £1.4bn on emergency admissions, with about 50% of all people aged 85+ admitted in emergencies every year. And if things don't change Scotland will need to add £1bn to its budget for health care by 2016, rising to £3.5bn by 2031. The consequences of doing nothing might mean, for example, every single school leaver soon being recruited to work in a care home – only an illustration, but one which showed how "unsustainable" the situation had become, he added.

In addition Mr Dickson explained that, "we are spending the biggest chunks of our current resources on institutional models of care that very often don't address their patients' and carers' individual requirements in ways which they regard as cost-efficient or effective." Unless we do things differently we will have to make compromises.

Better and more personalised care is needed in order to address this situation. Mr Dickson was very clear, however, that there is no time to lose. This was not something that could just wait to be acted upon a few years from now, he added – because "the future is here already".

Telehealthcare is not the whole solution, he said, but it is certainly a significant part of it. The Government has already reshaped its relationship with local authorities in terms of achieving "single outcomes" and is promoting better integration in performance targets and systems, focusing on improved joint working between health and social care organisations. Part of this entails a greater emphasis on preventative services as well as a properly co-ordinated national approach to telecare and telehealthcare.

The statistical backdrop to the difficult choices available to us is already there for all to see, he continued. For example, if the same number of people aged 65+ are in institutional care in 2016, the increase in the ageing population will challenge us either to enable an extra 175,000 people to live independently at home – or to compound the unsustainable pressures on healthcare systems by requiring them to provide an extra 175,000 beds in institutional care.

In response to these pressures, Mr Dickson explained that the *Reshaping Care for Older People* agenda[10] being jointly pursued by NHSScotland, COSLA and the Scottish Government therefore seeks to develop and deliver better, smarter solutions to these difficulties by focusing on independent living, through improved collaboration and cross-party support in initiatives such as Telehealthcare. Since 2006, over £16m has already been invested in the national Telecare Development Programme,[11] plus over £3m via the Scottish Centre for Telehealth[12] to support development of Telehealth solutions by innovative clinical activity within and between NHS Board areas.

While acknowledging the positive impact of Telehealthcare so far in Scotland, Mr Dickson drew attention to several barriers to its continued success as

- lack of awareness
- small, sporadic coverage
- limited strategic buy-in and drive

"There are real opportunities around to make more from what we have." he said. "It is my personal view that we need to strengthen our national infrastructure and governance framework for Telehealthcare to better reflect the different stakeholder interests and utilise expertise more effectively."

10 http://www.jitscotland.org.uk/action-areas/reshaping-care-for-older-people/
11 http://www.jitscotland.org.uk/action-areas/telecare-in-scotland/
12 http://www.sct.scot.nhs.uk/

Graeme Dickson took a few questions from delegates, to which his responses are recorded as below.

Q: Could consumers buy their own telehealthcare solutions, and then get re-imbursed by the NHS?

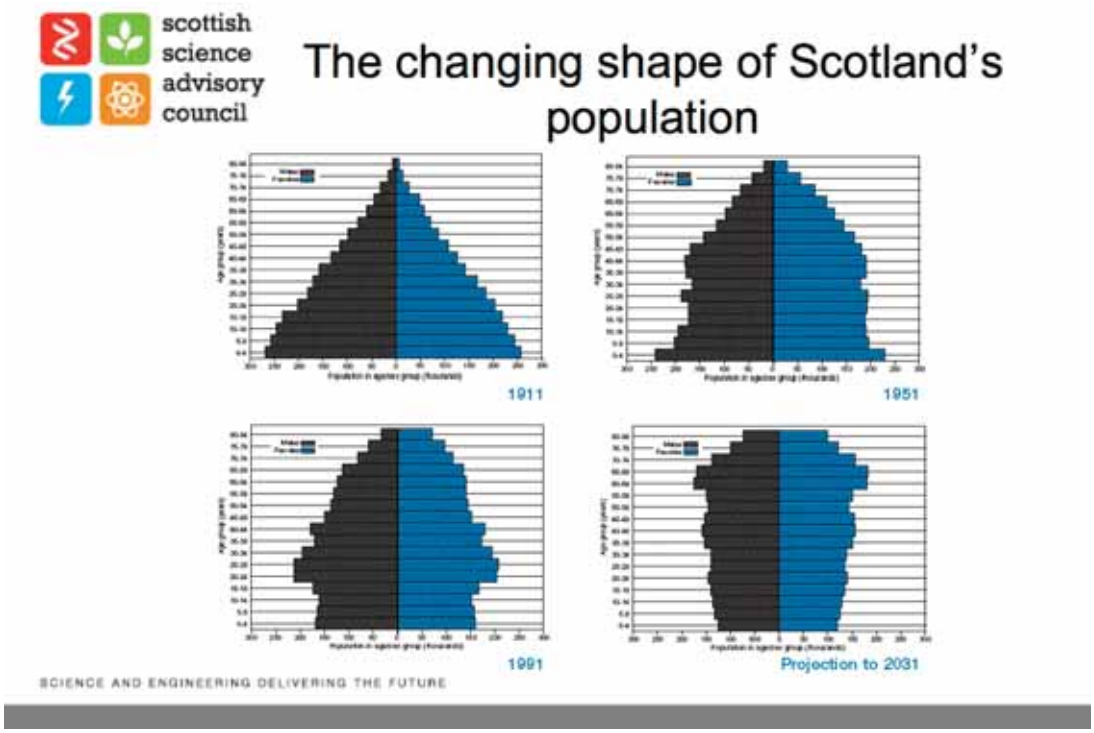
A: Mr Dickson replied that the shared vision of Telehealthcare was not as something that comes in a box, but as a different way of delivering health and care – a service not a product. While consumer choice is undoubtedly a factor, the real impetus for change will lie in the way in which services are delivered – not simply equipment on the market.

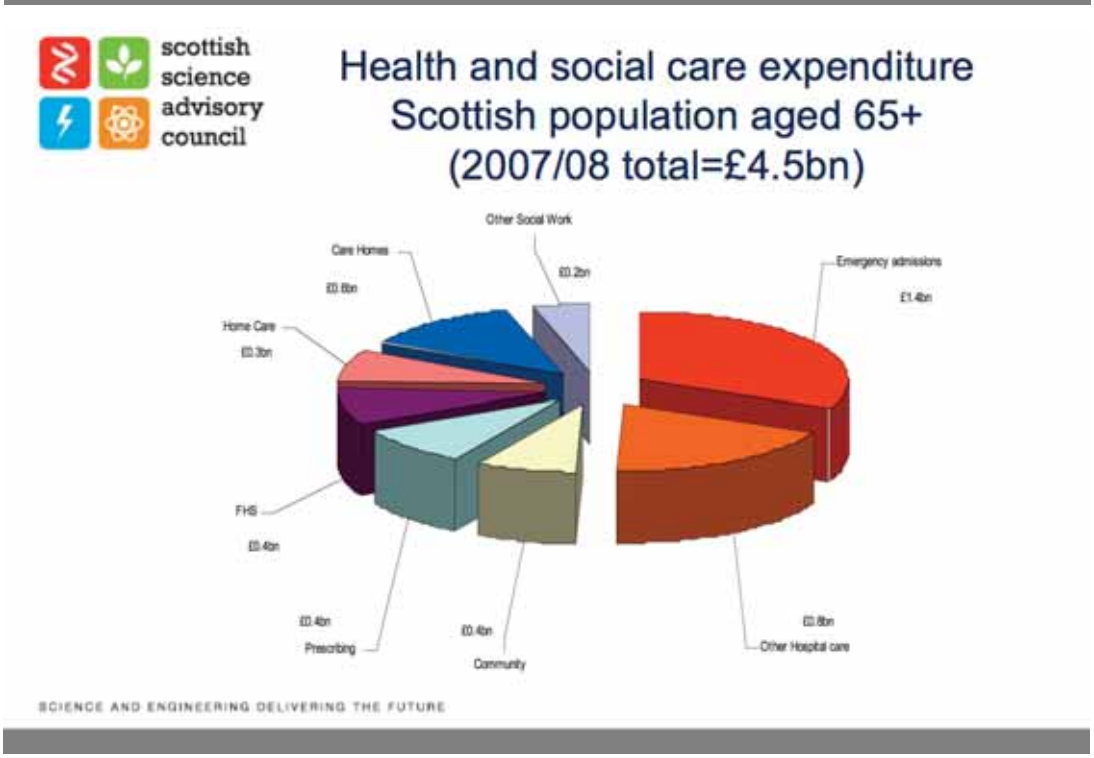
Q: The reality is that there is no current market. Is it Scottish Government policy to drive down the number of people receiving acute care (by 2016) to create a market for telehealthcare?

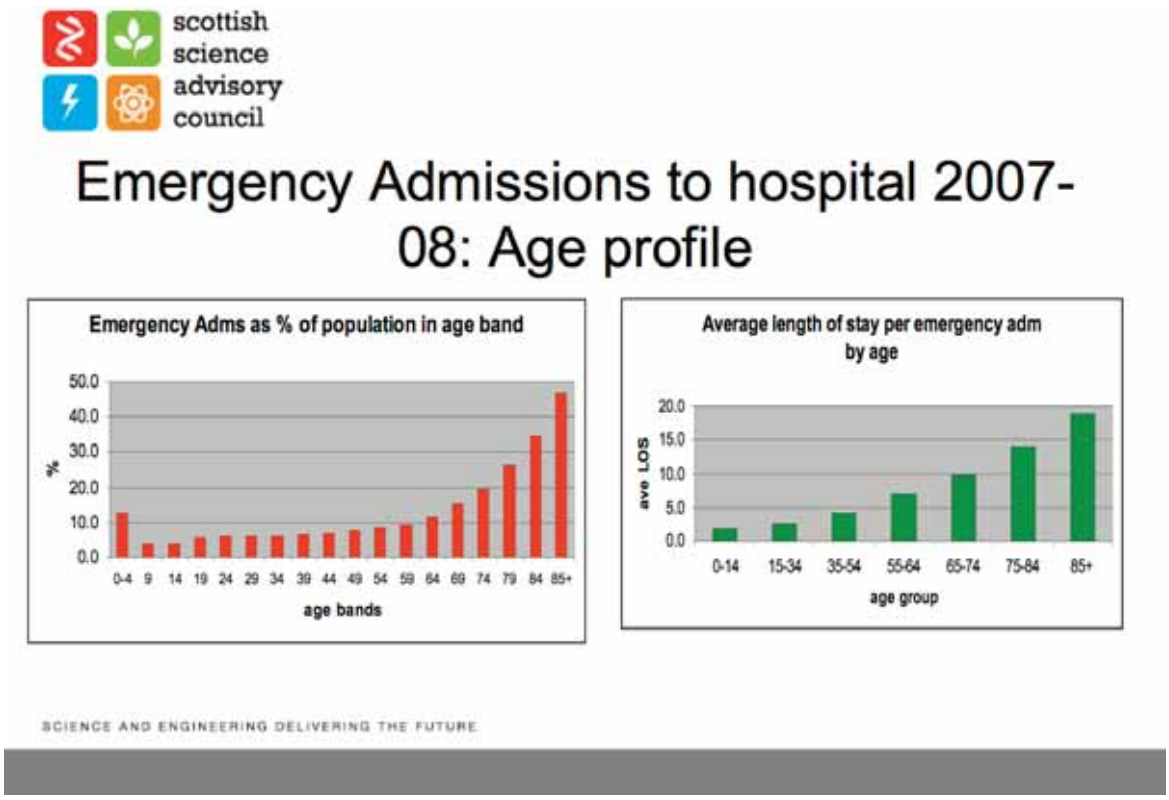
A: Mr Dickson pointed out that the figures he mentioned referred to possible scenarios rather than policy objectives. But these scenarios reflected the difficulties he had mentioned in sustaining, funding and providing these services in future.

Q: How do we overcome the difficulties caused by having 32 local authorities involved and correspondingly complex finances.

A: Mr Dickson acknowledged the difficulties of this, and said that the challenges had been, and would remain, to integrate different local approaches while encouraging innovation across the piece – as well as not simply focusing on “buying kit” but also on a national approach to the monitoring and analysis of how well outcomes for patients, service users and their carers were being delivered and achieved.


scottish science advisory council
The changing shape of Scotland's population
1911
1951
1991
Projection to 2031
SCIENCE AND ENGINEERING DELIVERING THE FUTURE


scottish science advisory council
Health and social care expenditure
Scottish population aged 65+
(2007/08 total=£4.5bn)
Other Social Work
£0.2bn
Care Homes
£0.8bn
Home Care
£0.3bn
FHS
£0.4bn
£0.4bn
Prescribing
£0.4bn
Community
Emergency admissions
£1.4bn
£0.8bn
Other Hospital care
SCIENCE AND ENGINEERING DELIVERING THE FUTURE



Government statistics for the over 65's…

v. Industry Overview

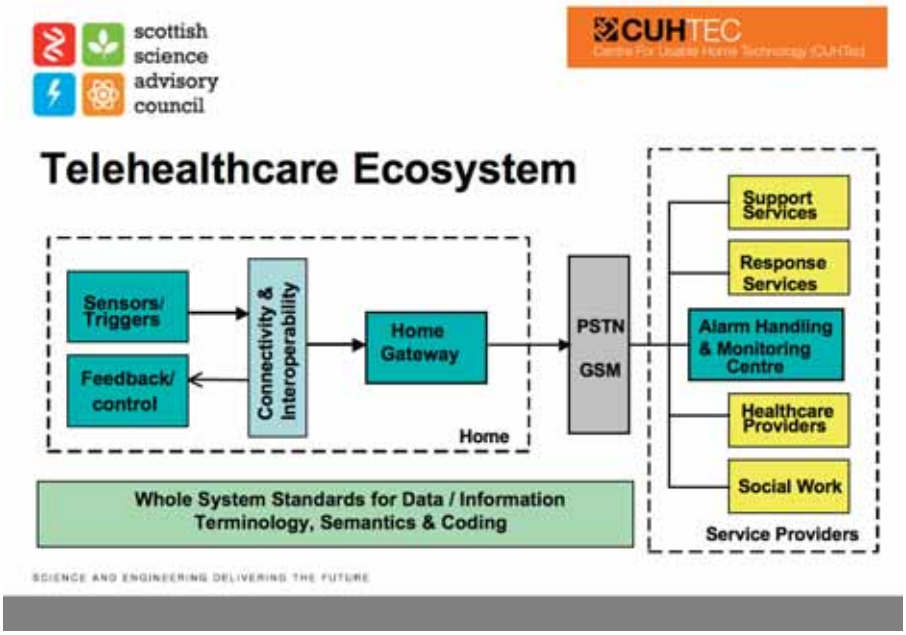
Dr Kevin Doughty, Deputy Director of the JRF Centre for Usable Home Technology, University of York, and independent Telecare Consultant

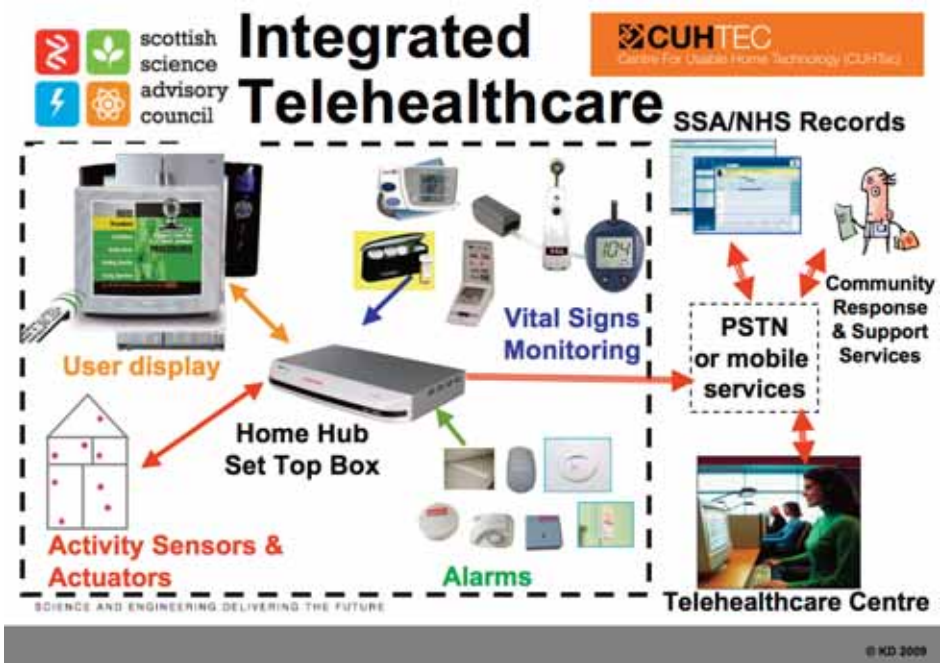
Towards a Telehealthcare Eco-system

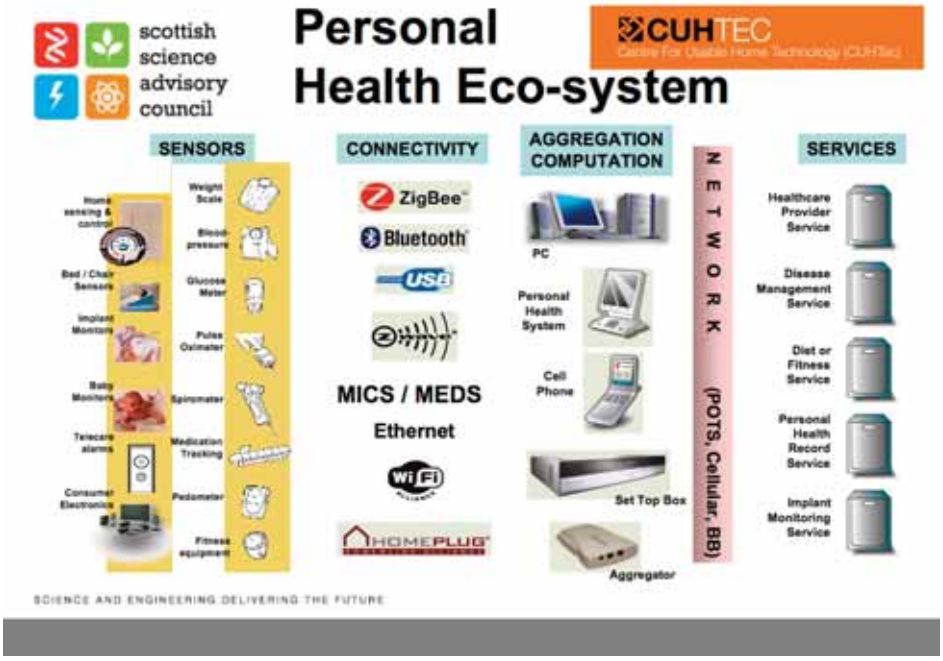
Kevin Doughty sketched out the industry background, including changing demographics and the increase in lifestyle diseases – and the rising user expectations and costs that we now have today. He also talked about the need to have a simple description of telehealthcare and make it relevant to government as well as individuals – in other words, a vision that can be shared. "There is an impression that there is a solution out there," he continued, "but if the vision and solution drift apart …"

Ten years ago, he said, we were vague about what we wanted from telehealthcare (or what we used to call "M-Care" and "E-Care"), but now we have the opportunity to take advantage of new technologies like "intelligent agents" to improve decision-making and create a "telehealthcare eco-system" which embraces sensors and triggers with standards-based communications via a home gateway, smart applications and software. The existing system (used mainly for alarms and voice communications) is "pretty dumb," Dr Doughty said, and we need to add a lot more intelligence and make it more interactive, with multiple applications. One of the keys to success would be ensuring connectivity and central overseeing of operations, and the ultimate aim would be an "integrated telehealthcare" system or a "practical health eco-system," delivered via a set-top box in the home, connected to vital signs monitors (for disease management), activity and lifestyle data (including diet and fitness), as well as mobile devices, with user-friendly interfaces and call centres handling the traffic.

There are lots of different products on the market already, and many countries such as Korea and China are not involved in manufacturing yet. "Prices will collapse," he said, "from about $6,000 to about $1,400 per device." Mr Doughty concluded that the supply chain is key to success, to ensure the delivery of a good telehealthcare service and equipment.







Highlights from Dr Doughty's presentation…

vi. Conclusion & Summary

Professor Anne Glover, Chief Scientific Adviser for Scotland

The Human Dimension

Professor Glover covered a wide range of issues, challenging the audience to think about telehealthcare from a number of different perspectives – with the emphasis on human and ethical factors rather than simply technology, and longer-term preventive care not just acute care.

In her opening remarks, she stressed the fact that Scotland has a huge amount of knowledge in telehealthcare and hoped that this would benefit not just the people of Scotland but people all over the world.

She also talked about our "quality of life" as well as our general health and well-being, pointing out that even though we may be wealthier today than in the 1950s, we are not necessarily happier. We are also more isolated and "live in our own worlds," she added, so perhaps we should use some of our wealth to promote social interaction – with telehealthcare playing a critical role in that process.

"Telehealthcare is not something we want to impose on old people," she said, or simply a means to save money on health care in general. We should consider older people not as passive patients but as people procuring telehealthcare services for themselves – in other words, clients. Telehealthcare can also benefit carers, she added, by making their lives easier and providing greater reassurance.

Professor Glover also talked about the importance of people having more control over their own lives, and the need to consider their mental as well as their physical health, including social interaction and inclusion.

"We have the platforms now for telehealthcare," she added, "but let's have the versatility to expand them to create a rich experience and a better living environment for everyone." She also urged the audience to think about delivering a wide variety of services and dare to be "different," at the same time as considering the ethical considerations such as management of medical data. It would be useful for all of us to monitor our medical data, she said, but who else may also have access?

She then concluded by talking about telehealthcare for all – the idea that people from all generations, whether healthy or not, could be involved in telehealthcare programmes, not just to prepare us all for later life but also to improve preventive care and make people in general more healthy.

4. DISCUSSIONS: Ideas and Views

After each presentation, delegates were split up into groups for discussions, with a facilitator chairing the discussion and a scribe recording "highlights" – including minority views.

To help steer the discussions, the following questions were posed:

- What are the **opportunities** and how can we realise them?
- What are the **drivers** and how can they be optimised?
- What are the **barriers** and how can they be addressed?
- How can we maximise **local strengths**?
- What can we **learn from other countries**?
- What **structures** need to be put in place to help us move forward **collaboratively**?

The Ideas

The **positive words** most commonly used in discussions were "collaboration, education, marketing, communication, opportunity, conclusive evidence, incentives, commitment, integrated."

The most common **concerns** were funding, a lack of standards for evaluating or pricing products, and technological barriers (standards, network capacity and interoperability). A minority also talked about a lack of evidence for the benefits of telehealthcare, but most thought the opposite and in fact felt frustrated there were too many pilots and more than enough conclusive evidence already.

The need for **government leadership** was also a regular topic, while the current economic climate was seen as an opportunity rather than a crisis, and delegates focused on budget management rather than simply demanding more funds.

i. General Ideas/Opportunities

Preventative care and providing telehealthcare to the general population were two of the dominant themes, along with incentives and housing.

"We need **integrated care models and better regulation**."

"All **new homes** should have telecare integrated at the build stage."

"Scotland's consolidated **patient records** are an **opportunity**."

"Another opportunity is for patients to view their own data – a move towards **preventative healthcare** and improved **health promotion**."

"There is an opportunity to improve the 'mental wellbeing' of people through **interactive social networking technology**."

"Services provided by the **private sector** should be considered."

"New-build housing should include **electronic infrastructures** which can be adapted to enable people to continue to live in their own homes …"

"Telecare could also be about **prevention**."

"Let people **buy their own** telecare kit – social policy will then follow."

"Articulate a long-term strategy (and identify the steps along the way) and an action plan/funding plan, and **seek cross-party commitment**."

"Can we **scale up THC initiatives**?"

"Get people to take more **personal ownership** of their own health (links to self-care agenda)."

"Give old people an account to **buy their own** health-care provision – but personalisation will not always work because local authorities will only help when people are really needy or very old, when they are not so well equipped to make decisions. On the other hand, **young disabled people** welcome the ability to make their own decisions …"

"We need to **roll out the available technologies**."

"We are not going down the road of a national IT infrastructure from a single supplier. It may be possible to **install £500 kits in houses** linked to the phone line, piggybacking on existing technologies, with services tailored to individuals."

"**Incentivise** people."

"Piggyback on the **green agenda** – e.g. shared networks for energy control and telehealthcare."

"We need a **code of practice**."

"**Incentivise** the 40-60 year olds to drive this through."

"We need target-driven **incentives**."

"**We need to change the whole health-care system, not just telehealthcare.**"

"We could encourage people to **purchase equipment now** rather than waiting until they're infirm, allowing **increased familiarity** in younger years – and these devices could in some way be linked to security devices, e.g. home monitoring and energy savings."

"We need **rewards and incentives** for care providers."

"How do we change the **reward system** for academics?"

"How do we **make the science accessible** to the people who push change?"

"Why do **housing** developers not build **intelligent systems** into new homes?"

"**Housing associations** could be a conduit for delivery."

"Like CO_2 emission reductions, we should **future-proof**, not retro-fit."

"If it is a 'no-brainer,' why is there **no action**?"

"Consider other groups such as the **homeless** and **prisons**."

"Have links to other agendas – e.g. **green issues**."

"**Educate** people via telehealth on how to care for themselves."

ii. Communication/Vision/Cultural Change

Communication or "marketing" was another dominant theme, along with education, incentives, exemplars and the need to change attitudes and expectations.

"Need **careful marketing** of telecare – the general public sometimes view the introduction of THC as a downgrading of acute care services."

"**Incentives** are needed to promote public, professional and political buy-in. Use **exemplars**."

"Crucial that we introduce measures to help **bridge the gap between national ambition and the current telecare landscape**."

"Look at **social and cultural differences**."

"Use **popular media** (including TV advertising) to make information more accessible – **change attitudes and expectations** and win hearts and minds as well as educate providers and funders."

"The **jury is still out** in terms of telehealthcare – we need a better **understanding** of the terminology, activities and research focus."

"**West Lothian** is a good example to use …"

"We need to try and **encourage people to embrace change** because they may be reluctant to have their information captured in certain ways."

"There is a need to **make telehealth more desirable** – positive association is key, as is setting the benefits. It's **not a useful tool just when you're ill**."

"We have **jargon** problems."

"There is **confusion** at the coal face **re jargon**."

"We need **communication**, **awareness and training**, and to make use of the popular media."

"Evidence is not the problem. It's all about hearts and minds. **Cultural change is harder than technological change**."

"Technology is not the problem but the **education** of the public and a new **economic model** for health."

"There are **demographic and poverty issues** – it is easy to sell telehealthcare to the better off but we need to address the acute needs of different socio-economic groups, including '**postcode-lottery**' analysis."

iii. Research, Evidence & Pilot Studies

Research attracted significant comment, and divided opinion the most. Chief concerns were evidence (too little as well as too much), links between research and real-world products, patchy implementation, incentives (more rewards for academics), collaboration and the need for better evaluation of results,

"We have to **re-evaluate our current approach to research**. Research does not travel well and the link from research to outcomes is not always made clear."

"**If implementation is part of a research agenda, this creates additional bureaucracy** and limits the freedom to improve the level of service."

"To drive the research agenda forward, we need **clear ownership**, **commitment and responsibilities** …"

"RCTs (Random Control Tests) are an **inappropriate and costly** approach, and too much research went into proving what is common sense."

"The **implementation** of telecare technologies is at best **patchy** and varies considerably between health boards and local authorities. This is partly because there is **no national strategy** and consequently no particular onus on either boards or councils to promote and encourage the roll-out of these technologies."

"To drive research, we need a **two-way discussion and focus groups** to tell us what people want."

"We **need a strong agenda for researchers**, through a process of roadmapping and prioritisation, and using examples."

"**Difficult to assess effectiveness** of some research or products."

"**Inadequate evidence** base."

"We **don't need more evidence** …"

"**Make all research and information more accessible** so people can influence change."

"How do we change the **academic reward** system?"

"**There are too many pilots – there is conclusive evidence – we don't need any more**."

"Lots of academic ideas are **impractical**."

"Diabetes and heart systems shown to save costs but **did not allow one single ward to be closed**."

"People in trials don't want kit taken out afterwards."

"There is **some resistance** – e.g. from community nurses."

"The science is well developed but **evaluations** not well established."

"One of the great difficulties is that **we are awash with pilots**. We need to get hold of **conclusive evidence** concerning benefits."

"We have to go beyond pilots into **mainstreaming**."

"Some people say the jury is still out, but telehealthcare is a '**no-brainer**' in view of the economic and demographic changes taking place."

"What **more evidence** is needed? Fewer hospital admissions, fewer re-admissions and fewer people in institutional care."

"Academics also need **information** from care organisations and end users, to help with their pilots."

"Academics are rewarded by **publications** rather than **turning research into products**."

"Scotland's **record** [in telehealthcare] holds up well but it is **patchy** and there are not many patients involved."

"We have to make the **breakthrough** from invention to innovation to use. It is not just about science but **real people using the systems**."

"**NHS research** is well established but local authorities are focused on service to research."

"Scotland is a good place to come – and a good environment for **collaboration**. This is a real opportunity for us in terms of **R&D** but Scotland is an immature market."

"We should link telehealthcare **pilots** to **acute therapy** cases – e.g. strokes, cardiac arrests and COPD."

"**Scotland is strong in research but weaker in product development**."

iv. Technology/Procurement/Standards

Technology was the subject which generated the most specific concerns – particularly industry standards and interoperability, as well as network capacity. "Smart procurement" was mentioned by several people, as well as the need for integrated, interactive and more personalised devices.

"There is a **lack of knowledge/awareness** at delivery level as to what technology is available and what it can do."

"**We need smart procurement, especially by the NHS. This would encourage innovation and help direct academic research**."

"There's a **lack of standardisation**.

"We need to review the **academic review system**."

"**Communication networks** and broadband in particular are a **limiting factor** to the roll-out of new technologies."

"Another technological barrier is **lack of standards and interoperability**."

"We need to **define standards for interoperability** and set standards for a **framework of acceptability**."

"**Procurement** can reduce incentives – processes are **constrained** by EU legislation."

"Some people say there are differences between monitoring and alarm systems, while others say they're **all alarm systems** ultimately …"

"Users have **very different requirements** – some are highly complex and cost a lot of money while others are cheap."

"There has been **pioneering** work on radio technology to overcome rural **connectivity problems**."

"**Broadband** in the Highlands & Islands is patchy and this causes installation difficulties."

"Telehealthcare devices should all **integrate** with each other."

"**Quality standards for telehealth don't exist**."

"There are **too many standards that conflict** with each other (health, housing and buildings regs, for example). There needs to be a single set of regulations."

"Any equipment needs to be **tailored to individual lifestyles**."

"We should use a **single monitoring platform with flexible interfaces** …"

"Honesty levels go up when people **interact** with the technology."

"We must go down the **open-source** route."

"The technology has been rigorously **tested**."

"We need more **automation**."

v. Government/Organisations

Government was urged to take the lead in telehealthcare, including housing regulations. Cross-party collaboration and the need for a long-term strategy were highlighted as key factors.

"Scottish Government is best placed to take this forward and provide the necessary **leadership**."

"**We need leadership from Government (a national push for telehealthcare) – a Scotland-wide strategy and national targets as well as incentives**."

"Government could influence **housing regulations**."

"**Different time horizons** in politics and academia."

"There are **too many Trusts** …"

"**No votes in shutting down hospitals and care-homes**."

"**COSLA** are key."

"The Government could play a **centre of excellence** role, developing service standards."

"Need a Government **strategy**."

"There are **too many layers** of organisations."

"One of the problems is the **short-term political horizon**."

"Central **Government** must take the **lead**."

"**NHS24** may be the best option to deliver telehealthcare services but it will **struggle to cope**."

"The landscape is fragmented but a more **coherent regulatory framework** would help."

"If NHS24 is asked to deliver the service, this will need **regulatory**, **financial and technological changes**."

"We need a **national structure** to implement telehealthcare – combined with **local ownership**."

"We need **cross-party commitment** to a **long-term strategy** for health – for 10-20 years."

vi. Finance

The current economic situation was largely regarded as an opportunity rather than a crisis, and the common themes were how to manage ring-fenced budgets and the pooling of social and health-care budgets, rather than simply demanding more funds.

"**Clarify funding responsibilities**."

"When it comes to **joint funding** (Health and Social Work), who manages the budget?"

"**Move from ring-fenced funding to more collaborative approaches**."

"There are **no incentives** for investment."

"Most countries have separate budgets for social and health care – so can we **pool budgets**?"

"Telehealthcare money to local authorities is currently **ring-fenced**. It should stay this way to ensure that money is spent in these areas (if it isn't ring-fenced then local authorities wouldn't spend money on it)."

"There will need to be an **increase in funding to train healthcare professionals** to use the equipment."

"There is huge interest and good evidence but **no funding**."

"The **economy** may force us into action."

"We need **longer-term funding**."

vii. Industry & SMEs

The main idea to emerge was to use Scotland as a testbed for research and encourage SME involvement.

"We should **encourage SMEs** to become more involved."

"Need more collaboration and a **better interface** between industry and commerce."

"Get SMEs more involved, and set up a '**marketplace**' for the exchange of ideas and developments."

"The **global market** for healthcare technology is enormous."

"SMEs need to address the **low-hanging fruit**."

"We need incentives and rewards …"

"Allow more **SMEs** to get involved."

"**SMEs and start-ups** need funding for R&D."

"The model that works is for small countries to get **critical mass for research**, get the providers to **collaborate**, use the country as a **testbed** and then **go global**."

"Businesses are interested in coming into Scotland to **trial telehealthcare solutions**, but **not** for **product development**."

"**Private-sector roll-out** of telehealthcare is **less likely** to happen in Scotland."

"There is an opportunity for Scotland to be innovative but we need an **industrial policy** first."

"The health-care industry is a **confusing landscape**. There is only so long that **business** will take the **risk**."

"The return on investment is obvious. **Reputation risk** is more of a concern to some people …"

viii. Learn from other countries

Canada, Denmark, Germany and Finland were mentioned as examples.

"Learn from other countries like **Finland** and its hearing aid technology…"

"**Wireless** technology is being well utilised in **Nova Scotia**."

"The lesson from **Denmark** and its initiatives re hearing aids and diabetes is that they got a range of stakeholders involved."

5. CONCLUSIONS

Based on the above "highlights" from discussions, several conclusions emerge:

1. THC is a **proven technology** which is ready to be implemented on a national scale – not just for better health care but also to encourage research and development. THC is a "win-win-win" concept for government and service providers, service users and researchers/industry. Most people in the health-care community say there is already conclusive evidence, although some still maintain that "the jury is out" and that more evidence is needed.

2. The **major benefits** of THC include:

- better health care in general due to better monitoring (vital signs and disease management, etc.) and greater individual (more proactive) engagement with personal health (e.g. better preventative care)
- savings in terms of hospital beds and human resources, etc.
- the ability for people to live independently in their own homes for longer or to go home sooner from hospital
- relief for unpaid carers and family members

3. It may be hard to "measure" every single benefit (e.g. preventative care) but pilot studies indicate evidence of **widespread acceptance** among consumers and service providers, as well as **significant savings**. (Insurance companies can also quantify health gains in terms of lower premiums.)

4. **Pilot studies** have already been held in a number of countries, including Scotland, but although the Scottish projects have provided solid evidence of benefits, implementation so far has been patchy, and there is also a perception that too many people focus on the barriers rather than the opportunities of THC, and have concerns about the way that THC is organised and delivered at local and national levels.

5. It's time to articulate **a shared vision** for THC, set **priorities** and agree an **action plan** – and establish Scotland as an international leader. This means first agreeing what THC is and learning to speak the same language – not just terminology but what it does and how it operates and who it is aimed at.

6. **The vision:**

Some initial ideas included:

- Until now, THC has tended to be associated with "negative" aspects of health care – addressing short-term problems rather than improving long-term health. But THC should be promoted as a modern, holistic solution **for all** – not just the elderly, sick and disabled – and should also be a key part of **preventative care**.
- Emphasise the fact that THC can also benefit unpaid carers and family members, by making people more independent.
- THC (thanks to miniaturisation and better user interfaces) is an intelligent and "**everyday**" solution which will become as easy to use and familiar as mobile phones or watches, TVs or microwave ovens.
- THC is not something for the future but is ready for implementation right now.
- THC is not a "cheaper" alternative but a highly cost-effective (and health-effective) **complement** to existing services and current technology.
- THC could also facilitate more **social interaction** rather than isolate people, by creating user networks.
- In addition, we should not only emphasise savings but also underline the **benefits to general health**, and cite anecdotal evidence as well as "big numbers."

7. This positive and inspirational vision could then be "sold" or "marketed" to the whole population, to educate as well as to change attitudes and expectations. Ideally, the vision would be shared by all stakeholders – e.g. **cross-party support** would be helpful, as well as greater **collaboration** between government, industry and academic researchers.

8. **The Action Plan:**

A number of ideas emerged, including:

- Successful implementation will require "**smart procurement**" – new professional standards to evaluate products, encourage innovation and help direct academic research, with a Core Package or an "approved" list with benchmarks for pricing.
- **Reward academic researchers** and ensure protection of their Intellectual Property (IP). Facilitate collaboration between researchers and product developers.
- We will need to **overcome the technological barriers** (e.g. network standards, interoperability and reliability, network capacity and reliability) and address regulatory issues, but current infrastructure is already good enough to make a start. Waiting for the network to be "perfect," however, would simply postpone implementation and hold back product research. In the early stages, THC would operate in parallel with current care delivery systems to minimise the **risks** involved in over-dependence on what is still a relatively new kind of health-care solution.
- We would also need to address **organisational** issues, and it was felt that a simplified organisational structure would greatly help implementation.
- By developing a shared vision of THC, we will also begin to overcome other barriers such as concerns about **funding** – incentivising everyone to maximise a sense of universal "ownership" or "buy-in."

9. **Strategic planning** will be key to the success of telehealthcare in the future, and the "THC community" strongly believes that **government** should take the lead in terms of setting policy and establishing professional standards for "smart procurement," as well as funding. In order to provide this **leadership**, government will need to work in partnership with all the stakeholders to articulate a shared vision for THC and draw up an action plan for nationwide implementation, ideally with **cross-party support**.

10. Because THC is simply "a new set of highly intelligent tools," if it is rolled out on a national scale without making any great fuss, using local "**champions**" (including doctors and nurses) and "exemplars" (e.g. West Lothian) to sell it to users and minimise "fear of the new," it may be more accepted by consumers. To make THC a success, we also need "**critical mass**" to drive competition and innovation, and improve delivery of services

11. **Scotland can do it**. Scotland could become a **testbed** for THC on a national scale, including central monitoring of medical data by specialists, linked to GP networks, implemented not just in the NHS but also new housing. This would not only improve general health-care provision but also stimulate Scottish industry/research and hopefully lead to profitable exports of both services and products.

6. FEEDBACK

During the forum, participants were asked a series of questions to seek their opinions on a number of issues related to telehealthcare.

Delegates emphatically supported telehealthcare but opinions varied on several questions, including "research collaboration" and the timetable for agreeing on a vision for telehealthcare.

Perhaps the most controversial result of the feedback session was Question 7, where the majority of voters clearly opted for NHS 24 as the first-choice "call receiving or monitoring centre" for a future telehealthcare service. Although the vote appeared emphatic, several delegates expressed strong disagreement and also suggested there could be alternative options beyond the four posed in the question.

Question 1

What is the best aspect of research collaboration?	**Votes (%)**
(A) new ideas	62
(B) fresh partners	16
(C) no competitive clash	12
(D) alternative funding	10

Question 2

What is the biggest barrier to research collaboration?

(A) cultural differences	30
(B) knowledge transfer	19
(C) IP ownership	21
(D) turning research into product	30

Question 3

What would result in the most effective collaboration?

(A) interdisciplinary work	32
(B) incentives for applied research	41
(C) staff exchanges	8
(D) joint workshops	19

Question 4
How important do you feel it is at this time to develop a more integrated and structured approach to telecare and telehealth activities across Scotland?

(A) Not at All	0
(B) Not Urgent	0
(C) Important	15
(D) Crucial	85

Question 5
Should we take time now to develop a roadmap to identify and make better links between research and practice? Would this be:

(A) A complete waste of time	4
(B) Of some merit	8
(C) Important	33
(D) Absolutely fundamental	55

Question 6
How far into the future should we be aiming to agree on a vision for telehealthcare?

(A) Less than 2 years	17
(B) 2 to 5 years	33
(C) 5 to 10 years	29
(D) Further than 10 years	21

Question 7
The models proposed for telehealthcare include an important role for a call receiving or monitoring centre. Scotland already has many centres capable of performing this function. Who is best placed to run these centres?

(A) NHS 24	59
(B) Local authorities	24
(C) Housing Associations	3
(D) Private sector	14

Question 8
Do you believe that the Continua Alliance approach to defining the requirements of a telehealth system is what we need?

(A) Yes, it covers everything	3
(B) Yes, it covers most things	36
(C) No, there are a number of gaps and shortcomings	43
(D) No, there are many gaps and shortcomings	18

Question 9
The great variety of products may benefit vendors of equipment rather than genuine innovators, and those with more specific solutions for Scotland. If government sponsors new partnership, where should most help be offered in the value chain?

(A) At research level	10
(B) At product development level	19
(C) At demonstration project level	19
(D) At roll-out level	52

7. TELEHEALTHCARE: SCIENCE FICTION OR REALITY?

To understand what telehealthcare really is and what it will mean to consumers and health-care professionals, it may be useful to consider what THC may look like in the not-too-distant future …

1. Science Fiction?

Everyone has medical monitors strapped to their wrists or built into their digital assistants. Whether they are walking around in the city or exploring the Highlands, the data from these very smart devices is streaming 24/7 to a central processing centre – via their local GP. Intelligent agents (or "expert systems") analyse the data and trigger alerts, and if their GP thinks it is important, he or she can contact a specialist doctor to ask for advice, then contact the patient, if required ...

Meanwhile a team of specialist doctors is monitoring medical trends, comparing data from rural and urban locations as part of a nationwide heart-disease study. The specialists also respond to emergency signals, automatically routed to them via the local GPs and the nationwide network, and advise GPs and hospital doctors on their trickiest cases, viewing "live" information from monitors and scanners …

Healthy individuals, as well as people with specific diseases like diabetes or chronic obstructive pulmonary disease, check their own medical data – at home and on the move – or are reminded to make an appointment. "Intelligent Advisors" offer advice about diet ("your blood sugar seems high today") or recommend an exercise programme – or even suggest people go for a check-up, because of a trend in their medical data. People compare each other's medical data and turn health checks into a "hobby" or even a "fashion …"

The population is rising but the number of occupied hospital beds is down by about 5% since the launch of the THC programme the previous year, and survival from heart attacks has improved by 20%, thanks to proactive responses …

2. Reality?

A study by the Joseph Rowntree Foundation Centre for Usable Home Technology at the University of York has identified a number of emerging telehealthcare technologies, including:

- Robopets that act as companions while doubling up as fire, gas and flood alarms and intruder detectors
- "Intelligent" coffee tables that can dispense medicines and give computerised reminders to people
- Kitchen worktop and fridge screens that monitor what's in the larder, suggest recipes and produce automatic shopping lists
- Talking walking frames that remind people where they are going
- Exoskeleton suits ("smart clothes") to help people move around and climb stairs
- Smart beds that help people to turn over and to get up, alerting carers if they are ill or need help
- Set-top boxes that allow people to consult nurses, doctors, social workers or friends and relatives using 3D video technology, surround-sound and virtual presence

In a press release issued by the Local Government Association (LGA) in October 2009, Dr Kevin Doughty commented on these technologies, saying: "Some of these might sound bizarre at the moment, but who would have thought twenty years ago that older people would today be using video games to exercise, and doing their shopping using a computer?"

ANNEX A

Forum Agenda

09:30 **Registration and refreshments**

10:00 **Welcome by the Co-Chair of the SSAC**
Professor Stuart Monro,
Scientific Director, Our Dynamic Earth

10:05 **The Vision for Health and Care Technologies in Scotland**
Nicola Sturgeon MSP
Deputy First Minister and Cabinet Secretary for Health and Wellbeing

10:15 **Scene setting and aims of the day by the facilitator and Chair**
Professor Gordon Peterkin
Director of Kithstone Consulting and former Director of the Scottish Centre for Telehealth

SESSION ONE: RESEARCH OVERVIEW

10:30 **Assisted Living Research:**
Professor Ken Turner, Professor of Computing Science at the University of Stirling & Technical Director of the MATCH project
Professor Ken Turner will give a short overview of the research landscape in assisted living highlighting particular Scottish strengths in this area. This is a broad research field covering many disciplines, with new and exciting results that will form the basis of future products. The focus will mainly be on computing aspects such as interface design, devices and sensors, platforms and services, smart and intelligent houses however reference will be made of other research areas outside computing. The presentation will conclude with some key barriers and opportunities for future research in this area.

10:45 **Open plenary session followed by focused round table debate**

11:30 **Refreshments**

11:45 Review of the findings and outputs from session one

SESSION TWO: GOVERNMENT OVERVIEW

12:00 A Scottish Government perspective on the role of new technologies in addressing our future challenges:
Graeme Dickson, Director of Primary and Community Care, Scottish Government
In isolation 'the market' has not yet maximised the impact of technological advances on our wider health and care system. This session promotes discussion on the role of policy and government in extending and investing in technology integrated services, and the potential economic benefits that may bring.

12:15 Open plenary session followed by focused round table debate

13:00 Lunch, networking and displays

13:45 Review of the findings and outputs from session two

SESSION THREE: INDUSTRY OVERVIEW

14:00 Future Healthcare – The Challenges Facing Industry
Dr Kevin Doughty Deputy Director, JRF Centre for Usable Health Technology, University of York and Independent Telecare Consultant
A vision of connected healthcare producing massive gains in efficiency is common to many technologists and politicians across the developed world. Yet the delivery of such a system is likely to remain elusive unless governments accept a need for long term planning, and the public show a willingness to foot the bill and to accept many changes in the way that they interact with the NHS. This presentation will focus on the challenges that face entrepreneurs and the large multi-national companies that are moving into the healthcare space. The risks will be considered and the potential for building partnerships explored.

14:15 Open plenary session followed by focused round table debate

15:00 Refreshments

15:15 Review of the findings and outputs from session three

SESSION FOUR: NEXT STEPS

15:30 Reaching a common vision
Professor Gordon Peterkin
Director of Kithstone Consulting and former Director of the Scottish Centre for Telehealth
An opportunity for delegates to reflect on the days discussion and agree a forward agenda and common vision for the future of Telehealthcare in Scotland. Delegates will be able to identify the structures and actions that are required to achieve this vision and develop a clear view of the roles and responsibilities of each of the key sectors in order to drive this agenda forward.

16:15 Conclusion and Summary by Professor Anne Glover
Chief Scientific Adviser for Scotland and SSAC Co-Chair

16:30 Close of Forum

ANNEX B

Delegate List

NAME	TITLE	ORGANISATION
Professor John Arnott	Chair of Communication Systems	University of Dundee
Ms Sandra Auld	Service Development Manager	Scottish Centre for Telehealth
Mr Pat Begley	Director	Carers Scotland
Ms Laura Birrell	Associate Director	BRE Scotland
Mr Grahame Blair	Director, Services to People	Clackmannanshire Council
Professor Alison Bowes	Chair in Dementia Research	Dementia Services Development Centre, University of Stirling
Professor Stephen Brewster	Professor of Human Computer Interaction	University of Glasgow
Dr Isabel Bruce		Scotland Malawi Partnership
Ms Melony Buchanan		BT Scotland
Professor Alan Bundy	Professor of Automated Reasoning	University of Edinburgh/SSAC
Dr Theopisti Chrysanthaki	Whole System Demonstrators Programme	Imperial College, London
Professor Patricia Connolly	Director of Institute of Medical Devices	University of Strathclyde
Mr Paul Crangle		
Mr David Cross	Senior Operations Executive	Scottish Enterprise
Dr Avril Davidson	Head of the SSAC Secretariat	Scottish Government
Mr Graeme Dickson	Director of Primary and Community Care	Scottish Government
Mr Steven Dodsworth	Head of Life Sciences	Highlands and Islands Enterprise
Dr Kevin Doughty	Deputy Director	Centre for Useable Home Technologies, University of York
Mr Tim Ellis	Whole System Demonstrators Programme Manager	Department of Health
Mr Mike Erikson		Dan Medical Ltd
Dr Jim Ferguson	Clinical Lead	Scottish Centre for Telehealth
Mr Kevin Geddes	Director of Self Management	Long Term Conditions Alliance Scotland
Mr Colin Gibson	Director for IT & Telecare	Hanover Housing Association
Mr Phil Gray	Senior Lecturer	University of Glasgow
Professor Anne Glover	Chief Scientific Adviser for Scotland	Scottish Government
Professor Jennifer Harris	Director of the Interdisciplinary Disability Research Institute	Dundee University

NAME	TITLE	ORGANISATION
Ms Sylvia Harvey		Scottish Centre for Telehealth
Dr Anne Hendry	Consultant Physician in Geriatric Medicine	NHS Lanarkshire – LTC Collaborative
Dr Rob Hendry	Chief Executive	Medical Protection Society Scotland
Dr Nick Hine	Lecturer	University of Dundee
Ms Janette Hughes	Project Manager	Wellness & Innovation Project
Mr Grant Hughes	Team Leader, Joint Improvement Policy and Support Team	Scottish Government
Mr Iain Hunter	General Manager	Scottish Centre for Telehealth
Mr David Kelly	Managing Director – Scotland and Ireland	Tunstall Telehealthcare (UK) Ltd
Mrs Christine MacFarlane-Slack	Operational Manager	Care at Home Service, Highland Council
Mr George MacGinnis	Programme Manager, Assistive Technology	NHS Technology Office
Ms Moira Mackenzie	Telecare Programme Manager	Scottish Government
Dr Peter Mackenzie	Head of Medical Governance	Medical Protection Society Scotland
Professor Duncan Maclennan	Director of the Centre for Housing Research (CHR)	University of St Andrews
Dr Brian McKinstry	Reader in Primary Care Research, Centre for Population Health Sciences; General Practice Section	University of Edinburgh
Professor Johanna Moore	Director of the Human Communication Research Centre	University of Edinburgh
Mrs Anna Milne	SSAC Secretariat	Scottish Government
Professor Stuart Monro	Scientific Director	Our Dynamic Earth/SSAC
Mr Silas Olsson	Member of the Central Management Unit	"Ambient Assisted Living" Programme
Dr Anthony O'Sullivan		Newhaven Research
Professor Gordon Peterkin	Director	Kithstone Consulting
Professor Steve Renals	Professor of Speech Therapy	University of Edinburgh
Mr Andrew Ruck	Director	Health2Health Limited
Mr John Sandbach	Clinical Development Nurse	NHS24
Ms Sue Shone	Policy and Practice Officer	Chartered Institute of Housing
Mr Paul Spence	Public Policy Advisor Public Sector ICT – Digital Inclusion	Scottish Government
Professor Ken Turner	Research Director MATCH	University of Stirling
Professor Robin Williams	Director Research Centre for Social Sciences	University of Edinburgh

NAME	TITLE	ORGANISATION
Ms Susan Wilson	General Manager	Angus Community Council Health Partnership
Mr Graham Worsley	Innovation Platform Leader – Assisted Living	Technology Strategy Board
Ms Iulia Young	Office of the Chief Scientific Adviser	Scottish Government

ANNEX C

Membership of the SSAC*

Professor Anne Glover CBE, Chief Scientific Adviser for Scotland, and Co-Chair of SSAC. Professor of Molecular and Cell Biology, University of Aberdeen

Professor Stuart Monro OBE, Scientific Director, Our Dynamic Earth and SSAC Independent Co-Chair of SSAC

Professor Steve Beaumont OBE, Vice Principal, University of Glasgow

Professor Alan Bundy, Professor of Automated Reasoning, School of Informatics, University of Edinburgh

Professor Michael Ferguson CBE, Dean of Research for the College of Life Sciences, University of Dundee

Professor Julie Fitzpatrick, Chief Executive, Moredun Research Institute

Dr Karen Jervis, Commercial Director and Chief Operating Officer, BigDNA Ltd

Professor Chris van der Kuyl, Chief Executive, BrightSolid

Professor Jim McDonald, Principal, University of Strathclyde

Professor Peter Morgan, Director of the Rowett Institute of Nutrition and Health and Vice Principal, University of Aberdeen

Professor Andy Porter, Professor of Biotechnology and Deputy Director of the Institute of Medical Sciences, University of Aberdeen

Professor Stuart Reid, Dean of the Faculty of Veterinary Medicine, University of Glasgow

Mr Ian Ritchie CBE, Non-Executive Chairman of Iomart plc, Scapa, CAS, Casapian Learning and the Interactive Design Institute

*as at time of workshop. For latest membership please see – www.scottishscience.org.uk/members.html

Dr Barbara Spruce, Senior Lecturer, University of Dundee

Professor Joyce Tait CBE, Scientific Adviser, Innogen, University of Edinburgh

Professor Bob Tooze, Managing Director, Sasol Technology UK Ltd

Professor Ian Underwood, Professor of Electrical Displays, University of Edinburgh

Professor Graham Wren, Managing Director, GSE Systems Limited

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