Technology and Innovation in the NHS
BMA Scotland

What do you consider have been the main successes of the existing Scottish Government's eHealth and telecare/telehealth strategies and why?

The success of the existing strategy is extremely difficult to measure and to quantify as there are only experimental implementations and no standard applications which could be evaluated with health-economic tools. There are also no clear key performance indicators specified with clear target ranges.

One of the positive outcomes might be the increase of awareness that there are alternatives existing to face to face management of conditions although these alternatives might not be suitable for everyone and in every case.

What do you consider have been the main failures of the existing Scottish Government's eHealth and telecare/telehealth strategies and why?

There seems to be space for improvement with regards to Digital Health awareness and capacity in the NHS and on government level. The implementation of the European General Data Protection Regulation (GDPR) has not been pursued well enough and the NHS as a whole will struggle to meet the GDPR targets in 2018, when the regulation comes into effect. This will seriously affect the implementation of any digital health tool and also the drive for further digitization and the integration of the electronic health record.

While Digital Health (including eHealth and mHealth) is rapidly progressing on a global scale, a lot of energy and resources are spent on telehealth and telecare in Scotland. In this context it is important to understand that the main focus should be on regulatory and standardisation issues. The communication technology with regards to telehealth and telecare has been readily available for far more than 10 years.

One of the biggest shortcomings of the current national strategy is the neglect of future technologies, such as the use of the Industrial Internet of Things (IIOT), 5G technology, Precision Medicine (Smart Pharmaceuticals) and Population Health Management. The current strategy does not provide guidance, support and resources to build sustainable Digital Health capacity inside and outside the NHS to catalyse the rapid uptake of latest generation eHealth technology over the next decade. Despite the involvement of expensive technology consultants on different levels the strategy has failed to create NHS wide interoperability standards which would allow the seamless integration of a large number of devices and allow for larger patient autonomy. There is no alignment with academic curricula (Medicine and Nursing) and students do not receive any guidance or preparation for future digitisation in their professional domain. The strategy falls short of providing guidance to establish knowledge bases for informal carers and patients. SMEs and large industries have no clear guidance on what to expect over the coming years with regards to the implementation of eHealth technology.
How well does the Scottish Government’s draft Digital Health and Social Care Vision 2017-2022 address the future requirements of the NHS and social care sector?

The Scottish Government’s draft is too much oriented towards the state of the art rather than future technologies and is not in line with recent global developments in the digital health domain. Highlighted visions do not really put upcoming information technologies such as latest generation network technologies (5G), cloud computing, radio access technologies, data security, etc in context with the delivery of care up to 2022. This is in particular difficult to understand as Scotland has the highest prevalence for asthma in the world and the introduction of smart, hyper-connected inhalers is just about to start. English publications, for example such as the NHS in England National Information Board publication “Personalised Health and Care” (November 2014) are far more explicit and inclusive.

Do you think there are any significant omissions in the Scottish Government’s draft Digital Health and Social Care vision 2017-2022.

First it is important to mention, that the outcomes of the 2011 McClelland report are still not fully implemented and that not all concerns raised by the report have been addressed.

Compared with the global progress on eHealth these topics should be far more progressed, maybe on a white paper level, and be much closer to implementation.

What key opportunities exist for the use of technology in health and social care over the next 10 years?

- Due to its size and availability of excellence in relevant fields (Cybersecurity, IT architecture, Law, Social Science, User-Interaction Design, Network Technology) Scotland is in an excellent position to develop future-proof and sustainable solutions to support world class eHealth solutions thus creating massive economic growth potential. This sits well with Scotland’s current strong growth in digital technology.
- Modern eHealth solutions would provide the backbone in order to protect and enhance Quality of Service and Quality of Experience in the Scottish NHS
- It would also enhance the safety, security and resilience of NHS network technologies
- It would allow patients to manage their own medical data
- It would enhance the government’s capability to provide world class population health management
- By working with telecommunication operators / network providers, the NHS, the public and other relevant stakeholders (co-creation / co-design) viable and sustainable eHealth solutions could be generated, making Scotland a leading provider of eHealth
- New curricula for medical professionals could be developed integrating digital strategies in the existing training and teaching programs
• Education and training for informal carers and patients and CPD for existing professionals could be developed and delivered via the Internet
• Savings in the NHS by digitalising the supply chain and preventing drug and consumable expiry dates to lapse
• Prevention of mixed identities and human error during the treatment process through tagging and tracking
• Streamlining of patient flow and increasing safety standards
• Seamless integration of hospital and outpatient treatment / monitoring
• Implementation of “Precision Medicine”
• Integration of “smart pharmaceuticals” for example for asthma, COPD and diabetes
• Enhanced integration of medical- and social care
• Allow for better integration of formal and informal care
• Support self-management

What actions are needed to improve the accessibility and sharing of the electronic patient record?
There needs to be a serious discussion on whether the current concept and architecture of the Scottish Electronic Health Record (EHR) are suitable and future proof. The Scottish Electronic Health Record is based on a “Hub-and-Spoke” approach which aims at the centralised integration of data. There is a variety of problems with this approach

• Contrary to public belief the centralised EHR is almost never complete as a variety of parallel databases continue to exist.
• The general trend is moving away from a centralised data basis to so-called “Multi Edge Cloud” architectures. These technologies will be supported by 4th and 5th generation networks
• The government has to assume overall responsibility for the centralised data and has to develop more and more sophisticated governance policies
• Central databases are susceptible to malignant attacks such as ransom attacks (such as WannaCry) or DDOS attacks

A comprehensive merger of all existing information into one centralised database will be almost impossible. Most NHS boards cannot even manage the merger of patient data and digital images (PACS), which are still completely different computer systems. It is unlikely that NHS boards will be able to find the funding to establish future-proof IT infrastructures over the next decade in order to provide end-to-end services including upcoming innovation.

The government should assess distributed strategies that actually banks on decentralised information including authorisation and monitoring capability for data owners. This should take into account future developments in the telecommunication industry.

In any case the existing data infrastructure should be assessed against the European GDPR requirements.
What are the barriers to innovation in health and social care?

- Lack of integration among NHS organisations
- Lack of integration of “health” and “digital” on government level
- Lack of recognition of “eHealth” as proper and relevant medical domains on GMC and RCN level
- Fears of further staff reduction following the implementation of eHealth technologies
- The shortage of financial resources caused for example by national policies such as austerity and “Brexit” are clearly a relevant issue to small-medium sized enterprises and academic institutions. The funding gap has so far not been compensated by either the Scottish- or national government
- Ongoing austerity in the NHS does not allow the NHS to provide funding for development, implementation and training in context with innovation. The growing pressure on staff is increasing the resistance of the NHS as an organisation to change. On the other hand the shortage of resources simply does not allow for time-intensive change management arrangements on all levels.
- Lacking academic- and training programs on all levels
- Lack of trust by patients and professionals
- Security and privacy concerns
- Bad press related to unauthorised data dissemination, for example the case of the Royal Free in London which did pass on rich patient data to Deep Mind, a Google subsidy without seeking explicit patient consent
- Lack of stakeholder integration into national decision-making processes in the health domain
- Uncritical and uninformed procurement with excessive spending on technology consultants