1. 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 any case.

2. 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.
3. 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 publication, for example such as the NHS in England National Information Board publication “Personalised Health and Care” (November 2014) are far more explicit and inclusive.

4. 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 are addressed.

A vision document is a very early stage policy creation. According to the relevant web-page http://www.ehealth.nhs.scot/strategies/the-person-centred-ehealth-strategy-and-delivery-plan-stage-one/ the following topics are addressed:

**Our Vision**

We have developed a draft vision for the new Strategy, in consultation with a wide range of stakeholders. Click on the link in each part of the Vision, to view existing case study examples that show how the Vision will be realised.

**As a citizen of Scotland:**

*I have access to the digital information, tools and services I need to help maintain and improve my health and wellbeing.*

*I expect my health and social care information to be captured electronically, integrated and shared securely* to assist service staff and carers that need to see it, and that *digital technology and data will be used appropriately and innovatively to help plan and improve services, enable research and economic development* and ultimately improve outcomes for everyone.

*We will add material to this page over the next few weeks, so please revisit regularly to be kept up to speed on developments. Whether you are a health care or social care professional, a sector manager or planner, a systems developer, or a patient or carer, we would welcome your views at the email address above. Please make sure you add your name, your role or interest, and your contact details as well as whether*
we can publish your comments (with or without your name and organisation) in any future consultation report.

Please also share this information with any relevant colleagues and encourage their participation – thank you!

June 2017

Compared with the global progress on eHealth these topics should at this point in time (2017) not be subject to a vision document but should be far more progressed, maybe on a white paper level, which is much closer to implementation.

An eHealth Strategy draft document 2017 – 2022 could not be found. The link provided in the call for views points towards a homepage providing a collection of mostly experimental, single standing eHealth solutions and applications. It is unclear in how far the individual solutions have been validated and what their role-out stages and adoption rates are.

However, there is reference to a 2015 document entitled: EHealth Strategy 2014 – 2017. This strategy document is in essence based on another vision document outlining the Scottish Government’s vision for the year 2020:

The eHealth Vision
By 2020 eHealth in Scotland will:
Enable information sharing and communications that facilitate integrated health and social care across all settings from the patient’s home to the hospital.
Provide information processing, analysis and intelligence that supports and complements the work of health and social care professionals and improves the safety and quality of care.
Support people to manage their own health and wellbeing and live longer, healthier lives at home or in a community setting.
Contribute to a partnership between the Scottish Government, NHSScotland, the research sector and industry to enable Scotland to be a long term leader in digitally enabled care.

It is very difficult to evaluate in detail in how far the outlined targets have actually been met. No particular key performance indicators and measurable quantitative targets have been provided and the promised eHealth outcomes are rather unspecific:

eHealth Outcomes

Achievement of the 2020 Vision for eHealth is expected to result in substantial benefits for citizens, patients and health and social care staff as follows.
Citizens and Patients, in addition to their face-to-face care, will be able to:
use a patient portal to access their own Personal Health Record and make their own contributions to the record;
have structured access to information about prevention, managing their health and the availability of relevant health services, and a route to access peer and community support, for example as currently being trialled through the Living it
Up programme; order repeat prescriptions and book appointments online and use secure two way electronic communication with their health and social care providers to receive information, make enquiries and track their care arrangements; access a portfolio of proven technology enabled solutions, such as home health monitoring, tailored to match individual patient’s condition(s) and circumstances. This will enable them to undertake a much larger role in managing their own health care.

Clinicians, Social Care Staff and other third sector partners will be able to: quickly access at the point of care an Electronic Patient Record that provides the information that they need to make their contribution to the patient’s care within the context of the wider health and social care team; electronically record their findings, and share these with the rest of the care team, and quickly and easily initiate care processes, such as investigations, referrals, and treatments, and generate clinical correspondence. Workflow will co-ordinate the inputs of other staff and monitor the patient’s progress; have quick and easy access to increasing amounts of clinical guidance and decision support that is relevant to the specific patient context, including highlighting any substantial variation from expectations, and generating appropriate prompts and alerts.

Managers, Planners and Researchers will have: better access to appropriately anonymised and summarised data, arising from the myriad of patient contacts taking place across NHSScotland, that will enable individual and teams of clinicians to analyse, better understand and improve their clinical practice; support from immediate information that enables them to take operational decisions on an hour-to-hour and day-to-day basis that can improve patient flow and the management of outpatient, inpatient and community services; a greater capacity to analyse and understand specific patient populations, whether by geography, age group or condition(s), and undertake risk stratification and predictive analytics that can inform prevention measures and early intervention with a view to improving health and reducing unplanned admissions.

As a result of the above, eHealth will contribute towards a continuing shift of the location of care along the spectrum from acute hospitals towards the patient’s own home, with eHealth support for community health and social care teams and capabilities to support self-management such as remote monitoring and teleconferencing. eHealth will enable care and treatment to be more personalised and continuous. People will be healthier for longer and when they have health problems these will be predicted and managed more effectively and more efficiently, benefitting not only the patient but also the overall sustainability and total capacity of the health system.

In light of the above stated question No. 4 cannot be answered in a satisfactory manner.
5. **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 generate, 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 prevent 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.

6. **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 believe the centralised EHR is almost never complete as a variety of parallel data bases continue to exist.

The general trend is moving away from centralised data basis to so called “Multi Edge Cloud” architectures. These technologies will be supported by 4<sup>th</sup> and 5<sup>th</sup> 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 data base 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 board 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.

### 7. What are the barriers to innovation in health and social care?

- Lack of integration among NHS organizations
- 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 organization 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