Scottish Science Advisory Council

Building on the Science Legacy of COVID-19 in Scotland
Annex 3

Summary of discussion from Breakout Group:
Testing/Sequencing

Chair: Sir Mike Ferguson
Note taker: Dr Jodie Hay

> **Q1. How would you summarise the most significant advances made as a result of the response to the pandemic?**

The most significant advancements made as noted by participants in the roundtable were:

- The rapid and successful formation of the Glasgow Lighthouse Lab (LHL)
- Improved/upgraded molecular diagnostic infrastructure in place in NHS labs, particularly now in rural locations
- Improved Next Generation Sequencing (NGS) capacity in Scotland – development of COVID-19 Genomics UK Consortium (COG UK)
- Cross organisation/discipline development "triple helix"
- Increase in workforce numbers, experience, and skillset within diagnostics/screening
- Increased public understanding and acceptance of testing and genomics
- Increased awareness of accreditation and quality assurance
- Forced improvement of data linkages and data flows, including linking to NHS Chi (community health index) number
- High proportion of the public embraced testing at home (68%). Testing at home has been transformational with people at home also becoming familiar with booking online and test site facilities.
- Rapid generation, testing and deployment of vaccines
- Well-co-ordinated clinical trials of scale – including for the repurposing of existing therapeutics
- Rapid deployment of structure-enabled drug discovery for new antivirals

> **Q2. Did major changes occur in how Scottish academia and/or the private sector interacted with governments (SG and UK) that should continue to be enabled into the future, which may be particularly important in responding to future emergencies?**

- All teams worked together to solve a problem. Main discussions were around how academia/health boards/industry worked well together, rather than government interactions
- A recurrent theme was "good behaviours" by the academic, industry and NHS partners rising to the pandemic challenge

Q3. What are the top 2 or 3 actions which you would recommend that SG takes to build on the legacy of the advances made, during 2022 and in the medium-term?

Embrace the momentum for change and try to preserve the triple helix and encourage more Public Private Partnerships (PPPs). This needs to come through incentives in terms of funding for the public sector partners and allowance to profit from innovation for the private sector partners.

Embrace and build on the public's readiness to self-test at home and expand this into other diagnostics (e.g. cancer liquid biopsy) and use this approach, together with targeting harder to reach communities, to tackle health inequalities.

Q4. What would be needed (in terms of resources, physical and/or organisational infrastructure change) to translate these actions into practical plans for improvements in health care and wellness for the Scottish population?

Significant investment should be made to:

Preserve and utilise what has been built: Enhanced NHS Core Labs and sequencing, and Lighthouse, should be configured for long-term pandemic preparedness and for current real and pressing issues, such as antimicrobial resistance (AMR) surveillance (requiring whole genome sequencing and bioinformatics).

The capacity and competence for screening/testing in rural setting should be capitalised and coordinated with central hubs in partnership. In doing so, this expands the skill sets and resources in rural locations and provides facilities much closer to the patient.

To capitalise on the well-embraced home-testing and mobile-testing revolution and use this to target areas of social deprivation where individuals may be less likely to visit GP. This should include "precision diagnostics" to triage and identify disease progression across a spectrum non-communicable as well as infectious diseases.

Q5. Any other key lessons that should be recorded.

The importance of (public/private) partnerships to meet common goals must be re-emphasised.

The opportunities for the improvement of individual and collective health, and associated improvements in national economic performance, through the application of diagnostic and surveillance innovations should be grasped by the Scottish Government (SG). Such innovations, coupled to a properly resourced and funded NHS, will address health inequalities and pay dividends.

Clinical Trials

Chair: Professor Craig Ramsay
Note taker: Holly Tibble

> **Q1.** How would you summarise the most significant advances made as a result of the response to the pandemic?

- Cut through the bureaucracy

- A higher degree of trust in boards, Clinical Trials Units (CTUs) etc.

- Great willingness of patients to engage. One of the mission statements of the NHS (England at least) is to support research – not sure if people who sign their contracts realise that.

- COVID showed us that clinical trials were valued by the community, and hospitals were enthusiastic to join. Data collection can occur in a clinical setting in near real time.

- At the local level, we implemented a system of rapid approvals and amendments, including informing people by WhatsApp (part of the standard operating procedure (SOP)). Created opportunities for breaches, but they were addressed as occurred. Raising the profile of non-clinical research staff in a positive way. Recently implemented local survey on research capacity and culture, with over 500 responses.

- Adaptation and adoption of new ways of working – delivering research, engaging with stakeholders and patients – can this be maintained? Great to hear that at a site level this is being put into routine practices. Want to retain the culture and momentum, while protecting resources and returning work to non-covid projects.

- Rapid easy access to near real-time Electronic Health Record (EHR) was also of huge importance. You can't run an Independent Data Safety Monitoring Committee (IDMC) without this. If you only get EHR data every 6 months (or less) then you need to have enough research staff to report events. Then you lose the efficiency and cost-saving etc. However, digital data charges can also be unhelpfully high.

- Task forces for prioritising drugs research and expedited process. Pragmatic data collection (like recovery trial) cut down the amount of data being collected. In big teaching hospitals there are loads of people getting involved in the trials.

- Proposing the model of their study to other health boards for access of patients to clinical trials (hub and spoke model).

- Second hand information, but from the RECOVERY & RECAP-CAP investigators Dumfries and Galloway (DG) hospitals were the best recruiters.

- Not surprised at the above. Lots of studies competing for Research Nurse (RN) resource in teaching hospitals, particularly vaccine trials.

- Was struck by one of the reflections on the "public health" slide presented earlier that I think applies equally to clinical trials i.e. need to invest in interoperability between health and outcome datasets.

- Clinical trials are diverse. International clinical trials do not readily lend themselves to data-enabled design. If most of the patients enrolled in Russia, Ukraine, Argentina, China and the USA then there is limited advantage.

- Health economics is important but it's very country specific.

> **Q2.** Did major changes occur in how Scottish academia and/or the private sector interacted with governments (SG and UK) that should continue to be enabled into the future, which may be particularly important in responding to future emergencies?

Q3. What are the top 2 or 3 actions which you would recommend that SG takes to build on the legacy of the advances made, during 2022 and in the medium-term?

- Urgent COVID trials agency met 3 times per week, with specialist advisors reviewing plans every night. Can we retain a sustainable version of this model? Want an agile, streamlined, and flexible infrastructure.
- More infrastructure to support community care, want trials to follow a similar model.
- We are not the only country that upped their game with data collection, although we did great. We have to keep this up and lobby to the government for more resources, so Scotland is a hot spot for trials.
- Within a region if you have an influx of Intensive Care Unit (ICU) admissions, there are opportunities for THAT site to be a centre for a trial. but not all hospitals have EHRs. Good energy and understanding of EHR benefits, but not the infrastructure. Need to invest here.
- Absolutely agree to rapid access to EHR data and routine hospital episode statistics was essential to these studies. This should be the norm for all trials.
- NHS staff should make Continuing Professional Development (CPD) mandatory. Reduce the links in the chain for approvals. As an investigator, there can be a them v. us situation and not genuine team spirit.
- Not everything is a 'clinical' trial, many are complex interventions etc. which have been largely ignored the survey.
- Health inequalities levelling up.

Q4. What would be needed (in terms of resources, physical and/or organisational infrastructure change) to translate these actions into practical plans for improvements in health care and wellness for the Scottish population?

- Recovering non-covid portfolio and keeping the good momentum needs a workforce strategy.
- Should we push Good Clinical Research Practice (GCRP) training as a key aspect of CPD. All Healthcare Personnel (HCP) have to do CPD. They have signed an NHS contract to support research. All HCP should have GCRP training as a mandatory part of CPD.

Q5. Any other key lessons that should be recorded.

- The Association of the British Pharmaceutical Industry (ABPI's) Clinical Research Report published in September 2021, details our recommendations for how we build from COVID learnings and transform clinical research across the UK: https://www.abpi.org.uk/publications/clinical-research-in-the-uk-an-opportunity-for-growth/

Data Science/Reuse

Chair: Professor Andrew Millar
Note taker: Alpana Mair

> **Q1.** How would you summarise the most significant advances made as a result of the response to the pandemic?

- Access to population level clinical data
- Public Health (PH) and data scientists from the universities were able to work together and build research component to broaden the impact of the data so that research informed health response.

> **Q2.** Did major changes occur in how Scottish academia and/or the private sector interacted with governments (SG and UK) that should continue to be enabled into the future, which may be particularly important in responding to future emergencies?

These arose due to the urgency of needing to understand the data to inform decisions and included:
- Genomics made a big difference in policy and on the public and was able to influence decision making
- Use of science to influence policy and this needs to be preserved
- Scientists and data analysts from Public Health Scotland (PHS) were brought together building on each other's strengths
- Access to real time data so that research informed policy

> **Q3.** What are the top 2 or 3 actions which you would recommend that SG takes to build on the legacy of the advances made, during 2022 and in the medium-term?

The key themes that arose can be categorised into the broad areas below:

1. Top level strategic need = leadership
- Need to set an agenda in Scotland.
- SG has a leadership role in signalling intent with regard to integration and use of health and related data.
- e.g. PHS action was limited due to waiting for results of pilots started earlier in UK PHE – so SG was slower to catch up.

2. Major message on data: Need to streamline permissions, as that process was limiting
- e.g. – see benefits from using unconsented data in near real time during COVID, next need national discussion on broadening to other diseases/conditions
- e.g. the first vaccines were developed faster than permissions for genomic data
- e.g. suggestion of insider advantage, inequitable access to data: for some researchers 'we couldn't even find someone to say no we can't have data access'
- e.g. need to broaden expectations, allow 'unusual' data types and data linkages to be permitted – e.g. for genomics, e.g. for wastewater monitoring
- Related e.g. need to ensure research results can be used quickly, before peer review, as during the pandemic with preprints

3. Messages on organisations
- Advantage of COVID was to broaden engagement across organisations and the country, seek to keep these advantages not return to siloes.
- Most broadly, don't focus/privilege the clinical; we saw evidence of this tendency even in the questionnaire summary for this meeting: the opportunity is to keep including the social/behavioural science, public health, environmental monitoring, broader determinants of health that we saw were effective in COVID.

- e.g. innovation links universities/NHS/PHS especially genomics
- e.g. beyond EAVE II (Early Pandemic Evaluation and Enhanced Surveillance of COVID-19) – preserving the underpinnings as people return to day jobs
- e.g. broaden the targets for wastewater monitoring, where the data are easier to share, making use of the investment and learning from sectors other than health e.g environment which created a nationwide wastewater monitoring system from scratch.

4. **But this requires so many actions that it was described as a change in culture (again, that's why signalling intent is important)**
   - e.g. need to increase overlap of Motivation and aims among participants – the pandemic broke down the previous divergence between researchers and public health, for example.
   - e.g. address Skills gap, as has been very valuable to have researchers embedded within PHS and Health Boards for two-way communication, help research to become embedded in the way PH is carried out. This then allows researchers to develop useful methods AND practitioners to adopt them, across Scotland.
   - e.g. specific need to upskill analysts with data skills so that universities work with Health Boards across the country.
   - e.g. Scottish Government often seems to have lacked the capacity to take an innovation and then ensure that it is deployed widely/scaled up/applied to health needs (referred to multiple times in different contexts).
   - From frontline practitioners perspective:
     - More needs to be done about considering the benefit science makes to practice and translation of this to the frontline. "1000 flowers bloom but how do we help the stars shine."
     - Find more effective way to get research to wider organisation that need reports some of which may not be peer reviewed so that we can react and make change quickly with appropriate risk management.

> **Q4. What would be needed (in terms of resources, physical and/or organisational infrastructure change) to translate these actions into practical plans for improvements in health care and wellness for the Scottish population?**

Practical plans for improvement:

- Clear streamlined process for permissions for data access, especially important for those from non-health backgrounds.
- Building data capacity: Public health surveillance – breadth at which we need to recruit expertise and capacity and have technical expertise vs health.
- Ensuring that research continues to be translated into practice and how this could be used for the management of Long Term COVID (LTC).
- Bridging the skills gaps and aligning motivations and ambitions and between academic researchers and those in PHS – collaboration being embedded in PHS and Health Boards (HB) to upskills analysts to upskill so that research becomes embedded in how we do things.
- Helping junior researchers see how they can contribute to health policy.
- A more collaborative approach among the scientists – sharing methodological approaches that might be developed and infrastructure and making that available nationally locally.
- Data should be fit-for-purpose to use to better support prevention in routine practice and not just emergencies and in policies across government not just health.

Q5. Any other key lessons that should be recorded.

Specific points:

- Funding is limiting – core funding to sustain not just projects
- Companies contributed more in England than in Scotland (none of our participants had worked with companies, or at least they had no points to share about that process), e.g. McLaren to data dashboards.
- Need to ensure computing capacity is available where it's needed e.g. in PHS for genomic analyses. At the moment universities have the computing power to manage the data analysis but do not have access to the data due to privacy and access issues.
- How lessons learnt can be used for upskill and expansion e.g looking at health inequalities especially with determinants of health so wider sharing of benefits from COVID
- Genomics linkage can be expanded to other areas e.g drug resistance – HIV outbreak in Glasgow
- Waste water surveillance – use this to look at alcohol misuse / serotonin environmental and health consequence
- COVID was a common goal – how do we create a new one to enable continuation of work?
- Allowing frontline practitioners to become involved in research

Scaling Up Engagement

Chair: Professor Julie Fitzpatrick
Note taker: Alasdair Maclean

High level points from discussion:

1. General agreement around positive cross sectoral working throughout the pandemic. Collaboration between academia, industry, government and NHS crucial. Lots has been achieved that would not have been possible by one of these groups alone. A need for all groups to understand the common goal. A One Scotland approach referenced throughout.

2. Interface between NHS, academia and industry has resulted in upskilling the workforce. Cross sectoral working and skilled workforce a key legacy.

3. While the above is true, a sense that more can be done, particularly around engaging with industry. Formal routes of communication to reach industry, such as the role of the Industry Leadership Group coming through.

4. Data infrastructure a problem, particularly around getting data from private sector.

5. Scotland in a unique position for testing capabilities. A huge opportunity here.

6. General agreement that government engagement has improved during the pandemic, however further channels of engagement would be welcomed and a real need to ensure this continues during a non-emergency setting.

7. Action required to document what went well and what lessons need to be learned. Essential to retain the people and resources so we're prepared for the next emergency. Planning and preparing for the next pandemic must happen now. Sense that we weren't prepared when COVID first hit, but this was because we did not invest beforehand.

8. Role of Scottish companies and how they remain at top. Danger that we go overseas for things rather than home grown. Need to fund and incentivise companies.

> **Q1. How would you summarise the most significant advances made as a result of the response to the pandemic?**

- A number of successful cross sector working that has never been done before – recruiting and upskilling of staff brought university and college sector together. Upskilling from different sectors. Real benefit of this is that we're able to grow on a large scale of a now highly skilled workforce (this example focuses on Glasgow). That interface between NHS, academia and industry really important to that. Industry experience given to people which makes them more employable.

- Key legacy is that we now have a skilled workforce that can contribute to Scottish economy. Cross sectoral working and skills development a lasting benefit.

- Talks of communication lines across diagnostics veterinary, industry and NHS at the beginning being difficult but once established interface it was a really successful collaboration. Key legacy is for veterinary and industry not to work in silos. Relationship worked well so need to make sure we build on this post pandemic. Should now be able to do this more easily.

- Scotland in a unique position for testing capabilities per capita. Not many other countries in such a strong position as Scotland. Support shown by companies for working with Scotland on how to harness this for Scotland and back to the NHS.

- Might be a perception but feels lots of good work between NHS and academia in particular. Does more work need to be done to engage with industry.

- Huge amount of collaboration between science and engineering. Good to know how that collaboration can continue going forward. This would be a great benefit to Scotland.

- Data infrastructure a huge problem. PHS generates all the data that goes to SG but big concern about how to get the data from private sector. Not enough engagement with industry partners. Really keen to take this forward.

- Reflects on fantastic individual success – but could have had a lot more. Haven't solved how we communicate with industry, maybe we do need more formal routes of communication to reach industry quickly. Industry Leadership Group (ILG) a good way to communicate as well as geographical groups so potential to have a more rapid way to communicate with industry.

Q2. Did major changes occur in how Scottish academia and/or the private sector interacted with governments (SG and UK) that should continue to be enabled into the future, which may be particularly important in responding to future emergencies?

- Agreement with points from above. More channels to engage with government, industry, academia and NHS. Recognise the role of Industry Liaison Groups (ILG) for example.

- A lot to say that's positive re relationships between these groups. Understanding each other's perspectives vital. Things have been achieved in pandemic that one group alone could not be done – collaboration key. Different sectors working together vital – a lot learned about thinking about/learning from about each other's drivers. Success can be achieved when we have a common goal. Lot to be done but lots of good work.

- Group set up years ago called Nexus. Linked industry and academia together. Might need a positive structure together going forward. Agrees about a need for common goal.

- On government engagement, increased engagement from UKG and SG. But what can we do to make sure this happens in normal times and not just in emergency setting. Need to bring four groups together to improve collaboration.

- Working on a study on COVID waste water. Talks about the time it takes to build trust. Brokerage organisation key to the type of trans disciplinary research. Lots of these organisations working in environmental side of things but not the same brokerage organisations in public health sector. Many of these brokerage organisation funding via SG, perhaps a need of a review of these and possibly more funding.

- Welcomed the links with SG over pandemic around vaccine usage and wastage. In terms of government, key role is getting policy environment right. In terms of COVID backlog, government must put together that policy framework.

- Academia v Industry: innovation centres set up to help with that so role for them again.

- Interested in trans disciplinary. People willing to work together and put things to back burner. Need to prepare for next one, funds required here. Talks of the need to spend to save.

Q3. What are the top 2 or 3 actions which you would recommend that SG takes to build on the legacy of the advances made, during 2022 and in the medium-term?

- One Scotland approach is key. Very much reliant on goodwill with her current project but need to bridge silo and continue with a One Scotland approach. Facilitation role for SG? Talks of network of networks and quadruple helix.

- Networks and resources really important but the need to have what worked well/lessons learned documented is key. Fears that if we let things go away, the people who are actually needed won't be here. Essential to retain and document the 'know how' and the people involved. Uses omicron as an example – had we lost the people, resources and infrastructure then we wouldn't have been prepared for this. We need to be ready for the next pandemic or something similar. Do these plans exists?

- Scottish companies developing things like Lateral Flow Tests (LFT) but is the investment in the industry to allow companies to stay at top of chain. Danger is that these things can be bought from overseas. Need to decide if we want these things to be home grown.

- On lessons learned, always something coming along. Suddenly COVID has hit the limelight and told us we weren't prepared – but this is because we didn't invest in it.

- Need to fund and incentivise companies. Need to look at business model. Sending tests to sites overseas is expensive. Is there a role for the labs here to do that? Key role for government would be getting the policy environment right – an economic forum to look at health service resilience. COVID backlog – need to get the work done for patients is critical to get this moving forward – government must push this through.

- Biggest area in Life Sciences in Scotland is around vaccines, biosafety and advanced therapies. Major infrastructure that we need to look at and needs further investment.

Q4. What would be needed (in terms of resources, physical and/or organisational infrastructure change) to translate these actions into practical plans for improvements in health care and wellness for the Scottish population?

We need to map out what Scotland has in terms of physical resources now, and we are then able to see what might be needed immediately, in the medium and in the long-term. Where can Scotland be truly competitive?

There needs to be an organisation (virtual network or otherwise) to focus on the triple/quadruple helix and how to maintain it in order to be prepared for the next pandemic or other emergency.

Q5. Any other key lessons that should be recorded.

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