

Scottish Microbiology & Virology Network (SMVN)

Annual Report 2021 - 2022

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A key objective for the Scottish Microbiology and Virology Network (SMVN) has always been preparedness to respond to national emergencies, which has been realised in the response to the COVID-19 pandemic.

NB: Severe acute respiratory syndrome coronavirus 2 [SARS CoV-2] is the strain of coronavirus that causes coronavirus disease 19 [COVID-19].

The global pandemic is an unprecedented situation which has placed the SMVN community front and centre of NHS Scotland's response. The SMVN has met the enormous challenge of rapidly introducing, developing and maintaining an NHS laboratory diagnostic service to deliver SARS CoV-2 testing, whilst also informing and driving testing strategy and policy.

The SMVN has demonstrated exceptional leadership in a number of key areas including procurement, equipment / test validation, innovation, staffing, quality management, point of care testing, strategy development, production of weekly performance data reports for Scottish Government (SG) and informing policy as SG transitions towards an endemic state. The network has been responsive and flexible in a fluid and challenging situation. This has placed significant strain on staff throughout the Microbiology and Virology community. The capacity to deliver the previously agreed workplan for 2021 / 22 has therefore been severely impacted. It should be noted that the SMVN Scientific Manager, Dr Fiona MacKenzie, has moved from 0.5 FTE to 1.0 FTE to lead and deliver the pan-Scotland NHS diagnostic laboratory response to the pandemic.

Of note, in March 2022 the SMVN SARS CoV-2 Testing Technical Group received the Innovator award at the inaugural Scottish Government Chief Healthcare Science Officer awards. This is a testament to the dedication of the entire team to support Scotland's response to the COVID-19 pandemic.

A. Current position

Since February 2020, NHS Scotland's priority has been to react to and manage the COVID-19 pandemic with the SMVN placed at the forefront. Early in the pandemic the SMVN; in close collaboration with Scottish Government, Public Health Scotland and NSS National Procurement; has enabled delivery of SARS CoV-2 diagnostic testing in all Health Board areas across Scotland. Each NHS Board operates more than one new testing platform and the platforms selected are specific to the unique needs of each Board and patient population. Boards laboratories are accommodating an increase in workload of 30-70% due to SARS CoV-2 testing. NHS Scotland diagnostic labs have capacity to carry out 75,000 SARS CoV-2 tests/week with surge capacity for 96,000 tests/week. The workforce have gone above and beyond the call of duty, making many sacrifices during the pandemic. The SMVN Scientific Manager, Clinical Lead, Operational Group Chair, Virology Specialty Advisor to the CMO and other SMVN members serve on a number of national SARS CoV-2 / COVID-19 groups.

The SMVN has demonstrated its effectiveness as a network, both in the provision of expert clinical advice to shape NHS Scotland's response and in its ability to mobilise to develop a national response. The reliable leadership and communications provided by the SMVN have been appreciated by all NHS Boards.

B. SARS CoV-2 Testing Technical Group

The SMVN SARS CoV-2 Testing Technical Group has become pivotal in the management of COVID-19. It is chaired by Dr Fiona MacKenzie and has continued to meet twice a week since March 2020. The group provides national coordination of efforts, national rollout of equipment, peer support, sharing intelligence and experiences, sharing reagents / assays / consumables, subject matter expertise, input / feedback / commentaries on national papers from other groups. It also has close contact with the Specialist Virology Centres, Public Health Scotland (PHS), NSS National Procurement, Scottish Government, UK Government and companies providing equipment and tests as well as collating management data and reports. The group is also used as a conduit for sharing information and communications from other national groups.

Local provision of PCR diagnostic testing services is essential for patient treatment and management; in particular to avoid unnecessary cross-transmission of the virus and unnecessary deaths. Recently, differentiation between variants (Delta / Omicron) has enabled targeted neutralising monoclonal antibody and antiviral therapy in clinically unwell patients. Rapid testing has, in particular, been used on unscheduled admissions to inform patient placement and on staff to enable safe return to work during times of extreme pressure.

The net result has been delivery of a patient centred, safe, effective, equitable and sustainable service for SARS CoV-2 (and other pathogen) testing.

C. SARS CoV-2 Testing Informatics

The SMVN has been responsible for collating, analysing, visualising and presenting information on SARS CoV-2 testing within NHS Board laboratories on a weekly basis, since May 2020 and continues to do so. The SMVN continues to provide performance metrics across NHS Scotland which has informed Scottish Government strategy.

D. SMVN Infection Prevention and Controls Doctors (IPCD) Group

The role of IPCDs in the COVID-19 pandemic has been crucial. This group has provided subject matter expert input into a number of national policy documents and guidelines. The need for an IPCD Specialty Advisor to the CMO has been raised. The group submitted a paper on the roles and responsibilities of the IPCD as part of a larger piece of work on workforce development. The group provided feedback on a number of areas of the COVID-19 response and supported the IPC training day for infection trainees across Scotland.

E. SMVN Mycobacterial (TB) Testing Group

The SMVN business case, leading to the national procurement of a “Once for Scotland” solution for Molecular Diagnostics for the Rapid Identification of TB was successfully executed.

Equipment secured via the agreement was due to be delivered from March 2020 onwards however, the process was halted due to the COVID-19 pandemic. Cepheid GeneXperts originally stocked for mycobacterial testing were purchased using Scottish Government funds for SARS CoV-2 testing as, at the time, it was impossible to place new GeneXpert orders

for SARS CoV-2 testing. Smaller, remote / rural Boards with multidisciplinary laboratories, in particular, have acknowledged the significant contribution this has made to their ability to provide an essential local SARS CoV-2 testing service for their populations. This is a good example of the **right test** being delivered in the **right place** at the **right time** with the **right impact**.

F. Antimicrobial Resistance (AMR) Diagnostics Group

This SMVN Sub-Group has remained active despite prioritisation of COVID-19. In particular, Dr Mairi Macleod (Group Chair) has maintained engagement with bioMérieux in order for the NHS Scotland Vitek 2 equipment to be updated to include the most recent EUCAST interpretive criteria and dosing guidelines. Via the chair, the group has also maintained close contact with the British Society for Antimicrobial Chemotherapy (BSAC) AST Steering Group, the Scottish Antimicrobial Prescribing Group (SAPG), ARHAI Scotland and the Scottish One Health Antimicrobial Use and Antimicrobial Resistance (SONAAR) programme.

G. Molecular Testing

The landscape across NHS Scotland has changed significantly due to equipment becoming available for SARS CoV-2 testing which may be used for a range of additional molecular tests. A new subgroup has been formed to provide strategic direction and guidance across Scotland, with representatives identified across all NHS Boards.

H. SMVN Mycology Group

During the COVID-19 pandemic, higher than normal cases of fungal infections in ICU patients were observed. This new group has recently been established to assess the burden of fungal infections in Scotland and to standardise diagnostics and therapy of fungal infections.

I. SMVN Sexual Health Laboratory Group

A new SMVN Subgroup had been established which will liaise closely with and include sexual health leads and PHS. It will address issues such as implantation of British Association for Sexual Health and HIV (BASHH) guidelines, roll out of new platforms for *Chlamydia trachomatis* and *Neisseria gonorrhoeae* (CT / NG) testing as well as HIV testing.

J. SMVN Cystic fibrosis (CF) Microbiology Group

CF Microbiology is a challenging sub-specialty and there is a general lack of national / international guidance. The SMVN CF Microbiology guidelines were produced in 2015. The SMVN CF Microbiology Group was reconvened to update the guidance.

K. SMVN Microbiology Sample Solution (MSS) Group

Viral PCR Sample Solution (VPSS) was originally used by NHS Greater Glasgow and Clyde to inactivate pathogens in clinical samples for transportation to diagnostic laboratories. Its use was expanded across NHS Scotland during the COVID-19 pandemic. The SMVN has worked with NSS National Procurement and commercial companies to develop a more generic Microbiology Sample Solution (MSS) which inactivates a range of pathogens in clinical samples. The SMVN has created the MSS group to co-ordinate work demonstrating specific pathogen inactivation and to demonstrate that the product meets relevant health and safety standards.

L. Exceptions

Areas of the workplan that may not be completed in the current commissioning year due to COVID-19 prioritisation are highlighted in the appendix.

It should be noted that, where it has not been possible to progress workplan items, a plan is in place to ensure objectives are picked up in the 2022 / 23 workplan.

M. Looking forward

The SMVN is committed to delivering a workplan geared towards service modernisation in the post-pandemic landscape. This will include work with the DiSSG structures and the emerging Strategic Network for Diagnostics.

The SMVN will also continue to lead the SARS CoV-2 Testing Technical Group and work with the SG Test and Protect Transition Board to shape policy and services for COVID-19 endemicity. They will continue to provide their expertise to the ongoing management of the pandemic / endemic as subject matter experts.

N. Workforce Planning

The SMVN is committed to the development of a flexible and sustainable workforce and has been part of the laboratories-wide workforce planning initiative since inception. The SMVN provided workforce information for the 2021/22 data collection.

O. Continuous Improvement

The SMVN Operational Group (SMOG) will consider a return to benchmarking across microbiology and virology services in the second half of 2022 / 23.

P. Finance

Over the past two years, Dr Fiona MacKenzie's salary costs were paid for by the SG COVID-19 budget and did not come out of the SMVN budget.

Whilst planned meeting costs have not been incurred, the SMVN plans to utilise its budget to raise awareness of the network amongst its stakeholder communities.

SMVN WORKPLAN: 2021 - 2022

When defining network objectives please consider the Institute of Medicine's six dimensions of quality, which are central to NHS Scotland's approach to systems-based healthcare quality improvement:

1. **Person-centred:** providing care that is responsive to individual personal preferences, needs and values and assuring that patient values guide all clinical decisions;
2. **Safe:** avoiding injuries to patients from healthcare that is intended to help them;
3. **Effective:** providing services based on scientific knowledge;
4. **Efficient:** avoiding waste, including waste of equipment, supplies, ideas, and energy;
5. **Equitable:** providing care that does not vary in quality because of personal characteristics such as gender, ethnicity, geographic location or socio-economic status; and
6. **Timely:** reducing waits and sometimes harmful delays for both those who receive care and those who give care.

Key

RAGB status	Description
RED (R)	The network is unlikely to achieve the objective by the agreed end date.
AMBER (A)	There is a risk that the network will not achieve the objective by the agreed end date but progress has been made.
GREEN (G)	The network is on track to achieve the objective by the agreed end date.
BLUE (B)	The network has been successful in achieving the network objective to plan.

Objective Number	Smart Objective	Planned start/end dates	Detailed Plan Available / Owner	Description of progress towards meeting objective as at April 2021	Anticipated Outcome	RAGB status
1. Effective Network Structure and Governance <small>[linked to Quality Dimensions 3,4,5,6]</small>						
2021-01	SMVN will ensure an effective governance structure by developing a meeting calendar to support good planning in the year ahead, ensuring strategies are updated and refreshed.	April 2021 – March 2022	Core Team	Monthly meetings planned.	SMVN is enabled to manage delivery of its workplan effectively.	G
2021-02	Develop a refreshed five year vision for SMVN	April 2021 – September 2021	Core Team	This is on hold due to the COVID-19 pandemic.	A vision for optimising Microbiology and Virology services, informed by NHS Scotland's COVID-19 response.	R

2. Service Development and Delivery [linked to Quality Dimensions 1,2,3,4,5,6]

2020-03	Support the delivery of NHS Scotland's response to COVID-19	April 2021 – March 2022	SMVN Manager	SMVN is significant contributor to this work via the SARS CoV-2 Testing Technical Group. SMVN provides NHS Lab weekly performance metrics to SG. Labs comms are channelled via SMVN.	SMVN community actively engaged in strategic planning of response. Strategic decision making enabled through accurate information on lab position.	G
2021-04	Develop a strategy for molecular testing in partnership with other disciplines, informed by COVID-19 legacy equipment	April 2021 – December 2021	SMVN Manager	Types and locations of equipment have been collated.	Molecular testing deployed in Scotland in a planned and strategic manner, informed by appropriate experts	A
2021-05	Develop a Microbiology and Virology workforce to meet the challenges of the future as described in Realising Realistic Medicine and the Healthcare Science National Delivery Plan, through: Contribute to the realisation of the recommendations of the workforce planning report.	September 2021 – March 2022	SMVN Lead Clinician SMVN Manager SMVN PSO SMVN Steering Group	SMVN contributed to the DiSSG workforce data collection exercise in 2021/22.	Improved workforce intelligence. Support for the development of a long-term sustainable workforce profile.	G
2021-06	SMVN will lead work on the development of standardised SMIs, supported by the national laboratories programme. Identify and develop core reporting structures / codes requiring standardisation.	September 2021 – March 2022	Sandra Higgins	This is on hold due to the COVID-19 pandemic.	Streamlined practices to enable the implementation of a distributed services model, including a common LIMS.	A
2021-07	Lead a service review of Microbiology and Virology, supported by NLP	September 2021 – March 2022	NLP	The NLP was decommissioned in June 2021 and work halted.	Business case for new service model informed by SMVN conclusions.	R
2021-08	Develop a strategy for Molecular Diagnostics in Scotland through the mapping of infrastructure and establishment of a Subgroup	May 2021	Molecular Diagnostics Subgroup	A subgroup has been established and an initial scoping exercise undertaken.	Strategic approach to use of newly deployed technology	G
2021-09	Develop a clear understanding of the scale and management of fungal infections in Scotland	May 2021	Mycology Subgroup	A subgroup has been established and an initial scoping exercise will be undertaken in 2022/23.	A clear understanding of the burden and management of fungal infections in Scotland	G

3. Stakeholder Communication and Engagement [linked to Quality Dimensions 1,3,4,5,6]

2021-10	Continue to raise the awareness of SMVN and its work through:- Refreshed communications strategy Newsletters (minimum 2 per year) Informative and up to date website, including members area	April 2021 – March 2022	Core Team	Enhanced engagement took place over 2021/22 via E-mail communication to members although formal newsletters were not produced due to COVID-19 pressures. The communication strategy will be refreshed in 2022/23.	Stakeholders are updated on the work of SMVN and have opportunity to provide input. SMVN's work is enriched from the input of a wider range of stakeholders.	A
2021-11	Utilise the SMVN communications channels to provide a direct route for two-way communications on the COVID-19 response	April 2021 – March 2022	SMVN Manager	Regular (daily) communication is issued from the network Scientific Manager.	SMVN community informed and engaged on COVID-19 strategy.	G

4. Education [linked to Quality Dimensions 1,2,3,4,5,6]

2021-12	Refresh education strategy in line with NLP needs and post-COVID-19 landscape	September 2021 – March 2022	Core team	The NLP was decommissioned in June 2021. This will be refreshed in 2022/23	A strong and cohesive Microbiology and Virology workforce which is resilient, effective and sustainable that is capable of meeting challenges described in Realistic Medicine and the Healthcare Science National Delivery Plan.	R
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5. Audit and Continuous Quality Improvement [linked to Quality Dimensions 1,2,3,4,5,6]

2021-13	Work with the Information Management Service to develop a range of reports to provide accurate and useful information and drive service improvement.	September 2021 – March 2022	Core Team/IMS/SM OG	SMVN did not carry out a benchmarking exercise in 2021/22 due to the COVID-19 pandemic. Weekly data reports are issued to support the NHS response to the pandemic.	NHS Scotland will have a clearer picture of Microbiology and Virology activity and an agreed way forward to develop the data set further and use the information to target variation and improve quality.	G
2021-14	Provide SMVN support to the development of the national LIMS	April 2021 – March 2022	Stephen McGlashan	SMVN has representation on the LIMS National Board.	Specification for a national LIMS developed incorporating the needs of the microbiology and virology communities	G

6. Value [linked to Quality Dimensions 1,2,3,4,5,6]

2021-15	Work with National Procurement to finalise the procurement of TB molecular diagnostics equipment / consumables. Support national implementation. Evaluate this work and develop recommendations about other molecular technologies.	April 2021 – March 2022	NSM/PM	Work in complete in most Boards. There is a risk in relation to Islands Boards not implementing local TB testing.	Best value achieved for NHS Scotland in unified procurement	A
2021-16	Explore the new 5 year AMR strategy including publication of AMR & AST testing guidance (where this falls outwith European guidance)	September 2021 – March 2022	NSM/AMR Group		Unified approach to testing across NHS Scotland	G
2021-17	Publication of ESBL Guidelines	September 2021 – March 2022	NSM		Unified approach to testing across NHS Scotland	G

SMVN WORKPLAN: 2022 - 2023

When defining network objectives please consider the Institute of Medicine's six dimensions of quality, which are central to NHS Scotland's approach to systems-based healthcare quality improvement:

7. **Person-centred:** providing care that is responsive to individual personal preferences, needs and values and assuring that patient values guide all clinical decisions;
8. **Safe:** avoiding injuries to patients from healthcare that is intended to help them;
9. **Effective:** providing services based on scientific knowledge;
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Objective Number	Smart Objective	Planned start/end dates	Detailed Plan Available / Owner	Description of progress towards meeting objective as at April 2021	Anticipated Outcome	RAGB status
1. Effective Network Structure and Governance <small>[linked to Quality Dimensions 3,4,5,6]</small>						
2022-01	The network will organise Steering Group and sub-group meetings as required to ensure effective delivery of the 2022-23 workplan. They shall meet at least quarterly.	April 2022 – March 2023	Core Team		SMVN is enabled to manage delivery of its workplan effectively.	G
2022-02	Develop a refreshed five year vision for SMVN.	April 2022 – March 2023	No Core Team		A vision for optimising Microbiology and Virology services, informed by NHS Scotland's COVID-19 response	G
2022-03	SMVN will engage with the new, emerging strategic governance structure for diagnostic services in Scotland, and will be appropriately structured and resourced to ensure delivery of an effective workplan to deliver modernisation of imaging services.	April 2022 – March 2023				G

2. Service Development and Delivery [linked to Quality Dimensions 1,2,3,4,5,6]

2022-04	Support the delivery of NHS Scotland's response to COVID-19	April 2022 – March 2023	SMVN Manager		SMVN community actively engaged in strategic planning of response. Strategic decision making enabled through accurate information on lab position.	G
2022-05	Develop a strategy for molecular testing in partnership with other disciplines, informed by COVID-19 legacy equipment	April 2022 – March 2023	SMVN Manager		Molecular testing deployed in Scotland in a planned and strategic manner, informed by appropriate experts.	G
2022-06	Develop a Microbiology and Virology workforce to meet the challenges of the future as described in Realising Realistic Medicine and the Healthcare Science National Delivery Plan, through: Contribute to the realisation of the recommendations of the workforce planning report.	April 2022 – March 2023	SMVN Lead Clinician, SMVN Manager, SMVN PSO, SMVN Steering Group		Improved workforce intelligence. Support for the development of a long-term sustainable workforce profile.	G
2022-07	SMVN will lead work on the development of standardised SMIs. Identify and develop core reporting structures / codes requiring standardisation.	April 2022 – March 2023			Streamlined practices to enable the implementation of a distributed services model, including a common LIMS.	G
2022-08	Work with National Procurement to renew Vitek contract for AST.	April 2022 – March 2023	SMVN Manager SMVN AMR Group			G
2022-09	Update National Cystic Fibrosis Microbiology guidelines.	April 2022 – March 2023	SMVN CF Subgroup		Standardisation of testing based on up to date evidence.	G
2022-10	Develop a strategy for Molecular Diagnostics in Scotland through the mapping of infrastructure and establishment of a Subgroup	May 2023	SMVN Molecular Diagnostics Group		Strategic approach to use of newly deployed technology	G
2022-11	Assess the burden of fungal infections in Scotland by carrying out a national survey.	May 2023	SMVN Mycology Group		A clear understanding of the burden and management of fungal infections in Scotland	G

3. Stakeholder Communication and Engagement [linked to Quality Dimensions 1,3,4,5,6]

2022-12	Continue to raise the awareness of SMVN and its work through:- Refreshed communications strategy Newsletters (minimum 2 per year) Informative and up to date website, including members' area.	April 2022 – March 2023	Core Team		Stakeholders are updated on the work of SMVN and have opportunity to provide input. SMVN's work is enriched from the input of a wider range of stakeholders.	G
2022-13	Utilise the SMVN communications channels to provide a direct route for two-way communications on the COVID-19 response	April 2022 – March 2023	SMVN Manager		SMVN community informed and engaged on COVID-19 strategy.	

4. Education [linked to Quality Dimensions 1,2,3,4,5,6]

2022-14	Refresh education strategy and host an education event.	April 2022 – March 2023	Core team		A strong and cohesive Microbiology and Virology workforce which is resilient, effective and sustainable that is capable of meeting challenges described in Realistic Medicine and the Healthcare Science National Delivery Plan.	G
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5. Audit and Continuous Quality Improvement [linked to Quality Dimensions 1,2,3,4,5,6]

2022-15	Work with the Information Management Service to develop a range of reports to provide accurate and useful information and drive service improvement	April 2022 – March 2023	Core Team IMS SMOG		NHS Scotland will have a clearer picture of Microbiology and Virology activity and an agreed way forward to develop the data set further and use the information to target variation and improve quality.	G
2022-16	Provide SMVN support to the development of the national LIMS	April 2022 – March 2023	Stephen McGlashan		Specification for a national LIMS developed incorporating the needs of the microbiology and virology communities	G

6. Value [linked to Quality Dimensions 1,2,3,4,5,6]

2022-17	Work with National Procurement to finalise the procurement of TB molecular diagnostics equipment / consumables. Support national implementation. Evaluate this work and develop recommendations about other molecular technologies.	April 2022 – March 2023	No SMVN Mycobacterial Testing Group PM		Best value achieved for NHS Scotland in unified procurement	G
2022-18	Explore the new 5 year AMR strategy including publication of AMR & AST testing guidance (where this falls out with European guidance)	April 2022 – March 2023	No NSM/AMR Group		Unified approach to testing across NHS Scotland	G