

# **COVID-19 UK Inquiry**

## **Module 3: Impact of COVID-19**

### **pandemic on healthcare systems in the four nations of the UK**

#### **Public Health Scotland Statement**

#### **produced in response to Request for Evidence reference M3/PHS/01**

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## 1. Introduction to Public Health Scotland

- 1.1.1 Public Health Scotland (PHS) was launched at the outset of the COVID-19 pandemic, on 1<sup>st</sup> April 2020. PHS is responsible for protecting and improving the health and wellbeing of people in Scotland and reducing health inequalities across Scotland. This includes protecting the people of Scotland from communicable diseases and environmental hazards. PHS works with many partners and stakeholders, including national and local government, NHS Boards, public bodies such as prison and police services, academia, and the third sector.
- 1.1.2 PHS shared its detailed Corporate Narrative (PHS3/1 - INQ000108544) with the UK Public Inquiry in January 2023. This sets out the context in which PHS operates, PHS's joint accountability to the Scottish Government and the Convention of Scottish Local Authorities (COSLA), the general structure of PHS, an explanation of its responsibilities, its governance, an explanation as to arrangements for its funding, how it fits into the wider NHS structures within Scotland, the background as to how PHS came into being, and how staff were transferred across from the legacy bodies. This introduction provides a summary of the Corporate Narrative.
- 1.1.3 Health policy, services and funding are devolved, so national direction in Scotland is set by the Scottish Government, and funding for health is determined by the Scottish Government. However, because many of the determinants of health lie outwith the health sector (e.g., housing, education, income and employment, place and community), Public Health Scotland (PHS) operates in the context of wider public policy and in particular social policy aimed at reducing inequalities. The creation of PHS was an outcome of the Public Health Reform (PHR) programme (see chapter 5 of the Corporate Narrative: Creation of PHS). The PHR programme identified the need for stronger national leadership for public health and a 'de-cluttering' of the public health landscape. Recommendations around the optimal arrangements for PHS were developed and were taken forward through the development and implementation of a Target Operating Model (TOM) (PHS3/2 - INQ000183552).
- 1.1.4 The TOM described how all the parts of the new organisation would work together to:
- Provide strong collaborative public health leadership.

- Take a whole system approach with an external focus.
- Have a clear focus on supporting local systems and play a key role in enabling and supporting delivery at a local, regional and national level.
- Be intelligence, data and evidence led.
- Be innovative and find new ways of doing things.
- Be visibly a new and different organisation.

- 1.1.5 PHS brought together three legacy bodies (see chapter 4 of the Corporate Narrative: Legacy Bodies). These were NHS Health Scotland (a national Health Board), and the two components of the Public Health and Intelligence Strategic Business Unit of the national Health Board NHS National Services Scotland (NSS): Health Protection Scotland (HPS) and Information Services Division (ISD). The PHR programme intended for PHS to be more than the sum of its parts; to be more effective in meeting the challenges facing the people of Scotland than the legacy organisations before it.
- 1.1.6 All staff and functions from the legacy bodies transferred across to PHS under the Transfer of Undertakings (Protection of Employment) Regulations 2006 with two exceptions: a number of corporate services staff from NHS Health Scotland transferred to NSS under the shared services arrangement and the Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) function and staff that were part of HPS remained within NSS.
- 1.1.7 The decision to retain ARHAI within NSS is of particular relevance to Module 3 and is discussed in more depth later in the statement. ARHAI forms part of NHS Assure which was developed to help health boards and regions in Scotland to comply with regulations and avoid risks in healthcare built environment projects. Prior to 1<sup>st</sup> April 2020, PHS legacy organisation HPS had a role in Infection Prevention and Control (IPC), when it encompassed ARHAI. This ceased on 1<sup>st</sup> April 2020 when ARHAI remained within NSS. Professional collaboration between PHS and ARHAI continued throughout the pandemic, which is discussed in more detail below. PHS's role in providing advice, guidance and expertise to prevent infection in healthcare settings has been limited since April 2020. This is explored elsewhere in this statement (see especially section 3.3.16 on the COVID-19 Nosocomial Review Group, section 3.3.20 on the Clinical Care Cell, and section 3.4.13 – 3.4.21 on collaboration with ARHAI on guidance).

- 1.1.8 What follows in this statement demonstrates that PHS made a significant contribution to the healthcare response in key areas including:
- The provision of data and intelligence as the provider of official statistics for NHS Scotland.
  - Adapting and ensuring consistency of infection control guidance for use between healthcare and community settings.
  - The development of digital tools designed for use by NHS Boards and partners.
  - Research and evidence on the impact of the pandemic on the healthcare system.
  - The provision of strategic advice on managing and mitigating both the direct and indirect harms to health caused by the pandemic.

## 1.2 Joint accountability

- 1.2.1 PHS is jointly accountable to national and local government. This means that PHS is sponsored both by the Scottish Government and by COSLA, which represents the views of Scotland's 32 local authorities to central government. This arrangement is unique amongst Health Boards in Scotland. Please see section 3.3 of the Corporate Narrative on joint accountability for more information.

## 1.3 Organisational structure

- 1.3.1 PHS had 1,143 employees on 1<sup>st</sup> April 2020, within three directorates and one service area. The Chief Executive, Clinical and Protecting Health Director, Director of Place and Wellbeing, Director of Data Driven Innovation, and the Head of Strategy, Governance and Performance service area together made up the Senior Leadership Team (SLT).
- 1.3.2 Please see section 6.2 of the Corporate Narrative: Day one staffing and structure, and Appendix A of the Corporate Narrative: PHS organisational structure as at January 2023 for details of the organisation's structure and directorates.

## 1.4 Response structure

- 1.4.1 HPS initiated the Incident and Emergency Response Plan (IERP) (PHS3/3 - INQ000147543) for the COVID-19 pandemic on 27<sup>th</sup> January 2020. This implemented response arrangements including the structure and governance of the incident response going forward and the establishment of the Incident Room at the Meridian Court offices in Glasgow.

1.4.2 The response structure was split into overarching programme areas, each of which consisted of a number of 'cells'. The cells were made up of a temporary group of people working together to respond rapidly to the emerging situation. The groups had a mix of subject matter experts, professionals, service managers and support staff. The structure evolved as the pandemic progressed. The arrangements as at April 2020 can be found in Appendix A, and as at June 2020 in Appendix B.

1.4.3 The 'COVID-19 Response Portfolio Dossier' (PHS3/4 - INQ000147563) provides a detailed description of the four response programmes, the work of each of the cells, and three enabling programmes in place in June 2020:

Response programmes:

- Clinical response and guidance
- Intelligence, research and development
- Contact tracing
- Social and systems recovery

Enabling programmes:

- Data and analytics
- Health protection management and administration
- Coordination and planning

1.4.4 Information on key staff involved in PHS's response to the pandemic, including details of the role each person played in decision-making, and how the roles changed during the relevant period, is set out in Appendix C.

### 1.5 Strategic Plan 2020-23

1.5.1 PHS published its Strategic Plan 2020-23 (PHS3/5 - INQ000203075) on 29<sup>th</sup> September 2020. The plan set out four cross-cutting areas that PHS would prioritise between 2020 and 2023, each of which represented a complex challenge that required the collective action of partners across the system: COVID-19, community and place, poverty and children, and mental wellbeing.

### 1.6 Strategic Plan 2022-25

1.6.1 PHS published its latest three-year strategic plan on 7<sup>th</sup> November 2022 (PHS3/6 - INQ000228411). The plan reaffirms the organisation's vision of a Scotland where everybody thrives. PHS is clear that this means a Scotland where life expectancy is improving again and health inequalities are narrowing. The Strategy Map can be found in Appendix D, and a visual representation of the organisation's ambition is shown in Appendix E.



1.6.2 Improving life expectancy and eliminating health inequalities in Scotland requires action across the country by many organisations and individuals - both locally and nationally. As Scotland's national public health body, PHS is at the heart of that effort. The 2022 – 25 strategic plan sets out PHS's purpose as Scotland's national public health body: to lead and support work across Scotland to prevent disease, prolong healthy life, and promote health and wellbeing.

- Prevent disease: lead and support action to prevent people from getting diseases and improve life expectancy. Action in this area includes:
  - Leading Scotland's vaccination programme to make sure fewer people -especially those in our poorest communities – get vaccine-preventable diseases like COVID-19.
  - Reducing the harm done by infectious diseases such as hepatitis C, HIV, and tuberculosis, through our intelligence and providing trusted information and guidance.
  - Learning from the COVID-19 pandemic to prepare for future pandemics.
  
- Prolong healthy life: not all ill health can be prevented. Quickly getting people the highest quality care prolongs not only the length but the quality of their life. As stewards of Scotland's healthcare data, PHS provides vital insight into the performance of health and social care services – insight that drives performance and improvement. This insight will equip service planners to match resources to the changing needs of people coming into health and social care. PHS works with partners to strengthen services so:
  - Fewer people die each year from drug, alcohol, and tobacco use.
  - Fewer people die from cancer.
  - More people feel satisfied with the quality of the care services they receive.
  
- Promote health and wellbeing: Creating a Scotland where everybody thrives means looking beyond the NHS to the building blocks of health and wellbeing. In close collaboration with local and national partners PHS uses data and evidence towards:
  - Reducing the number of children living in poverty.
  - Empowering local areas to address pressing local public health concerns.
  - Improving mental wellbeing by taking a public health approach.
  - Creating an economy that prioritises wellbeing and population health.

1.6.3 The plan aligns PHS's work against national outcomes, elaborates on what it will do and sets out milestones for progress and measures of impact.

## 1.7 Current Position

1.7.1 New PHS Chief Executive Paul Johnston took up his position in March 2023. He and the Executive Team (formerly known as the Senior Leadership Team) have put in place a new framework setting out the activity to deliver the strategic plan. The framework – called the PHS Portfolio – consists of 22 cross-organisational programmes:

- Transforming Scotland: 15 externally focused programmes designed to help Scotland thrive by preventing disease, prolonging healthy life, and promoting health and wellbeing.
- Transforming PHS: seven internally focused programmes designed to deliver internal improvements and growth that will enable staff and the organisation to thrive and deliver PHS's strategic objectives.

## 2. Operating context and collaboration

### 2.1 Background to NHS Scotland

- 2.1.1 Healthcare services in Scotland are primarily delivered by NHS Scotland. NHS Scotland was founded in 1978 by the National Health Service (Scotland) Act and is accountable to the Scottish Government. NHS Scotland encompasses 14 territorial (or 'local') NHS Boards and seven national NHS Boards (referred to as 'special' boards in the Act). Independent, voluntary and private sector providers of healthcare also operate in Scotland.
- 2.1.2 Please see section 3 of the PHS Corporate Narrative (PHS3/1 - INQ000108544) for further information on the healthcare system in Scotland, including the integration of health and social care under the Public Bodies (Joint Working) (Scotland) Act 2014.

### 2.2 Emergency powers

- 2.2.1 The NHS in Scotland was placed on an emergency footing (PHS3/7 - INQ000235164) on 17<sup>th</sup> March 2020, and this remained in place until 30<sup>th</sup> April 2022. This impacted on PHS's operational autonomy, along with that of all other Health Boards. The Cabinet Secretary for Health and Sport made a statement (PHS3/8 - INQ000235161) in the Scottish Parliament on 17<sup>th</sup> March 2020 setting this out. This was followed by a letter (PHS3/9 - INQ000145709) to NHS Chairs and Chief Executives on 18<sup>th</sup> March 2020 from the Director General Health and Social Care and Chief Executive of NHS Scotland.
- 2.2.2 The Cabinet Secretary made a further statement (PHS3/10 - INQ000235159) to the Scottish Parliament on 2<sup>nd</sup> June 2020, to inform the parliament that the NHS in Scotland would remain on an emergency footing for a further 100 days. The letter from the Chief Executive of NHS Scotland to Chairs and Chief Executives on 4<sup>th</sup> June 2020 emphasised that 'the Cabinet Secretary will be utilising the direction making powers, where necessary, to instruct NHS boards to carry out certain actions. Where directions are issued, these will not be for local interpretation. They must be implemented in full and without delay in order to maintain the resilience of our NHS' (PHS3/11 - INQ000145710).
- 2.2.3 The Cabinet Secretary for Health and Social Care announced in the answer to a written question in the Scottish Parliament on 28<sup>th</sup> September 2021 that the emergency powers would remain in place until at least 31<sup>st</sup> March 2022. This

was in order to 'continue to balance the capacity of the NHS to recover from the COVID-19 pandemic against increasing demands of emergency, urgent and planned care and delayed discharges' (PHS3/12 - INQ000228415).

- 2.2.4 One consequence of the emergency powers was the change in lead role for the offer of public health advice which transferred from HPS/PHS to Scottish Ministers. This meant, for example, that while PHS continued to offer Scottish Government advice on the wording on guidance documents relating to COVID-19 public health matters, the Scottish Government was under no obligation to accept the suggested wording contained in guidance documents. Public health advice about Harm 1 was considered by the Scottish Government alongside advice relating to Harms 2-4 as set out in section 3.1.

## 2.3 Local NHS Boards

- 2.3.1 There are 14 local NHS Boards covering the population of Scotland. Local NHS Boards plan, commission and deliver NHS services and take overall responsibility for the health of their populations. This includes hospital and community health services including services provided by General Practitioners (GPs), dentists, community pharmacists and opticians, who are independent contractors.

### Directors of Public Health

- 2.3.2 Each territorial Board has a Director of Public Health (DPH) responsible for protecting and improving the health of the population in their area. The 14 territorial DsPH come together with the Director of Clinical and Protecting Health in PHS as a national leadership group – the Scottish Directors of Public Health group (SDsPH). The SDsPH group provides specialist public health knowledge, expertise and leadership to the public health system. The SDsPH supported the national response throughout the pandemic by working with Scottish Government and PHS and providing capacity and specialist knowledge to national groups and pieces of joint work.
- 2.3.3 PHS and the SDsPH jointly led key pieces of work over the course of the pandemic. Two examples include work on the impact of COVID-19 on children, young people and their families (see section 10.8) and on public health workforce planning and development. The latter culminated in the Workforce Plan for Renewal of the Local Public Health Workforce in Scotland (PHS3/13 -

INQ000320558), which aimed to ‘identify what can and needs to be done to renew and develop the public health workforce to take a whole systems approach to public health, with a clear focus on collaboration, which will make a significant impact on reducing health inequalities.’

- 2.3.4 The plan was intended to ‘inform and where appropriate recommend key workforce actions and decisions that should be taken to build workforce capability, capacity and resilience to enable an overall long term, cross-sector and collaborative focus on recovery and more importantly the renewal of public health functions and services that respond to the deepening inequalities in health, further exposed by COVID-19.’ The Scottish Government responded positively and the next steps outlined in the report are being taken forward collaboratively under the auspices of the Scottish Public Health Workforce Planning and Development Group. (PHS3/14 - INQ000320570).
- 2.3.5 Originally chaired by NR of PHS before he retired, the group was refreshed and re-established by the Scottish Government in Autumn 2022 and is now co-chaired by a Director of Public Health and the Deputy Chief Executive of NHS Education for Scotland. The group provides a forum for reviewing and shaping policy in relation to the public health workforce in Scotland. Specifically, it advises the CMO, Scottish Government Health Directorates, the Scottish Directors of Public Health and other key stakeholders on the strategic direction for public health workforce planning and development and the impact of emerging policy on the capacity and focus of the public health workforce.

### Local Health Protection Teams

- 2.3.6 PHS teams engaged directly with local Health Protection Teams (HPTs), meeting several times a week, collectively, to maintain situational awareness and foster collaborative learning between HPTs and PHS. This also facilitated rapid engagement and professional peer support on operational and guidance issues such as for testing and contact tracing and in the management of outbreaks in a variety of settings, including care homes, workplaces and schools. The pace of change in pandemic policy with implications for guidance and operational health protection work required such links, which then reduced in frequency and duration as the pandemic headed towards recovery.
- 2.3.7 PHS also directly supported – on request – local Incident Management Teams (IMTs), usually chaired by health board HPTs. Each territorial Health Board



determined whether their HPT or Infection Prevention and Control (IPC) team would lead the IMT for a healthcare outbreak or cluster. For the most part the HPT would support primary care outbreaks and the IPC team would lead on outbreaks in secondary care settings such as hospitals. In a small number of cases, PHS was asked to support IMTs for outbreaks in healthcare settings, where ARHAI were the main source of guidance and support. HPTs frequently requested PHS support for IMTs relating to social care and community outbreaks, where PHS supported several hundred local IMTs over the course of the pandemic.

- 2.3.8 As explained elsewhere in this statement, national support and leadership for IPC in healthcare settings is the remit of Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) Scotland. ARHAI was part of HPS prior to the formation of PHS on 1<sup>st</sup> April 2020 but since then has been part of NHS Assure in NSS. Therefore, IPC guidance and support for healthcare settings was provided to local health boards' Infection Prevention Control services by ARHAI rather than by PHS. ARHAI guidance covered IPC processes and protocols for daily routine work and during outbreaks in healthcare settings such as hospitals, as well as care homes. COVID-19 guidance published by PHS included ARHAI IPC guidance and linked directly to ARHAI's national guidance resources for healthcare, social care and care home settings. PHS guidance also included general advice for pandemic times in all non-healthcare settings and specifically in relation to the management of outbreaks, particularly for care homes, promoting IPC guidance from ARHAI. This was a combined effort aiming to support varied settings in the health and social care sector, including residential premises. Please see the following sections for more detail:
- 1.1.6 – 1.1.7: the formation of PHS and retention of ARHAI in NSS.
  - 3.4.15 – 3.4.19: collaboration with ARHAI on guidance.

### Other Local Board teams

- 2.3.9 Other teams within local NHS Boards with which PHS regularly engaged were Information and eHealth Leads to address immediate issues or queries around data submissions or analysis, Primary Care leads and Out of Hours Primary Care, hospital infectious disease and other clinical leads, local and reference laboratories, and communications teams.

## 2.4 National NHS Boards

- 2.4.1 In addition to the territorial Boards, seven national NHS Boards provide national services and the healthcare improvement body – Healthcare Improvement Scotland – provides scrutiny and public assurance of health services. PHS worked closely with four of the other national Boards on the support for the healthcare system response: NHS National Services Scotland (NSS), NHS24, the Scottish Ambulance Service (SAS) and NHS Education for Scotland (NES).

### **NHS National Services Scotland (NSS)**

#### **Antimicrobial Resistance and Healthcare Associated Infection (ARHAI)**

- 2.4.2 PHS worked on a daily basis throughout the pandemic with colleagues in the Antimicrobial Resistance and Healthcare Associated Infection (ARHAI) team.
- 2.4.3 Prior to the formation of PHS in April 2020, ARHAI was part of Health Protection Scotland (HPS), within NSS. It had originally been intended that ARHAI would transfer to PHS as part of HPS. However, the Cabinet Secretary for Health and Sport decided in March 2019 that ARHAI should remain within NSS pending further consideration. This was explained in the public consultation on the establishment of PHS:

‘In light of recent infection incidents and the associated independent external review that has been commissioned, the Cabinet Secretary for Health and Sport is considering what provision may be needed at the national level in future in relation to infection prevention and control. Decision-making around the ARHAI component of HPS will therefore require further consideration.’

- 2.4.4 The independent review referred to above is the Scottish Hospitals Inquiry. As a result of this decision, all staff and functions of HPS transferred to PHS on 1<sup>st</sup> April 2020 with the exception of ARHAI, which became part of NHS Assure, with in NSS. NHS Assure works to manage risk in the healthcare-built environment across Scotland.
- 2.4.5 In October 2019, ARHAI was tasked by the Chief Nursing Officer (CNO) to lead work to review where the service should be hosted in future. This review was paused in March 2020 as a result of the pandemic. The CNO decided to resume the review of ARHAI in early 2023 and commenced the recruitment of two independent Chairs to co-lead the work. The call for interest in these roles is clear that the appointees would work independently of the Scottish Government

and would be required to deliver a report with recommendations/options as to where ARHAI would best sit in the current landscape. PHS and NSS are working closely to help establish the optimal position of national expertise for infection, prevention and control, antimicrobial resistance and healthcare associated infection.



2.4.6 Collaboration between PHS and the ARHAI team remained close following 1<sup>st</sup> April 2020. Examples of areas in which PHS and ARHAI collaborated include:

- The development of guidance relevant to healthcare and social care settings (where ARHAI is responsible for IPC) and in the wider settings in which Health Protection Teams (HPTs) operate (the primary audience of PHS guidance) (see section 3.4).
- PHS and ARHAI worked closely on data relating to probable and definite hospital onset COVID-19 cases.
- Attendance (and when indicated) informal cross-cover at pandemic advisory meetings, e.g. Scottish Government Clinical Care Cell
- Outbreak advice to HPTs and IPCTs for services that overlapped between healthcare and community settings, e.g. prisons, SAS, social care, general practice settings.

#### **Corporate Data Warehouse**

2.4.7 PHS worked closely with NSS and on the data and IT infrastructure, in particular the use of the Corporate Data Warehouse where many of the data sets managed and analysed by PHS are stored (see Section 4.3).

#### **Long COVID**

2.4.8 The Scottish Government recognises that the long-term effects of COVID-19 impact both on those individuals affected and on NHS Boards. The government set out its approach to long COVID in September 2021 (PHS3/15 - INQ000320569). This included a commitment to establish an expert group to identify the capacity needs of NHS Boards and staff in delivering safe, effective and person-centred support for people with long COVID. PHS and NSS are working together to deliver on this commitment.

2.4.9 NSS has set up a long COVID programme and a governance structure to facilitate the work of a National Strategic Network on long COVID. The network supports NHS Boards and Health and Social Care Partnerships to deliver services for people experiencing long COVID. PHS Chief Officer Manira Ahmad chairs the Strategic Oversight Board (SOB) for the network. Reporting to the Cabinet Secretary for Health and Social Care via the Scottish Government Directorate for Healthcare Quality and Improvement, the SOB leads and directs the work of the network on behalf of the Scottish Government. As well as

chairing the SOB, PHS provides public health expertise to the Steering Group that oversees the activities of the network's workstreams.

### **National Procurement and Logistics**

- 2.4.10 PHS worked with NSS procurement colleagues on the initial procurement and logistics for the SARS CoV-2 testing service once commercial platforms started to become available (see section 5.1) and on the development of a Whole Genome Sequencing (WGS) service for Scotland (see section 5.4).

### **Practitioner Services**

- 2.4.11 PHS and NSS Practitioner Services worked together on operationalising shielding policy throughout the programme. PHS supplied templates of patient details that enabled Practitioner Services to facilitate the sending of letters to patients to advise them of their shielding status. The letter types included new additions to the list, removals from the list, any changes to the guidance from the CMO, Christmas cards and translated versions of these (language, easy read and audio versions).

### **NHS24**

- 2.4.12 PHS and NHS24, together with the Scottish Ambulance Service (SAS), collaborate on the Unscheduled Care Datamart. The datamart links data from NHS24, SAS, Out of Hours Primary Care, Emergency Departments, acute, mental health and death datasets to show patient journeys for records with a valid Community Health Index (CHI) number, which uniquely identifies a patient on NHS Scotland health data sets and systems. This data enables timely monitoring across the unscheduled care system and helps partners to understand the full patient journey through emergency and urgent care services.
- 2.4.13 The Unscheduled Care Datamart also forms a key part of the System Watch tool. System Watch is a restricted access tool that provides approved users in NHS boards, Health and Social Care Partnerships, and the Scottish Government with access to timely management information. It enables users to monitor and model potential emergency activity in hospitals and access supporting information gathered from sources across the NHS. PHS and NHS24 used System Watch during the pandemic to assess COVID-19 pathways and understand the flow of patients and their outcomes. This included activity in Primary Care Out of Hours and Community Assessment Centres (see section 10.4).

2.4.14 PHS also worked closely with NHS24 and the Scottish Government to develop and share pandemic information for the public on NHS Inform, which provides information to the public on health matters, ultimately signed off by Scottish Government (see section 12.1). There was also engagement with NHS24 on symptom surveillance; data from calls to the 111 unscheduled care line and the separate COVID-19 line provided a source of intelligence for the surveillance programme.

### **Scottish Ambulance Service**

2.4.15 As set out above, PHS, SAS and NHS24 collaborate on the Unscheduled Care Datamart.

2.4.16 In addition, the PHS statistical governance team worked with SAS to support the development of a weekly statistical publication. This experimental statistics publication has provided a weekly update of key statistics on unscheduled care operational measures across Scotland since November 2021. The information includes trends in the number of unscheduled care incidents, responses, conveyances to hospital, response times and hospital turnaround times. This ensured full public transparency of service response to, for example, 999 calls etc.

### **NHS Education for Scotland**

2.4.17 PHS worked closely with NHS Education for Scotland (NES) on workforce training and development materials (including on the use of Personal Protective Equipment) and with their digital function, in particular relating to vaccination data. This included developing training materials at pace over the festive period in 2020 after the Scottish Government announced that the Oxford AstraZeneca vaccine would be rolled out in Scotland from 4<sup>th</sup> January 2021, and holding three webinars on the new vaccine during the first week in January, which were attended by a total of 5,100 healthcare practitioners across the country.

2.4.18 PHS also worked with NES on the shielding programme (see chapter 9). NES was involved in the provision of supermarket priority slots and prescriptions to those on the shielding list. NES was also responsible for sending Scottish Government-approved SMS messaging to those that had registered a telephone number with them for digital messaging. PHS facilitated this by providing details of the shielding list.



## Healthcare Improvement Scotland

- 2.4.19 PHS worked with Healthcare Improvement Scotland (HIS) and the Scottish Government to establish the Mental Health Analytical Hub in 2020. The Hub's purpose was to coordinate requests for data and evidence on the impact of COVID-19 on mental health and to share information, reduce duplication of effort, and support collaborative work. Since 2021, the impacts of COVID-19 have continued to be part of the context of the hub's work, but the focus has widened to consider mental health more broadly.
- 2.4.20 PHS also worked with Healthcare Improvement Scotland to review an increase in neonatal deaths in 2021 identified by the Wider Impacts Dashboard (see section 4.6). PHS also contributed to the National Review of Neonatal Mortality that HIS was commissioned to undertake in response.

## 2.5 Wider collaboration within Scotland

- 2.5.1 PHS collaborated with a variety of agencies outwith NHS Scotland to support the healthcare system response.

## National Records of Scotland

- 2.5.2 PHS worked closely with National Records of Scotland (NRS), both as a partner in the ScotPHO Collaborative (see section 8.2.2) and on reporting deaths relating to COVID-19 (see section 5.6).
- 2.5.3 Collaborating on the reporting of COVID-19 mortality required robust governance and data sharing agreements. NRS provided PHS with daily extracts of registered deaths and the information was then linked to an extract of COVID-19 Polymerase Chain Reaction (PCR) testing data in order to determine the number of deaths from within 28 days of first positive COVID-19 test. The linked file was used by teams across PHS for wider reporting and surveillance and was shared with NRS on a weekly basis, enabling the location of deaths (e.g. hospital or care home) to be linked to their data for further analysis.

## 2.6 Four nations collaboration

- 2.6.1 PHS engaged with UK agencies through a variety of means and found this collaboration to be valuable for general situation awareness and intelligence on topic-specific issues. Examples include:

- Membership of UK advisory groups including the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG), the Scientific Pandemic Influenza Group on Modelling, Operational Sub-group (SPI-M-O), and the Joint Committee on Vaccination and Immunisation (JCVI).
- Providing data from Scotland direct to UKSHA and participating in UK wide studies including the FF100 (First Few one hundred) study of early cases (see section 6.4).
- The development of UK-wide guidance: PHS worked with Public Health England (and continuing with UKHSA), the Department of Health and Social Care in the UK Government, Public Health Wales, the Public Health Agency of Northern Ireland, and NHS England to develop and maintain a consistent and resilient UK-wide approach to COVID-19 guidance. This included jointly issuing guidance across the UK, which was then tailored to the specifics of the Scottish context.
- Liaising with UKHSA and other partner organisations at a UK level on whole genome sequencing (see section 5.4).
- Engaging with other statistics producers across the UK (including NHS England Department of Health, NHS Digital, Office for National Statistics, UK Health Security Agency, Public Health Wales, the Welsh Government, the Northern Ireland Statistics and Research Agency, and the Northern Ireland Department of Health) to share approaches and align where possible planned changes to reporting and/or definition changes.

### **National Institute for Health and Care Excellence (NICE)**

- 2.6.2 PHS had no direct involvement with the National Institute for Health and Care Excellence (NICE) or its Scottish counterpart the Scottish Intercollegiate Guidelines Network (SIGN). NICE and SIGN focus on the direct clinical aspects of COVID-19 management as opposed to the public health elements. Indirect engagement took place through the Scottish Government Clinical Care Cell (see section 3.3.20).

### **Academy of Medical Royal Colleges**

- 2.6.3 PHS had no direct involvement with the Academy of Medical Royal Colleges, whose members primarily focussed on the direct clinical aspects of COVID-19 management. The exception was the Faculty of Public Health, of which many of PHS's public health specialists are a member.



## Office for Statistics Regulation

- 2.6.4 PHS engages regularly with the Office for Statistics Regulation, which is the independent regulatory arm of the UK Statistics Authority. As part of their regulatory role, the OSR undertook a number of rapid assessments of statistics products produced during the pandemic, including the COVID-19 weekly report produced by PHS (PHS3/16 - INQ000235148). One of the key roles of the OSR is to use its voice to stand up for statistics and to represent the public, monitoring and reporting publicly where they had concerns about the dissemination and use of statistics and highlighting good practice. PHS engaged proactively with the OSR on casework relating to COVID statistics in Scotland.

## 2.7 International collaboration

- 2.7.1 PHS shared a range of COVID-19 data and analytical outputs during the pandemic with international agencies including the World Health Organization (WHO), the European Centre for Disease Prevention and Control (ECDC), and the Centre for Disease Control (CDC) in the United States. This included sharing surveillance data for global reporting purposes, sharing results from the EAVE-II, ISARIC-4C and IMOVE-COVID collaborations (see chapter 6), and reporting on international events held in Scotland during the pandemic.
- 2.7.2 PHS took part in several organised meetings such as those arranged by the WHO European Office to which all European region countries were invited to attend to discuss the clinical impact of COVID-19, the success or otherwise of the societal measures to reduce the number of cases, hospitalisations and deaths, and the effectiveness of vaccines.
- 2.7.3 PHS also engaged with public health colleagues in Israel over the course of the pandemic. This was part of an arrangement to exchange information between the CDC, UKHSA (and the devolved administrations) and Israel. Joint meetings took place from early 2021 onwards when the first vaccines became available and Israel had learning to share from their early roll-out.

### 3. Strategic context and engagement with the Scottish Government

#### 3.1 Overall strategic approach

3.1.1 The Scottish Government set out the decisions made on the handling of the pandemic in a series of strategic documents (PHS3/17 - INQ000235119) published between April 2020 and February 2022. Three over-arching elements provide the strategic context of the pandemic response in Scotland: the Four Harms Approach, the elimination strategy, and Test and Protect.

#### The Four Harms Approach

3.1.2 The Framework for Decision-Making (PHS3/18 - INQ000369689) published on 23<sup>rd</sup> April 2020 outlined the 'Four Harms' approach to the Scottish Government's decision-making. This involved balancing:

- Harm 1 - The direct harm to life and health.
- Harm 2 - The harm the virus does to wider health and care services, and indirectly to health and wellbeing.
- Harm 3 - The harm to wider society.
- Harm 4 - The damage to the economy, employment, and Scotland's prosperity.

3.1.3 The Scottish Government considered a range of sources of evidence, expertise and analysis in the course of their consideration of the Four Harms. This approach is set out in 'COVID-19: framework for decision making - assessing the Four Harms' (PHS3/19 - INQ000235135), published on 11<sup>th</sup> December 2020.

3.1.4 On occasions a decision might be made by the Scottish Government that did not reflect all aspects of the advice provided by PHS. Inevitably, in addition to advice from PHS, it is understood that the Scottish Government had to take account of the impact on the Four Harms and other factors and to balance these in determining the most appropriate course of action for Scotland.

3.1.5 By way of context, 'advice' may be verbal or written, informal or formal, while the term 'guidance' is specifically used to refer to published written materials that support agreed health protection principles and national policy in line with the Public Health etc. (Scotland) Act 2008). PHS provided the following two examples of when the Scottish Government did not follow the suggested wording in guidance documents proposed by PHS in submission to Module 2A of the UK Public Inquiry:



- Interim care home guidance: changes were made the day after publication following an exchange of emails between the Cabinet Secretary and the Chief Executive of PHS and a request from senior clinicians in the Scottish Government.
- Further guidance for care homes: challenges in the alignment of public health practice around risk assessment and Scottish Government testing policy.

3.1.6 The role of PHS alongside ARHAI in relation to healthcare settings is explained in paragraph 1.1.7 and elsewhere in this statement (for example, how PHS's role in providing advice, guidance and expertise to prevent infection in healthcare settings has been limited since April 2020). PHS notes that this evidence request is concerned with the impact of the COVID-19 pandemic on healthcare systems (not including the care sector) and the response of healthcare systems to the pandemic, rather than broader public health matters such as non-pharmaceutical interventions. Having reflected on the matter PHS does not believe there are any examples where advice and decisions did not align in the context of impact on healthcare systems, although PHS acknowledges that this may ultimately turn on one's interpretation of "healthcare systems". PHS notes that there are examples where decisions and advice did not entirely align, such as relating to testing, mask-wearing in education settings and vaccinations in children, but these examples do not fall within the scope of this module and for that reason PHS has not elaborated further.

### Elimination Strategy

3.1.7 The Scottish Government's strategic priority in the initial phases of the pandemic was to eliminate the COVID-19 virus. The language of 'elimination' was frequently used by the First Minister, the Cabinet Secretary for Health and Sport and the CMO in statements both to the Scottish Parliament and to the media, while the language of the Scottish Government's Framework for Decision-Making published in April 2020 was 'containing and suppressing the virus in order to minimise the harm it can do' (**PHS3/18**- INQ000235128). This is an example of the nuances of language that led to challenges for PHS in the operationalisation of Scottish Government policy through guidance explored in section 8.4.

### Test and Protect

3.1.8 One of the Scottish Government's early strategic documents was 'COVID-19: Test, Trace, Isolate, Support'. Published on 4<sup>th</sup> May 2020, this set out a 'public

health approach to maintaining low levels of community transmission of COVID-19 in Scotland’.

- 3.1.9 The language of ‘Test, Trace, Isolate, Support’ was replaced with ‘Test and Protect’, but the goal remained the same; reduce population-wide transmission of the virus. ‘Test and Protect’ became the language of public communications and was used operationally to describe the system of public health interventions: testing, contact tracing and supporting self-isolation.

### 3.2 Strategic documents specific to the healthcare response

#### Re-mobilise, Recover, Re-design: Framework for NHS Scotland

- 3.2.1 The Scottish Government set out the NHS approach to recovery on 31<sup>st</sup> May 2020 in Re-mobilise, Recover, Re-design: the Framework for NHS Scotland (PHS3/21 - INQ000235174). This detailed how health boards would safely and incrementally prioritise the resumption of some paused services, while maintaining COVID-19 capacity and resilience. PHS data and intelligence is cited as a source of information to support the modelling of safe and effective mobilisation.
- 3.2.2 PHS Chief Executive Angela Leitch was a member of the NHS Scotland Chief Executives Group subgroup leading work around recovery. Chaired by John Burns, NHS Scotland’s Chief Operating Officer, the group considered the next steps to support the remobilisation and recovery of health and care services for the period up to March 2021.
- 3.2.3 PHS was also represented on the subgroup of NHS Chief Executives looking at renewal. Working with Carol Tannahill and NR from the Scottish Government, the group’s ambition was to understand the impacts of COVID-19 and develop a 12-18 month programme of work that would set out the programme of reform required for a healthier Scotland in the future. Please also see section 8.6.1 on the inequalities work undertaken for the renewal group.
- 3.2.4 The Scottish Government announced (PHS3/22 - INQ000228598) on 29<sup>th</sup> June 2020 that a new expert group had been set up to advise on the recovery and renewal of health services. The Mobilisation Recovery Group was led by the Cabinet Secretary for Health and Sport and advised on the next steps for safe and effective service delivery, as informed by the Re-mobilise, Recover,

Re-design framework for NHS Scotland plan. This included emergency care, diagnostics, cancer services, scheduled care, mental health, social, primary and community care.

- 3.2.5 PHS was represented on the group by Chief Executive Angela Leitch, the focus of which was to generate system-wide input into decisions around resuming paused services and supporting continuing services for which activity has been intense, such as care homes and care at home services for older people throughout the pandemic.

### **NHS Recovery Plan**

- 3.2.6 The Scottish Government published the NHS Recovery Plan on 25<sup>th</sup> August 2021 (PHS3/23 - INQ000228406). The plan set out the government's ambitions for the recovery of the NHS and a series of actions to be developed and delivered over the next 5 years. The twin aims were to address the backlog in care and meet the ongoing healthcare needs of the population. The Primary and Community Care section highlighted the need to increase primary care capacity including urgently seeking to fully restore face to face consultations in GP surgeries and other primary care services as a priority.

### **3.3 Engagement with the Scottish Government**

- 3.3.1 PHS contributed public health expertise, both verbally and in writing, to the Scottish Government throughout the pandemic to support the healthcare system response and wider public health and societal response. In the case of healthcare settings this involved working closely with ARHAI who led on IPC advice to the Scottish Government (see section 3.4).
- 3.3.2 Working closely with colleagues in the Scottish Government is part and parcel of the delivery of many of PHS's functions. Staff from the legacy organisations brought with them into PHS close working relationships with their counterparts in the Scottish Government and indeed other bodies with which the organisation collaborates. These relationships were a significant strength throughout the pandemic, and new relationships were formed, particularly among health protection professionals, as roles changed both within PHS and within the government.
- 3.3.3 Colleagues in PHS and the Scottish Government had frequent informal discussions about the optimal response to the challenges presented by

COVID-19. During the height of the pandemic these discussions took place with great frequency and enabled PHS to contribute timely public health perspectives and expertise to the advice provided by civil servants to Ministers and therefore to support decision-making. This included being part of WhatsApp groups with senior civil servants, and representation from the Scottish Government at the daily cell leads meetings throughout the height of the pandemic.

- 3.3.4 The main strategic routes through which PHS engaged with the Scottish Government to support the healthcare system response (including the wider impact of the pandemic on health as outlined in section 8.4) are set out below.

### **The National Incident Management Team**

- 3.3.5 HPS set up a National Incident Management Team (NIMT) that met for the first time on 13<sup>th</sup> January 2020. The composition of the NIMT was dynamic and adapted to the evolving response to the pandemic. NIMT members include local Health Board Directors of Public Health or Consultants in Public Health, Scottish Government policy and analytical advisors, the CMO, and representatives from local government and PHS teams. Attendees changed over time between the initial set up in January 2020 to the formalisation of the group and the agreement of the Terms of Reference (PHS3/24 - INQ000147555) in September 2020. This is particularly true of Scottish Government attendees due to the structural changes within the civil service as the Scottish Government put in place their response structure.
- 3.3.6 Usually chaired by the PHS Head of Infections Service and Strategic Incident Director for COVID-19, Dr Jim McMenamain, and accountable to the CMO, one of the key functions of the NIMT was to provide strategic public health leadership and advice to Scottish Government Ministers on direct health harms and measures to control the pandemic. The NIMT reported to the Scottish Government through the provision of written advice from the NIMT Chair following the meetings. In addition to the role of PHS in chairing and providing secretariat for the meeting, representation of other PHS staff in the NIMT reflected standing agenda items on epidemiology, national testing, risk assessment and response, and guidance as well as focussed contributions from PHS colleagues leading on education, communication, immunisation and evaluation of effectiveness of vaccination.



- 3.3.7 Meetings were initially held twice weekly, then weekly, then monthly (with the option for temporary stand-up to more frequent meetings as circumstance dictated) until the NIMT was stood down on 27<sup>th</sup> April 2023. Ad hoc meetings of the NIMT were arranged as required in the event of concerns about the potential impact of new variants, issues or opportunities arising.
- 3.3.8 PHS is coordinating a lessons learned debrief from the NIMT, the report of which is expected in Winter 2023/24.

### **Undertaking specific analysis as requested by the Scottish Government**

- 3.3.9 PHS undertook a number of specific pieces of analytical work on the request of the Scottish Government. These analyses were directly used to inform policy and decision-making. For example, on 18<sup>th</sup> August 2020 the Cabinet Secretary for Health and Sport commissioned PHS to carry out work to identify and report on discharges from NHS Hospitals to care homes during the first wave of the pandemic (and specifically the period from March to May 2020).
- 3.3.10 PHS worked with the universities of Edinburgh and Glasgow in the production of the report, which was initially published on 28<sup>th</sup> October 2020 (PHS3/25 - INQ000147514), with an update to the report published on 21<sup>st</sup> April 2021 to aid understanding of the statistical analysis (PHS3/26 - INQ000147515).
- 3.3.11 The report is presented in three sections. Section one explains the methodology in defining the cohort of patients who were discharged and describes their demographics and COVID-19 testing status. Section two defines and describes care home outbreaks of COVID-19 with an analysis of the factors associated with those outbreaks, specifically including hospital discharges. Section three provides further analysis on classification of discharges based on residency prior to their admission to hospital, analysis of the outcomes of all those who were discharged from hospital to a care home and analysis of those discharged from hospital to a care home whose last test was positive (including viral genomic sequencing).
- 3.3.12 The analysis found that hospital discharge was associated with an increased risk of an outbreak when considered on its own. The report is clear that after accounting for care home size and other care home characteristics, the estimated risk of an outbreak due to hospital discharge reduces. No statistically significant association was found between hospital discharge and the occurrence

of a care home outbreak. However, due to the uncertainty observed, PHS was unable to rule out a small effect, particularly for those patients who were discharged untested or discharged positive. Care home size was found to be much more strongly associated with the risk of an outbreak than other care home characteristics, including the different types (negative test, untested, positive test) of hospital discharge.

### **PHS's contribution to healthcare system advisory groups**

3.3.13 PHS contributed public health expertise through membership of a number of expert advisory groups. The main strategic groups specific to matters contained in this statement on which PHS was represented are set out below:

#### **Scottish Government Four Harms Advisory Group**

3.3.14 Dr Jim McMenamin represented PHS on the Four Harms Advisory Group, with Dr Nick Phin joining in April 2022. As the Chair of the NIMT, Dr McMenamin's role was to contribute to the epidemiology update provided by the CMO and relay the advice provided by the NIMT, as well as provide input from a PHS perspective.

#### **Scientific Advisory Group on Testing**

3.3.15 Dr Jim McMenamin represented PHS on the Scientific Advisory Group on Testing, which was chaired by the Chief Scientist (Health), Professor David Crossman. Dr McMenamin provided detailed epidemiological analysis and evaluation of the health service impact of interventions in public health as they became available.

#### **Mobilisation Recovery Group**

3.3.16 Established under 'Re-mobilise, Recover, Re-design, the Framework for NHS Scotland', (PHS3/21 INQ000235174) the group's aim was to generate key expert, stakeholder and system-wide input into decisions on resuming and supporting service provision, in the context of the pandemic. This included emergency care, diagnostics, cancer services, scheduled care, mental health, social, primary and community care. PHS's then Chief Executive – Angela Leitch - represented the organisation on the group.



## **COVID-19 Nosocomial Review Group**

3.3.17 Dr Colin Ramsay and Dr Maria Rossi represented PHS on the COVID-19 Nosocomial Review Group, a time-limited multi-disciplinary expert group chaired by Professor Jacqui Reilly, Nurse Director and Healthcare Associated Infection Executive Lead at NSS. The advisory group considered the scientific and technical concepts and processes that are key to understanding the potential impacts of COVID-19 in hospitals in Scotland. PHS supported consideration of transmission risk in hospitals through expertise and evidence from a public health and health protection perspective.

## **Care and Wellbeing Portfolio Board**

3.3.18 Angela Leitch represented PHS on the Scottish Government's Care and Wellbeing Portfolio Board from May 2022 for the remainder of the period of interest to Module 3. The Portfolio Board provides oversight and strategic direction to the delivery of health and social care reform in Scotland and the ongoing recovery and mobilisation of health and social care. The aim is to ensure coherence, sustainability and improved outcomes both within health and care, and across government, with the overall goal of improving population health and reducing health inequalities. The Care and Wellbeing Portfolio incorporated existing work on unscheduled and urgent care, and existing work on planned care as well as new programmes on preventative and proactive care, and place and wellbeing (including NHS Boards working as anchor intuitions to address inequalities and improve wellbeing – see section 8.6: Healthcare inequalities and measures healthcare bodies can take to reduce health inequalities).

## **Engagement with the Chief Medical Officer**

3.3.19 The CMO Directorate is responsible for providing policy advice to Scottish Ministers on healthcare and public health. PHS works closely with the CMO, Deputy CMOs and officials, sharing expertise and evidence, and supporting the provision of advice to Ministers and the implementation of Scottish Government policy. This includes through the NIMT (see section 3.3), through informal dialogue, and through expert advisory groups such as the Scottish Government COVID-19 Advisory Group (see above).



3.3.20 The office of the CMO hosted the Clinical Care Cell. Originally part of the PHS cell structure outlined in section 1.4 above, the Clinical Care Cell was transferred to the Scottish Government on grounds that PHS does not have a leadership role in secondary care settings. The Clinical Care Cell provided a link between the PHS-led public health response and the NHS Scotland clinical care response. Supported by Healthcare Improvement Scotland, the cell provided rapid guidelines and expert reviews across a variety of topics relating to COVID-19. There was close collaboration with colleagues at the Scottish Intercollegiate Guidelines Network (SIGN) and the cell also worked with royal colleges and other common guidance providers including NICE. The thank you letter sent to contributors from the CMO in July 2022 provides further background (PHS3/28 - INQ000320528).

### **Engagement with the Chief Scientist Office**

3.3.21 The Chief Scientist Office (CSO) sits within the Scottish Government's Health and Social Care Directorates and is led by the Chief Scientist for Health. The CSO provides funding to support and encourage research to improve the health of people in Scotland, and as such is a key PHS stakeholder. PHS colleagues engaged regularly with the Chief Scientist for Health – Professor David Crossman – over the course of the pandemic. This engagement was both through expert advisory groups, including the Scottish Government COVID-19 Advisory Group and the Scientific Advisory Group on Testing (see above) and directly through engagement on specific issues and research projects. Examples of issues on which PHS worked with the CSO include testing, wastewater testing, Whole Genome Sequencing, and the Knowledge and Research Hub (see section 6.1).

### **Engagement with the Chief Scientific Adviser**

3.3.22 The Chief Scientific Adviser for Scotland (CSA) is the Scottish Government's primary source of science and engineering advice. PHS's engagement with the CSA was through membership of expert advisory groups such as the Scientific Advisory Group for Emergencies (SAGE), the Scottish Government COVID-19 Advisory Group and Education and Children's Issues Sub-Group, rather than direct engagement.

## **3.4 Operationalising Scottish Government policy**

- 3.4.1 PHS had a significant role in providing guidance that operationalised Scottish Government policy. The pandemic required a cross-government and whole system response, with rapid policy and delivery development and implementation. A wide range of guidance has, and continues to have, a significant role to play.
- 3.4.2 PHS guidance (agreed and signed off by the Scottish Government prior to publication) operationalised Scottish Government policy intent by setting out the necessary public health and health protection action to combat COVID-19 infection in Scotland. The guidance addressed the key topics of COVID-19 risk assessment, risk management and risk communication and incorporates elements of both health protection and infection prevention and control advice, with the latter provided by ARHAI in relation to healthcare settings, as set out below.
- 3.4.3 Whereas ‘advice’ may be verbal or written, informal or formal, the term ‘guidance’ is specifically used to refer to published written materials that support agreed health protection principles and national policy in line with the Public Health etc. (Scotland) Act 2008. Guidance documents are live documents that are updated as the situation develops. PHS published and maintained 50 pieces of guidance relating to COVID-19, including 20 pieces of guidance for health and social care settings (see Appendix F). PHS also supported the review of hundreds of documents produced by other organisations, including the sectoral guidance for businesses and workplace settings produced by the Scottish Government.

### Policy Alignment Check

- 3.4.4 As described above, PHS has a professional role to provide guidance that operationalises Scottish Government policy during the pandemic. PHS guidance is therefore aligned to and reflects Scottish Government policy. It also plays an important part in informing the evolution of effective policy and in encouraging societal compliance with Non-Pharmaceutical Interventions (NPIs).
- 3.4.5 PHS and the Scottish Government agreed a Policy Alignment Check (PAC) process (PHS3/29 - INQ000147529) in June 2020 in order to officially document the approval process and its timeframes. For the purposes of the PAC, ‘policy’ referred to Scottish Government positions that had been set out publicly by the First Minister and Cabinet Secretary for Health and Sport in press briefings and including agreements by the CMOs of the four nations, as well as in published

documents. The process recognises that clinical and public health advice is to be developed and agreed on a UK basis and therefore that the PHS guidance would align with that of the other devolved administrations, whenever possible. However, given that health is devolved, it was for Scottish Ministers to determine policy within Scotland if there were differences and PHS was therefore to ensure that guidance for relevant frontline services aligned with Scottish Government policy.

- 3.4.6 Scottish Government officials directed PHS to the policy to which the guidance must align. In most instances the Scottish Government was content with PHS's professional view on how best to operationalise the policy. Where there was a need for clarity, Scottish Government officials provided the necessary refinements from the relevant Scottish Government policy team in writing to ensure clarity around the intent of the policy. The PAC process required that the development of guidance by PHS had to wait until the clarification to the Scottish Government policy had been made. Similarly, if additions or amendments to the policy were required or officials did not agree that the wording used reflected policy, the guidance would undergo further revision once this has occurred. It is important to note that guidance could not be issued until signed off by Scottish Government, often at ministerial level. The process is set out in a flowchart in Appendix G below.

### **Challenges in the production of guidance**

- 3.4.7 The PAC process introduced additional layers into the existing process for health protection guidance sign-off (on which frontline teams and services relied when pandemic policy changed) which in some cases delayed the publication of guidance.
- 3.4.8 In some cases there were delays caused by the nuances of language used in policy documents and announcements such as 'elimination of the virus' and 'maximum suppression of the virus'. In order to operationalise the policy intent in the context of the scientific evidence and the professional view of PHS experts and other expert professional stakeholders, PHS would seek clarity from Scottish Government officials. There were also instances when Scottish Government officials felt that PHS had not accurately captured policy intent, and this too would cause delays whilst the nuances were clarified.

- 3.4.9 Due to the speed of policy changes, with little forewarning of the outcome of discussions and the uncertainty on whether a policy would be adopted across the four nations, media briefings were in many cases the arenas through which PHS learnt of decisions that would impact on PHS guidance. This indirect route, coupled with the nuances of language, the challenges in outlining risk assessment as an effective public health approach, the time to develop and offer professional PHS public health advice, and inadvertent delays within the Ministerial sign-off in the Policy Alignment Check (PAC) process, all contributed to the challenges around the timely production of guidance. The frequency of policy changes varied through the pandemic, with changes occurring on a weekly basis across different subject areas at peak times.
- 3.4.10 The correspondence between PHS and the Scottish Government relating to the PHS care homes guidance was the subject of a Freedom of Information (FOI) request in February 2021. The FOI release from the Scottish Government (response number 202000090557) illustrates the issues covered by the PAC process and the associated delays.
- 3.4.11 The PAC process came to an end in May 2022, following the end of the emergency powers referred to above.
- 3.4.12 The experience of the PAC process is an important part of the lessons learned and likely recommendation for preparing for and responding to future pandemics.

#### **Collaboration with ARHAI on guidance**

- 3.4.13 As set out elsewhere in this statement, national support and leadership for IPC was part of HPS prior to 1<sup>st</sup> April 2020. This means that prior to the formation of PHS on 1<sup>st</sup> April 2020, guidance owned by HPS and published on the HPS website covered general health protection, outbreak management and IPC guidance and advice, including for healthcare settings. Appendix F sets out the guidance relating to health and social care settings within the scope of Module 3 (i.e., guidance published up to 28<sup>th</sup> June 2022 and not including guidance relating to dentistry and ophthalmology). Guidance dated prior to 1<sup>st</sup> April 2020 is HPS guidance encompassing IPC advice as this is the period during which ARHAI was part of HPS.
- 3.4.14 Only during this period – when ARHAI was part of HPS – did HPS have any role in identifying and providing guidance on healthcare procedures which were

considered to be aerosol generating procedures (AGPs). This was undertaken by ARHAI colleagues and ARHAI retained the responsibility for guidance relating to AGPs after 1<sup>st</sup> April 2020. PHS therefore holds no information or documentation pertaining to the development of advice and guidance relating to AGPs.

3.4.15 When PHS was formed on 1<sup>st</sup> April 2020 and ARHAI remained within NSS, guidance documents that had been published previously that included content relating to IPC became jointly owned and maintained by PHS and ARHAI. ARHAI was responsible for the IPC content and for providing healthcare IPC support to local HPTs. PHS was responsible for the wider health protection content within the guidance and outbreak management support for HPTs. While this statement focusses on healthcare settings, where ARHAI led on IPC advice and guidance, it should be noted that PHS led on IPC measures in non-healthcare settings. For example, wearing masks and cleaning are IPC measures that are implemented differently depending on the setting.

3.4.16 In summary, there were therefore three categories of guidance after 1<sup>st</sup> April 2020:

- Health protection guidance developed and maintained by PHS.
- Health and social care IPC guidance developed and maintained by ARHAI.
- Joint outbreak management and IPC guidance developed and maintained in collaboration between PHS and ARHAI.

3.4.17 Before exploring these categories in more detail, PHS would like to highlight three contextual factors that impacted on the collaboration of PHS and ARHAI on guidance:

- The Scottish Government asked PHS to continue the use of the HPS brand past 1<sup>st</sup> April 2020 when PHS had formed in order to ensure consistency of messaging around the pandemic response and maintain confidence in the integrity of the information being released. As a result, the HPS brand and identity continued to be used on guidance documents and other publications after April 2020. The Cabinet Secretary for Health and Social Care agreed to the HPS branding no longer being used on 15<sup>th</sup> March 2022.
- The PHS website was not ready to publish COVID-19 guidance, so for that reason, and for continuity to the users of the guidance, the guidance was published on the HPS website until July 2021 when it was moved to the PHS website.



- ARHAI was not able to publish IPC-specific guidance that they solely owned on the NSS website so it continued to be hosted on the HPS website. This continued until December 2021 when they were moved to the National Infection Prevention and Control Manual website.

#### **PHS's health protection guidance**

3.4.18 PHS published and maintained a wide range of guidance documents relating to COVID-19. This included guidance for non-healthcare settings, for workplaces and community settings, and for prisons and offshore installations. Guidance documents relating to health and social care settings within the scope of Module 3 are listed in Appendix F. Guidance for health and social care settings that included IPC advice was developed and maintained jointly with ARHAI as set out below. The main pieces of guidance specifically related to healthcare settings (accessible through Appendix F) were:

- Guidance for healthcare settings.
- Guidance for primary care.
- Guidance for secondary care settings.

3.4.19 Prior to April 2020, there were separate guidance documents for pharmacies, dentistry, and optometry. These were incorporated into the primary care guidance, with the retention of two dental-specific annexes. In November 2021 the primary care and secondary care guidance were merged to create the guidance for healthcare settings.

#### **ARHAI's IPC guidance**

3.4.20 Guidance for healthcare settings that was entirely IPC-specific was the responsibility of ARHAI alone. This includes the COVID Compendium, (PHS3/30 - INQ000346172) the National Infection Prevention Control Manual (NIPCM) (PHS3/31 - INQ000320559) and the rapid reviews of the literature undertaken by ARHAI on topics such as eye protection in health and care settings and infrared thermal imaging in health and care settings for the prevention of COVID-19 transmission. PHS holds no information or documentation pertaining to the development of these IPC materials.

#### **Joint PHS/ARHAI guidance**

3.4.21 Guidance for healthcare settings that incorporated both general health protection and IPC advice was jointly developed and maintained by PHS and ARHAI.

Examples (accessible through Appendix F) include:

- Information and guidance for social or community care and residential settings.
- Guidance for secondary care.
- Guidance for stepdown of infection control precautions and discharging COVID-19 patients from hospital to residential settings.

3.4.22 The guidance for stepdown of infection control precautions and discharging COVID-19 patients from hospital to residential setting was first published on 11<sup>th</sup> April 2020 by which time HPS was part of PHS with ARHAI remaining within NSS. ARHAI led nine updates to this guidance in 2020, before incorporating it into the NIPCM in February 2021. This guidance advised hospitals when testing was needed prior to stepdown from isolation rooms and wards or before discharge to care homes or transfer to other hospitals and on isolation into single rooms. This guidance is now solely owned by ARHAI.



## 4. The provision of data and intelligence to support healthcare system response and recovery

### 4.1 Official provider of statistics for NHS Scotland

- 4.1.1 PHS is the main provider of official health and social care statistics for NHS Scotland, a role inherited from Information Services Division (ISD), one of the PHS legacy bodies, in April 2020. PHS continued its role as a producer of statistics throughout the pandemic. In order to best inform and support critical decision making for Scotland during the pandemic, new COVID specific publication series were released alongside our pre-existing reporting. Similar to other organisations, PHS temporarily paused some of its routine data series in order to best facilitate our organisational response to the pandemic.
- 4.1.2 The production of official statistics during the COVID pandemic was a crucial part of PHS's role in disseminating timely data to inform the pandemic response and provide public transparency. PHS worked closely with analytical teams in Scottish Government throughout the pandemic to coordinate statistical requests and orderly release of public statistics. Throughout the pandemic, a COVID-19 Data and Intelligence Forum (which met weekly) discussed emerging data and statistics requirements and publishing plans (see section 4.5.2).
- 4.1.3 The content of the published statistics changed over time to adapt to different stages of the pandemic (e.g. publication of vaccination statistics when vaccination began in 2021).

### 4.2 Statistical autonomy

- 4.2.1 The Head of Profession (HOP) for statistics at PHS is Scott Heald, the Director of Data and Digital Innovation (DDI). This role also covers the Official Statistics provided by NSS, the Scottish Ambulance Service (SAS), NHS24, and NHS Education for Scotland (NES), all of which are named in legislation as producers of Official Statistics alongside PHS. As HOP, Scott Heald is responsible for ensuring compliance with the Statistics and Regulation Services Act 2007 and implementing the provisions set out in the UK Code of Practice for Statistics.
- 4.2.2 The Code of Practice for Statistics is based on three pillars:
- Trustworthiness: confidence in the people and organisations that produce statistics and data through commitments to clear, orderly publication of statistics.

- Quality of outputs: by ensuring the use of suitable data sources and the best available methods that produce assured statistics.
- Value of the insight provided: ensuring that statistics support society's needs for information.

4.2.3 The HOP is professionally responsible to the UK National Statistician in order to discharge their professional responsibilities while remaining in the formal line management of PHS. The HOP has sole authority for statistical methods, standards, procedures and timing of statistical releases. The National Statistician, Sir Ian Diamond, is also head of the UK Government Statistical Service and Chief Executive of the UK Statistics Authority. The regulatory arm of the Statistics Authority is the Office for Statistics Regulation, the Director General of which is Ed Humpherson (see also paragraph 2.6.4).

### 4.3 Development of COVID-19 data collection and reporting processes

- 4.3.1 At the outset of the pandemic when there was a low number of cases, PHS undertook a manual process of data collection. This evolved rapidly as case numbers increased and more data became available including death registration data. A collaborative approach was developed with data managers and statisticians working together to manage and link the data, and perform the analysis, followed by epidemiologists and clinicians providing more in-depth analysis and setting direction for analysis at different stages of the pandemic.
- 4.3.2 With increasing volumes of testing in Scotland, the original data processing infrastructure and methodology that had been developed at pace at the beginning of the pandemic became increasingly inefficient. A long-term more viable solution to modernise the approach was to move all COVID-19 reporting from the Electronic Communication of Surveillance in Scotland (ECOSS) system, which had been used historically to hold all positive microbiology laboratory specimen results in Scotland, to the new Corporate Data Warehouse (CDW). This was necessary because ECOSS was not a suitable platform to deal with the volumes of the pandemic. Reporting moved over to the CDW on 28<sup>th</sup> July 2021. Benefits of transitioning to the CDW included:
- A single, consolidated set of data with automated updates each day, which could be accessed by both PHS and NHS Boards.
  - More accurate identification of cases and linkage to other sources (e.g. deaths and hospital admissions) through improved capture and use of CHI numbers which

enabled better linkage to other data sources and more accurate identification of individuals.

- Scalability as the CDW is a database specifically designed to support analysis and reporting.
- Saving time – as it was an automated process it saved over two hours in daily reporting.

#### **4.4 Management information**

- 4.4.1 Management information was produced daily for Scottish Government, NHS Boards and other key stakeholders (usually by 10am each day). The Scottish Government used the management information for its daily reporting on COVID-19 statistics.
- 4.4.2 Management information (MI) is data collated and used in the normal course of business to inform operational delivery, policy development and the management of organisational performance. PHS provides MI to a range of organisations including the Scottish Government, Health Boards and Health and Social Care Partnerships. MI may not comply with the UK Statistics Authority Code of Practice for Statistics with regards to high data quality or high public value, but there is interest by specific groups accessing these statistics as there are no associated official statistics available. MI is clearly labelled to ensure recipients are aware of its status and limitation on public use.

#### **4.5 Structures, processes and data sources**

- 4.5.1 Structures and processes that were most critical for the provision of this data on a routine basis included:
- The Real Time Epidemiology (RTE) team within PHS which – after daily collation of figures – held half hour daily huddles to validate data outputs, interpret and describe current trends in testing, case, and outcomes data (including hospital, ICU and death data).
  - PHS hosted a daily morning huddle with participation from PHS, Scottish Government and other partners to review daily trends in case numbers, hospital impact, Intensive Care Unit (ICU) cases and deaths and to capture occasional data quality issues before officially sharing with Scottish Government more widely to inform the Scottish Government’s daily press conferences. For this daily meeting, the RTE team would produce an overview of the data and identify any concerns in trends or issues of note.

- Data was also presented to the NIMT to inform advice made to the Scottish Government and CMO about managing the health impact of the pandemic.
- Data and time series information was provided to inform modelling at a Scotland and UK level.

4.5.2 PHS and the Scottish Government held a weekly Data and Intelligence Forum to ensure effective coordination and coherence across the various COVID-19 data and intelligence streams that flowed between Scottish Government, PHS and NSS as the main providers of COVID-19 data and analytical products and infrastructure solutions. Co-Chaired by the PHS Director of DDI and the Head of Health and Social Care Analysis at the Scottish Government, the Forum provided oversight to data and intelligence, including reports for ministerial briefings, support for incident management (both nationally and locally), support for performance management, and sharing of data for public consumption. The remit of the forum included:

- Monitoring the effectiveness of current data and intelligence flows and products.
- Proactively identifying new requirements for data and intelligence products.
- Ensuring that there was consistency between different data and reporting sources.
- Prioritising work against finite resources.
- Securing clarification of roles and responsibilities in relation to data and intelligence across member organisations.
- Ensuring coordination of changes to reporting, and ensuring key decisions were made by statisticians and epidemiologists.

4.5.3 The principal data sources that were especially relevant to routine advice provided to the Scottish Government included:

- The number of cases and tests by testing location (Scottish laboratories and UK Lighthouse laboratories)
- Demographic data such as age and sex.
- Geographic data by NHS Boards and local authority area
- Testing data from the contact tracing case management system (CMS), which provided an overview of exposures reported by cases, including overseas travel.

4.5.4 Timely NHS hospital admissions data was also vital. This was obtained through the RAPID reporting system and Intensive Care Unit (ICU) data provided through the Scottish Intensive Care Society Audit Group (SICSAG) and, in particular in the early phase of the pandemic, directly from health board service returns to the

Scottish Government. National Records of Scotland (NRS) death data linked to COVID-19 testing data was also crucial (see also section 2.5.2).

### **RAPID hospital admissions**

- 4.5.5 PHS monitored and published information on COVID-19 hospital admissions using the Rapid and Preliminary Inpatient Data (RAPID) tool. Hospital admissions data provided a crucial indicator both epidemiologically in relation to the severity and spread of the virus and from a planning and secondary care resilience perspective. Data from hospital admission was the main source of intelligence on positive cases at the outset of the pandemic before mass testing began.
- 4.5.6 RAPID contains patient-identifiable data on admissions to hospital and is based on the format of the Scottish Morbidity Record 01 (SMR01) dataset (the official source of published data on hospital admissions in Scotland).
- 4.5.7 The RAPID dataset was linked to COVID-19 testing data from the ECOSSE system (see 4.3.2) in April 2020 to identify people admitted to hospital with a positive COVID-19 test within an agreed timeframe. NHS Boards' submissions of RAPID data to PHS were stepped up from weekly to daily, and linkage to testing data was done each day. This enabled monitoring of COVID-19 admissions with a lag of around three days.
- 4.5.8 RAPID is a provisional dataset, with minimal validation, and therefore there are some data quality issues. For example, due to the timeliness of submission and frequency, the date of discharge is not mandatory, and only around 10% of records have clinical coding applied, as often the patient is still being treated when the record is first submitted. RAPID is therefore updated on a weekly basis and the information is subject to change as hospital inpatient records are updated or new records submitted.
- 4.5.9 The rules around how records were linked, and the frequency of submissions and linkage were adjusted as the pandemic and testing regime evolved. These data were also used to identify possible hospital acquired COVID-19 infections. PHS and NRS worked closely in this area. Please see the section on hospital admissions below (paragraphs 5.6.1 – 5.6.2) for further discussion.

### **Scottish Intensive Care Society Audit Group (SICSAG)**



- 4.5.10 SICSAG rapidly repurposed its reporting systems, which usually operate on a monthly basis, to develop a daily flow of data from all intensive care units in Scotland. This allowed daily reports to be issued by 9am reporting the number of patients in ICUs across Scotland. This was then linked with data from testing laboratories to identify ICU patients with a positive PCR test for SARS CoV-2, allowing a more detailed daily report to be issued by 12 noon providing national information on the numbers of patients in Scottish ICUs, their COVID-19 test status, the number of people requiring mechanical ventilation and other life support therapies (PHS3/32 - INQ000256631).
- 4.5.11 In addition to daily data reporting, SICSAG published ten detailed, public reports from May 2020 to April 2022 relating to patients admitted to ICUs across Scotland with COVID-19. This included a paper on 15<sup>th</sup> December 2020 on the findings of ICU admissions, which showed that patients from areas with greater socioeconomic deprivation had higher rates of admission to critical care and 30-day mortality (PHS3/33 INQ000346799) and that intensive care units in disadvantaged areas were more likely to be over-capacity. The study highlighted the need for extra support to be given to critical care units in poorer areas, and for more to be done to tackle health inequalities.
- 4.5.12 The SICSAG steering group also published four research articles contributing to international knowledge relating to COVID-19 critical illness, focussing on a range of features, including social deprivation, pregnancy, persistent critical illness and the use of non-invasive respiratory support:
- February 2021: Influence of socioeconomic deprivation on interventions and outcomes for patients admitted with COVID-19 to critical care units in Scotland: A national cohort study (PHS3/34 - INQ000346799).
  - June 2022: Prevalence, characteristics, and longer-term outcomes of patients with persistent critical illness attributable to COVID-19 in Scotland: a national cohort study (PHS3/35 - INQ000346804).
  - February 2023: COVID-19 infection and maternal morbidity in critical care units in Scotland: a national cohort study (PHS3/36 - INQ000346806).
  - May 2023: Use of protracted CPAP as supportive treatment for COVID-19 pneumonitis and associated outcomes: a national cohort study (PHS3/37 - INQ000346805).

## 4.6 Dashboards



4.6.1 PHS developed a range of COVID-19 dashboards during the pandemic, some of which were public-facing and some of which were restricted by dint of the use of management information (see section 4.4) and shared only with the Scottish Government, Local Authorities and NHS boards to support the healthcare system response. A description of dashboards developed by PHS relevant to healthcare impact is provided below.

### **Public-facing daily dashboard**

4.6.2 PHS launched a public-facing dashboard in April 2020 with data on confirmed cases updated on a daily basis. An enhanced version was launched in October 2020, which included neighbourhood level data and new interactive features. The dashboard has had over 55 million hits since its launch and was archived in February 2023. The dashboard measures and methodologies changed over time to reflect changes to testing policies. The dashboard reported a range of COVID-19 related statistics including:

- Daily Update: overview of headline COVID-19 indicators including testing, positive cases, hospital admissions, ICU admissions and deaths.
- Trends and Demographics: trend information about how positive cases, testing and admissions to hospital and deaths changed over time. Data was presented by NHS Board and Local Authority and further split by age, sex and deprivation where data was available.
- Cases by Neighbourhood: maps showing local levels of confirmed positive cases for 7-day periods.
- Vaccination: the latest information on COVID-19 vaccination uptake, aggregated by NHS Board and JCVI cohorts.

### **Wider Impacts Dashboard**

4.6.3 In May 2020 PHS launched a new dashboard in response to demand for timely data on the impact of COVID-19 on wider aspects of the healthcare system. The Wider Impacts Dashboard (WID) aimed to provide a high-level overview of how the pandemic was impacting more widely on health and health inequalities.

4.6.4 The initial version focused on hospital admissions, unscheduled care, Scottish Ambulance Service data and the volume of calls to NHS24. This used the national datasets that were returned to PHS most quickly, as these allowed PHS to monitor impacts with the minimum delay.

- 4.6.5 Parts of the dashboard was updated weekly, aligned to the release of the weekly COVID-19 statistical report. Data on cardiovascular disease, injuries, substance use, cancer services, excess mortality, mental health, maternity and child health was added as the dashboard developed.
- 4.6.6 For each topic, indicators are presented at Scotland level or at health board or health and social care partnership level. Indicators are presented by age, gender and deprivation. In addition, the WID provides expert commentary which provides interpretation for the user and highlights any limitations in the use of the data. The interactive drop downs, clear charts, wide range of topics and the comparisons between COVID-19 and pre-COVID-19 trends were the salient features of the WID. In addition to this the downloadable data was meant to help users to carry out further analysis such as performance comparisons between NHS Boards if they wished. Please see Chapter 11: Impact of COVID-19 on secondary care for an exploration of what the data showed.
- 4.6.7 The dashboard provided a single source of timely data and was widely used by policy makers, researchers, clinicians, the Scottish Government, NHS Boards, health and social care partnerships, local organisations, the media and the general public.
- 4.6.8 Google analytics show that the dashboard was used extensively during the pandemic. However, since the beginning of 2022, the number of visits to the dashboard gradually declined, reflecting the stabilisation of the fluctuations seen across healthcare with each wave of the pandemic. PHS therefore decommissioned the dashboard in October 2023 and signposted users to other sources of information.

### Geospatial Connections Tool

- 4.6.9 PHS worked with NSS to develop and deploy a geospatial tool for incident management teams within NHS Boards. The tool allowed the rapid identification and investigation of outbreaks in local areas by linking cases, contacts and places. It used visualisations to make it easier to spot patterns between cases and drill into the data to identify possible locations of community transmission. The tool helped to inform local and national policy, advice and communications.
- 4.6.10 NHS Board incident management teams used and tested the tool to support the identification of outbreaks and aid the local response. Local teams fed back that

they found it challenging to utilise the tool operationally in real time due to the complex nature of the associated data.

### Community Testing dashboard

- 4.6.11 PHS developed a Community Testing dashboard for use by partners in NHS Boards, Local Authorities and the Scottish Government. Launched in April 2021, the dashboard included a range of indicators on testing including positive rate per 100,000 people and wastewater information. The data was provided at local neighbourhood level and included seven day and 14 day trends where appropriate. Community testing sites were mapped on the dashboard, alongside education sites and area of wastewater testing. NHS Boards used this information to identify communities that had increasing COVID-19 rates, but lower access to testing.

### Serology Surveillance Dashboard

- 4.6.12 In December 2020 PHS launched a Serology Surveillance Dashboard. The serology surveillance programme used blood samples provided in community healthcare settings and by blood donors to estimate the proportion of people who had antibodies to the virus in the general population and to see if this changed over time.
- 4.6.13 NHS Boards used this to assess trends in population exposure (including among high-risk groups such as pregnant women and children) to SARS CoV 2. The dashboard also supported NHS Boards to validate local data and intelligence such as the impact of outbreaks or vaccination uptake on antibody prevalence rates within their communities. Scottish Government used serology dashboard data to inform their modelling of the pandemic.

## 4.7 Discovery

- 4.7.1 Discovery is an online management information system that provides approved users from Scottish Government, NHS Boards and Local Authorities with access to a range of dashboard and visualisations containing comparative healthcare information. It supports performance monitoring, service planning and quality improvement across health and social care in Scotland.
- 4.7.2 During the pandemic, specific COVID-related dashboards were developed for inclusion in Discovery. These dashboards included information on vaccinations,

testing, NHS24 calls, ambulance attendances for suspected COVID cases, hospitalisations, suspected cases in Care Homes, NHS workforce staff absences and COVID-related deaths. At the height of the pandemic these dashboards were updated on a daily basis.

#### **4.8 Open data platform**

4.8.1 PHS manages the Scottish Health and Social Care Open Data Platform, which currently has 96 datasets available. Open data is publicly released information which is made freely available to everyone to use and reuse in any way they like. Open data offers all those who want to make use of its potential an opportunity to make better decisions, improve and innovate. The released information is structured, able to be linked with other data and in a machine-readable format that enables programmatic use of the data. Open data is not patient identifiable and it should not disclose any personal information about individuals. PHS developed a range of COVID-19 open data outputs and was accessed by a range of users including researchers, the media and the Scottish Government. UKHSA also used these outputs to develop the daily UK COVID-19 dashboard.

#### **4.9 Respiratory Infection Statistical Data in Scotland**

- 4.9.1 PHS merged the weekly COVID-19 statistical report and National Respiratory Infection report into one publication from January 2023. This was necessary to ensure PHS continue to provide accurate, consistent, and timely respiratory information to provide a comprehensive overview of respiratory health in Scotland.
- 4.9.2 A new interactive dashboard was released as part of the new publication, providing key summary statistics and trend information. The dashboard has five sections:
- At a glance: provides an overview of headline COVID-19 and respiratory surveillance indicators held within the dashboard.
  - COVID-19 cases: shows the latest information on the number and rate of estimated infection levels in Scotland.
  - COVID-19 hospital admissions: the latest information on acute COVID-19 hospital admissions as a measure of severe disease and to capture pressures facing NHS hospitals.
  - COVID-19 hospital occupancy: the latest information on the number of patients in hospital with COVID-19. This is an indicative measure of the pressure on hospitals,

as these patients still require isolation from other patients for infection control purposes.

- Respiratory infection activity: contains latest information and trends of influenza cases in Scotland, by NHS Health Board and subtype.



## 5. Understanding the nature and spread of SARS CoV-2

### 5.1 January to March 2020: Early understanding

- 5.1.1 Throughout the course of the pandemic HPS and then PHS obtained epidemiological evidence from a number of reliable sources, including surveillance data, outbreak investigations, and research studies conducted within Scotland, the UK, and worldwide (see previous chapter). The evidence emerged rapidly, sometimes as preliminary findings, and later supported by more extensive evidence.
- 5.1.2 In January 2020, HPS (as this was the period before the formation of PHS) relied on information provided in the main to PHE (in their UK role as the National Focal Point under the terms of the International Health Regulations) from sources such as the World Health Organization (WHO) and European Centre for Disease prevention and Control (ECDC) along with reports from Chinese authorities to understand – to the extent that it was known – the underlying epidemiology of transmission and spread.
- 5.1.3  
The initial information from the WHO suggested that the novel coronavirus may have originated from animals, as many of the early cases were linked to a market with various animals. However, by 23<sup>rd</sup> January there was growing evidence of the virus spreading from person to person, including cases unrelated to the market. This understanding of person-to-person transmission increased as more cases were identified worldwide. Before the first case was reported in Scotland on 1<sup>st</sup> March 2020, it was recognised that the virus mainly spreads through respiratory routes.
- 5.1.4 As more information about cases became available from China and other countries like Italy and the UK in the first few months of 2020, HPS's understanding of the nature and spread of the SARS CoV-2 virus evolved rapidly. Established links with key experts such as the Chair of the Advisory Committee on Dangerous Pathogens (ACDP), and expert committees in the UK and Scotland were also used to keep abreast of the epidemiological characteristics of the virus.
- 5.1.5 In the early stages of the pandemic, based on the understanding of SARS (to which this virus is closely related), it was assumed by public health experts that it was unlikely people could spread the virus before showing symptoms or that asymptomatic individuals could transmit the virus.



- 5.1.6 On 23<sup>rd</sup> January the WHO published an early estimate of the infectiousness of the virus, referred to as R0, ranging from 1.4 to 2.5. During the pandemic, various groups in the UK worked on modelling to estimate R0, and a consensus of these estimates was used nationally to understand how the virus was spreading. Important sources of information for these estimates included the Scientific Advisory Group for Emergencies (SAGE) and the New and Emerging Respiratory Virus Threats Advisory Group (NERVTAG).
- 5.1.7 Early information from China suggested that around 25% of COVID-19 cases were severe. However, like mortality rates among those infected, it can be difficult to accurately assess rates of severe illness among people who are infected because the likelihood of identifying a case changed throughout the pandemic. For example, more testing was done for close contacts and asymptomatic individuals in different settings later in the pandemic, which means that severity of disease may appear lower because of increased testing.
- 5.1.8 As set out in Chapter 4, HPS and then PHS provided datasets throughout the pandemic, including information on cases, tests, and deaths, to support the wider UK modelling work on short term forecasting of incidence and the estimation of R0. Some of these datasets to inform the wider UK modelling work were updated daily to provide the most current information for analysis.
- 5.1.9 Surveillance and research studies also played a key role in developing early understanding. March 2020 saw the development of a surveillance system to monitor trends in the number of COVID-19 patients in hospitals and intensive care units (ICUs) (see section 4.5.10: SICSAG). Chapter 8 below explores the role of research studies in developing the understanding of the epidemiology and impact of COVID-19.
- 5.1.10 Additional information from other countries conducting similar studies, alongside the availability of testing, case and morbidity and mortality data from international studies, mathematical modelling, and routine surveillance complemented HPS's understanding in this early period.
- 5.1.11 The evidence base for transmission within healthcare settings evolved rapidly during the early stages of the pandemic. One of the first reports of transmission within a healthcare setting was reported in the WHO statement of 23<sup>rd</sup> January 2020 which reports amplification had occurred in one health care facility (PHS3/38 - INQ000256633).



## Early development of microbiology capacity and capability

- 5.1.12 The Public Health Microbiology (PHM) team in HPS worked on testing preparedness from January 2020 onwards. As no commercial or experimental tests for SARS CoV-2 testing were available, capacity and capability was a key consideration in developing an effective understanding of the epidemiology of the virus. Capacity for PCR testing had to be established in the Glasgow and Edinburgh Specialist Virus Laboratories. HPS worked to ensure all necessary support was provided to facilitate those laboratories developing in-house laboratory tests.
- 5.1.13 PHE hosted its first SARS CoV-2 Laboratory Cell meeting on 16<sup>th</sup> January. The HPS PHM team attended the meeting in order to ensure that plans for testing in Scotland were aligned with the four nations from the very early stages.
- 5.1.14 In February 2020, HPS submitted a paper to the national Diagnostics in Scotland Strategic Group alerting them to the need for rapid buildup of testing capacity.
- 5.1.15 Through discussions with PHE and senior colleagues in HPS, the PHM team worked to define the anticipated PCR testing capacity for diagnostic need in Scotland. The PHM team recognised NHS Scotland Health Boards and Labs were in differing states of readiness to respond to the pandemic. Concerns were raised with HPS by NHS Scotland laboratories about sample transportation, safety around sample handling in both microbiology labs and blood sciences, patient pathways, and diagnostics in rural areas. The virus was classified as a category three pathogen and laboratories were required to have stringent safety measures in containment level three laboratories. This limited where testing could be carried out and the operations of testing within labs.
- 5.1.16 On 23<sup>rd</sup> January 2020 HPS published 'Wuhan novel coronavirus (WN-CoV) Guidance for sampling and laboratory investigations v1.0' in line with PHE guidance and with input from NHS Scotland Reference Laboratories. Initially, it was recommended that suspected patient samples should be tested locally for common respiratory pathogens and sent to the National Reference Laboratory's Respiratory Virus Unit (RVU) at PHE Colindale for specialist SARS CoV-2 testing. This document was updated to reflect agreed changes in response and published a further seventeen times during the first year of the pandemic, and nineteen times in total, until it was incorporated into 'COVID-19: guidance for Health Protection Teams (HPTs) version 2.2' on 31<sup>st</sup> May 2022.

- 5.1.17 The PHM team established the Laboratories and Diagnostics Cell at the beginning of February 2020. The purpose of the cell was to facilitate the strategic coordination of laboratory services in line with public health need, focusing on – and in collaboration with – Specialist and Reference Laboratories as part of the clinical response to COVID-19 across Scotland. The co-chairs of the cell, Dave Yirrell, Consultant Clinical Scientist in Virology, and Michael Lockhart, Consultant Microbiologist, engaged with the Chair of the Scottish Government Clinical Care Cell, Professor Tom Evans, to discuss specific laboratory issues.
- 5.1.18 The Laboratories and Diagnostic Cell worked with NHS Scotland Reference labs in Glasgow and Lothian, the Scottish Microbiology and Virology Network, the National Laboratories Programme (NLP), and NSS Procurement to build up an initial PCR test infrastructure and to explore scale up of testing.
- 5.1.19 The role of the Laboratories and Diagnostic Cell evolved over the course of the pandemic. From an initial focus on the establishment of PCR testing and dataflow in Scotland, the focus shifted to assessing quality, developing new testing technologies, and building an end-to-end Whole Genome Sequencing (WGS) service for Scotland. Data gathering of results became more complex over time as testing increased and involved capturing results from UK Lighthouse laboratories, Regional Hub laboratories, and private laboratories, as well as capturing DNA sequencing data.
- 5.1.20 As the Laboratories and Diagnostic Cell developed, additional colleagues from Glasgow and Lothian Specialist Virology Laboratories, Highland Microbiology Reference laboratory, National Laboratories Programme (NLP), NSS Procurement, ARHAI Scotland, Scottish Microbiology and Virology Network (SMVN), NSS National Services Division (NSD), NHS Health Board teams, PHS Public Health teams, and Scottish Government representatives were invited to join the cell.
- 5.1.21 On 14 February 2020, the cell published ‘COVID-19 Laboratory testing frequently asked questions V1.3’. This document was updated and published a further four times during the pandemic.
- 5.1.22 In early March 2020, capacity for testing was limited in NHS Scotland Laboratories, partly by national laboratory infrastructure which was designed for

specialist microbiology testing rather than mass testing. Modelling information developed for testing capacity predictions was based on assumptions/revision on reasonable worst-case scenario for COVID-19.

5.1.23 The Laboratory and Diagnostics Cell developed a process in early March to ensure returns from Scottish NHS laboratories were accurate. This allowed quality measures to be developed to ensure that dataflow was robust, timely, and accurate, and enabled confidence in reporting of statistics.

5.1.24 The role of serological testing (antibodies in blood) as part of diagnosis of COVID-19 disease was explored in early March together with the UK and Scottish Government, PHE, and NHS Diagnostic labs. Stakeholders agreed to restrict the use of serology testing to epidemiological studies and surveillance of spread of disease.

5.1.25 PHS thereafter established the serology stream of its Enhanced Surveillance of COVID-19 in Scotland programme. The programme helped determine the proportion of the population exposed to the virus and monitored the spread of COVID-19 infection through the population in Scotland. Data gathered as part of this enhanced surveillance programme informed scientific modelling and helped the Scottish Government make decisions on public health measures. Residual samples from biochemistry laboratories (submitted from primary care) were tested.

5.1.26 When the required containment level of laboratories was changed from three to two in early March 2020, work commenced in setting up COVID-19 sample testing in NHS Scotland Laboratories that could work with medium risk biological agents and hazards.

5.1.27 The Scottish Government asked HPS about the potential demand for PCR testing in mid-March 2020. HPS's analysis found that the numbers for anticipated admissions would overwhelm existing planned capacity. An emergency meeting was held to discuss laboratories capacity on 16<sup>th</sup> March 2020 and a warning provided to Health Boards that there would be a substantial increase for the demand for laboratory testing for healthcare workers (PHS3/39 - INQ000280820).

5.1.28 The Joint Diagnostic Group (JDG) was established by the National Laboratories Programme (NLP), SMVN and HPS on 19<sup>th</sup> March 2020. The meetings were

held twice weekly and chaired by the clinical lead for NLP to deal with the roll out of PCR testing and procurement issues. Roll out of commercial tests to assist in upscale of testing capacity also commenced, in partnership with SMVN, the SMVN Operational Group (SMOG), and Diagnostic Steering Group (DSG). The Laboratories and Diagnostics cell helped to develop a Situation-Background-Assessment-Report (SBAR) which outlined the volume of testing required, and steps needed to get NHS Scotland diagnostic labs live, including funding with input from the members of the JDG.

- 5.1.29 During this time NHS Scotland laboratories had limited resources and capacity to undertake PCR diagnostic testing, partly because the national laboratory infrastructure was designed for specialist microbiology testing rather than mass testing. Although there was a lack of clarity around organisational responsibilities for coordinating the diagnostic response, HPS worked to address the issue and support procurement of commercial testing capacity in NHS Scotland Laboratories. Estimates of likely testing requirements and associated costs were shared with NSS Procurement on 29<sup>th</sup> February 2020 (PHS3/40 - INQ000346190).
- 5.1.30 Following the receipt of COVID-19 Testing UK expansion plans on 22 March 2020, Dr Michael Lockhart, co-chair of the Laboratories and Diagnostic Cell, sent the Scottish Government proposals for Scotland to take forward.
- 5.1.31 PHS worked with the NLP, SMVN, NSS National Procurement and the Scottish Government to align capacity and demand. This was a challenge due to escalating demands for testing and a global race for testing resources. The Scottish Government's testing strategy evolved as the pandemic progressed and there was closer alignment between capacity and demand by 2021.

## **5.2 April 2020 – December 2020: Evolving understanding of the epidemiology of SARS CoV-2**

- 5.2.1 As stated above, in the early stages of the pandemic, it was assumed it was unlikely that people could spread the virus before showing symptoms or if asymptomatic individuals could transmit the virus. However, the WHO stated in their Situation Report on COVID-19 published on 5th June 2020 that there was evidence suggesting that both pre-symptomatic and asymptomatic individuals could contribute to the spread of the virus. This recognition of the role of



pre-symptomatic and asymptomatic transmission further emphasised the importance of preventive measures to control the spread of the virus.

- 5.2.2 Like HPS in the early stages set out in paragraphs 5.1.1 – 5.1.5 above, PHS obtained epidemiological evidence from a variety of reliable sources during this period. Knowledge and understanding of the transmissibility of SARS-CoV-2 was rapidly evolving. Some of the early information was based on patterns of infection in China, reported internationally by the WHO. More information became available from other countries as SARS-CoV-2 spread, which again was largely accessed by PHS from reports from the WHO and other sources. PHS used a wide range of sources to keep up to date with the evolving information including data generated in Scotland, reports from UKHSA, ECDC, WHO, CDC, reports on the Program for Monitoring Emerging Diseases (ProMED) and other such sites and the advice from SAGE, Scottish national advisory groups and other expert committees and bodies. Therefore while the WHO was an important source, it was one of many.
- 5.2.3 As the pandemic progressed, testing policies in Scotland also evolved, facilitating an improved understanding of more mild and asymptomatic transmission.
- 5.2.4 PHS was invited to the Scottish Government COVID-19 Advisory Group on 6<sup>th</sup> April (PHS3/41 - INQ000256630) to discuss the analysis and modelling of testing demand referred to in paragraph 5.1.25 above. Mary Black, PHS Director of Clinical and Protecting Health, presented a paper setting out the work to match PCR testing supply to demand in order to enable flexible planning. The paper 'Strategic approach to testing capacity and deployment of PCR COVID-19 virus detection programme in Scotland' (PHS3/42 - INQ000286867) and associated analysis (PHS3/43 - INQ000286868) set out how PHS was coordinating testing, collaborating with NHS Board specialist virus and diagnostic laboratories and how Scotland was increasing its laboratory capacity and trying to manage demand. Dr Black explained that on a per capita basis Scotland was performing well relative to England but that full use was not being made of the diagnostic capacity available. Modelling scenarios were shared for the short, medium and long term. Appendix A of the paper shows that the policy on groups who needed to be tested was evolving at that time. Alignment between available capacity and identifying those who should be tested was highlighted as a factor in the apparent under-use of testing capacity. The balance between these factors may not have always been aligned during the early stages of building testing capacity.

## Seroprevalence surveillance

- 5.2.5 PHS’s serology surveillance programme featured in the letter the CMO wrote to all NHS boards on 23<sup>rd</sup> June 2020 to provide an update on Scotland’s approach to COVID-19 antibody testing (PHS3/44 - INQ000235194). He stated that “there is currently insufficient clinical evidence to absolutely conclude that people who have recovered from COVID-19 are protected from either a second infection or from infecting others.” Therefore the only clinically safe option was to assume no meaningful immunity from a positive result. Health boards were advised to focus the use of antibody tests on improving the understanding of the virus and in the clinical management of patients and not offer on-demand antibody testing. The intention was to avoid potentially negative impacts on public health if individuals assumed immunity from a positive result and adapted their behaviour in a way which could increase the risk of continued transmission.
- 5.2.6 On 15<sup>th</sup> July 2020 PHS published the first report from the serology surveillance programme (PHS3/45 – INQ000320518). The report estimated a national prevalence rate of 4.3%. The BBC reported on the findings of our report, (PHS3/46 - INQ000320539) and Deputy Chief Medical Officer Dr Nicola Steedman presented the findings during the Scottish Government’s daily briefing on 16<sup>th</sup> July (PHS3/47 - INQ000235121). Dr Steedman explained that it was likely that only a very small population of Scotland had been exposed to the virus at that time, reinforcing the need for the continued adherence with the control measures.
- 5.2.7 PHS launched an Enhanced Surveillance of COVID-19 in Scotland dashboard on 23<sup>rd</sup> December 2020, (PHS3/48 - INQ000228402) which shared weekly updates from the serology surveillance programme and allowed interrogation of the data by age band, local area and gender.
- 5.2.8 The serology surveillance programme continued into 2021/22 (PHS3/49 –

INQ000320533

## 5.3 December 2020 onwards

### Vaccination

- 5.3.1 With the introduction of COVID-19 vaccination in December 2020, research was conducted to assess the effectiveness of the vaccines against infection, severe

disease, and death. Scotland, through collaboration with academic partners through the EAVE-II study, documented some of the earliest findings on how vaccines mitigated severe disease. This work also added to the understanding of how the virus spreads and presented clinically with the introduction of widespread vaccine uptake and boosters. For further detail see section 6.3 on EAVE-II.

### Reinfections

- 5.3.2 PHS was aware of possible reinfections when they were first reported by Hong Kong in August 2020. A month later the European Centre for Disease Control and Prevention (ECDC) published a threat assessment brief that concluded further research and a standard approach to classifying reinfections was required as it can be difficult to distinguish between viral persistence and true reinfection. Evidence of higher transmissibility and immune escape from the Omicron variant heightened the importance of counting infection episodes rather than first infections only.
- 5.3.3 PHS worked on a four nations basis to undertake a review of the extant COVID-19 case definition to assess whether revision was needed to count episodes of COVID-19 infection (e.g. primary episode and subsequent re-infection episodes) as opposed to only the first time a person was infected, which was how a case was defined up until this time. Following six months of discussions across the UK and consideration of the evidence in this area due to complexities around distinguishing between viral persistence and possible, probable or confirmed reinfection, it was agreed that the case definition should be revised to include episodes of infection, not just the first time a person is infected. Viral persistence refers to positive samples from an individual that are part of the same COVID-19 infection episode, these would not amount to reinfection. Viral persistence can result from viable (RNA from live virus), or non-viable material (RNA from virus remnants). From this point on, positive tests belonging to the same person would be grouped together and considered as one episode if they were within 90 days. Positive test results that were 90 days apart would be considered as a separate episode of infection – a possible reinfection – and therefore counted as an additional case.
- 5.3.4 Once the four nations had completed the necessary work and agreement reached, PHS revised the Scottish national case definition for COVID-19 in January 2022 (PHS3/50 - INQ000357281) accordingly (PHS3/51 -

INQ000320541). The PHS COVID-19 weekly report (PHS3/52 - INQ000346179) issued on 2<sup>nd</sup> February 2022 provided interim data on reinfections and discussed the importance of moving to the new episode definition given the emergence of the Omicron variant. PHS then reviewed its methodologies and developed and built the necessary technological infrastructure to incorporate episode reporting routinely from 1<sup>st</sup> March 2022.

- 5.3.5 The change was applied retrospectively to all trend data reported since the beginning of the pandemic. In addition, any deaths or hospital admissions that had been reported following possible reinfection were reported on PHS's COVID-19 Daily Dashboard. Adoption of this revised case definition meant that PHS's surveillance data – and those of the other UK nations' public health agencies – would better reflect underlying transmission rates, notwithstanding the potential for significant under-ascertainment of asymptomatic or unreported infections.
- 5.3.6 This change in the case definition helped to capture changes in background transmission dynamics, which appeared to show two peaks in reinfections in July 2020 and April 2021. Reinfection proportions also appeared to increase in December 2021 and January 2022, likely due to the emergence of the Omicron variant. With the stand down in mass population testing in Scotland and the end of the UK ONS COVID-19 infection survey, it is no longer possible to estimate reinfection rates in the population.

### Change in testing policy

- 5.3.7 On 5<sup>th</sup> January 2022 the Scottish Government changed testing policy; asymptomatic people who returned a positive lateral flow test (LFT) would no longer have to confirm their positive result with a PCR (polymerase chain reaction) test. Thereafter, PHS began reporting a combined figure for the number of people who have recorded a first positive PCR or an LFD test (PHS3/53 - INQ000235193).
- 5.3.8 This was relevant to the reporting of reinfections described above because it meant that reinfections reported by LFD were also counted as cases. Given the volumes and complexity of data to be analysed – and the necessary work already underway around building the infrastructure necessary for reinfections reporting – PHS had originally planned for there to be a lag in reporting of this new measure. However, PHS was able to streamline the process and publish experimental

statistics (official statistics that are published in order to involve users and stakeholders in their development and as a means to build in quality at an early stage) at a national level from 19th January 2022 (PHS3/54 - INQ000346178) and thereafter at Health Board and Local Authority. The 26<sup>th</sup> January 2022 report also included a breakdown of the number of LFD tests by test group, including healthcare workers.

## 5.4 Whole Genome Sequencing

- 5.4.1 There was very little infrastructure or investment in Whole Genome Sequencing (WGS) in Scotland prior to the pandemic.
- 5.4.2 The COVID-19 Genomics UK (COG-UK) Consortium was set up in March 2020 to collect, sequence and analyse genomes of SARS CoV-2 as part of the UK's COVID-19 pandemic response. COG-UK was a collaboration between the four nation's public health bodies, NHS organisations and academic institutions. PHS was a member of COG-UK and contributed to the development of the UK service and to the publication of findings (PHS3/55 - INQ000256624).
- 5.4.3 The UK service was found to provide vital intelligence to inform the nature and spread of the virus in UK, and PHS again approached the Scottish Government for funding for a Scottish WGS service. Following the provision of Scottish Government funding in July 2020, PHS worked with NSS and partners in the specialist NHS Virus laboratories to establish an end-to-end COVID-19 WGS service for NHS Boards in Scotland.
- 5.4.4 Launched on 2<sup>nd</sup> December 2020, the new service offered rapid sequencing of COVID-19 samples so that genotype of the virus – the genetic fingerprint – could be compared with other samples. The aim was for PHS and NHS Boards to use this information to:
- Identify outbreaks and transmission of the virus.
  - Investigate the origins of outbreaks.
  - Genotype virus samples to identify clinically relevant mutations.
  - Take targeted action to reduce the size of the outbreaks.
  - Reduce the chances of repeat outbreaks in similar settings.
- 5.4.5 The service was used by infection prevention control and public health teams in NHS Boards to investigate community and hospital-based outbreaks, ruling out



transmission and improving prevention practices whilst also detecting and confirming Variants of Concern (VOCs) and Variants under Investigation (VUIs).

- 5.4.6 WGS was used in hospital-based outbreaks in conjunction with epidemiological evidence (such as the date the sample was taken, location of patient at the time of sampling, where that patient was prior to sampling) to identify whether samples were closely related and therefore to rule in and rule out common sources of infection. The results of WGS would not be used alone to establish whether a hospital-based outbreak was caused by patients acquiring COVID-19 in hospital. If the genetic fingerprints of two samples from a hospital were identified as being closely related this alone would not determine the direction of infection and epidemiological information was needed to suggest a potential common exposure that could be a source of an infection. Where WGS is perhaps more powerful is where patients from a hospital have samples that have very different genetic fingerprints, thereby ruling out a hospital-based outbreak.
- 5.4.7 The Scottish Government published an updated Testing Strategy on 17<sup>th</sup> March 2021. The strategy included a commitment to invest £13 million in 2021-22 to build a Whole Genome Sequencing Service for Scotland. The ambition was to be able to sequence all positive COVID-19 cases found in Scotland and to provide a legacy beyond COVID-19 to support Scotland's resilience to a range of threats, including antibiotic resistance. The new sequencing service built on the end-to-end COVID WGS service PHS developed with NHS Boards in 2020. PHS set up an Operational Coordination Group to oversee the Whole Genome Sequencing Upscaling Delivery Programme.
- 5.4.8 A major issue for the WGS service in Scotland was an inability to gain rapid access to isolates of Scottish patients tested through the Glasgow lighthouse laboratory. The Glasgow lighthouse laboratory tested samples from English and Scottish patients (mainly English) and at the point they were tested it was not possible to identify whether the sample was from a Scottish or English patient. All isolates had to be sent down to the Sanger Institute in England and it was only at this point that the identity became apparent. This led to delays in understanding whether an isolate contained a mutant or variant of concern and significantly hampered efforts within Scotland to improve testing turnaround time and the effective use of the evolving Scottish service. Despite extensive efforts to change the system no progress was made on this issue, possibly reflecting the predominant use of this laboratory by English patients.



- 5.4.9 A key factor that emerged was that due to the contracts that underpinned the PCR testing at the Lighthouse Laboratory and the sequencing of samples at the Sanger Institute, both sites lacked the necessary flexibility and resources to make the necessary changes to accommodate the requests for access for Scottish samples.
- 5.4.10 The Scottish Government's final Strategic Framework update, published on 22<sup>nd</sup> February 2022, (PHS3/56 - INQ000235158) included a commitment to work with PHS, Local Government and other partners to develop a plan for responding to future outbreaks. PHS made a significant contribution to this through work with partners to develop a plan for monitoring and responding to new variants and mutations; a core component of managing COVID-19 effectively and responding to future outbreaks. The Variants and Mutations (VAM) Plan (PHS3/57 - INQ000147521) sets out how PHS will collaborate to identify SARS CoV-2 variants and mutations as part of routine, national and international surveillance activities. Published alongside the VAM plan, Scotland's national respiratory surveillance plan (PHS3/58 - INQ000147522) describes the essential activities of a modern national respiratory surveillance function in Scotland. It explains how national and local teams will collaborate to deliver an effective and efficient service.

## 5.5 Hospital admissions

- 5.5.1 PHS monitored and published information on COVID-19 hospital admissions using the Rapid and Preliminary Inpatient Data (RAPID) tool (see section 4.5.5). Hospital admissions data provided a crucial indicator both epidemiologically in relation to the severity and spread of the virus and from a planning and secondary care resilience perspective. It can help signal whether population-level changes in public health measures may be warranted, such as a tightening or easing of restrictions. It can also help predict whether future pressures on hospital systems are likely based on recent patterns of infections in the surrounding community.
- 5.5.2 At the outset of the pandemic, before mass testing, data from hospital admission was the main source of intelligence on positive cases (PHS3/59 -INQ000188953). The official source of published data on hospital admissions is the Scottish Morbidity Record 01 (SMR01) dataset. Prior to the pandemic data on the reason for admission was not routinely recorded on RAPID. Instead, it was recorded as a discharge diagnosis on SMR01. There was up to a three-month lag in data becoming available through SMR01, which meant that it was not suitable for real-time monitoring of COVID-19 related admissions. RAPID was therefore used to provide a more limited but up to date management information flow which provided broadly comparable figures on numbers of admissions.

### Hospital Admissions ‘because of’ COVID-19

- 5.5.3 The PHS weekly statistical report published on 1<sup>st</sup> December 2021 (PHS3/60 - INQ000273607) included analysis for the first time of the proportion of people in hospital ‘because’ of their COVID-19 infection. A hospital admission ‘because of’ COVID-19 is defined as an admission where COVID-19 is recorded as the main diagnosis. This is as opposed to patients admitted to hospital for another reason that coincides with them having COVID-19, and patients who acquired COVID-19 while in hospital (‘nosocomial’ or ‘hospital acquired infection’, the data about which is held by ARHAI).
- 5.5.4 PHS analysed the clinical diagnosis information recorded on SMR01 to calculate the proportion of patients in hospital because of their COVID-19 infection. The report covered the period March – August 2021, which was the time when the Delta was responsible for nearly all circulating infections in Scotland. The report

found that 68% of hospitalised SARS CoV-2 positive patients were in hospital because of their COVID-19 infection.

- 5.5.5 Using data from SMR01 did not support timely analysis due to the up to three-month lag in receiving SMR01 discharge summaries from NHS boards referenced to in paragraph 5.6.2. PHS therefore developed a new approach based on clinical auditing of hospital admission records. PHS and NHS Greater Glasgow and Clyde conducted a clinical audit of case notes of people admitted with a recent COVID-19 diagnosis at acute care hospitals during the first two days of January 2022. NHS Grampian carried out a similar review using daily admission data routinely provided by acute care hospitals in the region and data from NHS Grampian was obtained over the course of a six -day period from 30<sup>th</sup> December 2021.
- 5.5.6 People admitted to hospital were included if they had a COVID-19 PCR-confirmed diagnosis within 14 days prior to or in the 48 hours following their admission date. Admissions that were either confirmed or probable 'because of' COVID-19 included those who met a clinical definition or who were admitted onto a COVID-19 ward, where available. If the positive test date occurred more two days after admission date, this was classified as an hospital-acquired infection and therefore excluded from the analysis. The findings were published in PHS's weekly statistical report on 7<sup>th</sup> January 2022, (PHS3/61 - INQ000256610) along with a detailed description of methods and definitions. The report found that 60% of SARS CoV-2 positive acute hospital admissions were 'because of' COVID-19 in NHS Greater Glasgow and Clyde and NHS Grampian as opposed to coincidental 'with' COVID-19. The proportion of 60% in hospital 'because of' COVID-19 was noted to be lower than the previously reported value of 68% based on SMR01 information.
- 5.5.7 The timeliness of the analysis was important as this was when there was a rapid increase in COVID-19 case numbers in Scotland, of which more than 90% were estimated to be the Omicron variant. This work featured prominently in the questions that followed the First Minister's statement to Parliament on 5<sup>th</sup> January 2020, during which the First Minister repeatedly emphasised the importance of robust and reliable information about hospital admissions.
- 5.5.8 PHS worked with ARHAI and local NHS Boards to continue to develop and refine the method used to monitor and report on hospital admissions and on 5<sup>th</sup> July

2022 published 'Changes to the severity of COVID-19 and impact on hospitals in Scotland' (PHS3/62 - INQ000320526). This report highlighted the importance of being able to differentiate between patients in hospital who are admitted to hospital 'because of' COVID-19 as opposed to patients who are admitted to hospital coincident 'with' their COVID-19 diagnosis in order to inform Scotland's public health response.

- 5.5.9 The report discusses changes in PHS's understanding of the severity of COVID-19 and the impact on hospitals in Scotland and how this had implications for the type of robust epidemiological evidence required to inform future COVID-19 policy and decision making in Scotland. This report aimed to inform future approaches to COVID-19 reporting and surveillance.
- 5.5.10 Two of the report's main findings were that during the first wave of the pandemic (March-June 2020), in those deaths where there was a positive COVID-19 result, 94% (2,389 out of 2,545) were considered to be caused by the virus. However, from January to April 2022 this has decreased to 43% (913 out of 2108). As a result, PHS stopped reporting deaths where there was a positive COVID-19 result and National Records of Scotland became the source of information of COVID-19 related deaths in Scotland.
- 5.5.11 Data from Intensive Care Unit (ICU) admissions shows that the percentage of patients positive for SARS CoV-2 in ICU with a clinical diagnosis of COVID-19 disease (defined as someone in ICU because of their COVID-19 infection as opposed to someone in for another unrelated cause but testing PCR positive at the time of admission) declined from over 80% in the early phases of the pandemic to 29% when Omicron became the dominant variant in Scotland in January 2022. This breaks down as:
- During the first wave of the pandemic (week 11 to week 28 2020), 94% of linked COVID-19 deaths (2,389 out of 2545) were caused by COVID-19, in 5% of deaths (125 out of 2,545) COVID-19 was listed as a contributory factor and in 1% of deaths (21 out of 2,545) COVID-19 was incidental to the death.
  - In the most recent wave of the pandemic (week 52 2021 to week 17 2022) the proportion of deaths caused by COVID-19 decreased to 43% (913 out of 2,108) and there was a corresponding increase in the proportion of deaths where COVID-19 was a contributing factor (588 out of 2,108; 28%) or incidental to the death (607 out of 2,108; 29%).

5.5.12 Learning that the percentage of patients in ICU because of their COVID-19 infection had declined to 29% was a significant finding. when Omicron became the dominant variant in Scotland in January 2022. ICU clinical auditors concluded on the basis of this that a positive PCR test was not sufficient to accurately describe the number of people in ICU due to their COVID-19 infection (as opposed to being in ICU for another reason whilst also testing positive for COVID-19). A clinical diagnosis of COVID-19 disease related to the reason for the person's admission to ICU was deemed necessary to accurately describe the number of people in ICU due to their COVID-19 infection. PHS also produced estimates of the numbers of people in ICU with a coincidental infection, as defined by having a positive PCR test only but no clinical symptoms related to their ICU admission. Although patients with a positive PCR confirmed COVID-19 infection require infection control procedures in the ICU to be put in place like any other infectious respiratory disease, to count an individual with a coincidental rather than a clinically relevant ICU case would overstate the impact of the infection on ICU hospital pressures from COVID-19.

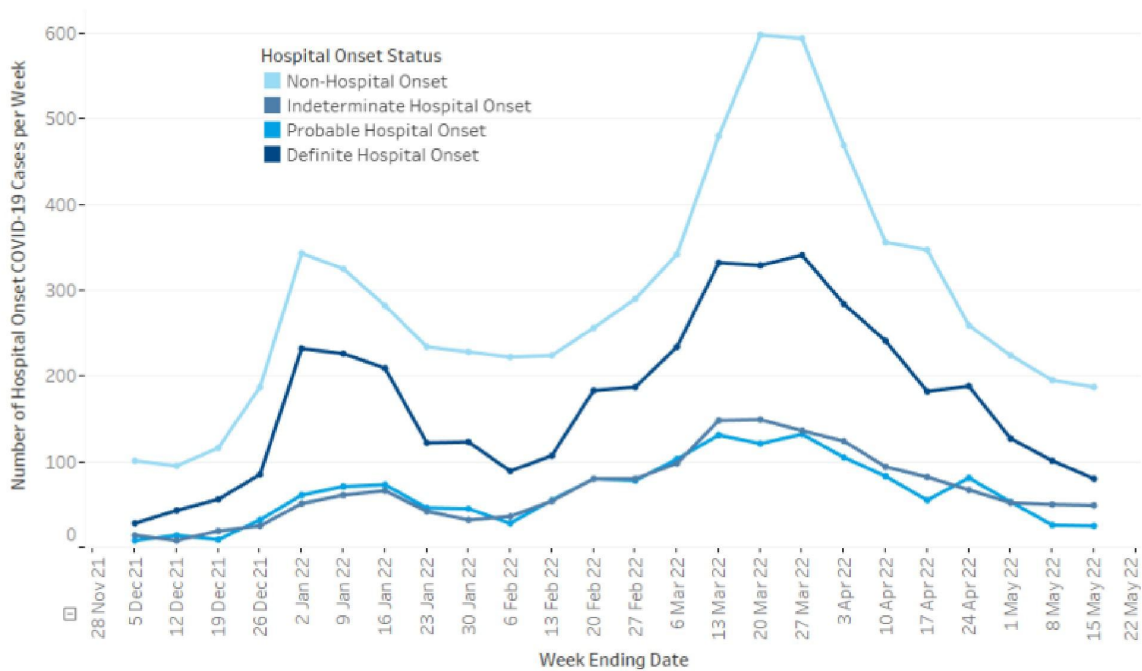
### Hospital-acquired infection

5.5.13 PHS does not hold data on hospital-acquired infections. ARHAI is responsible for routine monitoring and reporting of this data.

5.5.14 PHS worked closely with ARHAI on the report 'Changes to the severity of COVID-19 and impact on hospitals in Scotland' referred to in paragraph 5.6.8 below. This report contained information on probable and confirmed hospital-acquired SARS-CoV-2 infections. Nosocomial infections are those defined as having probable or definite hospital onset, with probable onset defined as the test taken 8 to 14 days after admission and definite onset defined as the test taken 15 days or more after admission.

5.5.15 The report found that between December 2021 and mid-May 2022, there was 14,215 hospital admissions (all admission types) and of these 5,644 were probable/definite hospital onset. The majority of cases diagnosed in hospital were diagnosed on admission or during the first two days of admission (non-hospital onset cases). Cases of definite hospital onset COVID-19 were the second most frequently occurring, after non-hospital onset COVID-19. The figure below is taken from the report.

**Figure 1: Number of hospital onset COVID-19 cases per week 29th November 2021 to 15th May 2022**



5.5.16 The report explains that the hospital onset surveillance system includes a validation step where local Infection Prevention and Control teams confirm the date of admission and date of test to enable the case definitions to be applied. This step results in a two-to-three-week lag in reporting but provides robust data for reporting nosocomial COVID-19.

## 5.6 Deaths linked to COVID-19

### March to April 2020

- 5.6.1 Mortality data provided crucial intelligence on the spread and severity of the virus, and together with hospital admission data, was key to the analysis that fed into planning for healthcare capacity and resilience.
- 5.6.2 From the start of the pandemic to 2<sup>nd</sup> April 2020 HPS/PHS recorded deaths manually. The initial process used by HPS to report COVID-19 mortality figures relied upon the compilation of data on deaths from the 14 territorial Health Board Health Protection Teams (HPTs). The data reported on deaths where a laboratory had confirmed a positive test for COVID-19 in the patient.



5.6.3 HPS data on cases of COVID-19 deaths could not be passed to the Scottish Government to announce the number of confirmed COVID-19 deaths until family liaison/notification checks were cleared. This was due to the small number of deaths in the early stages.

#### April 2020 onwards

5.6.4 From 2<sup>nd</sup> April 2020 the recording of COVID-19 deaths by HPS changed from the previous system of reporting manual returns of deaths with a laboratory positive test for COVID-19 to a new process where a death registered was cross-checked with a COVID-19 laboratory positive test. HPS/PHS thereafter reported statistics on deaths within 28 days of a positive COVID-19 test. This continued until 6<sup>th</sup> June 2022.

5.6.5 A new process of reporting also commenced at this time, with National Records of Scotland (NRS) publishing weekly death statistics where COVID-19 was mentioned on the death certificate.

5.6.6 Angela Leitch, Scott Heald, and Dr Jim McMenamin attended a briefing with the First Minister to explain the changes in reporting of death data and PHS contributed alongside NRS to an FAQ document. The First Minister explained the changes at her daily briefing on 2<sup>nd</sup> April 2020 and a news item was shared on the Scottish Government website.

5.6.7 The new process led to quicker compilation of statistics as the death could be reported once the death had been registered with NRS as opposed once family liaison had been completed.

5.6.8 A further change was that from 8<sup>th</sup> April 2020 PHS began to report on all registered deaths where COVID-19 was a probable or suspected cause. NRS published COVID-19 death statistics for Scotland based on death registrations. This included any deaths where COVID-19 was mentioned on the death certificate. These deaths did not have to have a lab positive result for COVID-19. This meant that the NRS data included deaths where the certifying doctor recorded that COVID-19 was a probable or suspected cause of death, whether it is the underlying cause or a contributory factor. This is in line with the approach of the Office for National Statistics (ONS).



5.6.9 The main differences between the NRS and HPS statistics were that:

- Data provided to the Scottish Government from HPS/PHS were updated daily, whereas figures published by NRS provided a weekly summary.
- HPS/PHS data only included deaths which had a confirmed laboratory positive test, whereas NRS data included suspected or probable cases. This could be based on a clinical diagnosis and did not need to be lab confirmed. This meant there was a larger number than the only lab confirmed deaths reported by PHS.
- HPS/PHS data provided information on deaths by age group and location while the NRS weekly reporting included a detailed breakdown by age, gender and Health Board.

5.6.10 The NRS weekly statistics always included a higher number of deaths as these include cases where COVID-19 was mentioned on the death certificate but was not confirmed with a test, either because no test was done or because the results were unavailable when the doctor completed the death certificate. There was some confusion about different reported numbers of deaths due to COVID-19, which required PHS to respond to enquiries and to clearly define the measures it was using.

5.6.11 PHS shared its data on COVID-19 deaths with UKHSA to contribute to the national evidence base.

5.6.12 The data was published on the daily COVID-19 dashboard (see section 4.6: Dashboards) until May 2022, with two revisions to the approach in early 2022 as a result of changes to the case definition (see section 5.3.2 – 5.3.9).

5.6.13 PHS ceased reporting of COVID-19 deaths within 28 days of a first positive test on 6<sup>th</sup> June 2022, instead signposting to NRS death certificate data as the single data source for COVID-19 death data in Scotland (PHS3/63 - INQ000256634).

5.6.14 PHS does not hold or have access to data around:

- The total number of patients within healthcare settings in Scotland recorded as having died of COVID-19.
- The proportion of patient deaths within healthcare settings in Scotland which are attributable to patients recorded as having died with COVID-19 hospital acquired infections.
- The total number of staff within healthcare settings in Scotland recorded as having died of COVID-19.

- The total number of healthcare staff in Scotland recorded as having died of COVID-19 during the relevant period, including the proportion considered to have contracted the infection in the workplace,
- The number of excess patient and staff deaths within healthcare settings in Scotland during the relevant period.

### **Mortality rate**

- 5.6.15 Throughout the pandemic, PHS regularly published data on the number of COVID-19 deaths linked to tests within 28 days, but not mortality rates among those infected. Owing to changes in testing policy coupled with challenges in detecting asymptomatic infection, the estimation of mortality rates among those infected (also known as a case fatality rate) will inevitably be overestimated in the population. In line with this conclusion, PHS conducted studies in collaboration with other organisations to investigate mortality amongst specific groups like those with diabetes, and these findings were published in peer-reviewed journals.
- 5.6.16 PHS was also aware of estimates of mortality rates in the population overall but not necessarily among those infected, in the early stages of the pandemic from China, where they reported 17 deaths on 23<sup>rd</sup> January 2020. Other countries with early severe epidemics, including Italy and Spain, also produced reports of the numbers of deaths with probable or confirmed COVID-19 infection.

## **5.7 Enhanced Community Surveillance of COVID-19**

- 5.7.1 PHS established a Community Surveillance programme to identify the proportion of people across Scotland with mild to moderate symptoms of COVID-19 who were unwell at home (following self-care advice) who were positive for COVID-19 infection. This was an adaptation of PHS's existing GP Influenza surveillance scheme.
- 5.7.2 The enhanced surveillance programme aimed to:
- Inform understanding of the epidemiology and transmission of COVID-19.
  - Evaluate and inform national control measures and current and future diagnostic strategies.
  - Describe and quantify the clinical features of COVID-19 and to monitor the overall health impact of COVID-19.
  - Fulfil duties for mandatory international reporting for Scotland and allow data sharing with equivalent surveillance programmes in Europe.

- Inform national health care planning and support local health and social care response.
- Understand the rate of positivity and linked clinical presentation including differences between age groups, geographical areas and other demographic factors in those presenting with symptoms (including changes over time).
- Support local intelligence, service planning and patient clinical management, thereby helping to maintain services across a wide range of primary care service providers.
- Support identification and triaging of patients in communities who were at higher risk of infection.

5.7.3 The Community Surveillance pilot scheme was launched on 13<sup>th</sup> April 2020 with the programme becoming fully operational from 27<sup>th</sup> April 2020. From this date, triage hubs and clinical assessment centres undertook swabbing and data collection across all Health Boards in Scotland. PHS gathered up to 1,000 samples every week from across Scotland from people who have mild to moderate COVID-19 like symptoms. The aim was to gather 500 samples per week from people who had attended clinical assessment centres, and 500 samples from people who had been triaged by COVID-19 telephone triage hubs. Data was shared on a weekly basis with front line practitioners and an infographic was produced to improve accessibility of the statistical release.

5.7.4 The programme of data collection was initially to run for 12 weeks. However the Scottish Government confirmed on 20<sup>th</sup> July 2020 that the programme would be extended into October 2020. On 12<sup>th</sup> October 2020 the government extended it further, to May 2021 with the addition of testing for influenza and Respiratory Syncytial Virus (RSV). This was outlined in a letter to NHS Boards from the CMO on 28<sup>th</sup> October 2020 (PHS3/64 - INQ000320571).

5.7.5 A total of 13,832 samples were analysed in the first 26 weeks of the community surveillance data collection (13<sup>th</sup> April 2020 to 11<sup>th</sup> October 2020). An important finding from the subsequent report (PHS3/65 - INQ000320536) was that presenting with symptoms of cough and altered sense of smell/taste, was associated with a significantly increased odds of a positive COVID-19 test. This reinforced the change that had been made to the clinical case definition for adults to include loss of smell or taste on 18<sup>th</sup> May 2020.

5.7.6 The Community Surveillance programme provided the Scottish Government with the evidence required to fulfil one of the criteria for the country to move from phase 2 to phase 3 in the routemap out of lockdown, (PHS3/66 - INQ000235175) namely that the number of infectious cases is showing a sustained decline.

## **5.8 Impact on guidance**

5.8.1 PHS's developing understanding of the SARS CoV-2 virus and its transmission informed the advice provided to the Scottish Government and the mechanisms for the operationalisation of Scottish Government policy through guidance set out in section 3.4 above.



## 6. Informing and advancing understanding through research

### 6.1 Support for research

#### eData Research and Innovation Service (eDRIS)

- 6.1.1 PHS's eData Research and Innovation Service (eDRIS) enables the research community to access NHS Scotland data by providing support in defining data requirements, seeking permissions from data controllers, linking and provisioning data directly or through a trusted research environment (see below) and undertake disclosure control checks on outputs.
- 6.1.2 eDRIS worked closely with the NHS Scotland Health and Social Care Public Benefit and Privacy Panel (HSC-PBPP), whose secretariat is provided by PHS. In April 2020 eDRIS worked with HSC-PBPP and established a rapid triage, support and approvals process for all urgent requests to access NHS Scotland administrative data for COVID work. This rapid process was available from April 2020 to June 2021. eDRIS handled over 220 COVID related enquiries, HSC-PBPP approved 73 COVID related applications (28 via rapid review) and eDRIS provisioned data for 100 projects.
- 6.1.3 The trusted research environment, known as Scottish National Safe Haven, managed by PHS hosts the ISARIC4C dataset (see below), the COVID-19 research dataset and the Post Hospitalisation COVID-19 study dataset. Both studies collected data across sites UK-wide and were used to support decision making during the pandemic.

#### Knowledge and Research Hub and COVID-19 Research Repository

- 6.1.4 PHS created a Knowledge and Research Hub in May 2020 in association with the Chief Scientist Office of the Scottish Government. The ambition of the hub was to maximise the use of research, data and evidence in policy and practice, brokering knowledge and encouraging engagement in research so that research has practical impact. This was to be achieved through collaboration with academia and by building closer links between academia and key partners, including COSLA and Scottish Government.
- 6.1.5 The hub's immediate focus was to galvanise and coordinate the research community in Scotland to contribute to the pandemic response. This included connecting academia to local and national organisations in order to contribute

expertise and bring additional capacity and skills to bear and identifying, summarising, and sharing knowledge resources so that researchers and policy makers could quickly access high-quality research.

- 6.1.6 The COVID-19 Research Repository was launched on 17<sup>th</sup> March 2021 to fulfil the aim of sharing knowledge resources. It provided a function for researchers and other stakeholders to quickly find out what research was being done on COVID-19 and by whom.

## 6.2 Background to research collaboration

- 6.2.1 Supporting and collaborating on research was fundamental to the PHS's evolving understanding of the nature and spread of the SARS CoV-2 virus. This began early in the pandemic.
- 6.2.2 Dr Jim McMenamin shared a summary of the scientific work on COVID-19 already in place with input from HPS as at 26<sup>th</sup> March 2020 with the Scottish Government COVID-19 Advisory Group to inform discussions at the meeting that day. This listed the following:
- Early Pandemic Evaluation and Enhanced Surveillance of COVID-19 (EAVE-II) (see below).
  - First Few One Hundred study (FF100) (see below).
  - COVID-19 Clinical Information Network (CO-CIN) (PHS3/67 - INQ000320534).
  - International Severe Acute Respiratory Infection Consortium Clinical Characterisation Collaboration (ISARIC4C).
  - Influenza – Monitoring Vaccine Effectiveness in Europe COVID (IMOVE-COVID).

## 6.3 EAVE-II Consortium

- 6.3.1 Early in the pandemic, PHS collaborated with partners and with the support of the Scottish Government re-started the Early Estimation of Vaccine and Anti-Viral Effectiveness (EAVE) project. This was a data reporting system originally created to support the 2009 swine flu pandemic response. PHS worked closely with the University of Edinburgh's Usher Institute, to bring together:
- General practice records for almost all of the population of Scotland.
  - NHS Scotland hospital, laboratory test results for SAR-CoV-2, vaccine and National Records for Scotland death data.
  - Researchers from the universities of Glasgow, Strathclyde and St Andrews

- Funding from the Medical Research Council and National Institute for Health Research.
- 6.3.2 The project was re-named Early Pandemic Evaluation and Enhanced Surveillance of COVID-19 (EAVE-II) and went on to generate vital intelligence, including one of the first evaluations into the effectiveness of COVID-19 vaccinations (to be covered in Module 4). Of relevance to Module 3 is the work on demographics and risk of hospital admission.
- 6.3.3 The EAVE-II study undertook a cohort analysis to describe the demographic profile of COVID-19 patients, investigate the risk of hospital admission for COVID-19, and estimate vaccine effectiveness in preventing COVID-19 hospital admissions in S gene-positive (Delta) cases.
- 6.3.4 Published through a letter (PHS3/68 - INQ000320568) in the Lancet on 14<sup>th</sup> June 2021, the study found that for S gene-positive (Delta) cases the risk of COVID-19 hospital admission was approximately double that of the Alpha variant. The risk of admission was particularly increased in those with five or more relevant comorbidities.

#### 6.4 First Few One Hundred study

- 6.4.1 To study the early cases and their close contacts in the UK, HPS/PHS participated in the UKHSA-led First Few One Hundred (FF100) study of SARS CoV-2 virus. (PHS3/69 - INQ000256608) The approach was used in the 2009 H1N1 pandemic and was deployed again in March 2020 for COVID-19.
- 6.4.2 The study helped to characterize in the UK:
- The clinical presentation of COVID-19, including common symptoms such as fever, cough, and loss of taste or smell. It also identified that some individuals may be asymptomatic or have mild symptoms, contributing to viral spread.
  - Factors like age, underlying health conditions, and occupations that were potentially more vulnerable to infection or severe disease.
  - Patterns of transmission of SARS CoV-2, including the modes of spread, such as via close contact with infected individuals in household settings.
  - Effectiveness of contact tracing efforts in identifying and containing the spread of the virus. It helped in understanding the role of contact tracing and isolation measures in controlling transmission.

## 6.5 SARS-CoV-2 Immunity and Reinfection Evaluation (SIREN) study

- 6.5.1 PHE/UKHSA led the four nations SARS-CoV-2 Immunity and Reinfection Evaluation (SIREN) study, working in partnership with the devolved nations' public health bodies. The study monitored infections in a cohort of 44,500 healthcare workers who provided samples for regular PCR and antibody testing. Analysis of these samples helped the UK to evaluate the immune response to COVID-19, provided insight into COVID-19 reinfections and helped build an understanding of the level of protection offered by vaccines.
- 6.5.2 PHS co-opted and collaborated with Glasgow Caledonian University (GCU) colleagues to deliver the Scottish arm of the four nations SIREN study, including the recruitment of Scottish healthcare workers to take part in the study. Professor Lesley Price of GCU ran the Scottish arm of the SIREN study. Professor Price coordinated the support of the CSO, NRS, PHS, ten Health Boards and the Scottish Government to enable the recruitment of 6,200 healthcare workers into the study. The aim had been to recruit 10% of the total number of participants in the UK-wide study but at the end of the recruitment period the study team had successfully recruited over 12% of the UK sample.
- 6.5.3 The Scottish Health Board research teams recruited participants, organised processes for collection, analysis and reporting of participants' PCRs and serology samples, supported and communicated with participants to ensure they were kept informed and ensured continuing participation for up to two and a half years. Health Board, Regional and Scottish sequencing laboratories processed the participants' samples and reported these to PHS.
- 6.5.4 PHS was the data controller for the SIREN Scotland database and created automated processes to establish and maintain the database which contained all Scottish participants' PCR and Serology results. These data were securely transferred to UKHSA along with information on participants' vaccination status and sequencing results.
- 6.5.5 PHS agreed that the research questions for SIREN were best addressed by analysis of the data for the whole UK cohort. Therefore, all analyses of the data, peer review publications and reports to the four CMOs and the JVCI was done by UKHSA (PHS3/70 - INQ000256632).



6.5.6 PHS produced a monthly data report from September 2021 to March 2023 for the Scottish Government on the Scottish data. The report did not include interpretation or recommendations.

## 6.6 COVID-19 in pregnancy in Scotland (COPS) study

6.6.1 PHS and the University of Edinburgh led the COVID-19 in pregnancy in Scotland (COPS) study under the auspices of the overall EAVE-II programme. COPS monitored SARS CoV-2 infection and COVID-19 vaccination during pregnancy until autumn 2022 (PHS3/71 - INQ000320561). PHS will discuss the findings relating to vaccination in Module 4.

6.6.2 PHS included data and commentary on confirmed cases of COVID-19 in pregnancy in the following COVID-19 statistical reports:

- 6<sup>th</sup> October 2021 (PHS3/72 - INQ000346175)
- 3<sup>rd</sup> November 2021 (PHS3/73 - INQ000346176)
- 8<sup>th</sup> December 2021 (PHS3/74 - INQ000346177)
- 2<sup>nd</sup> February 2022 **PHS3/52** - INQ000346179)
- 9<sup>th</sup> March 2022 (PHS3/76 - INQ000346180)
- 11<sup>th</sup> May 2022 (PHS3/77 - INQ000346181)
- 28<sup>th</sup> September 2022 (PHS3/78 - INQ000357277)

6.6.3 This final report of COVID-19 in pregnancy on 28<sup>th</sup> September 2022 provided updated data, covering cases of COVID-19 in pregnancy up to the end of April 2022 (when testing protocols changed). The key data and findings from the September 2022 report are summarised below.

6.6.4 As at late-August 2022, the COPS cohort included 189,912 pregnancies in 163,422 women in Scotland from the start of the COVID-19 pandemic on 1<sup>st</sup> March 2020 to end of April 2022. Among these, PHS identified a total of 18,564 confirmed cases of COVID-19 in pregnancy with date of onset from 1<sup>st</sup> March 2020 up to 30 April 2022, in 18,315 pregnancies in 18,264 women.

### Maternal confirmed COVID-19 in pregnancy

6.6.5 The number of confirmed cases of COVID-19 in pregnancy has varied over time, reflecting sequential waves of infection in the general population, and also increasing access to testing (and hence increasingly complete ascertainment of cases). Small numbers of confirmed cases of COVID-19 in pregnant women

were seen in the first wave of infection in March to May 2020. Subsequent peaks in case numbers were seen in October 2020 and January, July, and September 2021. Further peaks (by far the highest to date) were seen in late December 2021-early January 2022 and mid-March 2022, reflecting the spread of the Omicron viral variant.

- 6.6.6 Overall, 2,688 (14%) of the 18,564 total cases were associated with a hospital admission, and 159 (1%) were associated with a critical care admission. Cases occurring later in pregnancy were much more likely to be associated with a hospital or critical care admission than cases occurring in early pregnancy. This reflects the fact that admission is generally more common in later pregnancy (due to complications of pregnancy unrelated to COVID-19 and/or for delivery), and also that COVID-19 is more likely to cause severe maternal disease and/or pregnancy complications in later pregnancy.
- 6.6.7 For the duration of the pandemic up to the end of April 2022, the monthly rate of confirmed COVID-19 seen in pregnant women was very similar to that seen in the general female population of reproductive age (i.e., all women aged 18 to 44 years inclusive).
- 6.6.8 For the majority of the pandemic, the rate of confirmed COVID-19 in pregnancy was generally higher in younger, compared to older, pregnant women, and in pregnant women living in more, compared to less, deprived areas of Scotland. These patterns were less evident however from around December 2021 onwards, when Omicron became the dominant variant in Scotland.
- 6.6.9 For the majority of the pandemic up to the end of April 2022, there was no clear pattern in the rate of confirmed COVID-19 in pregnancy in women from different ethnic groups. However once Omicron became dominant, the infection rate was higher in women with white ethnicity, compared to women from South Asian; Black, Caribbean, or African; and other or mixed ethnic groups.
- 6.6.10 The COPS study found no maternal deaths under the definition of death from any cause occurring within 28 days of infections during pregnancy. Maternal death data was not therefore routinely included in the aforementioned monthly surveillance reports. The issue was however discussed in a COPS paper in the Lancet examining short-term outcomes following SARS-CoV-2 infection in pregnancy in the period when the omicron variant was dominant compared to that when the delta variant was dominant (PHS3/79 - INQ000346197). This



covered 17<sup>th</sup> May 2021 to 31<sup>st</sup> January 2022. There were, as previously stated, no maternal deaths within 28 days of these infections in pregnancy. However, the study team does observe in the paper that there was one maternal death after COVID-19 in pregnancy in the delta-dominant period. However, this occurred more than 28 days after the first SARS-CoV-2-positive test, and thus it is outwith the outcome definition of the study.

### **Babies' outcomes following maternal confirmed COVID-19 in pregnancy**

- 6.6.11 A total of 12,778 babies were born in the COPS cohort following the mother having confirmed COVID-19 at any stage during that pregnancy up to end April 2022. 12,738 of the babies were live births (born at any gestation) and 40 were stillbirths (born at 24+0 weeks gestation or over). 24 of the live born babies subsequently died in the neonatal period (within 28 days of birth). This gives an extended perinatal mortality rate for babies born following maternal confirmed COVID-19 at any stage during pregnancy of 5/1,000 total births.
- 6.6.12 1,982 of the 12,778 babies were born within 28 days of the date of onset of the mother's COVID-19 infection. 1,963 of these babies were live births (with 7 subsequent neonatal deaths) and 19 were stillbirths, giving an extended perinatal mortality rate for babies born within 28 days of confirmed COVID-19 during pregnancy of 13.1/1,000 total births.
- 6.6.13 It cannot be assumed that stillbirths and neonatal deaths following confirmed COVID-19 during pregnancy are related to the mother's infection. Stillbirths and neonatal deaths unfortunately occur for a wide range of reasons, and it is important to take the background rate of mortality into account when considering the rates seen among births following infection. For example, the overall extended perinatal mortality rate seen among all births registered in 2020 was 6.3/1,000 total births.

### **6.7 REACT-SCOT case control study**

- 6.7.1 PHS worked with the Usher Institute at the University of Edinburgh, the University of Glasgow, Glasgow Caledonian University, and the University of Strathclyde on the REACT-SCOT case control study (Rapid Epidemiological Analysis of Comorbidities and Treatments as risk factors for COVID-19 in Scotland). This sought to identify risk factors for severe COVID-19 and to lay the basis for risk stratification based on demographic data and health records.

- 6.7.2 In the study the health outcomes of people who have had COVID-19 are compared to controls.
- 6.7.3 The first output was published on 20<sup>th</sup> October (PHS3/80 - INQ000147574) and showed that, along with older age and male sex, severe COVID-19 is strongly associated with past medical conditions across all age groups; the risk to younger individuals without any recent history of hospital admission or use of prescription drugs was therefore very low.

### **Risk for healthcare workers and their households**

- 6.7.4 PHS was included in the REACT-SCOT consortium looking at the risk of COVID-19 hospitalisation among healthcare workers (18-65 years old), their households and other members of the general population. Work prior to this was insufficiently robust or comparable and there was a lack of studies evaluating the risk of covid-19 infection in household members of healthcare workers.
- 6.7.5 The findings, published in on 28<sup>th</sup> October 2020 in the BMJ, (PHS3/81 - INQ000357278) showed that during the first peak of the pandemic, whilst the absolute risk remained low, patient-facing healthcare workers were at three-fold higher risk of hospitalisation with COVID-19 than the general population and individuals living in the same households as a patient-facing healthcare worker were at two-fold higher risk than the general population. The study found that healthcare workers and individuals living in their households accounted for one in six of all individuals hospitalised with COVID in Scotland. The study highlighted that whilst the risk for many healthcare staff is similar to that of the general population, there is higher risk to some staff. The results helped inform action to protect those healthcare workers at greatest risk.
- 6.7.6 The study estimated the total Scottish population to be 5,463, 300, with the working age population (18-65 years) estimated at 3,452,592. Across the entire Scottish population, 6,346 hospital admissions with COVID-19 occurred within the study period. Of the 6,346 hospital admissions with COVID-19 in Scotland, 33% (n=2097) occurred in the working age population (18-65 years). Of these, 1,737 (82.8%) occurred in the general population, and healthcare workers and their household members accounted for 243 (11.6%) and 117 (5.6%) respectively. This meant that healthcare workers and their household members

accounted for 17.2% (360 out of 2,097) of admissions with COVID-19 while representing only 11.2% (388,350 out of 3,452 592) of the working age population. Among household members, a further 24 hospital admissions occurred in 89,327 people below the age of 18 or above 65 years.

- 6.7.7 The risk of admission to hospital with COVID-19 was 0.20% (181 out of 90,733), 0.07% (23 out of 32,615), and 0.11% (39 out of 35 097) in patient facing, non-patient facing, and undetermined healthcare workers. With the number of COVID-19 infections as the denominator, the risk of hospital admission with COVID-19 was 11.5% (23 out of 200) in non-patient facing and 7.3% (181 out of 2,485) in patient facing healthcare workers. The rate was 10.5% (39 out of 371) in healthcare workers classified as “undetermined.”

### **Risk for those eligible for the shielding programme**

- 6.7.8 As part of the shielding evaluation described in section 9.3, PHS led a follow-up study through the REACT-SCOT consortium to explore the risk of severe COVID-19 specifically among shielding people (PHS3/82 - INQ000147576). This demonstrated that the shielding programme correctly identified people at higher risk of severe COVID-19. The risk of severe COVID-19 varied between the different clinical shielding conditions. The study also looked at the effectiveness of the shielding programme and found that the efficacy of shielding vulnerable individuals was limited by the inability to control transmission in hospital and from other adults in the household.

## **6.8 British Paediatric Surveillance Unit**

- 6.8.1 At the start of the pandemic there was very little information on how often infants become infected with COVID-19, whether it transmits from mothers to their babies while they are still pregnant, during labour and birth, or whether the infection occurs following birth.
- 6.8.2 The British Paediatric Surveillance Unit (BPSU) established a study ‘Neonatal complications of coronavirus disease’ (PHS3/83 - INQ000320521). This study was coordinated by Professor Jenny Kurinczuk at University of Oxford.
- 6.8.3 As part of Scotland’s participation in this UK study a Public Benefit and Privacy Panel application was approved for the PHS Real Time Epidemiology cell to

provide a weekly list to the study team of infants with a laboratory positive sample for COVID-19 made on a sample taken before 29 days of age. This facilitated follow-up of these infants by the study team with the appropriate neonatal teams and helped ensure all eligible cases in Scotland were captured.

## 7. Modelling support for the healthcare system

### 7.1 Modelling Collaboration

- 7.1.1 The Scottish Government had the overall remit for modelling the pandemic and its impact. However, PHS supported longer-term scenario planning and modelling through the provision of data and contributed to the fortnightly State of the Epidemic reports (PHS3/84 - INQ000235118). These reports were considered by the Scottish Government Cabinet and brought together different sources of evidence and data about the pandemic to summarise and analyse the current situation, and what was likely to happen next.
- 7.1.2 PHS and the Scottish Government worked together from April 2020 to develop a new Modelling Collaboration. The aim was to ensure modelling resources were brought together to deliver the high quality and consistent modelling outputs that were needed to support decision-making in Scotland. The Modelling Collaboration included representation from SDsPH, Directors of Planning, and academic modellers as well as the Scottish Government and PHS.
- 7.1.3 The Modelling Collaboration worked to:
- Develop and share high level models including short-term modelling undertaken by PHS and longer-term modelling undertaken by the Scottish Government.
  - Develop COVID-19 pathway mapping and a demand/capacity model.
  - Identify latent non-COVID-19 demand and scenario planning to understand resource capability for recovery.
  - Develop a single national and board level SitRep/dashboard with early warning capability.
  - Share a resource compendium of local methods and approaches.

### 7.2 Pre-Pandemic context

- 7.2.1 One of PHS's legacy bodies, Information Services Division (ISD) started work on Whole System Modelling (WSM) in 2019/20. The intention was to develop models of the health and care system in Scotland that took account of the relationships between different parts of the system and thereafter to develop modelling tools that could support improved planning at a local service level as well as at a national level.
- 7.2.2 A commitment was made in the pre-pandemic Annual Operating Plan (AOP) (PHS3/85 - INQ000101039) for PHS's first year of operation to 'Develop a range



of modelling approaches and capabilities to support a Whole Systems Approach to public health policy making, service delivery and the management and planning of the Health and Care system.’ This was a key component of the ‘Supporting Whole System Approaches’ strategic area within the AOP. This set out how PHS would support the development and delivery of a whole system approach to public health in order to apply systems thinking, methods and practice to better understand public health challenges and identify collective actions.

- 7.2.3 The development of a whole system approach (WSA) to public health was one of the three tranches of the Public Health Reform programme. PHS planned to work in its first year to embed the principles of the WSA across the organisation as a core way of working, while also supporting the adoption of the WSA across the country.

### **7.3 Initial pandemic response**

- 7.3.1 As the impact of the pandemic became apparent in March and April 2020, PHS recognised the potential for the WSM work – and the skills and expertise within the WSM team in PHS’s Data Driven Innovation directorate – to be deployed to provide rapid support to health and social care service providers. Through discussions with the Scottish Government and NHS Board colleagues, two areas were assessed as being of potential value; a Susceptible Exposed Infectious Recovered (SEIR) model and a model to predict staff absences.

#### **Susceptible Exposed Infectious Recovered (SEIR) model**

- 7.3.2 The epidemiological Susceptible Exposed Infectious Recovered (SEIR) model was developed to predict how the pandemic might present by way of demand for acute hospital beds (both in general wards and in critical care). There was a perceived gap by NHS Board managers in the national support in terms of forecast demand and demand scenarios at a territorial Board level. There was also significant variation in demand for acute hospital beds across the country. This, coupled with then localised nature of the pandemic response (i.e. different care pathways), meant that national models had limited value in supporting NHS Board preparedness.
- 7.3.3 Many territorial Boards had local analysts developing models and it was felt there was an opportunity for PHS to provide a more robust locally tailored model and



associated tool to complement national modelling efforts. A SEIR model was chosen as it was a very common epidemiological modelling approach, one that was being used in other geographies relating to the pandemic and one that could be implemented rapidly.

- 7.3.4 The development of the COVID-19 SEIR model began in March 2020 with a formal release of an initial modelling product in May 2020 with further development continuing throughout 2020. During this time the WSM team developed additional functionality to allow NHS Boards to develop scenarios linked to national models but tailored to their own populations and public health advice. Additional functionality also allowed NHS Boards to determine their own assumptions around translation of demand into acute hospital demand through the adjustment of default modelling assumptions around the length of time patients spent in different settings and the probability of escalation from a general ward into critical care. This model and associated tool provided NHS Boards with the additional intelligence as to the potential level of demand for acute hospital bed capacity within a general ward setting and in critical care. NHS Boards were expected to interpret this alongside local intelligence on potential capacity.
- 7.3.5 The WSM team analysed historic and near-time data as well as Scottish Government modelling outputs to develop default modelling assumptions that served as the basis for alternative planning scenarios of the NHS Boards.
- 7.3.6 It is uncertain how impactful this modelling was. There was informal feedback from some NHS Boards that this capability and default modelling outputs were helpful in planning their response. However, there was limited engagement with many NHS Boards. Over the course of 2020, it appeared that confidence in national Scottish Government modelling outputs grew both in terms of predictive short-term modelling and the longer-term scenarios. The PHS team continued to play a role in disaggregating these outputs on behalf of Boards, but the wider SEIR model functionality was mothballed (data no longer updated but functionality still available to users) in October 2020 and decommissioned entirely in early 2021.

### **Workforce Absence Model**

- 7.3.7 The second area in which the WSM tool was initially deployed to support the healthcare system in the pandemic response was the prediction of staff absences. NHS Board Chief Executives and the Scottish Government

recognised early on that staff sickness due to COVID-19 would present a challenge to maintaining the necessary staffing levels to cope with demand. Working collaboratively with Scottish Government colleagues, PHS rapidly developed a model that utilised the relationship between community infection levels and staff absences and linked that to predictions or scenarios for future infection levels to project future staff absence levels. The intention was to provide NHS Boards with insight into the added challenge of staffing alongside potential future demand.

- 7.3.8 The Workforce Absence Model was developed initially in April 2020 through the analysis of patterns of workforce absence by different staff groups across NHS Boards and regression modelling of the relationship with community infection levels. This was then applied to projections of future community infection levels initially using the WSM COVID-19 SEIR model and latterly using national and disaggregated Scottish Government modelling outputs. This model was used to provide NHS Boards with additional intelligence on the likely staffing pressures and how that might present relative to projected demand for hospital care. A system was developed at pace to allow NHS Board users to interact with modelling outputs, review modelling assumptions and investigate a range of scenarios. Additional factors such as the seasonal patterns in the wider causes of workforce absence were included to provide wider context.
- 7.3.9 There is again some uncertainty as to the impact of this modelling work. However a number of NHS Boards as well as Scottish Government colleagues reported this information to be helpful in planning their pandemic response at different times. This work continued until May 2021 before being decommissioned.

#### **7.4 Whole System Service Recovery Model**

- 7.4.1 During the summer of 2020, PHS started to develop a model that would combine measures of wider (non-COVID-19) acute hospital demand alongside measures of capacity. This was intended to support NHS Boards with a more contextualised and powerful model of acute hospital pressures, one that would recognise both the baseline non-COVID-19 demand and the potential for it to return to pre-pandemic levels. The model included seasonal factors alongside other variations and recognised the flexibility (or otherwise) in capacity that NHS Boards have at their disposal. The Whole System Service Recovery Model

provided NHS Boards and the Scottish Government with additional intelligence on the potential availability of general acute and critical care beds.

- 7.4.2 The model was designed as a simulation model and, while there were predictive elements within the model, it was designed as a scenario planning model. It was developed using a discrete-event simulation approach with which the WSM Team in PHS had some prior experience. This approach was reviewed and found to be appropriate for the intended purpose and advice was received through colleagues on the COVID-19 Modelling Collaboration.
- 7.4.3 Multiple strands of acute hospital demand were modelled. Initially this focussed on COVID-19 admissions (using Scottish Government COVID-19 modelling outputs) and non-COVID-19 emergency admission, with the later addition of flu and elective admissions. The model used assumptions around length of stay in a general ward and critical care setting and incorporated transition probabilities relating to critical care escalation (derived from PHS held hospital discharge data) and capacity (sourced direct from Boards). Finally the model looked at modelling discharge into social care (including the potential for delayed discharge, again sourced from PHS held national data on social care and delayed discharge).
- 7.4.4 The first version of the Whole System Service Recovery Model was functional in October 2020 and PHS began working with a small number of NHS Boards to apply the model. The WSM team also discussed with the Scottish Government the potential to apply the model at a national level. While this was instrumental in supporting the development of the model and in building confidence in the model, it is unlikely that the Scottish Government or NHS Boards used the model for active decision making. This first pandemic winter was still dominated by COVID-19 specific forecasts and models with non-COVID-19 demand still well below what might be expected (restrictions limited the impact of a usual flu season). The model itself was relatively crude at this time in its development.
- 7.4.5 Although the Whole System Service Recovery Model was not functional during the early stages of the pandemic, it is unlikely that it would have made a significant difference at that point even had it been in operation with the capabilities it has now. The reasons for this include:
- uncertainty regarding methods of transmission (including concerns regarding hospital acquired infection) and the risks of severe illness

- the lack of a vaccine at that time
- the unpredictable nature of non-COVID emergency demand
- the impact of reduced social mixing on the circulation of other infectious respiratory illnesses

7.4.6 PHS is however of the view that had the model been functional (and mature in its development and adoption) from summer 2020, it could have allowed NHS Boards to be more informed as to the expected impact (and potential impact for alternative scenarios) of COVID-19, within the context of other areas of acute hospital demand. This could have enabled a more responsive approach to managing non-COVID-19 activity (particularly scheduled secondary care), which may have resulted in a reduced shortfall in non-COVID-19 activity, preventing some of the unmet need that occurred, and reducing the backlog in scheduled care.

7.4.7 Model development continued throughout 2021 and over that period the WSM team built up relationships with two NHS Boards specifically (NHS Ayrshire and Arran and NHS Borders) and the Scottish Government modelling team. While there was engagement with other Boards that, in some instances led to the initial application of the model, the level of engagement from planning and information teams from Boards and the early stage nature of the model and wrap around product was such that this did not convert into utilisation. PHS worked to calibrate the model and agree modelling assumptions and scenarios for the two Boards and the Scottish Government team and ran the model on a weekly or fortnightly basis throughout winter 2021/22. NHS Ayrshire and Arran and NHS Borders subsequently continued to use the model.

7.4.8 PHS undertook further development work, first creating a winter planning product designed to provide a view over the six-month period around winter 2022/23 and then creating a second product to provide a more 'live' view of the winter period. This remained scenario-based but was informed by current data emerging throughout the winter. For example, the non-COVID-19 demand shifted from historic winter benchmarks in the winter planning model to predicted demand informed by recent trends in admissions.

7.4.9 In preparation for winter 2022/23, the WSM team worked with seven NHS Boards and again with the Scottish Government modelling team to produce winter plans. The Scottish Government was responsible for the COVID-19 input into the model

and both the WSM and Scottish Government modelling teams worked with PHS COVID-19 and Respiratory teams to agree flu scenarios. NHS Board users were given flexibility to adjust these aspects alongside many other modelling assumptions in the winter scenarios that they settled upon. Over the course of the winter period, four NHS Boards and the Scottish Government modelling team continued to look to the WSM model for continued modelling outputs and these were provided on a weekly or a fortnightly basis.

- 7.4.10 A range of feedback has been sought from model users from this period that provides positive examples how this model supported the response to ongoing acute system pressures during this time.

## **7.5 COVID-19 Community Hub forecasting**

- 7.5.1 In March 2021 PHS recognised the need for modelling focussed on the COVID-19 Community Hubs. The intention was to provide intelligence about where the hubs were still needed, where they could be stood-down, and if necessary where they needed to be stood back up again. The WSM Team therefore developed a regression-based model utilising COVID-19 community hub contacts (sourced from PHS managed national data), and historic data on COVID-19 community infections that produced a forecast of future demand. The model was set up and ran manually with outputs distributed via email from May 2021 through to March 2022 at which point the COVID-19 Community Hub infrastructure had been or was in the process of being wound down. Informal feedback was received that this modelling had been important in informing advice from PHS on the standing up and down of the community hub services which subsequently took place.
- 7.5.2 The WSM team has continued to develop modelling focussed on acute hospital and wider health and social care system pressures. This is intended to support the ongoing pressure across health and social care following the pandemic. As part of this, the WSM team are working with PHS Respiratory Team colleagues to scope the development of a multi-variant/multi-pathogen infectious disease modelling framework. This modelling framework should provide a modelled view of demand for COVID-19 and flu in the first instance as well as potentially encompassing other pathogens including new emerging pathogens and variants.



## 8. Health inequalities

### 8.1 Strategic context

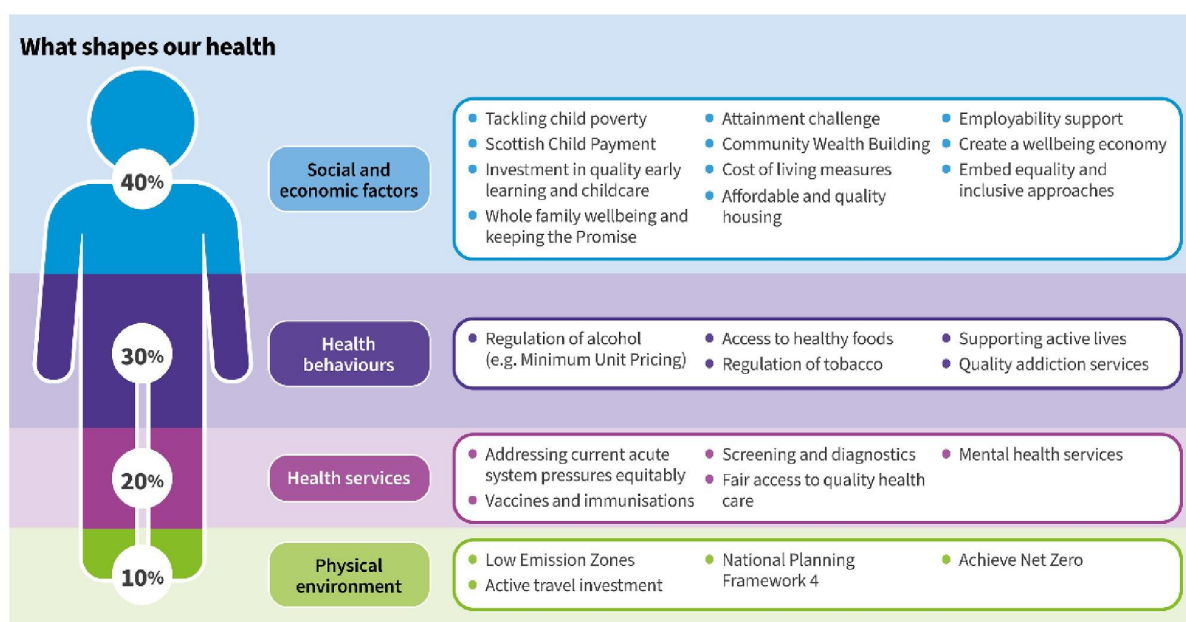
- 8.1.1 PHS is responsible for leading and enabling the drive to protect and improve the health and wellbeing of people in Scotland and reduce health inequalities. This role was inherited from NHS Health Scotland (NHSHS), one of PHS's legacy bodies. PHS defines health inequalities as 'differences in people's health across the population and between specific population groups, that are systematic, avoidable, and unfair.
- 8.1.2 A review of NHSHS's contribution to public health in Scotland was published in September 2019. 'Building our Future: NHS Health Scotland's Contribution to Public Health' (PHS3/86 - INQ000101027) discusses the organisation's change in strategic direction in 2012 to focus on actions to tackle the structural and social determinants of health. It describes the growing body of evidence about what was needed to reduce health inequalities. This includes the sociology research carried out by Columbia University that introduced the idea that some social conditions may be 'fundamental causes' of disease' (PHS3/87 - INQ000228393) and the WHO Commission on Social Determinants of Health, which was clear that 'the unequal distribution of power, income, goods, and services' (PHS3/88 - INQ000184077) was the root cause of health inequalities.
- 8.1.3 NHSHS undertook work in 2013 to assess whether the strategy set out in 'Equally Well: the Report of the Ministerial Task Force on Health Inequalities' and associated policies was effective and whether anything else might be needed. The work culminated in the publication of the 'Health Inequalities Policy Review for the Ministerial Taskforce on Health Inequalities'. The four key findings from the review were:
- Tackling health inequalities requires a combination of actions, including undoing fundamental causes, preventing harmful wider environmental influences and reducing the negative impact on individuals.
  - Interventions need to focus on a structural or regulatory level.
  - Providing universal services with added intensive support for vulnerable groups (known as proportionate universalism) is effective.
  - Interventions which require individuals to opt-in and those which involve significant price barriers may assist in improving health, but tend not to be effective at reducing health inequalities.



8.1.4 Social determinants theory has underpinned national strategies in Scotland since this time and has been reinforced in subsequent reviews including both the 2015 and 2022 (PHS3/89 - INQ000228399) Scottish Parliament inquiries into health inequalities and more recently the Health Foundation’s review of health inequalities in Scotland (PHS3/90 - INQ000228398).

8.1.5 PHS’s strategy, ‘A Scotland where Everybody Thrives’, is clear that action is required on the social determinants of health thereby preventing the causes of ill health and health inequalities. The visual representation of PHS’s strategy in Appendix E includes this figure illustrating what shapes health:

**Figure 2: What shapes our health**



Adapted from The Kings Fund (<https://www.kingsfund.org.uk/publications/vision-population-health>)

8.1.6 It can be seen that social and economic factors make the largest contribution to health and therefore also to inequalities in health outcomes. Within societies, people with greater income and wealth are generally healthier. Various longitudinal studies have established that this relationship is causal: greater income and wealth leads to better health (PHS3/91 - INQ000346194). The socioeconomic determinants also influence other factors including health behaviours, and access to services and social and cultural opportunities.

## 8.2 Pre-pandemic health inequalities and mortality trends

- 8.2.1 Scotland went into the pandemic with the worst health inequalities in western and central Europe and the lowest life expectancy in western Europe (PHS3/92 - INQ000233598). Life expectancy in Scotland had been increasing since the 1950s but then stalled in 2012 and by 2020 was decreasing in Scotland's poorest areas (PHS3/93 - INQ000320554).
- 8.2.2 PHS works as part of the Scottish Public Health Observatory (ScotPHO) collaborative to understand the factors that contribute to adverse mortality trends. ScotPHO aims to provide a clear picture of the health of the Scottish population and the factors that affect it. The best available evidence suggests that the stall in life expectancy is due to austerity and that pressure on health and social care services are also contributing (PHS3/93 - INQ000320554).
- 8.2.3 PHS worked with the Glasgow Centre for Population Health (GCPH) to produce an update of the work NHS Health Scotland undertook in 2016 with GCPH, the University of the West of Scotland and University College London, which resulted in the report 'History, politics and vulnerability: explaining excess mortality in Scotland and Glasgow' (PHS3/94 - INQ000228396). The report reviewed the evidence for the likely causes of the high levels of excess mortality seen in Scotland and Glasgow compared with elsewhere in the UK. The research produced 26 specific policy recommendations aimed primarily at Scottish Government and local government.
- 8.2.4 The 2020 report 'Policy recommendations for population health: progress and challenges' (PHS3/95 - INQ000228409) looked at progress against the original policy recommendations and found a mixed picture with several positive developments in relation to national and local policy, but also a number of areas where there has been little progress.

## 8.3 The impact of COVID-19 on health inequalities and mortality trends

- 8.3.1 The latest NRS report on life expectancy (PHS3/96 -INQ000228405) sets out that:
- Life expectancy in Scotland was 76.6 years for males and 80.8 years for females in 2019-2021 (compared to 77.1 years for males and 81.1 years for females in 2017-2019) (PHS3/97 - INQ000228404).

- Life expectancy in Scotland has decreased by more than 11 weeks for males and almost 8 weeks for females since 2018-2020.
- The majority of this fall is due to mortality from COVID-19.
- Scotland has the lowest life expectancy of all UK countries.
- Male life expectancy in the most deprived areas of Scotland was 13.7 years lower than in the least deprived areas in 2019-2021 (compared to a gap of 13.3 years in 2017-2019).
- Female life expectancy in the most deprived areas of Scotland was 10.5 years lower than in the least deprived areas in 2019-2021 (compared to a gap of 10 years in 2017-2019).

### Excess mortality

- 8.3.2 In June 2020, PHS published information (PHS3/98 - INQ000147513) on excess mortality (the number of deaths over and above what would be expected under 'normal' conditions) relating to the pandemic. This showed that about a quarter of the excess deaths between the beginning of the pandemic and the week beginning 1<sup>st</sup> June 2020 were not directly due to COVID-19.
- 8.3.3 Accompanying analyses (PHS3/99 - INQ000228391) of COVID-19 and non-COVID-19 mortality rates by Scottish Index of Multiple Deprivation (SIMD) compared age-sex standardised all-cause, COVID-19 and non-COVID-19 mortality rates by Scottish Index of Multiple Deprivation (SIMD) for weeks 1 to 23 of 2020 (30 December 2019 to 7 June 2020) against a pooled average for the same period in the previous five years (2015-19). The analyses found that:
- From the beginning of the pandemic to 7th June 2020, larger relative inequalities were observed for COVID-19 deaths than for non-COVID-19 deaths.
  - An excess of both COVID-19 and non-COVID-19 deaths contributed to increased absolute inequality in weekly all-cause mortality in Scotland between April and May 2020.
- 8.3.4 The accompanying analyses set out implications for research and policy, including suggesting the prioritisation of the following policy actions:
- Messages from government and the NHS should continue to make clear that the NHS remains open and should be used to meet health care needs.
  - Health boards should ensure that health care services remain in place and accessible for all those who may need them in the face of additional demands on services.

- Social mitigation efforts to reduce the unintended consequences of the social distancing measures should continue and be intensified. In particular, actions to reduce income insecurity should be prioritised as a means of addressing the fundamental causes of health inequality.

8.3.5 Pre-release access was provided to key Scottish Government colleagues on 22nd June 2020 in line with PHS's statistical governance procedures. The Scottish Government briefed Ministers, including the First Minister, on the report's findings.

### Burden of Disease study

8.3.6 PHS, as part of the ScotPHO collaborative, leads Scottish work on the Burden of Disease, an internationally recognised framework for assessing the comparative importance of diseases, injuries and risk factors in causing premature death, loss of health and disability in different populations. Disease burden is described in terms of disability-adjusted life years (DALYs) which represent the number of years of life lost (YLL) to premature mortality and ill health, compared to aspirational health. The study aims to support local planning and national decision-making by providing analysis of health and social care need at a national and local level.

8.3.7 In September 2021 ScotPHO published 'Inequalities in population health loss by multiple deprivation: COVID-19 and pre-pandemic all-cause disability-adjusted life years (DALYs) in Scotland' in the International Journal for Equity in Health. The aim of this study of inequalities in population health loss by multiple deprivation was twofold:

- To estimate inequalities in the population health impact of COVID-19 in Scotland in 2020, measured by DALYs.
- To scale COVID-19 DALYs – and inequalities therein – against the level of pre-pandemic inequalities in all-cause DALYs.

8.3.8 The conclusion was that the substantial population health impact of COVID-19 in Scotland was not shared equally across areas experiencing different levels of deprivation. Overall ill-health and mortality due to COVID-19 was, at most, a fifth of the annual population health loss due to inequalities in multiple deprivation. The implication for decision-making was that implementing effective policy interventions to reduce health inequalities should be at the forefront of plans to recover and improve population health.



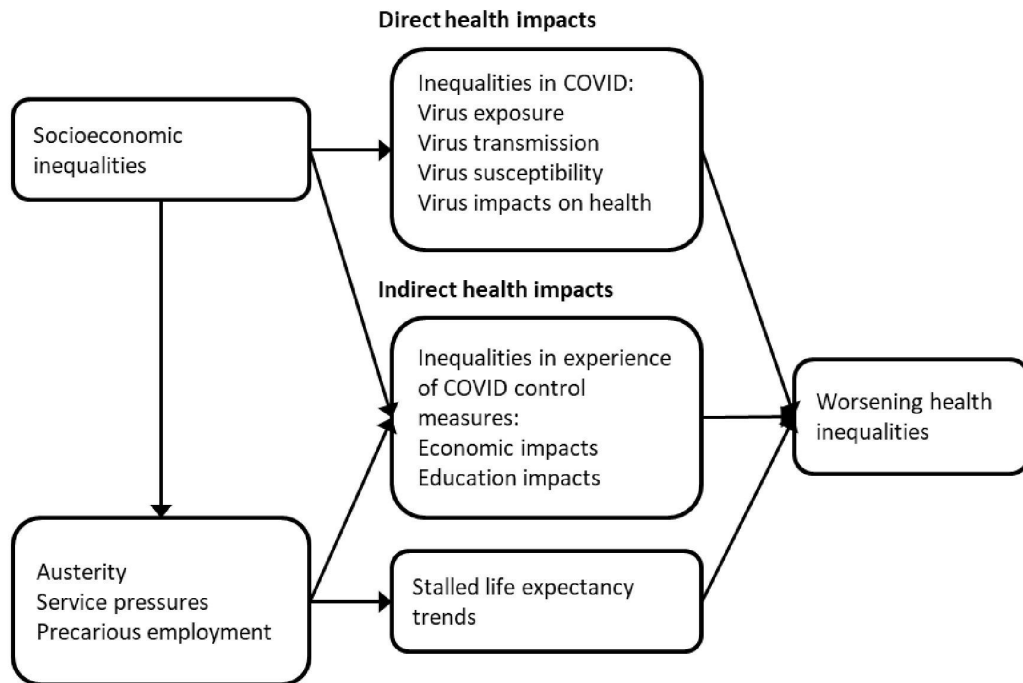


## 8.4 Inequalities in direct and indirect harms

- 8.4.1 As set out above, the Scottish Government's Framework for Decision-Making published on 23<sup>rd</sup> April 2020 outlined the 'Four Harms' approach to decision-making.
- 8.4.2 The Scottish Government considered a range of sources of evidence, expertise and analysis in the course of their consideration of the Four Harms. This included input from other Health Boards (local and national), executive agencies, Non-Departmental Public Bodies, civil society and academia. This approach is set out in 'COVID-19: framework for decision making - assessing the Four Harms', published on 11<sup>th</sup> December 2020.
- 8.4.3 For the purpose of Module 3, PHS will focus on the direct harm to life and health (direct health harms) and the harm the virus caused to wider health and care services, and indirectly to health and wellbeing (non-COVID health harms). PHS undertook analysis of the inequalities relating to direct and indirect health harms, led by colleagues with expertise in the reduction of health inequalities who had previously led the work described above in NHS Health Scotland. PHS set out how COVID-19 and the associated control measures exacerbated the pre-existing health and social inequalities in Scotland in a series of both published and unpublished papers.
- 8.4.4 The PHS paper 'How do socio-economic inequalities impact on inequalities in health during the COVID-19 pandemic and what can we do about it?' was clear that 'people living in more deprived circumstances were more likely to be exposed, infected, become unwell and to die from COVID-19 because of socioeconomic inequalities' and that 'The measures put in place to control the pandemic are also likely to have had disproportionate impacts on the most deprived groups.'
- 8.4.5 Figure 3 below sets out how the direct and indirect impacts of COVID-19 are experienced across society.



**Figure 3: Direct and indirect harms**



**Inequalities in direct health harm**

- 8.4.6 Direct health harm was assessed through data on case numbers, hospitalisation, the number of people requiring treatment in Intensive Care Units, and the number of deaths related to the virus. Chapter 4 sets out details of the data PHS provided to support this analysis, including daily data which the Scottish Government published on its website.
- 8.4.7 The briefing referred to above cited analysis by NRS which found that using occupation as an individual marker of socioeconomic position, and data between March and December 2020, the COVID-19 death rates for working-age adults employed as ‘process, plant and machine operators’ was eleven times higher than those working in ‘professional occupations’, while all-cause deaths was 5.3 times higher.
- 8.4.8 Direct COVID-19 mortality is also substantially higher for those in some ethnic minorities in Scotland (see below), with increasing age, amongst men compared to women, and for those with pre-existing health conditions. Early analysis of data on mortality from COVID-19 for people with learning difficulties suggests that

this might be three times higher than in the general population (PHS3/100 - INQ000320540).

- 8.4.9 In addition, the COVID-19 mortality rates have been found to be higher in some local authority areas than others. Data from the first wave of the pandemic show that this can be explained by higher income deprivation levels and household overcrowding (see section 8.5).

### Inequalities in indirect health harm

- 8.4.10 PHS worked with the Scottish Health and Inequalities Impact Assessment Network (SHIAN) and other collaborators to publish 'Mitigating the wider health effects of COVID-19 pandemic' in the British Medical Journal (BMJ), first as a pre-print on 21<sup>st</sup> March 2020 (PHS3/101 - INQ000228407) and then as a peer-reviewed publication on 27<sup>th</sup> April 2020 (PHS3/102 - INQ000147553). The pre-print was considered at the 2<sup>nd</sup> April meeting of the Scottish Government COVID-19 Advisory Group and the work was referenced in the paper outlining supporting evidence for the Framework for Decision-making, published in May 2020.
- 8.4.11 'PHS and collaborators have published a paper on the risks of distancing measures negatively impacting on people's health, and how to mitigate these wider harms. It finds that the interventions in place to lower transmission of the virus can themselves cause a wide range of harms and that building a more sustainable and inclusive economy for the future will be crucial to mitigating these wider harms.'
- 8.4.12 The analysis was further explored and published as 'The Health Impacts of Physical Distancing Measures in Scotland: rapid health impact assessment' on 26<sup>th</sup> May 2020 (PHS3/103 - INQ000147586).
- 8.4.13 The assessment looked at a range of mechanisms through which physical distancing measures could impact on health including economic impacts, social isolation, health-related behaviours and disruption to essential services. Potential impacts identified in relation to disruption to health and social care services include:
- The potential for the cancellation of face-to-face appointments to lead to inappropriate care or barriers to care for people who require interpreting services including Deaf people who use British Sign Language (BSL).

- The potential for delays to non-urgent health care provision to detrimentally impact on people with long-term health conditions. It was suggested that delays to treatment could result in ongoing unresolved morbidity and delays to prevention activities such as cancer screening, which could result in longer term adverse health impacts.

8.4.14 In June 2020, PHS published a paper produced at the request of the Scottish Government's Mental Health Research Advisory Group which provided a rapid review of the impact of COVID-19 on mental health (PHS3/104 - INQ000147575). The limited evidence available at the time indicated that a number of key groups could be at higher risk of adverse mental health outcomes, including frontline staff working with COVID-19 patients, women, those with a low educational level and individuals with underlying mental health conditions. PHS recommended that measures to mitigate this potential impact should be considered as a matter of urgency.

8.4.15 The rapid review found eighteen studies that looked at the impact of COVID-19 on mental health outcomes in healthcare workers. The lack of longitudinal studies in this population meant it was not possible to ascertain trends during the course of the pandemic. The majority of studies provided the point prevalence of a range of mental health outcomes, but some compared populations based on their involvement with the care of COVID-19 patients, geographical areas and roles/experience of healthcare workers. Based on these groupings, the following limited observations were drawn about which populations may have fared worse in terms of their mental health:

- Three studies compared medical healthcare workers with non-medical healthcare workers; in two of these studies of over 2,000 participants recruited online, there was a higher prevalence of anxiety, fear, depression, insomnia, somatisation and obsessive compulsive symptoms among medical staff (predominantly doctors and nurses) compared with non-medical staff. A smaller study of 470 participants found a higher prevalence of anxiety among medical workers after adjustment for age, sex, ethnicity, marital status, survey completion date and presence of comorbid conditions, but no significant differences in PTSD, stress and depression between groups.
- A small study of 190 participants, comparing the frequency of burnout between redeployed physicians and nurses to frontline COVID-19 wards with those working in their usual wards, showed that burnout prevalence in staff working in their usual ward was three times higher than in COVID-19 ward staff.

- One study of 1,521 participants showed that people without experience working in a public health emergency had poorer mental health, resilience and social support compared to those with experience.
- Two studies looked at effect of working in Wuhan, the original epicentre of the pandemic, compared with other Chinese towns/provinces and both suggested that local medical staff had poorer mental health outcomes (insomnia, depressive and anxiety symptoms) compared with people working outside of Wuhan. The other 11 studies reported the point prevalence of a range of mental health outcomes during the pandemic but these were carried out at different time points. Seven studies were conducted in frontline healthcare staff and three in non-frontline specialist staff (paediatrics, n = 2; multiple sclerosis, n = 1). Two studies were undertaken in certain subpopulations, such as in females and across different countries (India and Singapore). Two studies featured some psychological support for healthcare staff. Anxiety and depression prevalence rates ranged from 15.7% to 44.6% and from 10.6% to 50.4% in frontline staff, and 7% to 18.1% and 25% to 29.5% in non-frontline staff, respectively. The report is clear that these findings should be interpreted with caution due to the variation in the timing of the surveys, non-representative heterogeneous populations and different measurement scales used.

8.4.16 The rapid review found four studies that examined the impact of COVID-19 on mental health outcomes in children and young people. The studies included different ages of children and young people and examined different elements of mental health. Two studies measured anxiety among school-aged children (aged 12–18 years) and young people (college students, age not specified) using the 7-item Generalized Anxiety Disorder Scale (GAD-7). The rate of mild anxiety reported for high school students of China was 27.0%, and that of severe anxiety was 3.0%. The study involving college students (n = 7143) reported that 21.3% of participants had self-reported experiencing mild anxiety and 0.9% of participants experienced severe anxiety. However the review notes that it is not clear whether this differs from pre-COVID-19 levels. One study with an unrepresentative sample assessed the mental health of people aged 14–35 years using the 12-item General Health Questionnaire (GHQ-12). The authors of the study stated that 40.4% of those sampled reported having psychological problems (defined by the authors as scoring higher than 15 points on the 12-item questionnaire). However, most of this could be explained by the experience of mild symptoms. Excluding mild symptoms prevalence rates for anxiety and depression are reduced to 5% and 11.2%, respectively.

8.4.17 PHS and partners in the Mental Health Analytical Hub (see section 2.4.19) published ‘The early impacts of the COVID-19 pandemic on Scotland’s mental health – not just one story’ (PHS3/105 - INQ000320572) on 22<sup>nd</sup> July 2022. The report set out the uneven distribution of the mental health impacts of the pandemic and provided:

- Findings from two Scottish surveys that provide a quantitative picture of the extent and type of mental health impacts of the pandemic on the population.
- An in-depth look at a number of qualitative studies, drawing on samples from across the UK, that provide a picture of how people expressed and experienced the impact of the pandemic on their mental lives.
- Reflections on the combined learning from the quantitative and qualitative material.

## 8.5 Regional variation in outcomes

8.5.1 PHS published ‘What explains the spatial variation in COVID-19 mortality across Scotland?’ on 30<sup>th</sup> September 2020 (PHS3/106 - INQ000147584). The origin of the work was an exchange in the Scottish Parliament between the Cabinet Secretary for Health and Sport and Neil Bibby MSP on 7<sup>th</sup> May 2020 (PHS3/107 - INQ000235160). Mr Bibby asked ‘Does the Cabinet Secretary know why the west of Scotland appears to be disproportionately affected by the virus? If not, will she investigate why that appears to be the case?’ The Cabinet Secretary said in response that PHS had been asked to look at the figures and the factors that might contribute to them, and then advise the Scottish Government of its conclusions.

8.5.2 The resultant analysis undertaken by PHS found that between 1<sup>st</sup> March and 30<sup>th</sup> June 2020, the highest age-standardised mortality rates with COVID-19 recorded as the underlying cause on the death certificate have been experienced in West Dunbartonshire, Glasgow City, Midlothian and Inverclyde local authority areas. Potential reasons for the spatial variation were differences in rurality / population density, income deprivation, household overcrowding and the timing of first COVID-19 death.

## 8.6 Healthcare inequalities and measures healthcare bodies can take to reduce health inequalities

8.6.1 As set out in section 3.2.3 above, PHS was represented on the subgroup of NHS Chief Executives looking at renewal. Working with Carol Tannahill and NR

**NR** from the Scottish Government, the group's ambition was to understand the impacts of COVID-19 and develop a 12-18 month programme of work that would set out the programme of reform required for a healthier Scotland in the future.

8.6.2 Dr Diane Stockton, PHS Consultant in Public Health who led the organisation's Social and Systems Recovery work (see section 1.4.3) shared a working paper with the group at their June (PHS3/108 - INQ000280874), July (PHS3/109 - INQ000320565) and August 2020 (PHS3/110 - INQ000189528) meetings. The working paper 'How has the health of Scotland been indirectly impacted by COVID-19 and how can NHS Boards mitigate for this impact?' documented the emerging data and evidence on the indirect impacts of the pandemic on health and health inequalities and set out possible actions by NHS Boards to mitigate the impact. Diane Stockton presented a summary of the evidence of how the health of Scotland had been indirectly impacted by COVID-19 to the October 2020 meeting of the group (PHS3/111 - INQ000320562).

### Healthcare inequalities

8.6.3 As discussed above, health services, including the provision of equitable services, account for around 20% of what shapes population health. PHS's work on pandemic inequalities focussed more on the socioeconomic and environmental factors that contribute most significantly to health and health inequalities.

8.6.4 PHS has not undertaken specific research looking at how the pandemic impacted on healthcare inequalities. However, areas of work discussed elsewhere in this statement provide evidence relevant to healthcare inequalities:

- Paragraph 8.9.9: evidence that while most ethnic minority groups were at increased risk of adverse COVID-19 outcomes in Scotland, inequalities in outcomes for different ethnic groups did not persist following hospitalisation. This suggests that differences in hospital treatment did not substantially contribute to ethnic inequalities.
- Paragraphs 9.3.12 – 9.3.16: phase two of the Impact and Experience Survey (part of PHS's shielding evaluation) found issues with access to healthcare experienced by people with co-morbidities. This included access to GP appointments (mentioned most often by respondents to the survey), dentists, opticians and audiologists, rehabilitation support, cancer support, and mental health support. Respondents also report difficulties getting hold of medications. Many respondents



reported how challenging it had become to have face-to-face contact with their healthcare providers – again most often referring to contact with their GP.

- Paragraphs 11.4.8 – 11.4.9: Socio-economic inequalities in cancer screening. The pandemic does not seem to have worsened pre-existing healthcare inequalities in cancer screening.

8.6.5 Chapter 11 on the impact of the pandemic on secondary care discusses scheduled and unscheduled care drawing on the extensive statistics PHS publishes on healthcare services in Scotland and the analysis made available through the Wider Impacts Dashboard described in paragraphs 4.6.3 – 4.6.6. Much of the data is disaggregated by age, gender, ethnicity and deprivation. It is important in this context to distinguish between healthcare inequalities and variation in need. Healthcare inequalities are unfair and unjustified variations in healthcare quality, which are generally a result of the structures and processes of healthcare. In contrast, variations in need may be appropriate and justifiable – some population groups require greater access to healthcare than others (for example those with comorbidities and older people). It is not possible from population level data of this kind to conclude whether apparent variations in access to hospital care or critical care due to age, disability, comorbidities (or other personal characteristics) were a result of healthcare inequalities or variations in need.

8.6.6 A study by NHS Health Scotland in 2015 showed how Did Not Attend (DNA) data can be used to identify potential inequalities in access to NHS services by exploring the differences in the risk and rate of patients not attending outpatient appointments (PHS3/112 - INQ000346183). Ten-year trend data (PHS3/113 - INQ000346201) for 2013 – 2023 published by PHS alongside the 2022/23 report of acute hospital activity and NHS beds information referred to in paragraph 11.1.3 below includes data on DNAs at outpatient clinics. DNA rates have been generally reducing over the past few years as a result of action taken by NHS Boards such as the introduction of patient-focused booking approaches.

8.6.7 Although the risk of DNA has declined, the notable social gradient of DNAs has been relatively stable for the past 10 years. DNA rates in the most deprived areas averaged 14% over the decade compared to an average of 6% in the least deprived areas. In 2021/22, the two most deprived quintiles accounted for 56.5% of all appointments resulting in DNAs. Although the pandemic did not create or exacerbate this inequality (the equivalent figure for the two most deprived

quintiles in 2019/20 was 58.6%), this data nevertheless suggests that the structures and processes of scheduled care present a barrier to people in disadvantaged communities in Scotland, which is important to be cognisant of in the recovery and renewal of the NHS post-pandemic.

### **Measures healthcare bodies can take to reduce health inequalities**

8.6.8 There is a strong body of evidence around what healthcare bodies can do to improve health and reduce health inequalities, including healthcare-related inequalities. While much of the evidence pre-dates COVID-19, it remains relevant and was harnessed during and after the pandemic to support the recovery of the NHS in Scotland. The measures fall broadly into two categories: action to remove barriers to access to services and action that healthcare providers can take on the social determinants of health.

8.6.9 The PHS report 'Public health approach to prevention and the role of NHS Scotland' (PHS3/114 - INQ000346198) describes action on the social determinants of health as being 'primary prevention of poor health' along with actions to reduce lifestyle risks and prevent infectious disease. These can be delivered at both a whole population level (universal measures) or be targeted at groups at highest risk (such as women, single parents, people with disabilities and ethnic minority communities). PHS has been engaging with the Scottish Government and NHS Boards Chairs and Chief Executives since early 2022 to encourage a greater focus on – and investment in – primary prevention as part of NHS recovery and renewal.

8.6.10 The report sets out the following five actions that NHS Boards can take in primary prevention:

- Be an exemplar anchor organisation.
- Deliver equitable universal and targeted public health services.
- Advocate for a focus on primary prevention and equity.
- Strengthen accountability and performance management of prevention activity.
- Design and deliver equitable services.

### **Removing barriers to access to or uptake of services**

8.6.11 Healthcare providers can take an inclusion health approach to design and deliver equitable services. This helps tackle barriers to access that may prevent some

people reaching services such as cost (including hidden costs), stigma, physical and cultural accessibility, and discrimination. Inclusion health involves targeting those who experience the most marginalisation, exclusion and deprivation in a population. It is founded on the principle of proportionate universalism: the resourcing and delivering of universal services at a scale and intensity proportionate to the degree of need (PHS3/115 - INQ000346182). Inclusion health considers the cross-cutting nature (intersectionality) of the features that make up people's identities. It therefore goes beyond targeting services on the basis of protected characteristics under the Equality Act 2010, which may not always reach the most vulnerable people.

8.6.12 PHS published 'Inclusion health principles and practice: mitigating the impact of COVID-19' (PHS3/116 - INQ000202852) on 22<sup>nd</sup> September 2020. This report outlines how an inclusion health approach could support recovery from the pandemic, prevent negative impacts on health for the most marginalised people in Scotland, and reduce health inequalities. Produced under the auspices of PHS's Social and Systems Recovery programme (see section 1.4: Response structure), the report was developed in partnership with third sector organisations, local NHS Boards, Healthcare Improvement Scotland, and Strathclyde University.

8.6.13 The key points from the report are:

- The most marginalised and excluded people in Scotland are most at risk of the unintended, non-viral health impacts of the pandemic.
- A participative, human rights-based approach would strengthen the response, help to mitigate the unintended negative impacts of COVID-19 and protect those who are marginalised and excluded.
- Increases in inequalities were already being seen and more was needed to prevent a further rise due to disproportionate increases in morbidity and mortality rates in those who experience the most disadvantage and marginalisation.

8.6.14 Taking a human rights-based approach to health involves (PHS3/117 - INQ000346192):

- Ensuring the fair and equitable distribution of the social determinants of health.
- Thinking about how resources are allocated to ensure decisions about policy and spending are not contributing to health inequalities or making them worse.
- Working with people to understand the factors that undermine their right to health and together identifying actions to make improvements.

- Taking action to tackle economic and social inequalities alongside actions which specifically focus on disadvantaged groups and deprived areas.
- Ensuring services are planned and delivered in proportion to need (proportionate universalism).
- Ensuring services are available, accessible, appropriate and of equal quality.

The World Health Organization (WHO) has endorsed the AAAQ Framework (PHS3/117 - INQ000346192) as standards that healthcare providers (and other public bodies) should aim to deliver. This refers to services being accessible, available, acceptable, and high quality:

- **Accessible:** Services must be accessible to everyone without discrimination, especially the most vulnerable people. They must be physically and economically accessible.
- **Available:** Facilities, goods and services – both health-related and those that influence health – must be available in sufficient quantity. For example, hospitals, clinics, trained health workers, essential medicines, preventive public health strategies and health promotion, as well as the underlying determinants such as education and childcare.
- **Acceptable:** Health services must be respectful of medical ethics, culturally appropriate, trauma informed and gender sensitive. Medical treatment must be explained in an understandable manner and health workers need to be aware of cultural sensitivities.
- **High quality:** Services must be scientifically and medically appropriate and of good quality. Quality also extends to the manner in which people are treated, and the underlying determinants of health, which must be appropriate and of good quality.

8.6.15 Healthcare providers can also follow the PANEL principles (PHS3/117 - INQ000346192) to embed a human rights-based approach and ensure that services are targeted at the people who need them the most:

- **Participation:** People should be able to voice their experiences and take part in decision-making. Policies and practice should support people to participate in society and lead fulfilling lives.
- **Accountability:** Organisations and people should be accountable for realising human rights. There is a floor below which service standards must not fall, but above that human rights should be understood as a progressive journey towards fulfilling the full potential of every human being.

- Non-discrimination: Everyone has the same rights, regardless of their ethnicity, gender, income and religion.
- Empowerment: People, communities and groups should have the power to know and claim their rights in order to make a difference.
- Legality: All decisions should comply with human rights legal standards.

**Action healthcare providers can take on the social determinants of health**

8.6.16 PHS legacy body NHS Health Scotland led work setting out how NHS Boards (PHS3/118 - INQ000346200) and Health and Social Care Partnerships (PHS3/119 - INQ000346202) could maximise their contribution to reducing health inequalities in 2017 and 2018 respectively. The papers set out the following actions:

- Quality services with allocation of resources proportionate to need.
- Training the workforce to understand their role in reducing inequalities.
- Effective partnership with different sectors to help reduce health inequalities.
- Mitigation of inequalities through employment and procurement processes.
- Leadership and advocating to reduce health inequalities.

8.6.17 PHS committed to continuing NHS-focussed inequalities work in its inaugural Annual Operating Plan. After initially being paused when the majority of PHS's efforts pivoted to focus on the pandemic response, the work became central to PHS's efforts to support the remobilisation and recovery of the NHS post-pandemic.

8.6.18 The strategic context of this work is the Scottish Government's commitment to creating a wellbeing economy: an economic system that places the wellbeing of current and future generations at its core. The Community Wealth Building (CWB) approach to economic development is central to this ambition, harnessing the economic leverage of local 'anchor institutions' to reduce inequalities and improve wellbeing.

8.6.19 First developed in the Unites States by the Democracy Collaborative, the term 'anchor institution' refers to large organisations with a sizable workforce that are based in local communities. Anchors have leverage in their local area through their spending and commissioning power, their recruitment policies, the use of their land, estates and facilities, and their environmental practice. Anchors get their name because they are unlikely to relocate, given their connection to the

local population, and have a significant influence on the health and wellbeing of communities.

- 8.6.20 The Health Foundation and the Centre for Local Economic Strategies (CLES) have led work in the UK to understand how NHS organisations act as anchor institutions in their local communities and can positively influence wellbeing outcomes. They published 'Building Healthier Communities: The role of the NHS as an Anchor Institution' (PHS3/120 - INQ000346193) in August 2019. They set out five ways in which anchors like NHS Boards can positively influence health and wellbeing: through their roles in employment, procurement and commissioning for social value, use of capital and estates, environmental sustainability, and as a partner in place.
- 8.6.21 PHS partnered with the Health Foundation and CLES to support local dialogue and the development of an anchors approach with NHS Boards and their partners and consider where this contributes to CWB more generally. PHS's work around CWB and NHS Boards as anchor institutions featured in several significant meetings during the pandemic, demonstrating the strategic importance of the policy area. The Chief Executive of PHS provided an overview of the organisation's anchors work to two successive Ministers for Public Health in 2021: Marie Gougeon on 9<sup>th</sup> March 2021 and Maree Todd on 29<sup>th</sup> September 2021.
- 8.6.22 This work is now being taken forward under the auspices of the Scottish Government's Care and Wellbeing Portfolio. Developed in the second half of 2021, the aim of the Care and Wellbeing Portfolio (see also paragraph 3.3.18) is to stimulate national and local action to reduce health inequalities and ensure the people of Scotland live more years in good health. The portfolio consists of four programmes, one of which – 'Place and Wellbeing' – is about joint action within communities to reduce health inequalities and drive improvement in health and wellbeing within local communities. One of the three workstreams within the Place and Wellbeing programme focusses on supporting health and social care bodies to operate effectively as anchor institutions.
- 8.6.23 PHS developed three case studies together with colleagues from NHS Boards in Scotland setting illustrating what this approach involves:
- NHS Grampian's widening participation education programme (PHS3/121 - INQ000346187)



- Diversifying NHS Greater Glasgow and Clyde's supply chain (PHS3/122 - INQ000346186)
- NHS Ayrshire and Arran's approach to community wealth building (PHS3/123 - INQ000346185)

8.6.24 The Scottish Government embedded anchor-related performance measures into the NHS planning and performance framework in 2022/23, with support from PHS around the metrics.

## **8.7 Supporting the early consideration of inequalities by the Scottish Government COVID-19 Advisory Group**

8.7.1 PHS undertook analysis early in the pandemic to calibrate the impacts of COVID-19 with the impacts of its control measures in order to inform decision-making on NPIs. The paper, 'Calibrating the impacts of COVID-19 with the impacts of its control measures: informing decision-making on Non-Pharmaceutical Interventions (NPIs)', which was authored by Dr Gerry McCartney, inequalities expert and Consultant in Public Health at PHS, was considered at the 9<sup>th</sup> April 2020 meeting of the Scottish Government COVID-19 Advisory Group. The three key findings of the analysis outlined in the paper were:

- While COVID-19 represented a substantial mortality challenge, when considered in terms of age-standardised mortality and impact on life expectancy, the impact is comparable to other mortality risks Scotland faces, most of which are risks that impact on the population every year. We need to ensure that we are consistent in responding to mortality risks of similar magnitude and that we calibrate our response to the size of the risk.
- There are numerous unintended consequences of COVID-19 which have very substantial impacts on the economy, education, social relations, and through these pathways, on population health and inequalities in the short, medium and long-term. Ensuring the unintended negative impacts of NPIs are sufficiently mitigated is vital.
- There are difficult decisions to be made on when and how to reduce the NPIs. These will need to balance the potential impacts on COVID-19 mortality and morbidity, pressures on health and social care services, and the unintended consequences across society (including on population health and health inequalities). Further work can and should be done to estimate the intended impacts of NPIs on COVID-19 and the unintended impacts on health and other

outcomes urgently to inform this decision-making. There is a risk that, on many measures, the impact of the NPIs for COVID-19 could be more deleterious than the impact of a less mitigated approach to COVID-19. This balance requires careful ongoing monitoring and consideration.

8.7.2 The minutes of the meeting noted that ‘government is considering points raised in the paper and expressed that the paper should feed into broader thinking’ and that ‘while long-term issues are clearly incredibly important, there are urgent issues also to address. In the last week of full reporting there were almost 800 care home outbreaks in England. It is important that we address the issues of today as well as tomorrow.’

8.7.3 This work was further developed and published first as a pre-print on 7<sup>th</sup> May 2020 and then as a peer-reviewed article in November 2020 as ‘Scaling COVID-19 against inequalities: should the policy response consistently match the mortality challenge?’ (PHS3/124 - INQ000147580). The mortality impact of COVID-19 had thus far been described in terms of crude death counts. The paper calibrated the scale of the modelled mortality impact of COVID-19 using age-standardised mortality rates and life expectancy contribution against other, socially determined, causes of death to inform governments and the public and concluded that:

‘Fully mitigating COVID-19 is estimated to prevent a loss of 5.63 years of life expectancy for the UK. Over 10 years there is a greater negative life expectancy contribution from inequality than around six unmitigated COVID-19 pandemics. To achieve long- term population health improvements it is therefore important to take this opportunity to introduce post-pandemic economic policies to ‘build back better’.’

## 8.8 Racialised health inequalities

### Healthcare inequalities

8.8.1 PHS collaborated with academic partners on a study looking at ethnic inequalities in positive SARS-CoV-2 tests, infection prognosis, COVID-19 hospitalisations and deaths (PHS3/125 - INQ000346184). This was a population-based cohort study where the 2011 Scottish Census was linked to health records. The study period was from 1<sup>st</sup> March 2020 to 17<sup>th</sup> April 2022 with separate analyses

conducted for each of the four waves of COVID-19 to assess changes in risk over time.

- 8.8.2 Of the 4,358,339 individuals analysed (all individuals over 16 years old living in Scotland on 1<sup>st</sup> March 2020) there were 1,093,234 positive SARS-CoV-2 tests, 37,437 hospitalisations and 14,158 deaths. The risk of COVID-19 hospitalisation or death following a confirmed positive SARS-CoV-2 test was higher for White Gypsy/Traveller, Pakistani and African individuals relative to white Scottish individuals. However, the risk of COVID-19-related death following hospitalisation did not differ. The risk of COVID-19 outcomes for ethnic minority groups was higher in the first three waves compared with the fourth wave.
- 8.8.3 There is evidence therefore that most ethnic minority groups were at increased risk of adverse COVID-19 outcomes in Scotland, especially White Gypsy/Traveller and Pakistani groups. Ethnic inequalities persisted following community infection but not following hospitalisation, suggesting differences in hospital treatment (healthcare inequalities) did not substantially contribute to ethnic inequalities.

### Variations in COVID-19 outcomes by ethnic group

- 8.8.4 PHS published data six times over the course of the pandemic outlining variations in outcomes by ethnic group of those who have tested positive for COVID-19. None of the reports suggested that healthcare inequalities – variations in healthcare quality (including access, effectiveness, and safety) – contributed to variations in COVID-19 outcomes by ethnic group. However, apart from the first report where availability and completeness of data was a challenge, each of the reports found variations in COVID-19 outcomes:
- 20<sup>th</sup> May 2020: based on the available data, PHS found that the proportion of ethnic minority patients amongst those seriously ill with COVID-19 appeared no higher than the relatively low proportion in the Scottish population generally. PHS was clear that further work was required to improve the analysis.
  - 15<sup>th</sup> July 2020: PHS found emerging evidence of increased risks of serious illness due to COVID-19 in people of South Asian origin. There was evidence that some of the increased risk of the most severe outcomes may be accounted for by diabetes. The report was clear however that quantifying the raised risk was difficult due to small numbers and uncertain estimates. For other minority ethnic groups, numbers were too small to for differences in risk to be compared with confidence.

- 12<sup>th</sup> August 2020: the third report focussed on comparisons of the risk of more serious outcomes due to COVID-19. That is, patients requiring hospitalisation or intensive care or dying within 28 days following a positive swab test result. The analysis provided further evidence of increased risks of serious illness due to COVID-19 in those of South Asian origin, with a two-fold increase in risk of needing critical care or dying within 28 days of a positive test. This increase was still apparent after accounting for diabetes and when COVID-19 deaths in those never testing positive were included. There was also evidence of an increased risk of hospitalisation due to COVID-19 amongst those of Black, Caribbean or African ethnicity.
- 2<sup>nd</sup> December 2020: PHS found further evidence of around a two-fold increase in risk of admission to critical care or death due to COVID-19 among those of South Asian origin. This increased risk was particularly evident among the Pakistani group and was still apparent after accounting for deprivation, residential care home status and diabetic status. The analysis found evidence of an increased risk of hospitalisation due to COVID-19 among those of Caribbean or Black ethnicity.
- 3<sup>rd</sup> March 2021: PHS reported continued evidence of increased risks in some ethnic minority groups, which persisted during the second wave, rising to around a three-fold increase in risk for some ethnic groups. While rates of hospitalisation or death were higher during the second wave across all of Scotland's population, those of South Asian ethnicity appear to have been at proportionally greater risk.
- 27<sup>th</sup> October 2021: PHS published data showing how the impact across ethnic groups changed throughout the three waves of the pandemic. Rates of hospitalisation or death reduced between the second wave (1<sup>st</sup> August 2020 to 30<sup>th</sup> April 2021) and third wave (from 1<sup>st</sup> May 2021) across the population, but those of Pakistani, Caribbean or Black, and African ethnicity had continued to appear to be at proportionally greater risk compared to the White Scottish group. This sixth report included analysis of COVID-19 testing by ethnicity, showing that compared to the White British group, most ethnic groups had higher rates of positive cases per population.

### Expert Reference Group on COVID-19 and Ethnicity

- 8.8.5 The First Minister announced the establishment of an expert group to consider the impact of COVID-19 on minority ethnic communities on 9<sup>th</sup> June 2020. The



Expert Reference Group on COVID-19 and Ethnicity (the ERG) was asked to provide advice and recommendations by the Scottish Government in relation to data, evidence, risk and systemic issues. Two subgroups were formed to look separately at health data and evidence, and systemic issues and risk. PHS was represented on both subgroups, contributing expertise around both data and inequalities. Interim recommendations were published by both groups on 18<sup>th</sup> September 2020.

- 8.8.6 The data and evidence report considered the priorities for action on health data in relation to COVID-19 and race, including what should be done to improve the accuracy and completeness of data on ethnicity within Scotland's health system and whether there was a case for making the collection of health data on ethnicity mandatory? 14 recommendations were made including making ethnicity a mandatory field for health databases, and ongoing monitoring of health (and other) data by ethnicity including the publication by PHS of an annual monitoring report on ethnic group health inequalities in Scotland.
- 8.8.7 The Scottish Government established the Racialised Inequalities in Health and Social Care in Scotland Steering Group to address structural racism and reduce racialised health inequalities in health and social care in Scotland. Co-chaired by the Scottish Government's Director of Population Health and Healthcare Improvement Scotland's Director of Evidence, one of the priorities of the group is to ensure effective delivery of the ERG recommendations, including improved collection and use of ethnicity data to monitor and address inequities in access, experience and outcomes. PHS is represented on the Steering Group by Chief Officer, Manira Ahmad.
- 8.8.8 Part of the steering group's action plan to address racialised inequality in health and social care is the development of a community of practice to address racialised inequalities in health and social care. The community of practice, which is jointly administered by PHS and the Scottish Government, aims to provide a platform for health and social care policy and delivery professionals to better understand and address racism, discrimination and their outcomes. This includes building an understanding of structural racism and how it operates, and practical anti-racist actions to dismantle it.

### **Monitoring racialised health inequalities in Scotland**

8.8.9 PHS published the first annual monitoring report on racialised health inequalities in Scotland on 8<sup>th</sup> March 2022 (PHS3/126 - **INQ000147479**). The key messages were:

- Scottish data have consistently shown an increased risk of serious illness and death from COVID-19 among many ethnic minority groups. This mirrors similar trends seen in other countries of the UK.
- COVID-19 vaccination uptake rates have been persistently lower in some ethnic minority groups compared to the rest of the population. PHS continues to work to support all of Scotland's communities to increase vaccine uptake.
- The need for timely and accurate data at the onset of the pandemic highlighted the inadequacies in the availability of ethnicity data for health monitoring. Improvements have since been made to ensure ethnicity recording is mandatory on hospital admission data.
- Further work initiated by PHS has identified requirements for improving data collection within primary care to be taken forward within the Race Equality Immediate Priorities Plan.
- PHS is committed to publishing more data which meets the needs of policy-makers, service providers, and the patients and communities they serve to monitor and reduce ethnic health inequalities.
- PHS will work with the Scottish Government to support the delivery of the recommendations of the Expert Reference Group on COVID-19 and Ethnicity to tackle the health inequalities that minority ethnic communities face.

8.8.10 The second annual monitoring report on racialised health inequalities in Scotland was published on 30 May 2023 (PHS3/127 - INQ000236309). The report provides information on ongoing improvements in ethnicity data collection and analysis to allow routine monitoring of racialised health inequalities across the health and care system. The report:

- Focuses on ongoing work within maternity and early years data. This reflects both the importance of public health advice and interventions during maternity and early years in improving the health of the population and the progress being made in capturing ethnicity information in these key areas.
- Updates on an evaluation of the COVID-19 vaccination programme, looking at factors affecting vaccine uptake among different ethnic groups and the lessons learned to improve uptake in future vaccination programmes.
- Updates on work to refresh the 'Happy to ask, happy to tell' toolkit which seeks to empower health and care professionals to ask data providers about their equality characteristics, including ethnicity.



- Describes work to address the significant health inequalities experienced by the Gypsy, Roma and Traveller community.
- Shows that progress is being made on improving the availability of ethnicity data for monitoring racialised health inequalities but there is still more to do.

8.8.11 PHS is committed to publishing more data which meet the needs of policymakers, service providers, and the patients and communities they serve in order to monitor and reduce racialised health inequalities. PHS is currently leading a short life working group to review recording of ethnicity data and develop a series of recommendations to improve it.

8.8.12

## 9. Shielding and at-risk individuals

### 9.1 Background to the shielding programme

- 9.1.1 In March 2020, the Scottish Government created a list of people believed to be at highest risk of becoming severely ill if they caught COVID-19. This was initially called the Shielding List and was later renamed the Highest Risk List (PHS3/128 - INQ000320548). The four Chief Medical Officers decided on the shielding group based on the evidence available about the health conditions thought to put people at the highest risk of severe illness and death if they caught the virus. A precautionary approach was taken. PHS was not involved in creating the Shielding List or developing the programme of support for those on the Shielding List. The Scottish Government led the development of shielding policy and guidance and identified the medical conditions for inclusion on the Shielding List.
- 9.1.2 The shielding programme operated during the first phase of the pandemic to protect people who were clinically at high risk from COVID-19 by supporting them to self-isolate and minimise all interaction with others. The original advice was to shield for at least 12 weeks. This was to come to an end on 18<sup>th</sup> June 2020 but was extended to 31<sup>st</sup> July 2020 (PHS3/129 - INQ000320537).

### 9.2 Identifying individuals at high risk

- 9.2.1 Individuals at high risk were identified utilising PHS data sources (PHS3/130 - INQ000320553). There is no regular central collection of GP data in Scotland and it was felt to be too onerous on GP practices to ask them to individually collect data for this purpose. Instead the following PHS data sources were used instead:
- The database of dispensed GP medications was used to identify immunosuppression prescriptions.
  - The database of hospital events which included ICD10 coded diagnoses (the tenth revision of the International Classification of Diseases - used for disease recording and statistics purposes in primary, secondary and tertiary care, and also used on death certificates.) and OPCS coded procedures (Office of Population Censuses and Surveys Classification of Interventions and Procedures – used by clinical coders within NHS hospitals to codify operations, procedures and interventions performed during patient treatments).
- 9.2.2 Where information was considered to be absent or incomplete in these data sources, outside agencies were contacted to create lists of the highest risk patients. This applied in particular to transplant patients, cancer diagnosed

patients, patients at risk of immunosuppression, pregnant women with cardiac problems, and people receiving renal dialysis.

9.2.3 Individuals identified through this work received a letter from Scotland's Chief Medical Officer advising them to follow shielding guidance. The CMO also wrote to GPs with information and updates on:

- 13th April 2020 (PHS3/131 - INQ000320530)
- 11th May 2020 (PHS3/132 - INQ000320529)
- 5th June 2020 (PHS3/133 - INQ000320531)
- 18th June 2020. June 2020 (PHS3/134 - INQ000320532)

9.2.4 See also section 6.7 for the REACT-SCOT case-control study shielding report.

### 9.3 Evaluation of the Shielding Programme

9.3.1 PHS was commissioned by the Scottish Government in 2020 to develop an evaluation framework for the shielding programme (PHS3/135 - INQ000147581).

This was to:

- Evaluate the effectiveness of the shielding programme.
- Inform the advice, information and support offered to individuals in the shielding group during the pandemic.
- Inform the advice, information and support offered to at risk people more widely during the pandemic.
- Identify lessons learnt for future pandemic planning.
- Identify lessons learnt for work with at risk groups.

9.3.2 The evaluation adopted a number of different outreach mechanisms to ensure that individuals from a range of backgrounds were offered an opportunity to have their voice heard. This included establishing a Lived Experience Panel to advise on the design and implementation of the evaluation. The panel had ten members including a Black or Minority Ethnic individual, people with mobility and sensory impairments, three older people, and the carer of a disabled person.

9.3.3 The panel also had practitioner representation – a social worker who was supporting three shielding clients including someone with a history of criminal justice involvement and substance use, and an older person in sheltered housing. This enabled the evaluation to capture the voice of individuals who would have struggled to engage directly with PHS, including those from disadvantaged socioeconomic backgrounds.

9.3.4 Eight members of the panel attended an initial online meeting in July 2020 to help identify those evaluation questions that mattered most to individuals who were shielding or caring for someone who was shielding. The two members who could not attend the meeting were consulted one-on-one. The panel was also latterly asked for specific input on the wording of questions in the survey. One of the key impacts of working with the Lived Experience Panel was that the mental health impact of shielding became a more prominent feature of the evaluation.

9.3.5 There were three components to the evaluation of the shielding programme:

- Phase one of the Impact and Experience Survey: an online survey that ran between 1<sup>st</sup> and 14<sup>th</sup> June 2020, with the findings published on 23<sup>rd</sup> September 2020 (PHS3/136 - INQ000147532).
- A rapid evaluation: undertaken between March and November 2020, this used mixed methods (a survey, focus groups, interviews, collection of monitoring data) and was published on 27<sup>th</sup> January 2021 (PHS3/137 - INQ000202564).
- Phase two of the Impact and Experience Survey: an online survey that ran between 25<sup>th</sup> October 2021 and 7<sup>th</sup> November 2021 and was published on 30<sup>th</sup> March 2022 (PHS3/138 - INQ000147531).

### Phase one of the Impact and Experience Survey

9.3.6 A total of 12,851 individuals participated in the online survey, which represents 7% of the almost 180,000 individuals included on the shielding list at the time of the survey. The results (PHS3/136 - INQ000202563) suggested that the (self-reported) negative impacts of shielding were pronounced. The findings include:

- A large proportion of respondents were following the shielding guidance. More than four in ten (41%) respondents did not report any deviations from the shielding guidance. Only a third (33%) had left their home against advice.
- Many respondents reported negative impacts: 87% of respondents reported a negative impact on their quality of life; 85% reported a negative impact on how much physical activity they do; 72% reported a negative impact on their mental health; 79% of young people in education reported negative impacts on their education.
- 71% of respondents felt that they were coping okay with shielding.
- Negative impacts of shielding were more common among socio-economically vulnerable respondents. Among respondents for whom finding £100 for an unexpected expense would be impossible, only 48% felt that they were coping okay

with shielding (vs. 71% for all respondents). 88% reported a negative impact on their mental health (vs. 72% for all respondents). 26% struggled to access food that meets their needs (vs. 7% for all respondents). They were also less likely to know that they could ask their local authority for support (27% vs. 6% for all respondents).

- Negative mental health impacts of shielding were also more common among those respondents aged younger than 65, respondents who were caring for someone who was shielding, respondents living on their own or in larger households (with two or more other people in their household) and respondents with children in their household.
- Respondents who were more likely to cope with shielding did not necessarily report higher levels of adherence to the shielding guidance, which led PHS to conclude that it might be important to tailor the support and information offer.

9.3.7 The results indicated that there was scope to target the shielding support offer more towards those who need it most.

### Rapid evaluation

9.3.8 The rapid evaluation (PHS3/137 - INQ000202564) looked at the effectiveness of the shielding programme. The evaluation used a number of different methods:

- Data linkage between the list of shielding people and key socio-demographic and other COVID-19 datasets to monitor the profile of the shielding group, as well as COVID-19 cases and COVID-19 deaths in the shielding group, in line with General Data Protection Regulation.
- End-user research with shielding people (including the June 2020 online survey referred to above) with more than 12,000 responses and in-depth interviews with six people with lived experience of shielding or of supporting shielding people. The evaluation also had access to 21 written contributions from shielding people and to an analysis of 32 interviews with shielding people undertaken by the Scottish Government.
- Stakeholder research, including two focus groups with a total of 18 third-sector organisations (facilitated by Voluntary Health Scotland) and 15 interviews or small focus groups with a total of 20 people: seven local authority staff across six different local authorities, 10 health board staff across six different NHS Boards and three Scottish Government officials.
- A review of research relating to shielding undertaken by Scottish Government, NES, local authority, health board, third-sector and academic partners.



- A review of official statistics relating to COVID-19 published on the Scottish Government and National Records of Scotland websites.
- A review of selected peer-reviewed and grey literature publications relating to the Scottish (and UK) shielding programme.

9.3.9 The evaluation found clear evidence that the shielding advice changed people's behaviour and that the shielding support addressed real need. The evaluation found evidence that the free food box scheme addressed real need – some people who received these boxes would have struggled without them. However, this was not the case for all recipients.

9.3.10 The evaluation offered insight into people's responses to the advice to shield, their experience of the support offer, unmet support needs and the negative impacts of shielding. It helped identify some aspects of the existing guidance which individuals found unclear, unhelpful or challenging to adhere to. The evaluation found that the shielding guidance was neither necessary nor sufficient to change behaviour in all instances.

9.3.11 The evaluation considered the issue of access to healthcare and related unmet support needs. Healthcare appointments being postponed, cancelled or not available featured more prominently as a concern than individuals being dissuaded from accessing healthcare because of the advice to shield. A July 2020 Scottish Government survey of individuals on the shielding list (included in the January 2021 PHS evaluation report) suggested that almost one in five respondents had had a healthcare appointment postponed or cancelled; 2% had decided against attending an appointment because of safety concerns. The PHS evaluation findings about the difficulties individuals experienced in accessing healthcare were highlighted to the Scottish Government across the different PHS evaluation reports.

### Phase two of the Impact and Experience Survey

9.3.12 Following the publication of the January 2021 report, PHS was asked by the Scottish Government to evaluate the guidance and support offered to the highest risk group following the pause in shielding. To this end, PHS ran a second survey of the highest risk group to understand:

- The longer-term impacts of the initial (March–July 2020) shielding period.
- How individuals in the highest risk group were managing.



- Whether the support available to individuals in the highest risk group had met their needs.

9.3.13 A total of 13,581 individuals participated in the survey, which represents 7.5% of the 180,072 individuals included on the highest risk list at the time of the survey. The findings (PHS3/138 - INQ000147531) show evidence of ongoing negative impacts on the lives of people in the highest risk group:

- 76% of respondents who had already been advised that they were in the highest risk group at the time of the initial (March–July 2020) shielding period, reported an ongoing negative impact on their quality of life. Ongoing negative impacts were more pronounced amongst respondents who were socioeconomically more vulnerable, who had an impairment or who provided unpaid care.
- Respondents who were severely immunosuppressed or severely immunocompromised were also more likely to report ongoing negative impacts. Socioeconomic vulnerability showed the strongest association with ongoing negative impacts.
- There was evidence of ongoing worry and caution among the highest risk group. 81% of respondents still made decisions that were mainly influenced by fear of COVID-19 infection, and 36% of respondents still tried to minimise all physical contact with other households. Evidence of ongoing caution was more pronounced amongst respondents who were socioeconomically more vulnerable, who had an impairment or provided unpaid care. Respondents who were severely immunosuppressed or severely immunocompromised were also more likely to continue to be cautious. Socioeconomic vulnerability had the strongest association with ongoing caution.

9.3.14 There was evidence to suggest that the advice and support offered to the highest risk group had made a difference, but also that this was not shared equally:

- 85% of respondents reported that the letters from the CMO had influenced some of their actions.
- A large proportion of respondents (77%) agreed that having been included on the highest risk list had made them feel supported. Socioeconomically vulnerable respondents were less likely to have felt supported.
- Respondents who were younger than 65 years, who had an impairment, who provided unpaid care or who had children in their household were also less likely to have felt supported.
- Respondents who had been advised that they were severely immunosuppressed or severely immunocompromised similarly were less likely to have felt supported.

- Socioeconomic vulnerability had the strongest association with not having felt supported.

9.3.15 Unmet needs were found to be diverse and include issues relating to COVID-19 advice, COVID-19 vaccination, health and social care support, and financial and employment support. There was evidence of ongoing advice and support needs with a total of 88% of respondents thinking that it is very or quite important that there continues to be a separate highest risk group. Practical examples of requests for ongoing support included access to antibody testing, additional employment protection and public awareness-raising around the continued vulnerability of the highest risk group.

9.3.16 The PHS evaluation also found that the shielding guidance was neither necessary nor sufficient to change behaviour in all instances. The conclusion was that a repeat of shielding, in its initial form, was not recommended and that any future approaches would need to give greater consideration to personal choice, the multifaceted nature of risk, and hospital-onset infections. The evaluation thereby helped the Scottish Government to shape and evidence their support for people on the Highest Risk List. PHS was advised that Scottish Government colleagues used findings from the evaluation to input into Cabinet papers around the removal of legislative COVID-19 restrictions.

## 10. Impact of COVID-19 on Primary and Community Care

### 10.1 Background

- 10.1.1 PHS maintains a range of data outputs relating to general practices in Scotland including practice list sizes, demographics, GP workforce, in-hours activity, disease prevalence, and GP payments.
- 10.1.2 The Scottish Primary Care Information Resource (SPIRE) was a primary care data extraction tool that provided information nationally from General Practice data. SPIRE was not a central dataset containing all the GP practice information for Scotland. Instead, requests for aggregated information relating to specific purposes were sent to practices and relevant data were extracted. SPIRE was decommissioned on 31<sup>st</sup> August 2023.
- 10.1.3 SPIRE provided individual practices with local reports on topics such as practice activity, vaccination uptake and multi-morbidity. A good example of a local report within SPIRE is the eFrailty Index Tool. This tool, which pre-dated the pandemic, supported the identification of patients at highest risk of COVID-19 complications (see chapter 9 on shielding). The eFrailty Index aimed to identify and stratify patients within a practice by a frailty index score which is calculated through a cumulative deficit approach. The purpose of this is to identify people living in the community who are frail before they have a crisis that requires an acute admission or other serious intervention. While subject to review by the relevant clinician, the application of the tool helped to improve the completeness of shielding lists.
- 10.1.4 PHS maintains a dashboard of healthcare statistics of interest to General Practice, the Primary Care Information (PCI) Dashboard. PHS worked with the Scottish Government Shielding Identification team to include shielding list data on the PCI Dashboard during the pandemic. Practices were able to access a list of their patients who are, or have been, on the central database for shielding and the group each patient is in. Practices were also able to view which patients have been removed from the central list and the reason for this e.g. clinician request, deceased, false positive, etc.

- 10.1.5 PHS worked with the Scottish Government on a short-term solution to the gaps in information about changing pressures in General Practice at the onset of the pandemic.
- 10.1.6 In late 2021, PHS and NSS in collaboration with the Scottish Government agreed to undertake work to better understand the volume of activity in GP practices. Following consultation with the BMA Scottish General Practitioners Committee (SGPC) and the Royal College of General Practitioners (RCGP), practices were informed of the intention to start extracting activity data from clinical systems. The data being targeted is the number and type of patient 'encounters', where an encounter is anything from a face-to-face appointment with a GP to a medication review conducted without the patient present. The encounters data has been processed into meaningful categories and a national dashboard of activity data has been developed and published by PHS. While official statistics, it was agreed the data being released would have an 'experimental' status due to the data quality issues present. The information within the dashboard is published monthly.
- 10.1.7 To inform improvements in data quality, an in-practice dashboard has been made available to all practices alongside guidance on recording data in clinical systems as part of a move to standardise activity data across Scotland. The ambition to improve the quality of primary care information continues to be a high priority. PHS, the Scottish Government and NSS are exploring the potential of a future development of a Primary Care Data and Intelligence Platform which will provide better access and bridge the gaps in primary care intelligence.

## **10.2 Support for GP clusters and practices**

- 10.2.1 GP clusters are typically groups of between five to eight GP practices in a close geographical location working together to undertake quality improvement activity and contribute to the oversight and development of their local healthcare system. The planning of GP cluster quality improvement initiatives is informed by evidence and on population health needs, service capacity and demand and effective interventions to improve health and reduce inequalities.
- 10.2.2 PHS provides analytical support to GP clusters through its Local Intelligence Support Team (LIST). LIST analysts are deployed locally to provide analytical

support. LIST activities during the pandemic were focused on data provision in support of the healthcare system's COVID response as opposed to advice or guidance in relation to the handling of the pandemic. LIST staff, who are largely information analysts, work with local partners to help to source, link and interpret data to support local decision-making. LIST staff typically work to priorities set by local partners.

10.2.3 When the pandemic struck it was necessary to redeploy a proportion of LIST analysts (along with analysts from other teams in PHS) to assist with national COVID-19 priorities, such as testing and vaccinations. Whilst the majority of LIST staff continued to provide essential local support, the nature of the work undertaken by LIST became largely focussed on local priorities that related to COVID-19. LIST responded to over 100 local enquiries in relation to Primary Care and/or any other part of the Health and Care system in the first few months of the pandemic. Help that local partners sought from the team includes work relating to the production of shielding lists, mapping of COVID-19 cases, and work to understand impacts (actual or potential) on services. Much of this work supported not only primary care but also other health and care services.

10.2.4 As an example, one NHS Board area asked LIST to help provide new evidence on COVID-related activity in GP practices and in local assessment centres / hubs. New daily information was recorded online by each GP practice and daily reports were prepared by LIST for local COVID planning. In addition, new analysis of activity at COVID assessment centres and hubs was produced daily based on a combination of daily national data plus a range of local data including hospital admissions.

### **10.3 Unscheduled Care in wider primary care context**

10.3.1 PHS works collaboratively with GP Out of Hours services, NHS 24 and the Scottish Ambulance Service. Patient level data is received by PHS on a daily basis from these services. PHS analyses and provides this intelligence to multiple users including NHS Boards and the Scottish Government in order to inform action at both local and national levels.

10.3.2 The analysis involves linking data at a patient level from these different bodies in order to show pathways and journeys that individuals take. The data can also look at different cohorts such as people from deprived areas, different age groups, and gender. This work was used to support service redesign and improve outcomes for individuals.



## 10.4 COVID Community Hubs and Assessment Centres

10.4.1 PHS collected daily data from COVID-19 Community Hubs and Assessment Centres, (PHS3/139 - INQ000320535) which was published in the weekly COVID-19 statistical report from April 2020 until March 2022 when the community COVID-19 pathway came to an end. The publication dashboard included trend information on the number and type of consultation (advice/assessment/other). Information was also presented by age and deprivation quintiles. Stakeholders could also access this information via System Watch (see paragraph 2.4.13) which included daily activity and COVID-19 pathways information.

## 10.5 General Practice Workload and Activity Survey 2020-2021

10.5.1 During the first phase of the pandemic PHS was asked to provide insight into GP practice activity to help the Scottish Government better understand and respond to workload and capacity issues. PHS used data from SPIRE together with a survey of individual consultations from GPs and the wider primary care team to provide insight into primary care activity during the pandemic recovery phase.

10.5.2 PHS developed guidance (PHS3/140 - INQ000320545) for completing the survey and a joint letter was sent on 17<sup>th</sup> December 2020 from the Royal College of General Practitioners Scotland and the Scottish GP Committee of the BMA to ask each GP in Scotland to complete a short survey on a weekly basis. The survey asked about the number and nature of encounters with patients that took place in their practice in the previous week. It also asked about non-clinical hours, as well as any staff absences related to COVID-19. Practices were able to access their own information and review their practice's trends over time using the PHS Primary Care Information Dashboard.

10.5.3 Potential benefits of the survey included the ability to:

- Identify surges in practice activity.
- Identify imminent workforce capacity issues within practices.
- Identify where additional practice support might be required.
- Help COVID-19 response and service planning more generally within practices.

10.5.4 PHS collected the data securely and provided high-level analysis to the Scottish Government on a weekly basis (including charts showing how practice responses were changing over time). PHS also produced a national summary, aggregated to the level of HSCPs/ NHS Board areas. The aggregated data was not practice-identifiable but was considered by the Scottish Government in conjunction with NHS Boards' existing weekly reporting on service levels and capacity.

## 10.6 Mental health services and outcomes

10.6.1 The PHS Wider Impacts Dashboard provided data on prescribing of selected mental health medicine, A&A attendances for mental health reasons, and out of hours mental health cases for the first time on 30<sup>th</sup> September 2020.

10.6.2 Information on the number of patients starting a new treatment course for medicines commonly used for depression, anxiety or insomnia through General Practice indicated that:

- The number of patients starting new treatment with the selected medicines fell by almost 40% between the week ending 22<sup>nd</sup> March 2020 and the week ending 5<sup>th</sup> April 2020 compared with the previous two years' average for the same period. This period corresponds with the first national lockdown in response to COVID-19 in Scotland. Since then, the total numbers have been gradually increasing but have generally remained below the 2018-2019 baseline levels to April 2022.
- Looking at the selected medicines in separate groups, the number of new treatment courses for depression returned to expected in July 2020, whilst new treatment courses for insomnia and anxiety continued to remain below the 2018-2019 baseline to May 2022.
- Observed downward spikes in the trend seen around the Christmas Periods in late December/early January reflect low overall activity in those periods, most likely due to reduced access over the holiday periods.

10.6.3 Information on the number of contacts for mental health problems with accident and emergency (A&E) indicated that:

- A&E attendances for mental health problems fell by 40-50% from early March 2020 and by the beginning of September had still not fully recovered, remaining at around 10% below previous levels.

- The trend in A&E attendances was similar for males and females and also broadly similar by age group and by level of deprivation, with wide fluctuations in numbers of contacts from week to week.

10.6.4 Information on the number of contacts for mental health problems with primary care out of hours (OOH) services indicated that:

- Compared to the pattern seen in previous years, there was a sharp fall of 30-40% in OOH contacts for mental health problems, starting in early March 2020.
- OOH contacts for mental health remained below the previous average until late April, corresponding to the period of lockdown in Scotland. Between April and the end of July numbers of contacts rose to around 10% above the previous average.
- The trend in OOH contacts was similar for males and females and also broadly similar by age and by level of deprivation, with wide fluctuations in numbers of contacts from week to week.

### Child and Adolescent Mental Health Services (CAMHS) waiting times

10.6.5 NHS Boards' Child and Adolescent Mental Health Services (CAMHS) had to adapt quickly to the COVID-19 pandemic to enable service delivery to continue from mid-March 2020. This included using digital technology to allow appointments to take place.

10.6.6 PHS publishes statistics on CAMHS waiting times. (PHS3/141 - INQ000346170) In January and February 2020, the average number of patients referred was 3,189 per month across Scotland. In March 2020 the number of patients referred decreased to 2,642 and reduced further in April 2020 to 823 as the pandemic and national lockdown (including school closures and GPs moving to limited face to face consultations) started to take effect. In May 2020, referrals to CAMHS increased to 1,307, and had increased further to 2,948 by December 2020, averaging 453 per month between May and December 2020. However, referrals once again reduced in January 2021 to 2,070 following the school Christmas break and the new lockdown but increased once again as services adapted PHS3/141 - INQ000346170).

10.6.7 The number of patients seen for January and February 2020 averaged 1,424 per month across Scotland. In March 2020 that number decreased to 1,284 and to

955 in April 2020. During this period NHS Boards moved to emergency measures and had to cancel a number of face-to-face appointments while continuing to see their most urgent cases as priority. It should be noted that during this period of lockdown, although patients were being prioritised, there could still have been issues for some young people who may not have access to a safe or confidential space to engage in digital appointments. Or they may have preferred to wait for an in-person appointment. From May 2020, there was a recovery in the number of patients seen.

10.6.8 From January to March 2020 across Scotland there was an average of 11,311 patients waiting for treatment. This decreased to an average of 9,391 from May to September 2020. The decrease in those waiting from May 2020 is as would be expected as the number of referrals decreased from March 2020.

## **10.7 Substance use services and outcomes**

10.7.1 People experiencing disadvantage and those living in marginalised communities have greater challenges accessing health and social care services. The pressure on health services during the pandemic is likely to have disproportionately affected people who already have established barriers to care and support, such as people who use drugs.

10.7.2 People with problematic drug use are often amongst the most marginalised in society and can have multiple complex needs. People who experience socio-economic disadvantage disproportionately also experience harms from drug use. Scottish communities with high levels of economic and social disadvantage have higher rates of drug-related harms than the national estimate and higher rates of drug-related deaths.

10.7.3 NRS figures show that 1,339 people lost their lives to a drug-related death in Scotland in 2020. This was the seventh consecutive year of the death toll representing the highest number of drug-related deaths ever recorded in Scotland.

10.7.4 The increase in deaths highlighted the importance of essential services remaining open and accessible, including health, care and recovery support

services as well as financial support, housing support, public transport, education and childcare.

10.7.5 Monitoring on the Wider Impacts Dashboard (see section 4.6.3) identified that the pandemic impacted on substance use services in a variety of ways. Factors analysed include:

- Take Home Naloxone supplies.
- Specialist drug treatment referrals.
- Opioid Substitution Treatment.
- Injecting Equipment Provision.
- Drug overdose/intoxication attendances at Emergency Departments.
- Drug-related acute hospital admissions.

10.7.6 Drug treatment and support service providers were faced with a lack of timely data and, in some cases, a lack of analytical support to determine the impact of radical alterations to service provision as the pandemic took hold. PHS provided drugs surveillance management information to local and national partners on a monthly (or in some cases more frequent) basis in order to quickly inform relevant partners about the impacts on the health and social care system and enable them to adjust their response. Using experimental approaches to data PHS was able to show how prescribing practices were changing and confirm that these changes had not negatively impacted on the amount of Opioid Substitution Treatment people received. PHS demonstrated to partners that referrals to treatment and harm reduction services had decreased suddenly and rapidly prior to the onset of the first UK lockdown (March 2020). PHS encouraged local areas to use these data and remain vigilant for potential sudden and unexpected reductions in access to services irrespective of the COVID-19 control measures in place.

10.7.7 PHS also worked with key stakeholders to understand why the number of referrals was consistently below those observed in 2019. It would appear that changes in service processes were sustained (e.g. reduction in discharges from services). This work formed the foundation of building an indicator set to establish a drugs early warning system to support local improvement work and timely response to prevent drug harms.



## 10.8 Maternal and child health services and outcomes

- 10.8.1 The Scottish Government designated maternity and neonatal care as an essential acute, integrated and community service, providing both scheduled and unscheduled care (PHS3/143 - INQ000320538). Midwives, obstetricians and the wider maternity and neonatal workforce were required to continue to care for pregnant women, babies and families and NHS Boards were asked not to deploy staff outwith this setting.
- 10.8.2 There were however marked changes to maternity service provision. Pregnant women in the UK were classed as a vulnerable group, which alongside national guidance on social distancing, altered the experiences of women and staff accessing and providing maternity care in Scotland.
- 10.8.3 There were also alternations to how early childhood health reviews were delivered. There was an initial switch to delivering reviews remotely until June 2020, and then priority was given to recommencing in-person reviews for particular age groups.
- 10.8.4 Information on a number of indicators relating to child and maternal health and healthcare during the pandemic is available on the COVID-19 Wider Impacts Dashboard (see section 4.6.3).

### Perinatal experiences during the COVID-19 pandemic in Scotland

- 10.8.5 PHS and the Scottish Government commissioned a research report to identify how people experienced maternity care during the pandemic; both women accessing services and the relevant staff. This was on grounds of concerns about whether inequalities in healthcare could increase further. Disadvantaged women were recognised to be at greater risk of economic hardship due to the pandemic, but also to be vulnerable to digital exclusion due to increased reliance on technology in delivery of care. The study was carried out by researchers at University of Aberdeen and University of Dundee (PHS3/144 - INQ000202968).
- 10.8.6 Published in April 2022, the findings highlighted that socially disadvantaged women were more likely to experience poorer quality maternity care when technology is used to replace in-person appointments. Similarly, women with



mental health conditions were found to be less likely to receive good quality care across a range of appointment types and care settings.

10.8.7 The study recommended prioritising care at home for women who experienced the greatest social adversity. The researchers concluded that the use of technology to deliver appointments has benefits for some women and for specific appointment types but should not be a default approach. As a result virtual appointments should be subject to very careful consideration before being adopted for women in adverse social circumstances or for those with mental health conditions.

### Termination of pregnancy

10.8.8 As the official provider of statistics for the NHS in Scotland, PHS provides national statistics on the termination of pregnancy. The most recent report provides an annual update on termination of pregnancy to December 2022. The outcomes are described for Scotland, NHS Board and local authority areas, and for age, ethnicity and deprivation sub-populations where numbers are sufficient.

10.8.9 Findings from the report include a steep rise in termination rates between 2021 and 2022 with a less pronounced increase for women living in the least deprived areas, and a widening of socioeconomic inequalities in multiple termination rates. Inequalities were also evident in multiple termination rates by ethnicity: 67% of black and Caribbean women self-reported a previous termination compared to 42% of white women.

10.8.10 There was a narrowing of the gap between the most and least deprived groups in the percentage of terminations undertaken at less than 9 weeks gestation. This may at least in part be due to accessibility to termination services increasing through provision of full early medical abortion at home service introduced in 2020 as a COVID transmission mitigation measure.

### Childhood immunisations

10.8.11 PHS recognised the delivery of routine childhood immunisations as a potential area of impact during the pandemic. Immunisation protects children against many serious infectious diseases including diphtheria, whooping cough, and measles.

Childhood immunisation services continued to operate throughout the pandemic and PHS included information on childhood immunisation rates in the Wider Impacts Dashboard to ensure that immunisation rates remained high throughout the pandemic.

10.8.12 Analysis of data during the lockdown periods in 2020 found that uptake of five childhood vaccinations within four weeks of eligibility was higher in this period than in 2019 (PHS3/145 - INQ000320573). There are a number of likely explanations for this, including increased awareness among parents of the importance of immunisation reinforced by national communications to encourage attendance, as well as local communications and new processes introduced in response to the pandemic. For example, immunisation teams in some NHS Boards phoned parents/carers shortly before the day of appointment to ensure families were free of symptoms of COVID-19 before attending, to reassure them, and to answer questions.

10.8.13 However, more recent data suggests that in 2022 and 2023 there has been a decline in immunisation uptake compared to the pre-pandemic period. There has been a gradual decline in Scotland over the past 10 years across all routine immunisations. Although declining, uptake remains high, with the latest figures (PHS3/146 - INQ000320527) showing that around 95% of children received each routine immunisation by the time they were 12 months old, except for rotavirus vaccine, which had 92.8% uptake (slightly lower due to the strict age limits within which the vaccine must be administered).

10.8.14 The Scottish Vaccination and Immunisation Programme (SVIP) is a change programme led by PHS and the Scottish Government in partnership with Health Boards. PHS will have full national responsibility leadership, coordination, and oversight of national and local service delivery of immunisation programmes by January 2024. SVIP is taking action to address the decline in childhood immunisation uptake in Scotland, including implementing changes to the childhood immunisation schedule 2025 and introducing an additional visit at 18 months.

## Child health reviews

10.8.15 All children in Scotland are offered a series of health reviews through early childhood. These assess health and development and aim to provide timely support for any issues identified. Monitoring on the Wider Impacts Dashboard identified that coverage of the reviews was lower than expected for children who became eligible for review in February, March and April 2020. These data informed policy discussions with Scottish Government regarding the importance of maintaining these universal services.

### Joint work with SDsPH

10.8.16 PHS worked with the SDsPH in early 2022 to establish priority areas for action in order to address the impact of COVID-19 on children, young people and their families. The report, 'Ensuring our future: addressing the impact of COVID-19 on children, young people and their families' (PHS3/147 - [INQ000189082](#)) considers the impact of the pandemic on healthcare for pregnant women, children and young people. Recommendations relating to child health and health care include:

- maintaining the capacity to deliver child health reviews and input data into the system and prioritising those who have had no review, a virtual review or missed their 6–8-week review.
- ongoing investment in children and young people's mental health services.
- recognising the potential for increased levels of sexual exploitation and sexual abuse experienced by children and young people during the pandemic and of the resulting impact of this in the short and longer term.
- ongoing cross-sectoral information sharing and coordinated action will be needed to address the broad and interacting impacts on children, young people and their families.

## 10.9 NHS dental services and outcomes

10.9.1 PHS is responsible for the production of management information and official statistics on NHS Dental Services. PHS has used these data to analyse the impact of the pandemic on dental services and oral health in Scotland in order to inform and advise Health Boards and the Scottish Government on the trajectory of recovery from the pandemic. This work is led by David Conway, PHS Honorary Consultant in Dental Public Health and Professor of Dental Public

Health at the University of Glasgow. Professor Conway submitted written evidence on the recovery of NHS dentistry services to the Scottish Parliament COVID-19 Recovery Committee in May 2023.

10.9.2 Professor Conway led the COVID-19 Recovery Dental Analysis project, a PHS-funded project involving a partnership of research academics from University of Glasgow Dental School, University of the West of Scotland, and the PHS dental analysis team. The COVID-19 Recovery Dental Analysis project monitored and analysed inequalities in access to primary care dental services in Scotland over the pandemic. This was done through the analysis of routine PHS data on dental registration and participation and treatments. The project produced 'The Impact of COVID-19 on NHS dental services and oral health in Scotland' which was published by PHS on 26<sup>th</sup> April 2022. The project partners also wrote a peer-review publication 'Inequalities in access to NHS primary care dental services in Scotland during the COVID-19 pandemic', which included detailed inequalities analysis with data to May 2022 and was published in the British Dental Journal. This concluded that COVID-19 had a major impact on access to NHS primary dental care, and while inequalities in access are apparent as services recover from lockdown, these inequalities are not a new phenomenon.

10.9.3 The project produced monthly Dental Recovery Indicators (covering the range of dental services) at both national and Health Board level which were shared with Health Boards and Scottish Government as management information to monitor and plan services.

### **Dental care in Scotland**

10.9.4 Most of the population in Scotland access routine dental care through the primary care setting of the NHS General Dental Service (GDS). The majority of GDS is provided by independent contractor dentists ('High Street dentists') who have arrangements with NHS Boards to provide GDS. The Public Dental Service (PDS) provides access to primary NHS dental care for patients who cannot obtain treatment from a general dental practice. This includes vulnerable patients such as those living in care homes, people with learning disabilities and those who may have complex needs.



10.9.5 Due to the anticipated risks of transmission associated with receiving dental care, NHS dental practices were asked not to see patients on their premises during the first lockdown in Scotland, from 23<sup>rd</sup> March 2020. Across Scotland over seventy Urgent Dental Care Centres (UDCCs) were established for the provision of emergency dental treatment. With the closure of GDS dental practices, in March 2020, there was an abrupt, sharp fall in the number of patients seen by an NHS dentist. Despite the reopening of GDS practices and attendances subsequently climbing, the number of patients seen in 2021 was less than half when compared to 2019.

### Inequalities in access to dental care

10.9.6 The aforementioned report on the impact of COVID-19 on NHS dental services and oral health in Scotland found that by February 2022:

- Access to NHS primary dental care in Scotland had reduced due to COVID-19.
- Socioeconomic inequalities in access to these dental services, while apparent prior to the pandemic, had increased in the most recent months (defined in the report as 1 December 2021 to 28 February 2022).
- Dental contacts and treatments in the General Dental Service (GDS) declined due to the COVID-19 public health measures and had not yet fully recovered to pre-pandemic levels.
- PDS activity reduced during the first national lockdown and although not yet fully recovered, some parts of this service had returned to pre-pandemic levels.
- There had been a reduction in Hospital Dental Service (HDS) activity with recent levels still lower than before the pandemic.
- Oral health improvement programmes were impacted by the COVID-19 public health measures (particularly in schools and care homes), with reduced activity evident in Childsmile and Caring for Smiles.
- Socioeconomic inequalities in access to NHS primary dental care (in terms of contact) were evident prior to the pandemic. In September 2019, registered patients from the most deprived areas (SIMD 1) were least likely to have attended within the previous two years, with 79.9% of children from SIMD 1 participating compared to 89.0% from the least deprived areas (SIMD 5); and 62.1% of adults from SIMD 1 compared to 71.6% in SIMD 5.

- At the population level, inequalities in access to NHS primary dental care were evident prior to the pandemic. In the month of January 2019, 10.2% of those living in the least deprived areas (SIMD 5) had contact with primary care NHS dental services compared to 8.1% in the most deprived areas (SIMD 1).
- The analysis undertaken by PHS found that while there had been a reduced number of patients seen overall, as dental services recovered there had been an increase in inequalities (relative to the already existing pre-pandemic inequalities), with those from the most deprived areas less likely to have contact with a primary care NHS dentist than those from the least deprived areas.

10.9.7 A key measure of access to dental services among children is dental registration levels. The inequality gap in dental registrations between children from the most and least deprived areas of 13% in 2010, which had reduced to 3% by 2022. This is a positive improvement in overall access to primary care dental services for children.

10.9.8 Despite the rise in registrations, there are growing health inequalities between children from the most and least deprived areas actually attending the dentist regularly (dental participation rates). This gap grew from 7% in 2010 to 12% in 2020, and now to 20% in 2022. Inequalities in attendance levels among children have been exacerbated due to COVID-19, although this gap was widening prior to the pandemic.

10.9.9 There is limited evidence as to the reasons behind these inequalities and they are likely multifactorial with socioeconomic, behavioural, and service factors contributing. Both registration from an early age and participation for children are important for receiving Childsmile prevention interventions and preventing dental disease. As the Childsmile programme fully remobilises following the pandemic these trends could potentially improve.

## **10.10 NHS ophthalmic services and outcomes**

10.10.1 NHS General Ophthalmic Services in Scotland are provided by eye care professionals who use a wide variety of tests and procedures to examine the eyes of a patient during an eye examination.



- 10.10.2 PHS holds and maintains a range of data relating to eye care in Scotland, including information on eye examinations by NHS board, type of condition, and referral; as well as data on patient vouchers claimed.
- 10.10.3 Routine eye care services were suspended in a domiciliary setting (patients' own homes, day centres and residential centres) from 13<sup>th</sup> March 2020 and in practice premises from 23<sup>rd</sup> March 2020. Emergency Eyecare Treatment Centres (EETCs) were established with practices carrying out telephone triage/remote consultations, intra-referral between practices, and referral to EETCs where necessary. Community optometry practice premises resumed the provision of face-to-face emergency and essential eye care from 29<sup>th</sup> June 2020, whilst continuing to manage patients remotely where possible. From 13<sup>th</sup> July 2020 practices were permitted to increase their provision and start to meet outstanding care where capacity allowed. Then from 3<sup>rd</sup> August 2020, routine eye care in practices as well as patients' own homes resumed and from 7<sup>th</sup> September 2020, face-to-face domiciliary eye care in day centres and residential centres resumed.
- 10.10.4 Official statistics on NHS General Ophthalmic Services for 2020/2021 provide data on eye examinations and related findings with comparisons to previous years. The report found that there was a reduction of 32.2% in eye examinations in 2020/21 compared to 2019/20. There was then an increase of 49.3% in 2021/22. The number of eye examinations had steadily increased between 2006/07 and 2018/19, before dropping to under 1.5 million in 2020/21, as a result of the COVID-19 pandemic restrictions.
- 10.10.5 The report for 2021/22 highlights that although there were no major restrictions to the provision of General Ophthalmic Services, the data should be considered in the wider context of the pandemic during this period, including the significant infection prevention and control measures, when compared to previous years.
- 10.10.6 Eligible patients in Scotland can receive help towards the cost of purchasing spectacles or contact lenses using a voucher. The voucher can only be issued following a valid GOS eye examination. The 2021/22 report shows that the number of claims for spectacles, lenses and supplements peaked at over

501,000 in 2011/12, before gradually declining to under 404,000 in 2019/20. There was an abrupt drop in 2020/21 due to the COVID-19 pandemic restrictions, and despite climbing in 2021/22, claims remain below 401,000, the lowest reported figure.

## 11. Impact of COVID-19 on Secondary Care

### 11.1 Background

11.1.1 The Scottish Government instructed NHS boards to implement several key actions at pace, that enabled them to treat COVID-19 patients while maintaining vital emergency, maternity and urgent care. This included all non-urgent surgery, treatment and appointments being suspended, and national screening programmes for some types of cancer were paused.

11.1.2 PHS worked with local partners to provide intelligence and interpretation, provide increased real time data flows and ensure access to timely management information. This included maintaining and developing the System Watch tool (see paragraph 2.4.13), which helps NHS Boards to monitor and predict emergency activity in hospitals and access supporting information gathered from sources across the NHS.

11.1.3 PHS's annual report of acute hospital activity and NHS beds information provides an overview of a range of statistics on various aspects of hospital care, sourced from hospital administration systems across Scotland. The reports include information on trends in outpatient, inpatient and day case activity, numbers of medical diagnoses, procedures, emergency admissions and beds statistics. The 2021/22 report found that inpatient, day case and outpatient activity all reduced by 13% compared with pre-pandemic levels (2018/19) (PHS3/148 - INQ000346171). By 2022/23 inpatient and day case activity was still 10% lower than pre-pandemic and outpatient activity 8% lower (PHS3/149 - INQ000346174).

### 11.2 Unscheduled care

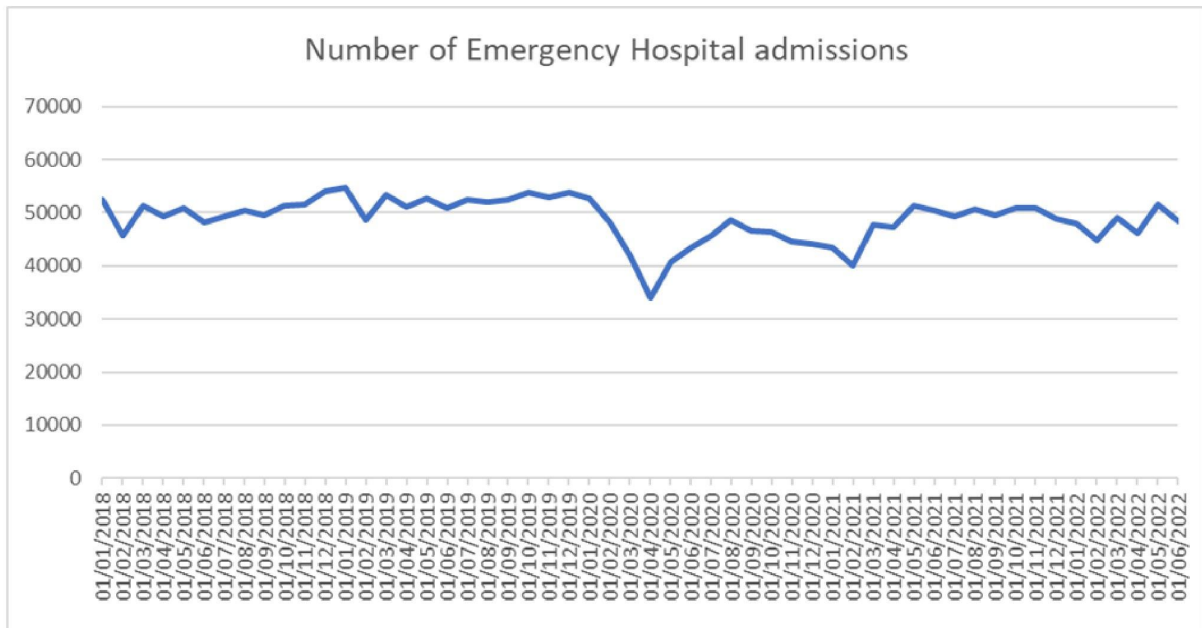
11.2.1 The Scottish Government and NHS Scotland prioritised the development of a model of urgent unscheduled care early in the pandemic. This refers to offering people scheduled urgent appointments to avoid long waits in A&E. This approach was seen as key to ensuring system redesign was successful in the short term (by October 2020) and sustainable in the longer term.

- 11.2.2 A Strategic Advisory Group was set up, jointly chaired by Angiolina Foster (then Chief Executive of NHS24) and Calum Campbell (Chief Executive of NHS Lothian). The group explored how a model of scheduled unscheduled care could be developed, building on examples of good practice which had emerged during the pandemic. 11 workstreams were established to support the development and delivery of this work, with representatives from across NHS Scotland. PHS provided public health expertise to the inequalities workstream and the data and monitoring workstream. These workstreams underpinned many of the other workstreams as it was important that all areas considered equity of access to services, the impact of inequalities and the risk of digital exclusion. Almost all workstreams incorporated aspects of data collection, data definitions, measurement and monitoring of outcomes.
- 11.2.3 PHS publishes a range of weekly, monthly, and annual statistics relevant to unscheduled care. This includes Accident and Emergency activity and waiting times statistics, and emergency (unplanned) admissions to hospital.
- 11.2.4 NHS Boards, the Scottish Government and others can use these regular releases and the PHS Wider Impacts dashboard (see section 4.6.3) to interrogate the data at a local level and analyse trends relating to the impact of the pandemic on unscheduled care. The Wider Impacts Dashboard also included published figures on NHS24 and Scottish Ambulance Service activity, and breakdowns for drug related and mental health conditions.
- 11.2.5 From the second week of March 2020 there was an abrupt and steep fall in unplanned hospital admissions, attendances at Accident and Emergency (A&E) departments and cases in out of hours services. Use of all of these services fell to around half the average levels seen 2018-19. Activity levels for these services remained lower than seasonal averages throughout most of the pandemic, with particular decreases observed during each period of lockdown. Numbers of NHS24 111 completed contacts did not change appreciably, though the data presented in the PHS Wider Impacts Dashboard do not include additional NHS 24 services specific to COVID-19 that handled high volumes of calls. During periods of lockdown, there was a small decrease in attended ambulance incidents.

## Unplanned (emergency) hospital admissions

- 11.2.6 An unplanned hospital admission occurs when, for clinical reasons, a patient is admitted unexpectedly at the earliest possible time. This might be after a visit to a doctor, emergency department or calling an ambulance. PHS publishes quarterly statistics on unplanned hospital admissions.
- 11.2.7 The monthly average for 2018/19 was 49,861 (with a total figure for 1<sup>st</sup> April 2018 to 31<sup>st</sup> March 2019 of 598,332). The monthly average for 2019/20 was 51,422 (with a total figure for 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020 of 617,058).
- 11.2.8 There were 121,060 unplanned hospital admissions in the quarter from January to March 2020 (a monthly average of approximately 40,350) (PHS3/150 - INQ000346203). The monthly average for 2020/2021 was 42,534 (with a total figure for 1<sup>st</sup> April 2020 to 31<sup>st</sup> March 2021 of 510,514).
- 11.2.9 2021/2022 saw an increase in unplanned hospital admissions, with a monthly average of 47,571 and an annual figure for 1<sup>st</sup> April 2021 - 31<sup>st</sup> March 2022 of 570,857. However, admissions remained below pre-pandemic levels.
- 11.2.10 Figure 4 below shows how emergency hospital admissions fluctuated over this period.

### Figure 4: Unplanned (emergency) hospital admissions



### Attendances at Accident and Emergency departments

11.2.11 PHS reports statistics on accident and emergency (A&E) departments across Scotland. This includes 30 large consultant-led emergency departments and 60 minor injuries units and community units. Overall A&E statistics are released once a month. This is because data for some smaller sites is only available monthly. Statistics for Emergency Departments are released weekly.

11.2.12 There were 101,225 unplanned A&E attendances in March 2020. The monthly average for 2020/2021 was 98,079 (with a total figure for 1<sup>st</sup> April 2020 to 31<sup>st</sup> March 2021 of 1,176,952).

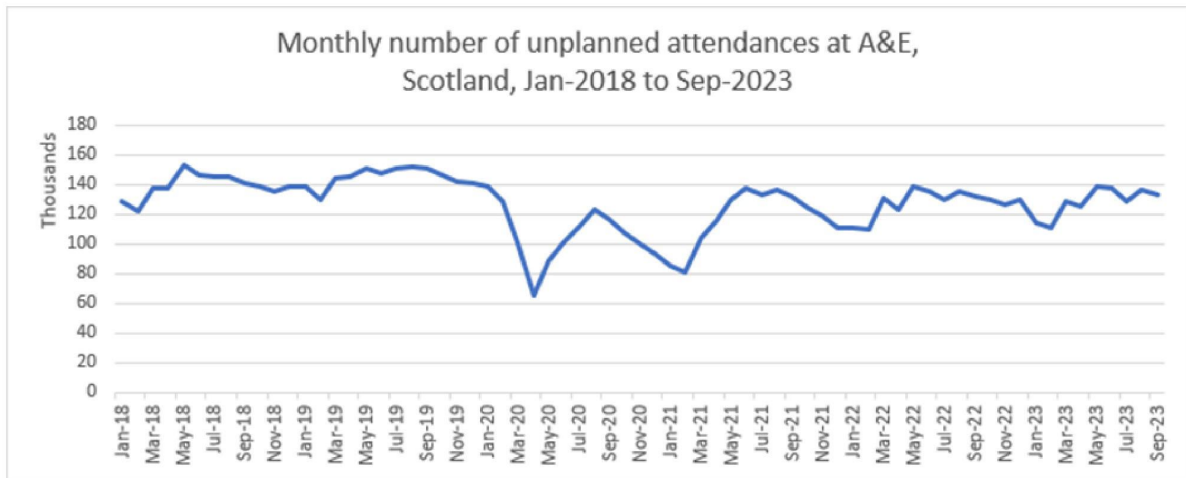
11.2.13 As a pre-pandemic comparison, the monthly average for 2018/19 was 141,149 (with a total figure for 1<sup>st</sup> April 2018 to 31<sup>st</sup> March 2019 of 1,696,783). The monthly average for 2019/20 was 141,296 (with a total figure for 1<sup>st</sup> April 2019 to 31<sup>st</sup> March 2020 of 1,696,783).

11.2.14 2021/2022 saw an increase in A&E attendances, with a monthly average of 124,111 and an annual figure for 1<sup>st</sup> April 2021 - 31<sup>st</sup> March 2022 of 1,489,337. However, attendances remained below pre-pandemic levels.

11.2.15 Figure 5 below shows how A&E attendance levels fluctuated over this period.



**Figure 5: Unplanned A&E attendances**



### 11.3 Scheduled care

11.3.1 PHS worked with the Scottish Government and NHS Boards to ensure optimum use was made of national data sources to understand the impact that COVID-19 and the associated restrictions had on the demand for scheduled (elective) care and those waiting for treatment. This included monitoring patterns of referrals, attendance and admission as well as changes to waiting lists as lockdown measures eased.

11.3.2 PHS also examined ways national data collection could be used to monitor and evidence the impact of new approaches to respond to elective demand, such as Active Clinical Referral Triage. PHS is working with the Centre for Sustainable Delivery (CFSD) to understand and develop a standard approach to capture and report on initiatives that are designed to create capacity for outpatients, reduce waiting lists and deliver better value for people and for the system as a whole.

11.3.3 PHS publishes a range of statistics relevant to scheduled care including data on acute hospital activity and NHS beds information, cancelled planned operations and stage of treatment waiting times.

- 11.3.4 During this pandemic, NHS Boards, hospitals, and healthcare providers were required to change their normal way of working to allow them to focus their efforts locally on their COVID-19 response. As such, this directly impacted on the volume of hospital activity and trends observed. Substantial reductions were observed in both inpatient and day case activity as well as outpatient attendances.
- 11.3.5 Hospital admissions fell sharply from the fourth week of March (week ending 29<sup>th</sup> March 2020), reaching levels 44% below those expected based on admissions during 2018-19 (8,706 compared to 15,426 in 2018-19). There was some recovery after late April 2020 (week ending 03 May 2020), but numbers of admissions remained around 33% below the 2018-19 average (10,422 compared to 15,609 in 2018-19). Similar patterns were seen by sex and by deprivation, but there were differences by age. Hospital admissions for children 5 – 14 years old fell by 53% (307 compared to 654 in 2018-19) but only by 23% for those aged 85 years and over (1,200 compared to 1,558 in 2018-19). In the week ending 05 April 2020, there were much larger falls in planned admissions - around 64% (1,269 compared to 3,491) than in emergency admissions – around 36% (7,563 compared to 11,746). There were particularly large falls - around 53% (540 compared to 1155 in 2018-19) for emergency paediatric admissions.
- 11.3.6 This data was taken from the RAPID dataset, which as explained in paragraph 4.5.8 is a dynamic dataset. PHS has updated the data originally reported on the Wider Impacts Dashboard on 3<sup>rd</sup> June 2020 to be accurate as at 1<sup>st</sup> November 2023.
- 11.3.7 Following the early stages of the outbreak when many non-urgent care services were paused or reduced and there were fewer referrals to services, NHS Boards started to gradually resume services in the summer of 2020 as part of the planned remobilisation of services. On 30 April 2022, NHS Scotland was stood down from emergency footing. However COVID-19 still affected the provision and availability of services with subsequent waves of infection resulting in reduced capacity, for example due to increased staff absence (data held by NHS Education for Scotland) and higher demand from emergency departments and inpatient wards. During these periods there was often a requirement to prioritise and treat only those patients with the most urgent clinical needs.

## Clinical prioritisation

11.3.8 In November 2020, the Scottish Government published a clinical prioritisation framework as an interim measure to provide NHS Boards and clinicians clear guidance for prioritising elective care whilst ensuring appropriate COVID-19 safety and priority measures were in place. PHS was asked to capture and quality assure data relating to the prioritisation of patients waiting for treatment as an inpatient or day case. The resultant report (PHS3/151 - INQ000357276) spans the period from July 2021 to June 2022, covering the period Health Boards started submitting prioritisation categories to PHS up until the latest reportable date before the framework was stepped down by Scottish Government on 22<sup>nd</sup> July 2022. The report and accompanying dashboard (PHS3/152 - INQ000346196) show how the proportion of cases in each clinical prioritisation category varied across different specialties, reflecting the differing levels of urgency in the conditions being treated. The clinical prioritisation categories were:

- Priority level 1a Emergency – operation needed within 24 hours
- Priority level 1b Urgent – operation needed with 72 hours
- Priority level 2 Surgery – scheduled within 4 weeks
- Priority level 3 Surgery – scheduled within 12 weeks
- Priority level 4 Surgery – may be safely scheduled after 12 weeks.

11.3.9 The focus of PHS's work was on waiting for treatment and therefore numbers are low in relation to priority levels 1a and 1b as these were patients who did not in the most part wait for treatment.

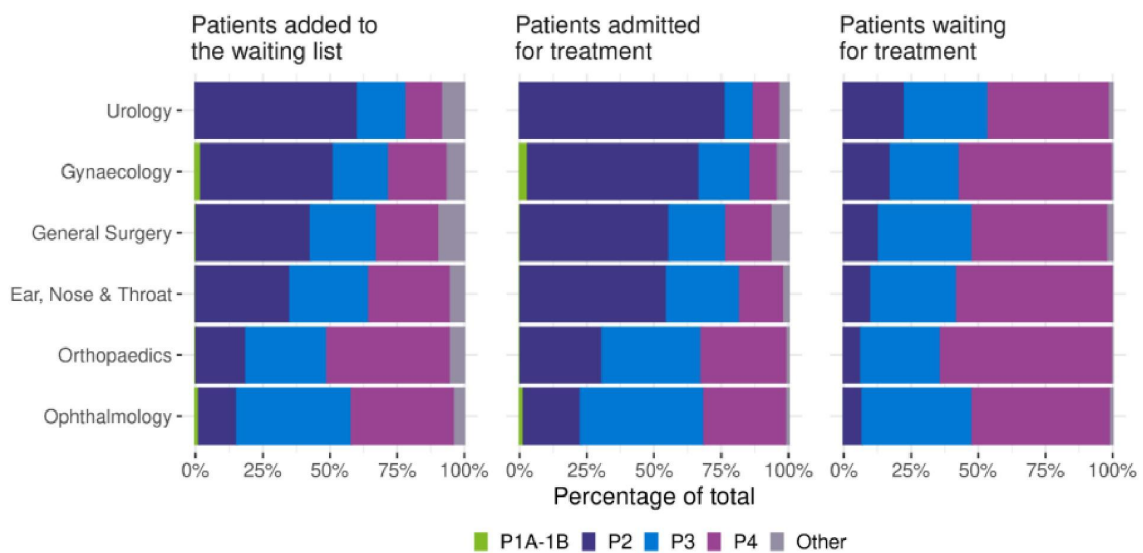
11.3.10 The report found that demand was yet to return to pre-pandemic levels. During the month of June 2022, there were 23,329 additions to the waiting list, 5,519 lower than the monthly average in 2019. Of these, the category representing the most patients added to the list was P2 (7,843 patients, 33.6%), followed by P3 (6,746, 28.9%), P4 (6,096, 26.1%) and Other (2,465, 10.6%). P1A-1B accounted for the smallest number of additions (179, 0.8%) for the reasons explained above.

11.3.11 There were 139,584 patients waiting to be admitted as an inpatient or day case, at the end of June 2022. This is 81.2% (62,563) higher than the month-end

average in 2019 (77,021). The focus of admissions was on providing care for those patients who have the greatest clinical need, with P2 patients accounting for 45.7% of the 49,707 admissions. P4 patients accounted for over half (52.8%) of the total waiting list at the end of June 2022. It can be seen therefore that the COVID-19 restrictions and pressures, which resulted in the reduction of non-urgent treatment provision, has resulted in a large increase in the number of P4 patients waiting for treatment. Additions to the list and admissions for P2 patients have been roughly equal month-on-month, reflective of their need for urgent care.

11.3.12 The statistics highlight how the proportion of cases in each clinical prioritisation category varied across different specialties, reflecting the differing levels of urgency in the conditions being treated. For example, urology had the highest proportion of additions to waiting lists that were categorised as P2, 60.5% during the latest quarter. This is in contrast to specialties such as ophthalmology and orthopaedics where over 75% of additions were either P3 or P4. Figure 6 below, taken from the report, shows waiting list activity and clinical prioritisation for the top six specialties by volume of patients waiting.

**Figure 6: Waiting list activity and clinical prioritisation – specialty comparison for quarter ending 30th June 2022**



## 11.4 Cancer services and outcomes

- 11.4.1 Early in the pandemic, the main questions around cancer were about balancing the restrictions on all parts of the health service with the need to diagnose and treat patients who most urgently needed treatment; and minimising illness associated with COVID-19 infection. The Scottish Government decided to pause the cancer screening programmes in March 2020 (PHS3/153 - INQ000320547) in order to focus NHS resources on the pandemic response. The programmes resumed over a period from June to October 2020, as a key part of health service remobilisation. The risks of COVID-19 for cancer patients included being infected through contact with health services and increased risks of serious illness from COVID-19 infection because of immune suppression (either due to the cancer or its treatment). Later, the focus became on informing recovery and redesign of cancer services (PHS3/154 - INQ000320560).
- 11.4.2 PHS is responsible for generating and processing a number of types of cancer data and providing information and intelligence for cancer control. Cancer control describes the full range of activities to reduce the burden of cancer in society: preventing cancers occurring; stopping people dying from cancer; and improving the wellbeing of people living with cancer. During the pandemic, as well as continuing with business-as-usual, PHS carried out new work on cancer to help inform the response to the pandemic.

### Cancer incidence and prevalence

- 11.4.3 PHS generates a high-quality population-based cancer registry, the Scottish Cancer Registry, that records all new cancers diagnosed in Scottish residents. The Scottish Cancer Registry was able to continue its work uninterrupted by the pandemic largely because IT systems and information governance were already in place to allow staff to work at home. The other UK nations suffered various levels of interruptions in their cancer registration while making new arrangements to allow staff to work from home. As a result, cancer registration publications were not delayed from their expected dates in Scotland.
- 11.4.4 All population-based cancer registries take time to assemble an accurate record of cancer diagnoses and their treatment. This is often around 1-3 years from the time of diagnosis. To provide a more recent account of cancer diagnoses to

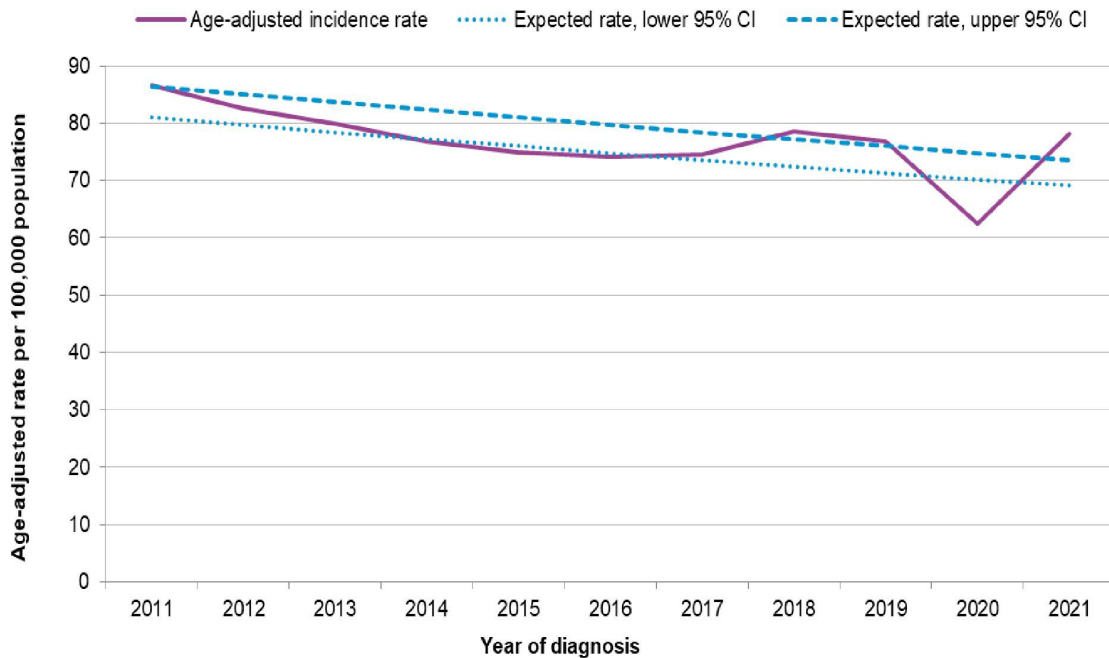
guide health services, PHS included pathologically-confirmed cancers on the Wider Impacts Dashboard (see section 4.6.3). The work contributed to a collaborative report with Wales and Northern Ireland, comparing and contrasting patterns (PHS3/155 - INQ000320574). This included expert commentaries to aid interpretation of the data. The first report was released on 18<sup>th</sup> November 2020 to describe data to 21<sup>st</sup> June 2020. These showed initial falls of around 40% in expected lung and breast cancer diagnoses and a 60% fall in colorectal cancer diagnoses.

- 11.4.5 By the end of 2020, the total number of individuals in Scotland with a pathological confirmation of cancer (excluding non-melanoma skin cancers) in Scotland was 4,800 less than would have been expected (28,474 in 2020 compared to 33,343 in 2019). The lower number of diagnoses was likely to be due to not diagnosing patients who would otherwise have been diagnosed with cancer rather than reflecting a true reduction in the occurrence of cancer. Under-diagnoses might have been due to a mixture of patients not accessing the usual investigations and diagnostic services and to patients dying of COVID-19 before a cancer diagnosis might have been made. As a result of the progressive nature of cancers, it seems likely that some patients will be diagnosed at a later stage in the future.
- 11.4.6 Publication of the gold standard information on cancer incidence from the Scottish Cancer Registry for 2020 (PHS3/156 - INQ000357275) showed that the rate, or risk and numbers of new cancer diagnoses had fallen by 9% and 8%, respectively, in 2020 compared to 2019. While this confirmed a large drop in numbers of cancer diagnoses in 2020, the number was smaller than that reported in the Wider Impacts Dashboard.
- 11.4.7 Cancer incidence in 2021 was published on 28<sup>th</sup> March 2023 (PHS3/157 - INQ000346173). Overall, cancer diagnoses increased not only compared with lower numbers in 2020 but also compared with the pre-pandemic period. The issue of under-diagnosis in 2020 had largely been resolved by 2021 but in more deprived areas, there was evidence of this persisting to some extent for certain cancer types (e.g. breast and colorectal cancer).
- 11.4.8 Figure 7 below shows that colorectal cancer incidence rates fell by 13% in the decade to 2019, with year-on-year changes typically varying between decreases



of 1% and 5%. However, there was a much larger than expected fall of 19% to 61.6 per 100,000 in 2020 from 2019 (the rates would have been expected to be 72.1 per 100,000 had the pandemic not occurred). Numbers fell by 758, or 19%, between 2019 and 2020 to 3,309. These additional drops are almost certainly due to the pause of the screening programme and disruptions in access to primary care and not true reductions in the occurrence of colorectal cancer. In 2021, there was an increase of 4.4% (180 cases of colorectal cancer) compared with 2019. The rate for colorectal cancer in 2021 was 78 per 100,000, similar to that observed in 2019 (77 per 100,000) but higher than the rate of 71 per 100,000 that was expected based on the decreasing trend over time. This increase was driven by a higher-than-expected rate in men (93 per 100,000 [observed] versus 82 per 100,000 [expected]).

**Figure 7: Colorectal cancer incidence in Scotland – age-adjusted rates 2011-2021**



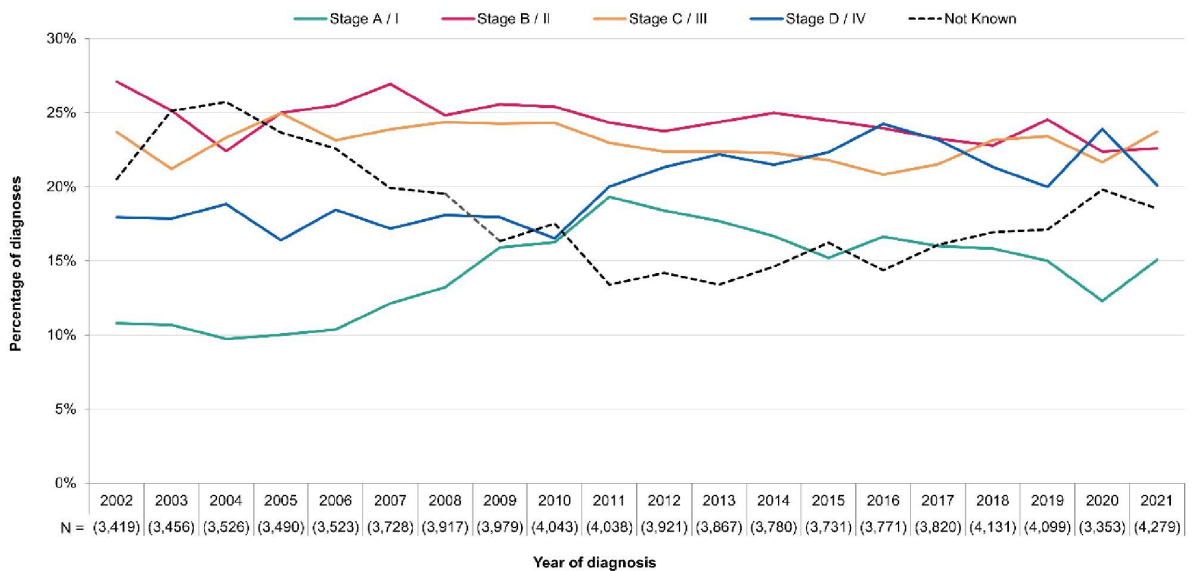
11.4.9 PHS will complete and publish cancer incidence data for 2022 in the spring of 2024.

11.4.10 Individuals aged 50-74 years old are invited to participate in a national screening programme for colorectal cancer in Scotland. In 2019, 34% of colorectal cancers

in 50–74-year-olds were diagnosed through screening; this fell to 20% in 2020; and rose to 32% in 2021.

11.4.11 The greatest reductions in colorectal cancer diagnoses were in earlier stages of the disease (see Figure 8 below). Stage 1 diagnoses fell by a third (33%), Stage 2 fell by just over a quarter (26%) and Stage 3 fell by just under a quarter (24%) in 2020 compared with 2019. Stage disease, when it has metastasised, decreased by 3%. Some of these reductions are likely to be due to pausing of bowel screening in 2020. Some are also likely to be due to fewer symptomatic patients being diagnosed with potentially curable cancer. In 2021, stage patterns were similar to those in 2019, although an increasing proportion of unknown stage cancers makes interpretation difficult.

**Figure 8: Trends in stage distribution (%) of colorectal cancer diagnoses in Scotland, 2014-2021**



### Socio-economic inequalities

11.4.12 The largest decreases in diagnoses were among people from the most deprived areas. However, the effects were sometimes to reduce observed differences. Pausing of screening (for which uptake is greatest in more affluent populations) for example reduced some socio-economic differentials; and excesses of

smoking-related cancers (which are higher in more deprived populations) were reduced.

11.4.13 Overall, the pandemic appears not to have increased pre-existing socio-economic inequalities in cancer incidence (33% higher in more deprived areas pre-pandemic compared with 30% in 2020). These short-term reductions in differences between most and least deprived are more likely to indicate a greater level of under-diagnosis rather than greater falls in cancer occurrence in more deprived areas.

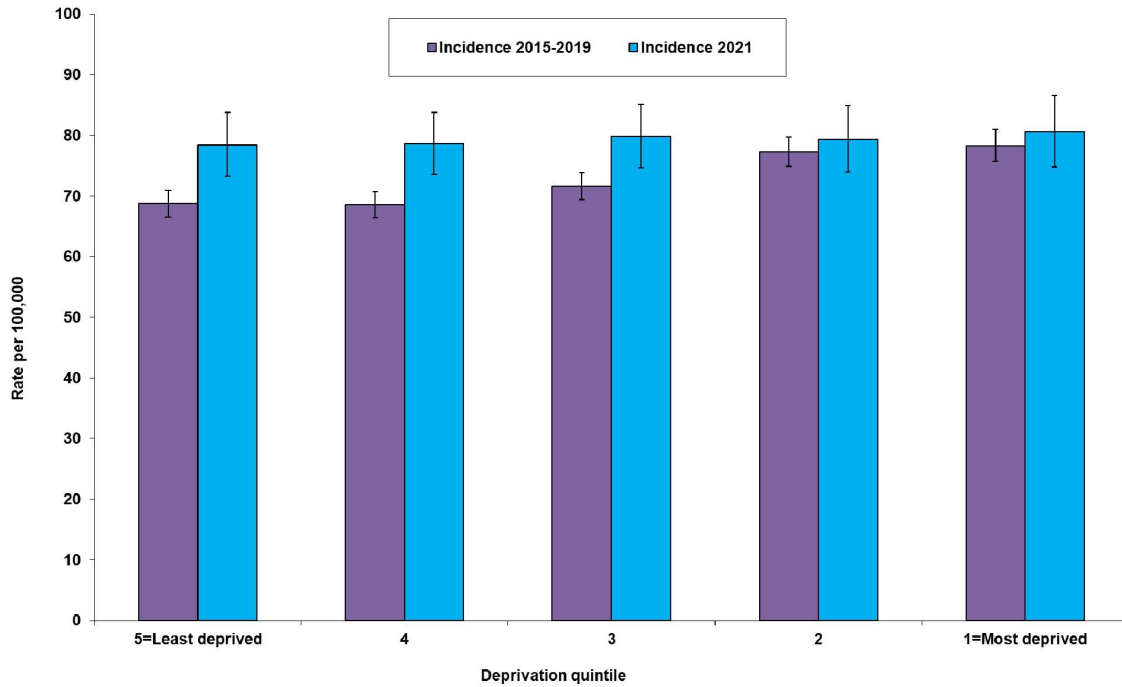
11.4.14 Looking specifically at colorectal cancer, colorectal cancer is more common in people from more deprived areas. This is probably due to a mixture of higher prevalence of risk factors (including obesity, poor diet, and smoking) and lower uptake of screening (which can detect and remove pre-cancerous polyps and therefore prevent cancer occurring). Incidence fell in all socio-economic groups in 2020 but it fell by a greater amount in people from more deprived areas. The usual interpretations of cancer risks do not apply to these short-term changes because they take years, and decades, to have an effect. The most plausible explanation for short-term changes is non-diagnosis of patients with cancer. This comprises people who are continuing to live with colorectal cancer, undiagnosed, and people who die from other conditions before their colorectal cancer could be detected (COVID-19 related conditions being the particular new factor).

11.4.15 The pausing of bowel screening in 2020 might have been expected to lead to a greater reduction in colorectal cancer diagnoses in people from more affluent areas, because they are more likely to take up screening. Pausing of bowel screening does not therefore readily explain the opposite finding – of a greater reduction in colorectal cancer diagnoses in people from more deprived areas. It may be that a combination of greater barriers to diagnosis among patients with symptoms of colorectal cancer, as well as greater risks of dying from COVID-19, in people from more deprived areas explain these socio-economic patterns.

11.4.16 In 2021, there was no longer a convincing difference in incidence of colorectal cancer between socio-economic areas. A larger – relatively speaking – increase in the least deprived compared to the most deprived in 2021 further narrowed

any difference. Please see Appendix H for data tables relating to the stage distribution of colorectal cancer diagnosis by deprivation category and Figure 9 below for colorectal cancer incidence rates by deprivation between 2015-2019 and 2021.

**Figure 9: Age-adjusted colorectal cancer incidence rates by deprivation quintile in Scotland, 2015-2019 and 2021**



### National Cancer Recovery Group

11.4.17 The Scottish Government established the National Cancer Recovery Group (NCRG) in July 2020 to provide national oversight of cancer services during the recovery phase of the NHS. Reporting to the NCRG, the National Cancer Data Programme Board was responsible for advising on and enabling data to support the recovery of cancer services and oversight of the integration of data reporting with current/evolving regional and national information systems. PHS undertook a suite of new work and provided expert input into the NCRG via the Cancer Data Programme Board.

11.4.18 A review of evidence for the Cancer Data Programme Board was produced in December 2021. This included an example of a detailed summary for lung cancer.

11.4.19PHS shared management information with NHS Boards providing an analysis of emergency and non-emergency routes to cancer diagnosis during the pandemic.



## Stage of cancer at diagnosis

11.4.20 PHS published data examining the impact of COVID-19 on the cancer staging distributions, comparing 2021 data with pre-pandemic data from 2018 and 2019 (PHS3/158 - INQ000320520). The report highlighted:

- a significant stage shift for breast cancer since the pandemic, with more women diagnosed with late-stage disease in 2018-2019 and correspondingly fewer women diagnosed with early-stage disease in 2021. This stage shift was more apparent for women resident in the least deprived areas of Scotland, likely reflecting the effect of the screening programme being paused for four months in 2020.
- There was no evidence of an overall stage shift for colorectal cancer in 2021 when compared with the pre-pandemic stage distribution. However, the stage distribution of colorectal cancer in different deprivation areas did vary between 2021 and 2018-2019.

11.4.21 Before the pandemic (2018-19), people from less deprived areas with colorectal cancer were more likely to be diagnosed with the earliest stage disease (Stage 1), probably because they were more likely to take part in bowel screening. Stage 1 comprised 21% of cases in the least deprived and 15% in the most deprived. However, there was no difference between most and least deprived in those diagnosed with metastatic, Stage 4 colorectal cancer (23.2%). These are rarely diagnosed through screening.

11.4.22 In 2020, the proportions of Stage 4 diagnoses increased across all socio-economic groups to a similar extent. The benefits of screening, leading to higher Stage 1 proportions in the least deprived, were largely lost in 2020. It should be noted that these are changes in proportions – actual numbers were lower due to under-diagnosis. By 2021, proportions of Stage 4 diagnoses had fallen to pre-pandemic levels in all socio-economic groups (23.3% of most deprived, 23.7% of least deprived) but the benefits of screening in the least deprived had not returned to pre-pandemic levels. In 2021, Stage 1 diagnoses comprised 17% of those in the least deprived (compared with 21% pre-pandemic) and 16% of those in the most deprived (compared with 15% pre-pandemic).

11.4.23 PHS will publish Detect Cancer Early data for 2022 on 28<sup>th</sup> November 2023.

## Mortality and survival

- 11.4.24 PHS's annual update of 2020 cancer mortality (PHS3/159 - INQ000357274) noted that while the number of deaths increased, the risk of death from cancer decreased in line with long-term trends. It was noted in particular that the continued fall in cancer mortality rates (or risk) in 2020 was in line with long-term trends. Since mortality is the product of both incidence and survival from cancer, it was not possible to conclude whether changes in either or both of them might have contributed to the unchanged patterns in 2020.
- 11.4.25 PHS analysis of the impact of the COVID-19 pandemic on cancer survival statistics for Scotland (PHS3/160 - INQ000320524) found lower survival estimates for the cohort diagnosed with cancer in 2020 compared to 2018/19. This is likely a reflection of both under-diagnosis of early-stage cancers and delayed diagnosis/treatment.

## Cancer waiting times

- 11.4.26 PHS publishes official statistics for NHS Scotland on cancer waiting times, covering the two treatment standards that apply in Scotland set out in the Scottish Government's Better Cancer Care Action Plan in 2008:
- The 62-day standard states that 95% of eligible patients will wait a maximum of 62 days from referral to first cancer treatment.
  - The 31-day standard states that 95% of all patients will wait no more than 31 days from decision to treat to first cancer treatment.
- 11.4.27 Data for April to June 2020 (PHS3/161 - INQ000357273) showed little difference in the proportion of patients seen within the 62-day standard time. However, there had been a large decrease in referrals (22%) compared to the same period in 2019. Similarly, the proportion of patients meeting the 31-day standard was similar to the previous quarter but again, there had been a large reduction in numbers of patients (23% compared to the same period in 2019). The impact of the pandemic was apparent from the following quarter, with patients not seeking out help so as to be referred, and delays in patients having diagnostic tests and/or starting treatment because hospitals were treating COVID-19 patients.

Boards also reported staffing and capacity issues as a result of pandemic factors such as self-isolation, social distancing, and cleaning time between patients.

## Cancer screening

- 11.4.28 Scotland's cancer screening programmes play a vital role in early diagnosis of cancer by detecting early signs of cancer in people who appear healthy. There are three cancer screening programmes in Scotland: cervical screening, and bowel and breast cancer screening.
- 11.4.29 All of the adult screening programmes were paused in March 2020, in response to the COVID-19 pandemic, and resumed at different times. Elements of the cervical screening programme resumed from June 2020, abdominal aortic aneurysms (AAA) from July 2020, breast screening from August 2020, and bowel screening from October 2020.
- 11.4.30 PHS supported the restart of the cancer screening programmes by analysing data to understand issues relating to uptake, participation, and inequalities as the programmes resumed. Prior to the pandemic and the pause in screening services, evidence showed that uptake of cancer screening was lower in more deprived areas. This pattern of inequalities was also seen in other screening programmes. PHS produced monthly management reports for the National Screening Oversight Board and NHS Boards to support timely analysis of the impact of the pandemic and the 2020 pause on inequalities in uptake.

## 11.5 Delayed Discharges

- 11.5.1 A delayed discharge occurs when a hospital patient who is clinically ready for discharge from inpatient hospital care continues to occupy a hospital bed beyond the date they are ready for discharge. PHS publishes official statistics on delayed discharges and maintained the monthly publication schedule throughout the pandemic.
- 11.5.2 Delayed discharge figures in NHS Scotland were affected by measures put in place to respond to COVID-19, with efforts made to reduce delayed discharge in order to free up hospital capacity and create a better outcome for individuals at risk of acquiring infection in hospital. Between February 2020 and March 2020 there was a reduction in both the average number of bed days associated with delayed discharges (10% decrease) and in the delayed discharge census figures (28% decrease) (PHS3/162 - INQ000320542).

11.5.3 This was followed by an even larger reduction in both the average bed days associated with delayed discharges and in the delayed discharge census figures between March 2020 and April 2020. At the April 2020 census point, there were 604 people delayed compared to 1,171 people at the March 2020 census point, a decrease of 48%. With regards to the average number of bed days associated with delayed discharges there was an average of 676 bed days in April 2020 compared to 1,452 in March 2020, a decrease of 53% (PHS3/163 - INQ000346801).

11.5.4 After this initial decrease, the figures for the number of delays at the census started to rise again from April 2020 to September 2020, fluctuating between then until May 2021 before increasing again. In summary, delayed discharge figures for the census and the average bed days were generally lower than the February 2020 delayed discharge figures until December 2021. From January 2022 they have been higher.

## 12. Public health messaging

### 12.1 National roles and responsibilities

#### Scottish Government

12.1.1 The Scottish Government led on public messaging around the pandemic, including restrictions, changes in policy, the vaccination programme and the 'NHS Open for Business' campaign.

#### Public Health Scotland

12.1.2 Whilst the Scottish Government led on pandemic messaging, PHS had an important supportive role. PHS worked closely with ARHAI and local and national NHS Boards to ensure continuity of and congruence of public health messaging in tandem with Scottish Government direction. This included:

- Providing data to support daily briefings (see section 4.6) and by supporting Scottish Government scientific media briefings.
- Sharing information with the public and stakeholders through news articles: PHS published 95 news items relating to COVID-19 between April 2020 and April 2022. Senior PHS staff – primarily Dr Nick Phin and Dr Jim McMenamin – took part in 13

interviews for television and 7 for radio. In addition, PHS was mentioned in 24 Scottish Government press releases.

- Sharing information with the public and stakeholders through social media: PHS issued 961 social media posts relating to COVID-19 between April 2020 and April 2022, which supported the delivery of accurate and timely information to the public.
- Working with NHS24 to ensure that the NHS Inform website was kept up to date with information for the public.
- Leading marketing campaigns including providing social media materials to be used to raise awareness that some screening services (Breast, Bowel, Cervical, Diabetic Eye Screening and Abdominal Aortic Aneurysm) were temporarily paused during the early part of the pandemic and what to do while waiting.
- Countering misinformation and disinformation with facts presented in a clear and accessible way, including direct to the public through television and radio interviews.

## 12.2 Local roles and responsibilities

12.2.1 Long-standing arrangements exist for local bodies to inform the public of incidents in their area and this formed the basis of the approach to public communications around COVID-19. This approach is set out in the 'Management of Public Health Incidents Guidance' (PHS3/164 INQ000130954) and 'Communicating with the Public about Health Risks' (PHS3/165 - INQ000147511).

## 12.3 Public messaging in healthcare settings

12.3.1 Public messaging in hospitals and other healthcare settings was the responsibility of the local NHS Board, utilising information materials such as posters and leaflets, either produced locally or accessed from a national health board.



## 13. Lessons learned and recommendations

### 13.1 The principal challenges PHS faced in the pandemic response

13.1.1 When PHS was launched on 1<sup>st</sup> April 2020, the UK was in the first lockdown and the majority of staff of the newly created public health body were working from home. Responding to the pandemic whilst establishing a new national public health organisation for Scotland was a unique and highly challenging scenario. Plans for organisational change and transformation were delayed as the organisation pivoted to focus almost entirely on the pandemic response. Many of the challenges faced by PHS – and set out in the Learning Lessons from COVID-19 report discussed below – should be seen in this context of a new organisation coming together at the same time as responding to a global pandemic.

#### Staffing and resources

13.1.2 As set out in section 6.4 of the PHS Corporate Narrative, PHS's opening budget and staffing levels were not sufficient for PHS to deliver the health protection response required by the pandemic. Although requirement for a stand-up in staffing and resource had always been anticipated when pandemic hit, HPS had experienced a period of reduction in funding in certain areas in the lead up to the pandemic as a result of required efficiency savings. This reduction in funding led to a reduction in baseline staffing levels and surveillance of respiratory pathogens, which in turn affected our ability to respond to the pandemic.

13.1.3 Although the Scottish Government provided PHS with assurance that additional COVID-19 funding would be provided, in some instances the funding was not the barrier. Take for example respiratory surveillance, which is known to be vital to the early stages of a pandemic. As a result of the cost savings HPS had been required to make, only six Full Time Equivalent (FTE) members of staff transferred from HPS to PHS in April 2020. Although PHS quickly identified a need to recruit, difficulties were encountered due to the timescales inherent in recruitment exercises and in particular due to the demand from NHS Boards across Scotland outstripping the supply of respiratory surveillance specialists.

PHS now has 50 FTEs in its respiratory surveillance team, which it believes to be an adequate number.

### Funding model

13.1.4 PHS is currently working with its sponsors to increase the organisation's flexibility by making changes to the organisation's funding model. Much of PHS's budget comes from ring-fenced non-recurring sources in Scottish Government. 38% of PHS's funding in 2021/22 was non-recurring, short-term funding, ring-fenced for a specific issue, with little flexibility in how PHS uses it. The PHS Board's position is that efficiency and sustainability of PHS's services, including those relating to protecting health and pandemic preparedness, would be improved if more of the organisation's funding was baselined and recurring.

### Status under the Civil Contingencies Act

13.1.5 PHS played a substantial role in leading, managing, and co-ordinating national incidents and supporting local arrangements throughout the pandemic. This was despite lacking the status of a Category 1 responder under the Civil Contingencies Act 2004 (Contingency Planning) (Scotland) Regulations 2005 (as amended). As set out in paragraphs 3.4.27 – 3.4.35 of the PHS Corporate Narrative, the organisation's status as a Category 2 responder under the terms of the Act resulted in a lesser set of duties of cooperating and sharing information compared to the full set of civil protection duties required by Category 1 responders.

13.1.6 Designating PHS as a category 1 responder would formalise duties and legitimise roles and activities that are currently being undertaken and would enable PHS to enhance and develop its approach, including risk preparedness, situational awareness, testing and exercising and emergency capability and capacity.

13.1.7 The Scottish Government is supportive of this change, indeed the Scottish Government's Lessons Learned report (PHS3/166 - INQ000147847) published in August 2021 identified consideration for extending Category 1 responder status to PHS as a key finding. Conversations with Scottish Government are ongoing with regards to Category 1 responder status being conferred on PHS. A wider review of the Scottish regulations of the Civil Contingencies Act was planned to take place this year, by Scottish Government Resilience, and was likely to include changes to responder categorisation, however it has been deferred.



## 13.2 Overview of the key findings from PHS's Lessons Learned exercise

13.2.1 PHS instigated a lesson learned programme in 2022 to examine the organisation's response to the pandemic, including debriefing of staff directly involved in the response to gather their views, observations, and experiences to help us to understand what worked well and to identify areas for improvement. The exercise culminated in the report Learning Lessons from COVID-19 (PHS3/167 - INQ000187754), which outlines the principal challenges faced by PHS in discharging its functions in the response to the pandemic and the changes that have been identified and implemented to overcome these challenges.

13.2.2 The key findings were:

- Flexibility and adaptability were key to PHS's ability to deal with the fast-paced and changing nature of the pandemic and the far-reaching implications for the public in Scotland.
- There was significant and ongoing pressure on PHS staff, especially where expertise was held by a small number of people who needed to be part of the response throughout the pandemic.
- The development of clear and well-communicated governance arrangements is critical in the early stages of future pandemics or serious public health incidents.
- Forming a new organisation and developing the necessary organisational systems, processes and procedures whilst responding to the pandemic added to the challenge facing staff.
- There were significant resource challenges, particularly in the early days of the pandemic, which had a direct impact on employee wellbeing.
- The recruitment of large numbers of new staff, many on fixed-term contracts and secondments, while working from home presented real operational, leadership and staff wellbeing challenges including in relation to induction, team-building and training.
- Situational reporting must be used from the outset to keep staff updated.
- As PHS came into existence during the pandemic, not all staff were adequately trained in incident management and systems were not fully established.
- Ongoing evaluation and reflection should be built into future pandemic planning to help to make maximum use of available resources and help to rapidly reprioritise activity during sustained periods of heightened and refocused activity.





### 13.3 NIMT Lessons Learned Exercise

13.3.1 The NIMT (see section 3.3.5) is in the process of undertaking a lessons learned exercise. PHS will make this available to the inquiry on completion, which is expected towards the end of 2023.

### 13.4 Recommendations

13.4.1 PHS would make the following recommendations in order to improve the response of the healthcare system in Scotland in the event of a future pandemic.

#### Essential services

13.4.2 It is important that in planning for healthcare system resilience that decision makers have an explicit and shared understanding of what constitutes an essential service, that this includes ongoing surveillance of inequalities in wider health outcomes and determinants of outcomes including accessibility and quality of healthcare provision.

#### Data infrastructure

13.4.3 Access to reliable, timely data is critical to the effective management of healthcare services at all times and never more so than when dealing with the pressures of a pandemic.

13.4.4 The Office for Statistics Regulation (OSR) made four main recommendations in their report 'Lessons learned for health and social care statistics from the COVID pandemic' (PHS3/168 - INQ000320555). The recommendations focussed on:

- Understanding the information that people need to enable effective prioritisation.
- Ensuring data and statistics are made available in an accessible, transparent and timely way.
- Collaborating to provide maximum value for users i.e. through data sharing.
- Communicating in an innovative, clear and engaging way to a wide range of users.

13.4.5 PHS aligns with these recommendations and has learnt from how statistics were reported and responded to during the pandemic, including the positive feedback received from stakeholders to the range of interactive, accessible dashboards described in section 4.6. An example of how this learning has been implemented

is in the development of a new online platform to communicate Accident and Emergency (A&E) waiting times. This is an area of significant public interest and it is important that statistics are presented in an easily accessible format. The new platform has received positive formal feedback from the OSR.

- 13.4.6 It is important that work such as this continues and that the public sector in Scotland works collaboratively to bring data together to build a fuller picture of issues affecting population health.

### **Whole system working**

- 13.4.7 The pandemic saw all parts of the public health system in Scotland working together towards a common goal in a way not previously seen in Scotland. Health was recognised as not being the responsibility of the healthcare system alone, with partners from across sectors coming together for the good of the public's health. PHS is now focussed on harnessing this whole system way of working to galvanise partners in shared action towards reducing health inequalities and improving health. A healthier population going into a pandemic would result in less pressure on the healthcare system in responding.

**Statement of Truth**

The facts provided in this statement are true and accurate to the best of my knowledge and belief.

**Personal Data**

Signed: \_\_\_\_\_

Name: Paul Johnston

Designation: Chief Executive Officer

Date: 27/11/23

**Personal Data**

Signed: \_\_\_\_\_

Name: Scott Heald

Designation: Director of Data and Innovation

Date: 27/11/23

**Personal Data**

Signed: \_\_\_\_\_

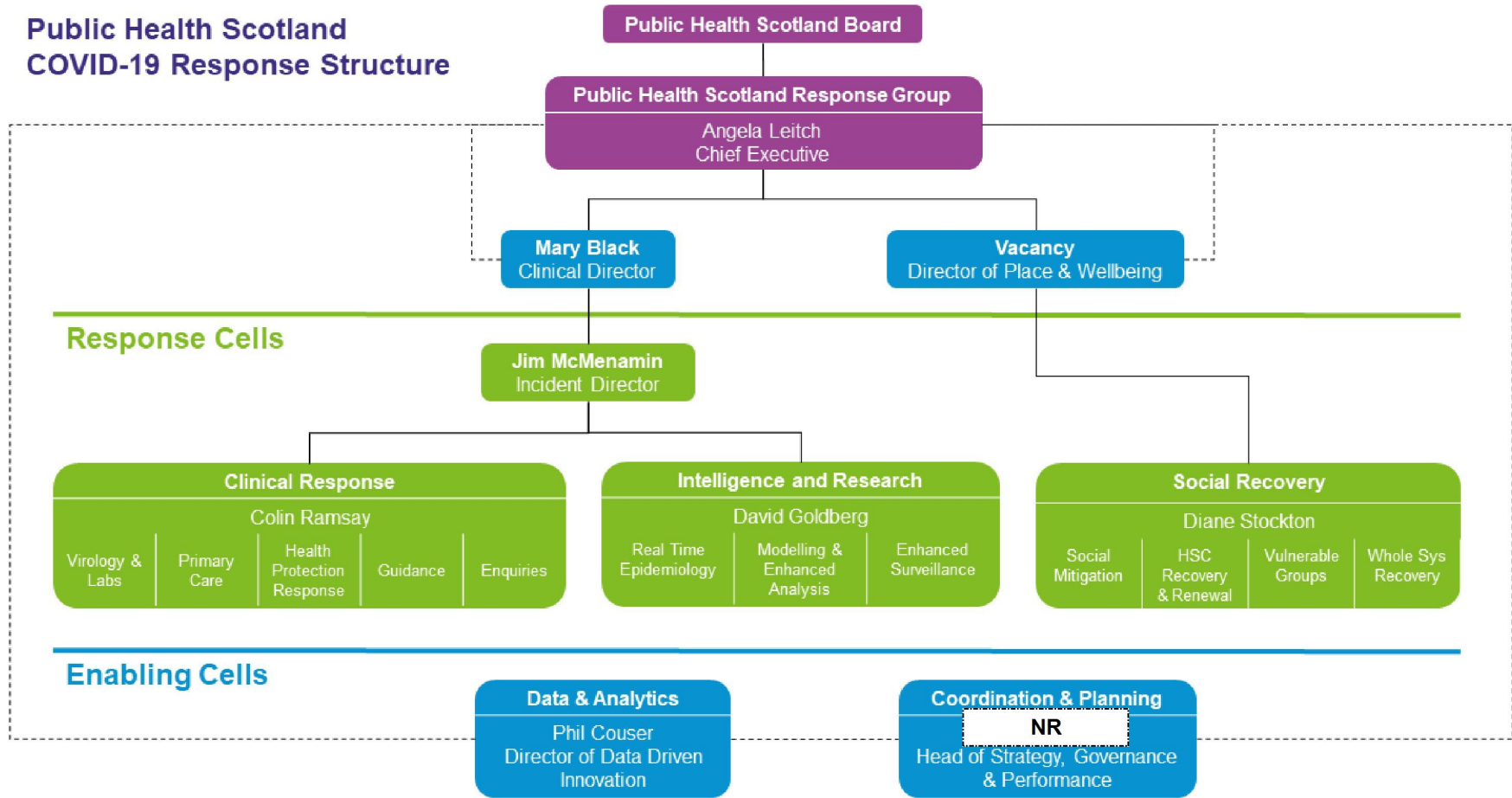
Name: Nick Phin

Designation: Director of Public Health Science

Date: 27/11/23

**Appendix A: COVID-19 Response Structure as at April 2020**

**Public Health Scotland  
COVID-19 Response Structure**



Title: Public Health Scotland COVID-19 Response Structure

Version: 1.0

Author

NR

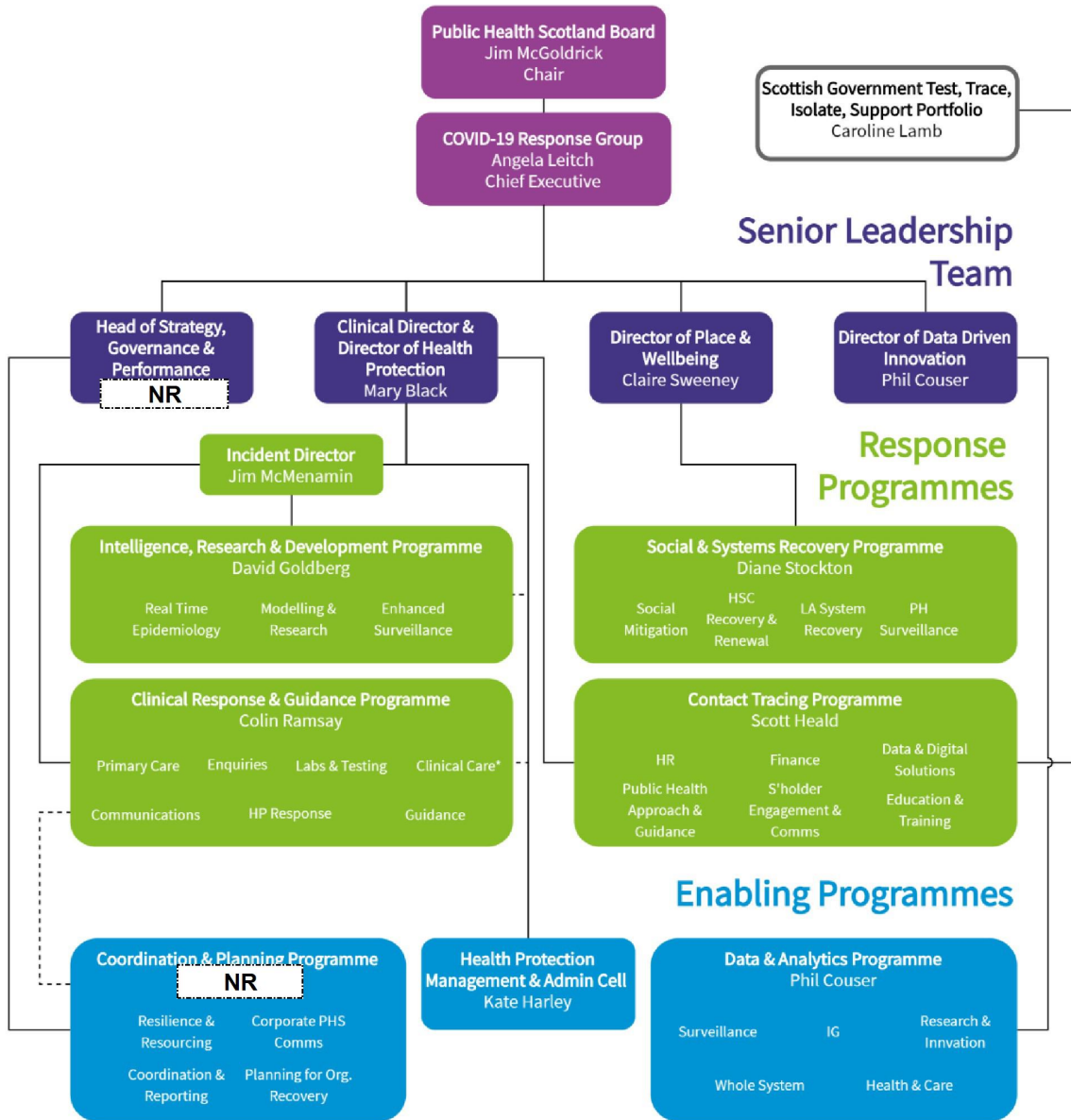
Date: 16 Apr 2020





Appendix B: COVID-19 Response Structure as at June 2020

# Public Health Scotland COVID-19 Response Portfolio Structure



Title: Public Health Scotland COVID-19 Response Structure  
 Version: 2.7  
 Author: NR  
 Date: 8 June 2020

**KEY**

Programme Name  
 Programme SRO

Cell Name   Cell Name   Cell Name

### Appendix C: Key staff involved in supporting Scottish Government decision-making

Name	Job Title	Description of role
Angela Leitch	Chief Executive (November 2019 – March 2023)	Angela Leitch led the organisation and represented the executive on the Board. As Accountable Officer, Angela Leitch was responsible for the effective management and use of all the resources entrusted to PHS by the Scottish Parliament.
Dr Nick Phin	Director of Public Health Science and Medical Director (January 2021 – present)	Dr Phin leads the directorate responsible for national public health protection and leads clinical professional development and training. He took up post in Scotland in the beginning of January 2021, joining from PHE/UKHSA, where he held the position of Deputy Director National Infection Service and PHE Incident Director for the COVID-19 pandemic from January 2020 to December 2020.
Dr Jim McMenamin	Interim Clinical Director Health Protection, HPS/PHS (April 2018 to October 2021)  Strategic Incident Director for COVID-19 (January 2020 – present)  Head of Health Protection (Infection Services) (October 2021 – present)  Consultant Epidemiologist since 2003	As one of the strategic incident directors and the Chair of the NIMT, Dr McMenamin was the main contributor to the advice offered to SG (Scottish Government) through representation at SGoRR, ministerial deep dives, and coordinated response from PHS to specific questions posed by SG. He is a consultant epidemiologist in the field of Infectious Disease and for the past 19 years has been the strategic lead for the Respiratory team in PHS3/HPS.
Scott Heald	Interim Contact Tracing Director (May 2020 – January 2021)  Interim Chief Officer (January 2021 – May 2021)	Scott Heald leads the directorate responsible for the collection, access, and use of data to derive insight and drive innovation in how PHS protects and improves health.  In his role of the Head of Profession for Statistics, Scott is responsible for all health and social care statistics in five national Health Boards - PHS, National Services Scotland (NSS), Scottish Ambulance Service

	<p>Interim Director of Data and Digital Innovation (June 2021 – May 2022)</p> <p>Director of Data and Digital Innovation (June 2022 – present)</p> <p>Head of Profession for Statistics (April 2020 – present)</p>	<p>(SAS), NHS 24, and NHS Education for Scotland (NES) which are named in legislation as producers of Official Statistics. The head of profession for statistics role is set out in the Framework for National Statistics 2000 and the UK Code of Practice for Statistics 2018.</p> <p>He held several roles throughout the pandemic including lead director for the establishment of contact tracing in Scotland for COVID-19, one of the Interim Chief Officers and he took over the Director of DDI from Phil Couser.</p>
Phil Couser	Director of Data Driven Innovation (April 2020 – June 2021)	Led the directorate responsible for the collection, access, and use of data to derive insight and drive innovation in how PHS protects and improves health.
Carol Sinclair	<p>Associate Director (Data Driven Innovation) (April 2020 – August 2021)</p> <p>Interim Chief Officer (August 2021 – retirement August 2022)</p>	Carol Sinclair led on a number of data-related workstreams during the pandemic including Whole System Modelling, improving social care and primary care data, digital and data innovation including implementation of a PHS innovation hub, and digital and data elements of the vaccination programme.
George Dodds	<p>Contact Tracing Director (January 2021 – August 2021)</p> <p>Interim Chief Officer (August 2021 – January 2023)</p> <p>Chief Officer (January 2023 – present)</p>	George Dodds held a variety of roles over the course of the pandemic, including leading collaborative work on contact tracing with the SDsPH.
Dr Mary Black	Director of Clinical and Protecting Health (April 2020 – January 2021)	Dr Black led the directorate responsible for national public health protection and clinical professional development and training.

Dr Maria K Rossi	<p>Consultant in Public Health Medicine (April 2020 – present)</p> <p>Interim Lead for COVID-19 Clinical Response and Guidance Group (November 2020 – September 2022)</p> <p>Interim Head of Health Protection (Environment and Emergency Response) (February 2022 – present)</p>	<p>Dr Rossi contributed throughout the pandemic to the PHS Guidance function.</p> <p>She supported the incident directors in the public health (clinical) response, stepping in during two leads' sickness absence and eventual retirements.</p> <p>Dr Rossi also led the response function in support of health board Health Protection Teams (June 2020 to date) and COVID-19 Clinical Response and Guidance Group (as interim lead) from Nov 2020 – Sept 2022).</p>
Professor David Goldberg	<p>Strategic Incident Director for COVID-19 (January 2020 – December 2021)</p> <p>Interim Depute Clinical Director (April 2020 – December 2021)</p> <p>Programme Lead for Blood Borne Viruses/Sexually Transmitted Diseases</p>	<p>Professor David Goldberg is a Clinical Epidemiologist who, was one of the Strategic Incident Directors for COVID-19 alongside Dr McMenemy and Dr Ramsay. He retired in January 2023.</p> <p>Dr David Goldberg had two periods of long-term sickness absence between 05 January 2022 until 31 May 2022 and 01 July 2022 until 05 January 2023. Dr McMenemy carried out duties as Strategic Incident Director throughout this period.</p>
Dr Colin Ramsay	<p>Strategic Incident Director for COVID-19 (January 2020 – October 2020)</p> <p>Consultant Epidemiologist (April 2020 – October 2020)</p> <p>Lead for Modelling and Research Cell</p>	<p>Dr Ramsay was one of the Strategic Incident Directors for COVID-19 alongside Dr McMenemy and Professor David Goldberg. Dr Ramsay was the PHS Clinical Response Group (CRG) Lead provided overall accountability and strategic leadership to the PHS Guidance Cell from January 2020 to October 2020 He is a consultant epidemiologist in the field of environmental public health. He retired in autumn 2021.</p> <p>Dr Ramsay had a period of long-term sickness absence between 26 October 2020 until 31 October 2021. Dr McMenemy and Professor Goldberg carried out duties as Strategic Incident Director throughout this period.</p>

Dr Colin Sumpter	<p>Consultant in Public Health (March 2021 – present)</p> <p>COVID-19 Guidance Lead (May 2021 – Sept 2022)</p>	Dr Sumpter joined PHS as a consultant in March 2021. He was lead Consultant for COVID-19 health protection in education settings, reviewing and contributing to SG education guidance. He prepared guidance documents for policy alignment check (PAC) before sign-off from Scottish Government.
Dr David Yirrell	<p>Consultant Virologist (January 2020 – retirement in March 2023)</p> <p>Co-Chair of Labs and Diagnostic cell (January 2020 – retirement in March 2023)</p>	As a consultant clinical scientist in virology with many years' experience of running an NHS diagnostic laboratory Dr Yirrell was able to offer advice at both a technical and clinical level on laboratory testing, new technologies, and quality measures. He acted as a representative for the labs & Diagnostic cell on Scottish Government led meetings such as the Clinical Cell, Elite Sports, Scottish Scientific Advisory Group on Testing, and Testing Operational Delivery Group.
Dr Michael Lockhart	<p>Consultant Microbiologist (January 2020 – present)</p> <p>Co-Chair of Labs and Diagnostic cell (January 2020 – present)</p>	Dr Lockhart sat on Scottish Government led groups and provided clinical and technical expertise on laboratory testing, and dataflow from laboratories to PHS. Michael provided updates to Scottish Government on the development of the SARS CoV-2 Whole Genome Sequencing Service and Scottish National Upscaling project.
Professor Matt Holden	Consultant Pathogen Sequencing Advisor (January 2020 – present)	Professor Holden provided pathogen sequencing expertise. He was key lead for the development of the SARS CoV-2 Whole Genome Sequencing Service and Scottish National Upscaling project. Matt provided updates to Scottish Government as a key lead on the development of the SARS CoV-2 Whole Genome Sequencing Service and Scottish National Upscaling project.
Dr Diane Stockton	<p>Acting Director of Place &amp; Wellbeing (April 2020 – June 2020)</p> <p>Lead consultant for the education cell (July 2020 – July 2022)</p>	Dr Stockton was responsible for surveillance, evidence and guidance around children and young people, with a specific focus on education settings (Early learning and childcare (ELC), schools and advanced learning (AL)). She led and co-ordinated the work and liaised with the SG education department on a daily (weekly latterly) basis (through a morning daily stand up) providing advice and intelligence, from when

	<p>Chief Officer (December 2020 – February 2021)</p> <p>Consultant in Public Health (February 2021 – present)</p>	<p>she took up the role in July 2020 (when the cell was formed ahead of education settings re-opening) until the cell was stood down in July 2022.</p>
Dr Eileen Scott	<p>Public Health Intelligence Principal (2020-present)</p>	<p>Dr Scott was responsible for supporting the education cell through supporting the design and management of the surveillance and evidence review work streams, with a specific focus on education settings (Early learning and childcare (ELC), schools and advanced learning (AL)). She liaised with the SG education department on a regular basis (through a morning daily stand up) providing advice and intelligence, from when she took up the role in July 2020 (when the cell was formed ahead of education settings re-opening) until the cell was stood down in July 2022. Dr Scott was a member of the World Health Organization Europe Technical Advisory Group on Safe Schooling During the COVID-19 Pandemic. She was also a member of the Scottish Government Coronavirus (COVID 19): Advisory Sub-Group on Education and Children’s Issues which provided advice to support and inform the development of operational guidance.</p>
Dr Claire Cameron	<p>Strategic Lead, Immunisation (Jan 2011-April 2020)</p> <p>Consultant in Health Protection (April 2020 – present)</p>	<p>Dr Cameron has over 20 years’ experience at a national level, focusing on immunisation. This includes Covid vaccination and ensuring continued high uptake of other immunisations. She has had lead responsibility for a range of vaccine preventable diseases, chaired national immunisation programme groups and represented PHS at the UK Joint Committee for Vaccination and Immunisation.</p> <p>During the pandemic she was part of the leadership team for covid immunisation at PHS, continued to work within the Scottish</p>



		Immunisation Programme to ensure high uptake of other vaccines, and represented PHS at JCVI.
Professor Chris Robertson	Honorary Professor PHS Professor of Health Epidemiology in the Department of Mathematics and Statistics at the University of Strathclyde.	Professor Robertson has an honorary contract with PHS for the provision of statistical expertise and represents the organisation on SPI-M-O.
Dr Gerry McCartney	Consultant in Public Health and Head of the Public Health Observatory Honorary Consultant in Public Health (since September 2021)	Dr Gerry McCartney took up post as Head of the Scottish Public Health Observatory (ScotPHO) at NHS Health Scotland in 2010 and then Public Health Scotland. Dr McCartney left PHS to take up the post of Professor of Wellbeing Economy at the University of Glasgow in September 2021.

**Appendix D: The 2022-25 Strategy Map**

## Our vision | We want to see A Scotland where everybody thrives

### That means:

- Life expectancy in Scotland to improve
- The 10-year difference in life expectancy between the poorest and wealthiest neighbourhoods to reduce

### Our mission | We lead and support work in Scotland to:

- **Prevent disease** through vaccination and preventing the spread of infectious diseases
- **Prolong healthy life** by improving access to and quality of treatment
- **Promote health and wellbeing** by strengthening the building blocks of health

### Shared outcomes | To deliver this ambition, by March 2025, we will work with our partners to improve national outcomes on:

#### Prevent disease

- The number of people – especially in our most deprived communities – getting vaccine-preventable diseases like COVID-19 (3.1.1)
- The number of people losing health to infectious diseases – especially hepatitis C, HIV and TB (3.1.2)
- Scotland's readiness for future pandemics (3.1.3)

#### Prolong healthy life

- The number of people dying from drug, alcohol and tobacco use (3.2.1)
- The number of people dying from cancer (3.2.2)
- Satisfaction with the quality of public services (3.2.3)
- The proportion of people over 55 say their health is 'good' or 'very good' (3.2.3)

#### Promote health and wellbeing

- The number of children living in poverty (3.3.1)
- The proportion of people describing their neighbourhoods as a 'very good' place to live (3.3.2)
- Mental wellbeing (3.2.3)
- Income inequalities (3.2.4)

The promote health and wellbeing outcomes will lead to fewer people dying from conditions like heart disease, stroke and diabetes

### Our objectives | To achieve this, we will:

- Be the go-to source of public health data and intelligence (4.1)
- Put reducing health inequalities at the heart of all we do (4.2)
- Equip our people with the systems and structure to deliver for Scotland (4.3)
- Increase our collaboration with local partners to improve the health of communities (4.4)
- Support Scotland's recovery from COVID-19 so no one is left behind (4.5)

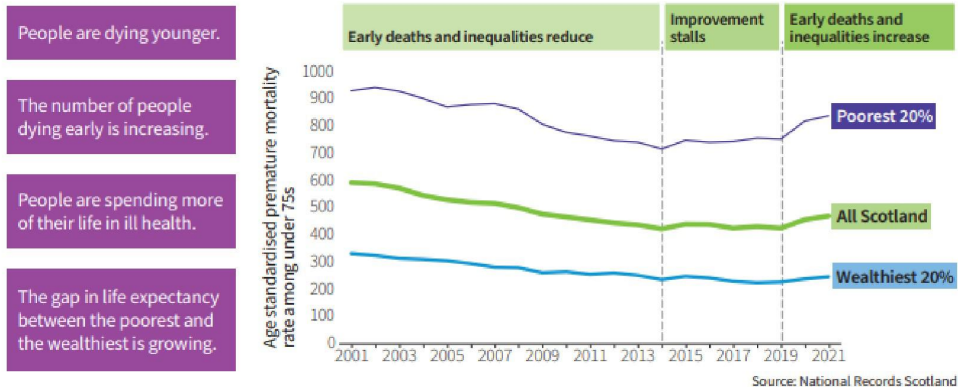
### Our programmes and projects | Our vital initiatives:

- Create a pandemic preparedness team
- Continue to deliver the vaccination programme
- Remobilise key health protection services
- Transform our infectious disease intelligence systems
- Mainstream our COVID-19 response
- Continue our data and digital transformation
- Underpin the creation of the national care service with data
- Support decision-making on health and social care with better demand modelling
- Deliver more national support for local action on health
- Deliver an impactful mental health offer
- Get evidence and data into action on child poverty
- Reducing cancer deaths
- Reducing drugs, alcohol and tobacco deaths
- Support public sector anchor institutions
- Improve health via the justice system
- Support creating a wellbeing economy
- Be an exemplar anchor institution
- Get the right systems, structures and processes
- Create an innovation hub to drive our transformation

# Together we can create a Scotland where everybody thrives



## After decades of improvement, Scotland's health is worsening



## Services look increasingly unsustainable

“More people are being added to waiting lists than are being removed from them, and people are waiting longer for treatment.”

Audit Scotland assessment of NHSScotland, February 2023


Available at: [https://www.audit-scotland.gov.uk/uploads/docs/report/2023/nr\\_230223\\_nhs\\_overview.pdf](https://www.audit-scotland.gov.uk/uploads/docs/report/2023/nr_230223_nhs_overview.pdf)

## The burden of disease in Scotland is forecast to increase 21% by 2043

Two thirds of this increase will be due to increases in:

-  Cancers
-  Cardiovascular disease
-  Neurological conditions

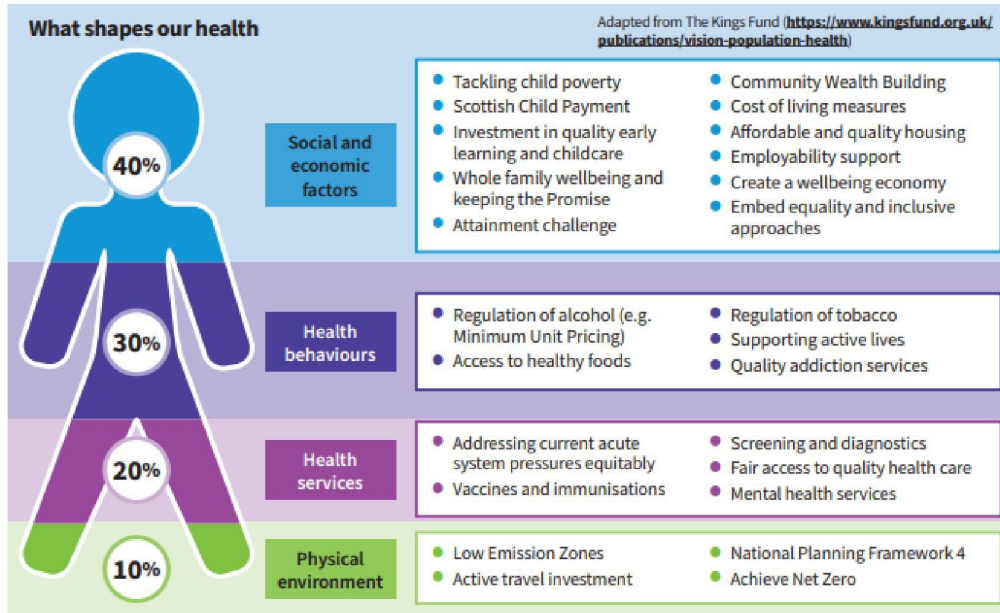
## Change is possible by investing in prevention

Success so far 

<p><b>HPV vaccine:</b> 89% reduction in pre-cancer cervical cell changes from 2008 to 2014.</p>	<p><b>Minimum Unit Pricing (MUP):</b> reduced alcohol hospital admissions (4.1%) and deaths (13.4%) from 2018 to 2020.</p>	<p><b>Childsmile:</b> halved tooth decay amongst children between 2003 and 2020.</p>
<p><b>Hepatitis C prevention:</b> will eliminate the virus by 2024.</p>	<p><b>COVID-19 vaccines:</b> More than 27,656 deaths were directly prevented in Scotland by COVID-19 vaccines</p>	<p><b>Smoking ban:</b> reduced admission for child asthma (18%) and heart attacks (17%).</p>

# Scotland needs collective action to improve life expectancy and reduce health inequalities

## 1 Protect investment in the building blocks of health



**2 Long-term investment in prevention: every sector has a role to play**

**3 Sustained collaboration: review of NPF; renewed national and local government partnership; measure what matters; stronger accountability.**

## Public Health Scotland continues to lead and support Scotland's efforts

Strengthening the building blocks of health	Drive whole system working locally and nationally	Providing public health data and evidence for action
<ul style="list-style-type: none"> <li>Supporting delivery of the Child Poverty Delivery Plan, Best Start, Bright Futures.</li> <li>Supporting NHSScotland to embed the Anchor Institution approach.</li> <li>Working with teachers to adopt a public health approach to learning.</li> </ul>	<ul style="list-style-type: none"> <li>Increasing the support we provide to Community Planning Partnerships.</li> <li>Working in partnership with Police Scotland and justice system to improve community health and wellbeing.</li> <li>The Care and Wellbeing Dashboard will support collaborative action on health.</li> </ul>	<ul style="list-style-type: none"> <li>Providing data and intelligence to address immediate pressures and recovery of health services.</li> <li>Modelling current and future demands on health and care supports planning and redesign.</li> <li>Evidence supports decision making.</li> <li>Policy evaluations, such as MUP, identify what works.</li> </ul>

More on how Public Health Scotland is leading and supporting change can be found at: <https://publichealthscotland.scot/publications/public-health-scotland-strategic-plan-2022-2025/>

To discuss further, email [phs.chiefexecutive@phs.scot](mailto:phs.chiefexecutive@phs.scot)

## Appendix F: COVID-19 guidance for health and social care settings

Advice for social or community care and residential settings staff			
Version	Published	Removed	URN
Version 1.4	23 Dec 2020 16:10	29 Dec 2021 03:20	PHS3/169 - INQ000189130
Version 1.2	13 Aug 2020 18:00	23 Dec 2020 16:10	PHS3/170 - INQ000189128
Version 1.3	13 Aug 2020 18:00	13 Aug 2020 18:00	PHS3/171 - INQ000189129
Version 1.1	20 May 2020 15:05	13 Aug 2020 18:00	PHS3/172 - INQ000189127
Version 1.0	17 Apr 2020 19:10	20 May 2020 15:05	PHS3/173 - INQ000189126
Care homes outbreak checklist			
Version	Published	Removed	URN
Version 2.0	2 Feb 2022 16:10		PHS3/174 - INQ000189137
Version 1.13	24 Jun 2021 12:30	2 Feb 2022 16:10	PHS3/175 - INQ000189063
Version 1.12	3 Jul 2020 09:50	24 Jun 2021 12:30	PHS3/176 - INQ000189136
Version 1.11	1 Jul 2020 17:00	3 Jul 2020 09:50	PHS3/177 - INQ000189135
Guidance for domiciliary care			
Version	Published	Removed	URN
Version 1.41	20 Aug 2020 16:25	16 Apr 2021 16:20	PHS3/178 - INQ000189171



Version 1.4 amended	19 Aug 2020 16:30	20 Aug 2020 16:25	PHS3/179 - INQ000189169
Version 1.4	19 Aug 2020 15:00	19 Aug 2020 16:30	PHS3/180 - INQ000189170
Version 1.3.2	10 Jul 2020 14:35	19 Aug 2020 15:00	PHS3/181 - INQ000189168
Version 1.2	4 Jun 2020 13:10	10 Jul 2020 14:35	PHS3/182 - INQ000189167
Version 1.1	20 May 2020 15:30	4 Jun 2020 13:10	PHS3/183 - INQ000189166
Version 1.0	4 May 2020 17:20	20 May 2020 15:30	PHS3/184 - INQ000189165
<b>Guidance for health protection teams (HPTs)</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 2.3	21 Jun 2022 09:30	12 Jul 2022 14:25	PHS3/185 - INQ000189078
Version 2.2	31 May 2022 14:20	21 Jun 2022 09:30	PHS3/186 - INQ000273606
Version 2.1	19 May 2022 09:30	31 May 2022 14:20	PHS3/187 - INQ000189076
Version 2.0	14 Apr 2022 17:20	19 May 2022 09:30	PHS3/188 - INQ000189075
Version 1.8	28 Feb 2022 15:50	14 Apr 2022 17:20	PHS3/189 - INQ000189074
Version 1.7	7 Jan 2022 16:45	28 Feb 2022 15:50	PHS3/190 - INQ000189069
Version 1.5	21 Dec 2021 16:10	7 Jan 2022 16:45	PHS3/191 - INQ000176741

Version 1.2	13 Sep 2021 16:40	21 Dec 2021 16:10	PHS3/192 - INQ000189067
Version 10.0	28 Jan 2021 13:30	13 Sep 2021 16:40	PHS3/193 - INQ000189174
Version 9.9	22 Jan 2021 16:45	28 Jan 2021 13:30	PHS3/194 - INQ000189201
Version 9.8	31 Dec 2020 15:30	22 Jan 2021 16:45	PHS3/195 - INQ000189200
Version 9.7	19 Dec 2020 16:00	31 Dec 2020 15:30	PHS3/196 - INQ000189199
Version 9.6	20 Aug 2020 16:00	19 Dec 2020 16:00	PHS3/197 - INQ000189198
Version 9.5	31 Jul 2020 14:45	20 Aug 2020 16:00	PHS3/198 - INQ000189197
Version 9.4	16 Jul 2020 15:30	31 Jul 2020 14:45	PHS3/199 - INQ000189196
Version 9.3	14 Jul 2020 16:50	16 Jul 2020 15:30	PHS3/200 - INQ000189195
Version 9.2	10 Jul 2020 15:20	14 Jul 2020 16:50	PHS3/201 - INQ000189194
Version 9.1	26 Jun 2020 17:30	10 Jul 2020 15:20	PHS3/202 - INQ000189193
Version 8.6	22 May 2020 22:30	26 Jun 2020 17:30	PHS3/203 - INQ000357280
Version 9.0	22 May 2020 18:10	22 May 2020 22:30	PHS3/204 - INQ000189192
Version 8.6	20 May 2020 15:20	22 May 2020 18:10	PHS3/ 203 INQ000357280
Version 8.5	1 May 2020 19:40	20 May 2020 15:20	PHS3/206 - INQ000189191

Version 8.4	1 May 2020 18:30	1 May 2020 19:40	PHS3/207 - INQ000189190
Version 8.3	29 Apr 2020 19:05	1 May 2020 18:30	PHS3/208 - INQ000189189
Version 8.1	16 Apr 2020 18:30	29 Apr 2020 19:05	PHS3/209 - INQ000189188
Version 8.0	12 Apr 2020 16:30	16 Apr 2020 18:30	PHS3/210 - INQ000189187
Version 7.8	2 Apr 2020 21:00	12 Apr 2020 16:30	PHS3/211 - INQ000189186
Version 7.5	27 Mar 2020 18:50	2 Apr 2020 21:00	PHS3/212 - INQ000189185
Version 7.4	24 Mar 2020 16:10	27 Mar 2020 18:50	PHS3/213 - INQ000189184
Version 7.0	17 Mar 2020 07:20	24 Mar 2020 16:10	PHS3/214 - INQ000189183
Version 6.5	12 Mar 2020 12:55	17 Mar 2020 07:20	PHS3/215 - INQ000189181
Version 6.4	5 Mar 2020 14:50	12 Mar 2020 12:55	PHS3/216 - <b>INQ000189180</b>
Version 6.3	2 Mar 2020 14:00	5 Mar 2020 14:50	PHS3/217 - INQ000189179
Version 6.2	28 Feb 2020 15:50	2 Mar 2020 14:00	PHS3/218 - INQ000189182
Version 6.1	24 Feb 2020 15:20	28 Feb 2020 15:50	PHS3/219 - INQ000189178
Version 6.0	13 Feb 2020 08:00	24 Feb 2020 15:20	PHS3/220 - INQ000189177
Version 5.1	7 Feb 2020 17:05	13 Feb 2020 08:00	PHS3/221 - INQ000357279

Version 5.0	7 Feb 2020 10:20	7 Feb 2020 17:05	PHS3/222 - INQ000189176
<b>Guidance for healthcare providers</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 3.0	28 Feb 2020 11:55	27 Jul 2021 16:55	PHS3/223 - INQ000189306
Version 2.1	24 Feb 2020 15:15	28 Feb 2020 11:55	PHS3/224 - INQ000189573
Version 2.0	13 Feb 2020 11:25	24 Feb 2020 15:15	PHS3/225 - INQ000189572
Version 1.0	12 Feb 2020 14:20	13 Feb 2020 11:25	PHS3/226 - INQ000189571
<b>Guidance for healthcare settings</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 1.2	23 Dec 2021 15:10	28 Feb 2022 15:55	PHS3/227 - INQ000347537
Version 1.1	19 Nov 2021 16:30	23 Dec 2021 15:10	PHS3/228 - INQ000347536
Version 1.0	2 Nov 2021 11:00	19 Nov 2021 16:30	PHS3/229 - INQ000347535
<b>Guidance for pharmacies</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 3.4	2 Apr 2020 18:05	27 Jul 2021 15:50	PHS3/230 - INQ000189244
Version 3.3	24 Mar 2020 11:50	2 Apr 2020 18:05	PHS3/231 - INQ000189243
Version 3.2	16 Mar 2020 10:30	24 Mar 2020 11:50	PHS3/232 - INQ000189242

Version 2.0	3 Mar 2020 15:40	16 Mar 2020 10:30	PHS3/233 - INQ000189241
Version 1.0	14 Feb 2020 12:10	3 Mar 2020 15:40	PHS3/234 - INQ000189240
<b>Guidance for primary care</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 13.3	1 Apr 2021 14:40	2 Nov 2021 10:30	PHS3/235 - INQ000189268
Version 13.2	9 Feb 2021 17:00	1 Apr 2021 14:40	PHS3/236 - INQ000189267
Version 13.1	1 Feb 2021 17:55	9 Feb 2021 17:00	PHS3/237 - INQ000189266
Version 13.0	29 Jan 2021 16:40	1 Feb 2021 17:55	PHS3/238 - INQ000189265
Version 12.4	17 Sep 2020 12:35	29 Jan 2021 16:40	PHS3/239 - INQ000189264
Version 12.3	24 Aug 2020 12:35	17 Sep 2020 12:35	PHS3/240 - INQ000189263
Version 12.2	17 Aug 2020 15:35	24 Aug 2020 12:35	PHS3/241 - INQ000189247
Version 12.1	16 Jul 2020 13:30	17 Aug 2020 15:35	PHS3/242 - INQ000189262
Version 12.0	10 Jul 2020 13:20	16 Jul 2020 13:30	PHS3/243 - INQ000189248
Version 11.9	8 Jul 2020 13:35	10 Jul 2020 13:20	PHS3/244 - INQ000189246
Version 11.81	14 Jun 2020 12:45	8 Jul 2020 13:35	PHS3/245 - INQ000189245

Version 11.8	4 Jun 2020 16:50	14 Jun 2020 12:45	PHS3/246 - INQ000189261
Version 11.5	20 May 2020 15:25	4 Jun 2020 16:50	PHS3/247 - INQ000189260
Version 11.4	13 May 2020 15:00	20 May 2020 15:25	PHS3/248 - INQ000189259
Version 11.3	2 May 2020 13:40	13 May 2020 15:00	PHS3/249 - INQ000189258
Version 11.2	29 Apr 2020 17:30	2 May 2020 13:40	PHS3/250 - INQ000189257
Version 11.1	16 Apr 2020 18:40	29 Apr 2020 17:30	PHS3/251 - INQ000189256
Version 11.0	11 Apr 2020 15:15	16 Apr 2020 18:40	PHS3/252 - INQ000189255
Version 10.5	2 Apr 2020 18:10	11 Apr 2020 15:15	PHS3/253 - INQ000189253
Version 10.4	27 Mar 2020 19:35	2 Apr 2020 18:10	PHS3/254 - INQ000189252
Version 10.3	24 Mar 2020 18:00	27 Mar 2020 19:35	PHS3/255 - INQ000189254
Version 10.2	20 Mar 2020 17:20	24 Mar 2020 18:00	PHS3/256 - INQ000189251
Version 10.1	19 Mar 2020 17:30	20 Mar 2020 17:20	PHS3/257 - INQ000189250
Version 10.0	17 Mar 2020 07:10	19 Mar 2020 17:30	PHS3/258 - INQ000189249
Version 9.1	14 Mar 2020 19:35	17 Mar 2020 07:10	PHS3/259 - INQ000347539
Version 9.0	13 Mar 2020 20:10	14 Mar 2020 19:35	PHS3/260 - INQ000189276



Version 8.5	12 Mar 2020 17:00	13 Mar 2020 20:10	PHS3/261 - INQ000189274
Version 8.4	5 Mar 2020 15:20	12 Mar 2020 17:00	PHS3/262 - INQ000189273
Version 8.3	28 Feb 2020 16:35	5 Mar 2020 15:20	PHS3/263 - INQ000189272
Version 8.1	24 Feb 2020 15:20	28 Feb 2020 16:35	PHS3/264 - INQ000189275
Version 8.0	13 Feb 2020 14:20	24 Feb 2020 15:20	PHS3/265 - INQ000189271
Version 7.1	7 Feb 2020 10:15	13 Feb 2020 14:20	PHS3/266 - INQ000189270
Version 7.0	7 Feb 2020 10:10	7 Feb 2020 10:15	PHS3/267 - INQ000189269
Version 6.0	5 Feb 2020 13:00	7 Feb 2020 10:10	PHS3/268 - INQ000189009
Version 5.0	2 Feb 2020 14:40	5 Feb 2020 13:00	PHS3/269 - INQ000189006
Version 4.0	1 Feb 2020 09:55	2 Feb 2020 14:40	PHS3/270 - INQ000188993
<b>Guidance for primary care: annex 1 (dental advice)</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 1.0	11 Apr 2020 14:30	2 Nov 2021 10:30	PHS3/271 - INQ000189348
<b>Guidance for primary care: annex 2 (general dental advice)</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 1.0	10 Jul 2020 13:00	2 Nov 2021 10:30	PHS3/272 - INQ000189349
<b>Guidance for secondary care</b>			

<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 10.1	31 Dec 2020 16:00	2 Nov 2021 10:30	PHS3/273 - INQ000189279
Version 10.0	19 Dec 2020 12:00	31 Dec 2020 16:00	PHS3/274 - INQ000189278
Version 9.9	30 Oct 2020 12:00	19 Dec 2020 12:00	PHS3/275 - INQ000189299
Version 9.8	20 Aug 2020 14:30	30 Oct 2020 12:00	PHS3/276 - INQ000189298
Version 9.7	14 Aug 2020 13:35	20 Aug 2020 14:30	PHS3/277 - INQ000189297
Version 9.6	6 Jul 2020 17:00	14 Aug 2020 13:35	PHS3/278 - INQ000189296
Version 9.5	29 May 2020 12:30	6 Jul 2020 17:00	PHS3/279 - INQ000189295
Version 9.4	26 May 2020 15:45	29 May 2020 12:30	PHS3/280 - INQ000189294
Version 9.3	20 May 2020 15:15	26 May 2020 15:45	PHS3/281 - INQ000189293
Version 9.2	29 Apr 2020 18:55	20 May 2020 15:15	PHS3/282 - INQ000189292
Version 9.1	11 Apr 2020 17:05	29 Apr 2020 18:55	PHS3/283 - INQ000189291
Version 9.0	2 Apr 2020 19:30	11 Apr 2020 17:05	PHS3/284 - INQ000189290
Version 8.2	27 Mar 2020 19:30	2 Apr 2020 19:30	PHS3/285 - INQ000189289
Version 8.1	19 Mar 2020 19:10	27 Mar 2020 19:30	PHS3/286 - INQ000189288

Version 8.0	17 Mar 2020 07:15	19 Mar 2020 19:10	PHS3/287 - INQ000189287
Version 7.1	14 Mar 2020 18:50	17 Mar 2020 07:15	PHS3/288 - INQ000189286
Version 7.0	13 Mar 2020 20:25	14 Mar 2020 18:50	PHS3/289 - INQ000189285
Version 6.6	12 Mar 2020 13:00	13 Mar 2020 20:25	PHS3/290 - INQ000189284
Version 6.3	5 Mar 2020 15:40	12 Mar 2020 13:00	PHS3/291 - INQ000189283
Version 6.2	2 Mar 2020 14:00	5 Mar 2020 15:40	PHS3/292 - INQ000189282
Version 6.0	13 Feb 2020 08:00	2 Mar 2020 14:00	PHS3/293 - INQ000189281
Version 5.0	7 Feb 2020 10:20	13 Feb 2020 08:00	PHS3/294 - INQ000189280
Version 3.0	31 Jan 2020 20:50	7 Feb 2020 10:20	PHS3/295 - INQ000189670
Version 2.0	23 Jan 2020 00:00	31 Jan 2020 20:50	PHS3/296 - INQ000189669

**Guidance for stepdown of infection control precautions**

<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 1.9	31 Dec 2020 16:25	15 Feb 2021 12:00	PHS3/297 - INQ000189413
Version 1.8	19 Dec 2020 11:45	31 Dec 2020 16:25	PHS3/298 - INQ000189412
Version 1.7	16 Dec 2020 14:45	19 Dec 2020 11:45	PHS3/299 - INQ000189411

Version 1.61	20 Aug 2020 14:30	16 Dec 2020 14:45	PHS3/300 - INQ000189410
Version 1.6	19 Aug 2020 16:30	20 Aug 2020 14:30	PHS3/301 - INQ000189409
Version 1.5	4 Jun 2020 13:55	19 Aug 2020 16:30	PHS3/302 - INQ000189408
Version 1.4	22 May 2020 22:40	4 Jun 2020 13:55	PHS3/303 - INQ000189407
Version 1.2	29 Apr 2020 13:40	22 May 2020 22:40	PHS3/304 - INQ000189406
Version 1.1	26 Apr 2020 18:40	29 Apr 2020 13:40	PHS3/305 - INQ000189405
Version 1.0	11 Apr 2020 16:35	26 Apr 2020 18:40	PHS3/306 - INQ000189404
<b>Guidance on COVID-19 PCR testing in care homes</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 4.0	7 Oct 2020 16:00	19 Dec 2020 16:20	PHS3/307 - INQ000347542
Version 3.0	13 Aug 2020 18:30	7 Oct 2020 16:00	PHS3/308 - INQ000347541
Version 2.9	31 Jul 2020 14:45	13 Aug 2020 18:30	PHS3/309 - INQ000347540
Version 2.82	10 Jul 2020 14:15	31 Jul 2020 14:45	PHS3/310 - INQ000301055
Version 2.6	16 May 2020 17:25	10 Jul 2020 14:15	PHS3/311 - INQ000347544
Version 2.4	14 May 2020 17:50	16 May 2020 17:25	PHS3/312 - INQ000320628
<b>Information and guidance for care home settings</b>			

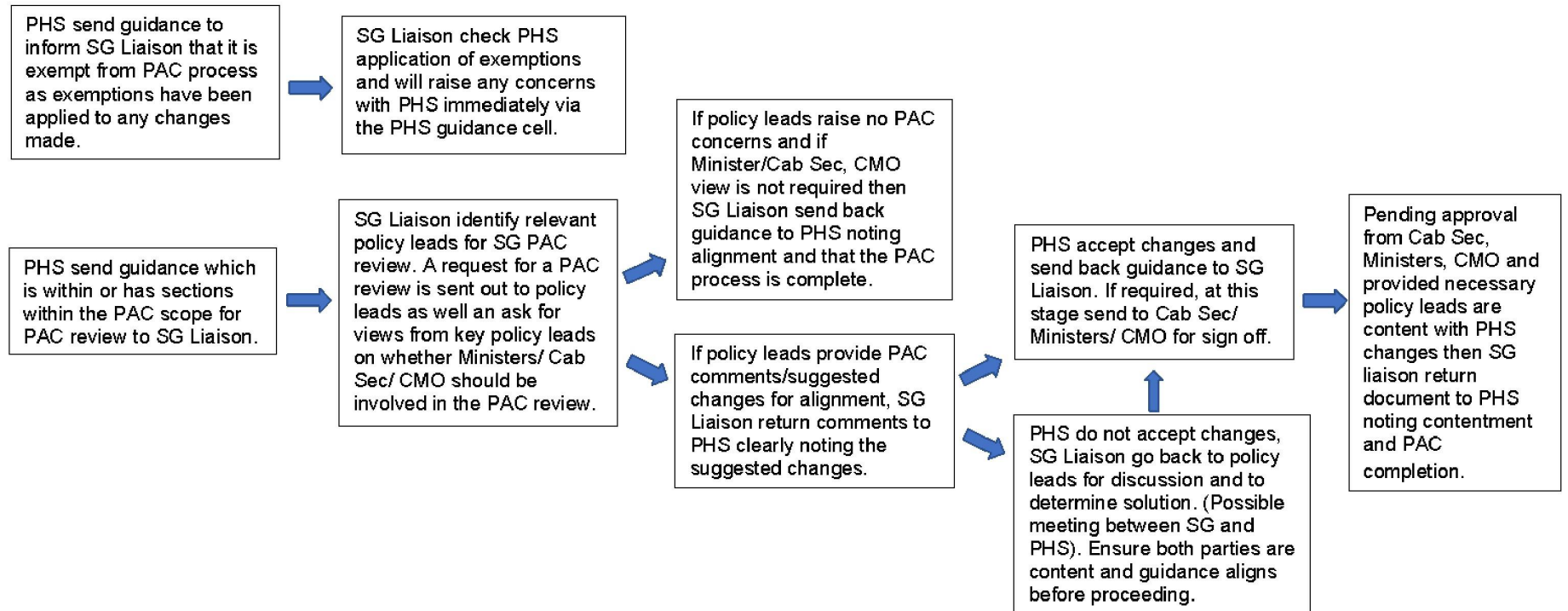
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 2.9	3 May 2022 14:45	11 Jul 2022 11:25	PHS3/313 - INQ000150328
Version 2.8	4 Apr 2022 12:40	3 May 2022 14:45	PHS3/314 - INQ000189346
Version 2.7	27 Jan 2022 16:30	4 Apr 2022 12:40	PHS3/315 - INQ000189345
Version 2.6	24 Dec 2021 14:15	27 Jan 2022 16:30	PHS3/316 - INQ000189344
Version 2.5	17 Dec 2021 12:45	24 Dec 2021 14:15	PHS3/317 - INQ000189343
Version 2.4	8 Sep 2021 16:05	17 Dec 2021 12:45	PHS3/318 - INQ000189342
Version 2.3	13 Aug 2021 16:15	8 Sep 2021 16:05	PHS3/319 - INQ000189341
Version 2.2	24 Jun 2021 12:30	13 Aug 2021 16:15	PHS3/320 - INQ000189340
Version 2.1	31 Dec 2020 16:50	24 Jun 2021 12:30	PHS3/321 - INQ000189339
Version 2.0	19 Dec 2020 16:30	31 Dec 2020 16:50	PHS3/322 - INQ000189347
Version 1.9	13 Oct 2020 12:00	19 Dec 2020 16:30	PHS3/323 - INQ000189338
Version 1.8	7 Oct 2020 16:25	13 Oct 2020 12:00	PHS3/324 - INQ000189337
Version 1.7	17 Sep 2020 17:20	7 Oct 2020 16:25	PHS3/325 - INQ000320627
Version 1.6	4 Aug 2020 17:15	17 Sep 2020 17:20	PHS3/326 - INQ000189336

Version 1.52	15 Jun 2020 17:00	4 Aug 2020 17:15	PHS3/327 - INQ000189335
Version 1.3	20 May 2020 15:20	15 Jun 2020 17:00	PHS3/328 - INQ000189334
Version 1.2	1 May 2020 17:55	20 May 2020 15:20	PHS3/329 - INQ000189333
Version 1.1	26 Apr 2020 19:55	1 May 2020 17:55	PHS3/330 - INQ000189332
Version 1.0	21 Apr 2020 12:20	26 Apr 2020 19:55	PHS3/331 - INQ000189331
<b>Information and guidance for social or community care and residential settings</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 1.7	17 Apr 2020 19:20		PHS3/332 - INQ000189304
Version 1.6	2 Apr 2020 19:40	17 Apr 2020 19:20	PHS3/333 - INQ000189303
Version 1.5	26 Mar 2020 18:20	2 Apr 2020 19:40	PHS3/334 - INQ000189302
Version 1.3	23 Mar 2020 18:00	26 Mar 2020 18:20	PHS3/335 - INQ000189301
Version 1.2	20 Mar 2020 18:30	23 Mar 2020 18:00	PHS3/336 - INQ000189300
Version 1.0	12 Mar 2020 18:40	20 Mar 2020 18:30	PHS3/337 - INQ000189305
<b>Safe practice in care homes poster</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 2.0	17 Jun 2020 11:35		PHS3/338 - INQ000189395



Version 1.0	22 May 2020 10:10	17 Jun 2020 11:35	PHS3/339 - INQ000189394
Version 1.0 with additional shielding and PPE advice	20 May 2020 12:50	22 May 2020 10:10	PHS3/340 - INQ000189393
<b>Search criteria for highest risk patients for shielding</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 6.0	19 Feb 2021 15:25	14 Jul 2022 17:35	PHS3/341 - INQ000189402
Version 5.0	17 Feb 2021 11:00	19 Feb 2021 15:25	PHS3/342 - INQ000189401
Version 4.0	11 May 2020 13:15	17 Feb 2021 11:00	PHS3/343 - INQ000189400
Version 3.0	28 Apr 2020 17:45	11 May 2020 13:15	PHS3/344 - INQ000189399
Version 2.0	16 Apr 2020 17:55	28 Apr 2020 17:45	PHS3/345 - INQ000189398
Version 1.0	3 Apr 2020 15:00	16 Apr 2020 17:55	PHS3/346 - INQ000189397
<b>Social, community care and residential settings outbreak checklist</b>			
<b>Version</b>	<b>Published</b>	<b>Removed</b>	<b>URN</b>
Version 1.0	5 Aug 2020 15:55	13 Apr 2022 15:05	PHS3/347 - INQ000189616

## Appendix G: Policy Alignment Check Flowchart





**Appendix H: Stage distribution of colorectal cancer diagnosis by deprivation category**

**Table 1: Number and proportion of patients diagnosed with colorectal cancer by stage at diagnosis and deprivation category for 2018-2019**

	Stage 1	Stage 2	Stage 3	Stage 4	Stage not known	Total
SIMD 1 (Most deprived)	193 (14.9%)	321 (24.8%)	324 (25.0%)	300 (23.2%)	157 (12.1%)	1,295 (100.0%)
SIMD 2	217 (16.4%)	317 (24.0%)	304 (23.0%)	304 (23.0%)	179 (13.6%)	1,321 (100.0%)
SIMD 3	203 (14.3%)	367 (25.9%)	378 (26.7%)	300 (21.2%)	169 (11.9%)	1,417 (100.0%)
SIMD 4	279 (19.7%)	335 (23.6%)	343 (24.2%)	328 (23.1%)	134 (9.4%)	1,419 (100.0%)
SIMD 5 (Least deprived)	302 (20.8%)	321 (22.1%)	350 (24.1%)	336 (23.2%)	142 (9.8%)	1,451 (100.0%)
<b>Total</b>	<b>1,194 (17.3%)</b>	<b>1,661 (24.1%)</b>	<b>1,699 (24.6%)</b>	<b>1,568 (22.7%)</b>	<b>781 (11.3%)</b>	<b>6,903 (100.0%)</b>

**Table 2: Number and proportion of patients diagnosed with colorectal cancer by stage at diagnosis and deprivation category for 2020**

	Stage 1	Stage 2	Stage 3	Stage 4	Stage not known	Total
SIMD 1 (Most deprived)	56 (11.2%)	103 (20.7%)	127 (25.5%)	136 (27.3%)	76 (15.3%)	498 (100%)
SIMD 2	59 (11.6%)	97 (19.1%)	124 (24.5%)	149 (29.4%)	78 (15.4%)	507 (100%)
SIMD 3	87 (15.1%)	126 (21.9%)	141 (24.5%)	146 (25.3%)	76 (13.2%)	576 (100%)
SIMD 4	91 (15.6%)	149 (25.5%)	134 (22.9%)	130 (22.3%)	80 (13.7%)	584 (100%)
SIMD 5 (Least deprived)	93 (15.4%)	166 (27.6%)	120 (19.9%)	157 (26.1%)	66 (11.0%)	602 (100%)

	Stage 1	Stage 2	Stage 3	Stage 4	Stage not known	Total
<b>Total</b>	<b>386</b> (14.0%)	<b>641</b> (23.2%)	<b>646</b> (23.3%)	<b>718</b> (25.9%)	<b>376</b> (13.6%)	<b>2,767</b> (100%)

**Table 3: Number and proportion of patients diagnosed with colorectal cancer by stage at diagnosis and deprivation category for 2021**

	Stage 1	Stage 2	Stage 3	Stage 4	Stage not known	Total
SIMD 1 (Most deprived)	96 (15.8%)	129 (21.2%)	145 (23.8%)	142 (23.3%)	97 (15.9%)	609 (100.0%)
SIMD 2	117 (16.8%)	143 (20.6%)	165 (23.7%)	169 (24.3%)	99 (14.2%)	695 (100.0%)
SIMD 3	124 (16.3%)	186 (24.5%)	185 (24.4%)	161 (21.2%)	97 (12.8%)	759 (100.0%)
SIMD 4	146 (17.5%)	177 (21.3%)	226 (27.2%)	185 (22.2%)	94 (11.3%)	832 (100.0%)
SIMD 5 (Least deprived)	133 (17.2%)	182 (23.5%)	207 (26.7%)	184 (23.7%)	68 (8.8%)	775 (100.0%)
<b>Total</b>	<b>616</b> (16.8%)	<b>817</b> (22.3%)	<b>928</b> (25.3%)	<b>841</b> (22.9%)	<b>468</b> (12.8%)	<b>3,670</b> (100.0%)

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