Health Information and Quality Authority

An tÚdarás Um Fhaisnéis agus Cáilíocht Sláinte

Analysis of a public consultation survey to inform the work of the Public Health Reform Expert Advisory Group – Organisational Responses

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About the Health Information and Quality Authority

The Health Information and Quality Authority (HIQA) is an independent statutory authority established to promote safety and quality in the provision of health and social care services for the benefit of the health and welfare of the public.

HIQA's mandate to date extends across a wide range of public, private and voluntary sector services. Reporting to the Minister for Health and engaging with the Minister for Children, Equality, Disability, Integration and Youth, HIQA has responsibility for the following:

- **Setting standards for health and social care services** — Developing person-centred standards and guidance, based on evidence and international best practice, for health and social care services in Ireland.
- **Regulating social care services** — The Chief Inspector within HIQA is responsible for registering and inspecting residential services for older people and people with a disability, and children's special care units.
- **Regulating health services —** Regulating medical exposure to ionising radiation.
- **Monitoring services** — Monitoring the safety and quality of health services and children's social services, and investigating as necessary serious concerns about the health and welfare of people who use these services.
- **Health technology assessment** — Evaluating the clinical and cost-effectiveness of health programmes, policies, medicines, medical equipment, diagnostic and surgical techniques, health promotion and protection activities, and providing advice to enable the best use of resources and the best outcomes for people who use our health service.
- **Health information** — Advising on the efficient and secure collection and sharing of health information, setting standards, evaluating information resources and publishing information on the delivery and performance of Ireland's health and social care services.
- **National Care Experience Programme** — Carrying out national service-user experience surveys across a range of health services, in conjunction with the Department of Health and the HSE.

List of abbreviations used in this report

CCO	Chief Clinical Officer
CIDR	Computerised Infectious Disease Reporting
COVAX	COVID-19 Vaccines Global Access
COVID-19	Coronavirus Disease 2019
EPHF	Essential Public Health Function
ePrescribing	electronic prescribing
ESRI	The Economic and Social Research Institute
GDPR	General Data Protection Regulation
HIQA	Health Information and Quality Authority
HPSC	Health Protection Surveillance Centre
HPV	human papilloma virus
HPZone	Health Protection Team zone
HRB	Health Research Board
HSE	Health Service Executive
HTA	health technology assessment
ICT	Information and Communications Technology
IHR	International Health Regulations
NHS	National Health Service

NIO	National Immunisation Office
NPHET	National Public Health Emergency Team
NSS	National Screening Service
PCR	polymerase chain reaction
PH	Public Health
PHR EAG	Public Health Reform Expert Advisory Group
RHA	Regional Health Area
SARS-COV-2	severe acute respiratory syndrome coronavirus 2
UHI / IHI	unique/individual health identifier
WHO	World Health Organization

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Not all members of the Evidence Synthesis Team are involved in the response to each research question.

Conflicts of interest

None declared.

Key points

- The current report provides an analysis of organisational responses to five open ended survey questions which focus on the:
  - — delivery of Essential Public Health Functions (EPHFs) before the pandemic
  - — key lessons learned from the pandemic, and how the delivery of EPHFs changed in light of the pandemic
  - — success stories of new partnerships, models, or innovations that could provide scalable solutions to current Public Health system barriers
  - — key areas of the Public Health system which need strengthening, and how this can be achieved
  - — main barriers to achieving these actions, and the potential solutions.

Survey Response Characteristics:

- Twenty-eight organisational responses were included within this survey analysis, with representation from medical, academic, scientific, environmental and governmental organisations.

Delivery of EPHF before the pandemic:

- Prior to the pandemic, it was identified that Public Health in Ireland focused disproportionately on Health Protection, with less attention given to the other Public Health pillars of Health Improvement, Health Service Improvement and Health Intelligence. Survey respondents frequently highlighted issues with system fragmentation, a lack of coordination between central and regional Public Health Departments and a lack of investment as challenges to EPHF delivery.
- Respondents identified a lack of integrated information and communication technology (ICT) and Public Health research infrastructure, insufficient staff numbers to meet growing healthcare demand and health policy needs, and a lack of funding to promote wider health system reform.
- Seven themes were identified about the delivery of EPHFs before the pandemic:
  - — pillars of Public Health
  - — implementation issues
  - — the workforce

- leadership, governance and legislation
- ICT, data and research
- health service delivery
- emergency preparedness.

Delivery of EPHFs and key lessons learned in light of the pandemic:

- Inadequate ICT infrastructure was highlighted consistently as a difficulty for effective delivery of EPHFs during the pandemic. Respondents highlighted that a key lesson learned was the need to increase investment in this area, and to ensure technology is future proofed, fit for purpose, interoperable, and integrated.
- Low staff numbers and difficulties ensuring that the appropriate skill-mix existed within departments were reported as obstacles to the delivery of EPHFs. Key lessons learned included the need for investment in recruitment and training opportunities, as well as a review of hiring practices to ensure that appropriate staff are in post.
- Nine themes were identified around the delivery of EPHFs and key lessons learned in light of the pandemic:
    - ICT, data collection and research
    - workforce issues
    - communication and collaboration
    - leadership/governance and Public Health structures
    - the health service
    - broader Public Health focus
    - emergency preparedness and management
    - legislation and regulation
    - miscellaneous factors and implementation barriers.

Success stories during the pandemic:

- The most commonly reported success story of the COVID-19 pandemic response was the improved collaboration between organisations that facilitated the Public Health response (for example, Public Health Departments with Community Healthcare Organisations or the Department of Health with

agencies involved in health research such as the Health Information and Quality Authority and the Economic and Social Research Institute).

- Other commonly reported success stories were the Public Health response itself (for example vaccine rollout, COVID-19 testing, laboratory work, contact tracing, and effective use of evidence from expert advisory groups and evidence synthesis teams) and technological innovation (for example telehealth, the COVID Care Tracker system and the HSE COVID Tracker App).
- Eight themes were identified on the success stories of new partnerships, models, or innovations during the COVID-19 pandemic:
    - collaboration
    - Public Health response
    - ICT, data, and research
    - workforce
    - communication
    - leadership and oversight
    - legislation
    - broad public health focus.

Key areas for strengthening, and actions to address weaknesses:

- The respondents identified that the development of a National Public Health strategy was key to Public Health being prepared and focused, while full implementation of Sláintecare and the Crowe Horwath report recommendations would support Public Health in overcoming weaknesses. Further actions identified as necessary to strengthen Public Health included Public Health workforce training, and implementation of a case and incident management system and an integrated national immunisation system.
- When asked to identify key areas for strengthening and the tangible actions to overcome weaknesses, six themes and four sub-themes were identified:
    - being prepared, focused and putting into action:
        - strategy
        - preparedness
        - Public Health focus
        - implementation.
    - changes to the workforce

- ICT, data collection and research
- collaboration and communication
- leadership, management and governance
- legislation and policy.

Barriers to achieving actions, and potential solutions:

- Respondents identified a lack of staff, inadequate ICT and lack of investment in ICT, and a lack of coordinated strategic action amongst the barriers to change. While workforce planning and contract improvement, implementation of Unique/Individual Health Identifiers (UHI/IHI), and the development of a National Public Health Strategy were identified as possible solutions to overcoming these barriers.
- Eight themes were identified on the barriers to achieving actions and the potential solutions to overcoming these barriers:
  - the workforce
  - funding and resources
  - ICT, data collection and research
  - Public Health fragmentation
  - cultural and societal barriers
  - prioritisation of Public Health
  - leadership, management and governance
  - legislation and policy.

Overall:

- The current report identified recurring themes around: the workforce; leadership, management and governance; ICT, data collection and research; and preparedness across respondents' comments. These themes may be key areas for consideration when guiding the work of the Public Health Reform Exert Advisory Group (EAG). Noting that collaboration was reported as a success story of the Public Health response to COVID-19, the Public Health Reform EAG may also want to consider initiatives that could support collaborative working and harness the multidisciplinary expertise of those working in Public Health in order to strengthen Public Health in Ireland.

1 Introduction

Public health, as defined by Donald Acheson (UK Chief Medical Officer) in 1988, is "the science and art of preventing disease, prolonging life, and promoting health through the organised efforts of society".[1] Public health is vital to protecting, promoting and restoring the public's health and combines science, skills and beliefs, culminating in the maintenance and improvement of population health through collective or social actions.[2]

In Ireland, the Sláintecare report (May 2017) identified that the reorientation of the model of care towards primary and community care would seek to ensure that the majority of people's health needs could be met locally, thereby ensuring equal access to health services for everyone.[3] This led to the development of the 2018 Sláintecare Implementation Strategy and the Sláintecare Implementation Strategy & Action Plan 2021 — 2023. Prevention and Public Health is identified as one of the eight key principles within both strategies. The prioritisation of Public Health has never been more important than during the coronavirus disease 2019 (COVID-19) pandemic, which has caused unprecedented pressure on public health and required extraordinary mobilisation of healthcare systems.[3, 4]

On 25 January 2022, the Public Health Reform Expert Advisory Group (PHR EAG) was established by the Minister for Health to identify lessons from the Public Health response to the COVID-19 pandemic in Ireland. The PHR EAG aims to identify learnings which will strengthen health protection and increase future pandemic preparation.[5] To inform the work of the PHR EAG, the Department of Health designed a public consultation survey, which was distributed among organisations working in the Public Health domain in Ireland.[5] The aim of this survey was to:

- gain insights from organisations on the delivery of Essential Public Health Functions (EPHFs) before the pandemic
- identify the key lessons learned from the pandemic, and how the delivery of EPHFs changed in light of the pandemic
- identify success stories of new partnerships, models, or innovations that could provide scalable solutions to current Public Health system barriers
- gain insights from organisations on key areas of the Public Health system which need strengthening, and how this can be achieved
- identify the main barriers to achieving these actions, and the potential solutions.

At the request of the Department of Health, the Health Information and Quality Authority's (HIQA) undertook an analysis of the public consultation survey to inform the work of the PHR EAG.

2 Methods

The current report presents a synthesis of survey data collected by the Department of Health from 2 March 2022 to 25 March 2022, of organisations working in the Public Health domain in Ireland.

2.1 Survey details

The survey, designed and distributed by the Department of Health, consisted of the following five open-ended questions:

1. What were your views on the delivery of the EPHF before the pandemic? (Please identify which EPHF(s) you are specifically referring to in your answer)

2. Have your views changed in light of the COVID-19 pandemic experience? If so, how have they changed? What are the key lessons from the pandemic? (Please identify which EPHF(s) you are specifically referring to in your answer)

3. During the COVID-19 pandemic response, what do you think were success stories of new partnerships, models, or innovations that could provide scalable solutions to current system barriers? (Please state which EPHF you are referring to)

4. From your perspective, what key areas in the public health system need strengthening over the next 3-5 years? What tangible actions could be taken to address these?

5. What are the main barriers to achieving these actions, and what could be potential solutions?

Survey respondents were also asked to identify which organisation they were answering on behalf of.

The 12 EPHFs referred to within the survey are those proposed by the WHO to support and strengthen a resilient Public Health system (Table 1).[6]

Table 1: Twelve Essential Public Health Functions (EPHFs)

EPHF	Description
EPHF 1 (Surveillance)	Monitoring and evaluating population health status, health service utilisation and surveillance of risk factors and threats to health
EPHF 2 (Emergency Management)	Public health emergency management
EPHF 3 (Governance and Regulation)	Assuring effective public health governance, regulation, and legislation
EPHF 4 (Planning and Financing)	Supporting efficient and effective health systems and multi-sectoral planning, financing, and management for population health
EPHF 5 (Health Threats)	Protecting populations against health threats, including environment and occupational hazards, food safety, chemical and radiation hazards
EPHF 6 (Disease Prevention)	Promoting prevention and early detection of diseases including non-communicable and communicable diseases
EPHF 7 (Health Promotion)	Promoting health and wellbeing and actions to address the wider determinants of health and inequity
EPHF 8 (Engagement)	Ensuring community engagement, participation and social mobilization for health and wellbeing
EPHF 9 (Adequate Workforce)	Ensuring adequate quantity and quality of public health workforce
EPHF 10 (Quality and Access)	Assuring quality of and access to health services
EPHF 11 (Research)	Advancing public health research
EPHF 12 (Medicines Access)	Ensuring equitable access to and rational use of essential medicines and other health technologies

Source: World Health Organization (WHO)[6]

2.2 Data analysis and presentation

On receipt of survey results, the data were reviewed for clarity and missing data (item (question) non-response). The following exclusion criteria was applied to the data: Responses that did not provide any information were excluded. After data review, no responses were excluded, resulting in a final dataset of 28 organisational survey responses from:

- Child and Family Agency (Tusla)
- Department of Agriculture
- Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)
- Health and Safety Authority (HSA)
- Health Information and Quality Authority (HIQA)
- HSE Consolidated, consisting of responses from, but not limited to:
  - Health Protection Surveillance Centre (HPSC)
  - Directors of Public Health group
  - National Cancer Control Programme (NCCP)
  - HSE National Immunisation Office (NIO)
  - National Health Intelligence Unit (NHIU)
  - National Social Inclusion Office
  - National Screening Service (NSS)
  - Healthcare associated infections and anti-microbial resistance team/AMRIC
  - National Lead Testing and Contact Tracing
  - National Quality and Patient Safety Directorate (to include Global Health Programme, Quality Improvement)
  - Health Promotion and Improvement
  - Integrated Care Programme for Prevention and Management of Chronic Disease (ICPCD)
  - HSE Environmental Health Service (HSE)
  - National Ambulance Service (NAS)
  - Emergency Management
  - HSE Community Operations
- HSE Environmental Health Service (EHS)
- HSE National Health Intelligence Unit (NHIU)
- Institute of Public Health in Ireland
- Irish Epidemiological Modelling Advisory Group (IEMAG)

- Irish Medical Organisation (IMO)
- Irish Nurses and Midwives Organisation (INMO)
- Irish Pharmacy Union
- Irish Society of Specialists in Public Health Medicine
- National Physical Activity Plan Implementation Group, co-chaired by the Department of Health and Department of Tourism, Culture, Arts, Gaeltacht, Sports and Media, Healthy Ireland
- National Screening Advisory Committee (NSAC)
- Obesity Policy Oversight and Implementation Group (OPIOG)
- Pharmaceutical Society of Ireland (PSI)
- Road Safety Authority of Ireland (RSA)
- Royal College of Physicians of Ireland (RCPI)
- Royal College of Surgeons in Ireland (RCSI)
- School of Public Health, University College Cork (UCC)
- The Directors of Public Health group - representing the Directors of Public Health of the ten regional departments of Public Health
- The Executive Board (President, Vice-President and Secretary) of the Association of Public Health Registrars in Ireland (APHRI), co-submitted with the Lead Non-Consultant Hospital Doctor (NCHD) for Public Health Medicine.
- The Health Products Regulatory Authority (HPRA)
- UCD National Virus Reference Laboratory (NVRL), University College Dublin
- UCD School of Public Health, Physiotherapy and Sports Science, University College Dublin
- University of Limerick School of Medicine (UL)

Thematic analysis was undertaken, using NVivo software, to identify themes, following the Braun and Clarke's six-step guide:

- Step 1 — Familiarisation: The researchers familiarised themselves with the survey results, through reading and re-reading of the data collected.

- Step 2 — Coding: These researchers independently derived initial codes, using mixed deductive and inductive coding, where the survey questions aided in the identification of relevant information, and the researchers were open to the identification of additional codes within the data. These initial codes were discussed. Codes were finalised to create a codebook which subsequently facilitated data coding.

- Step 3 — Theme development: All researchers generated initial themes.

- Step 4 — Theme review: All themes were reviewed, modified and developed to ensure they were accurate.
- Step 5 — Theme refinement: All themes were refined to derive the finalised set of themes and identify subthemes and categories (where required).
- Step 6 — Write up: Data write-up was undertaken and representative survey respondent quotes were selected to elicit the findings.[7]

3 Survey results

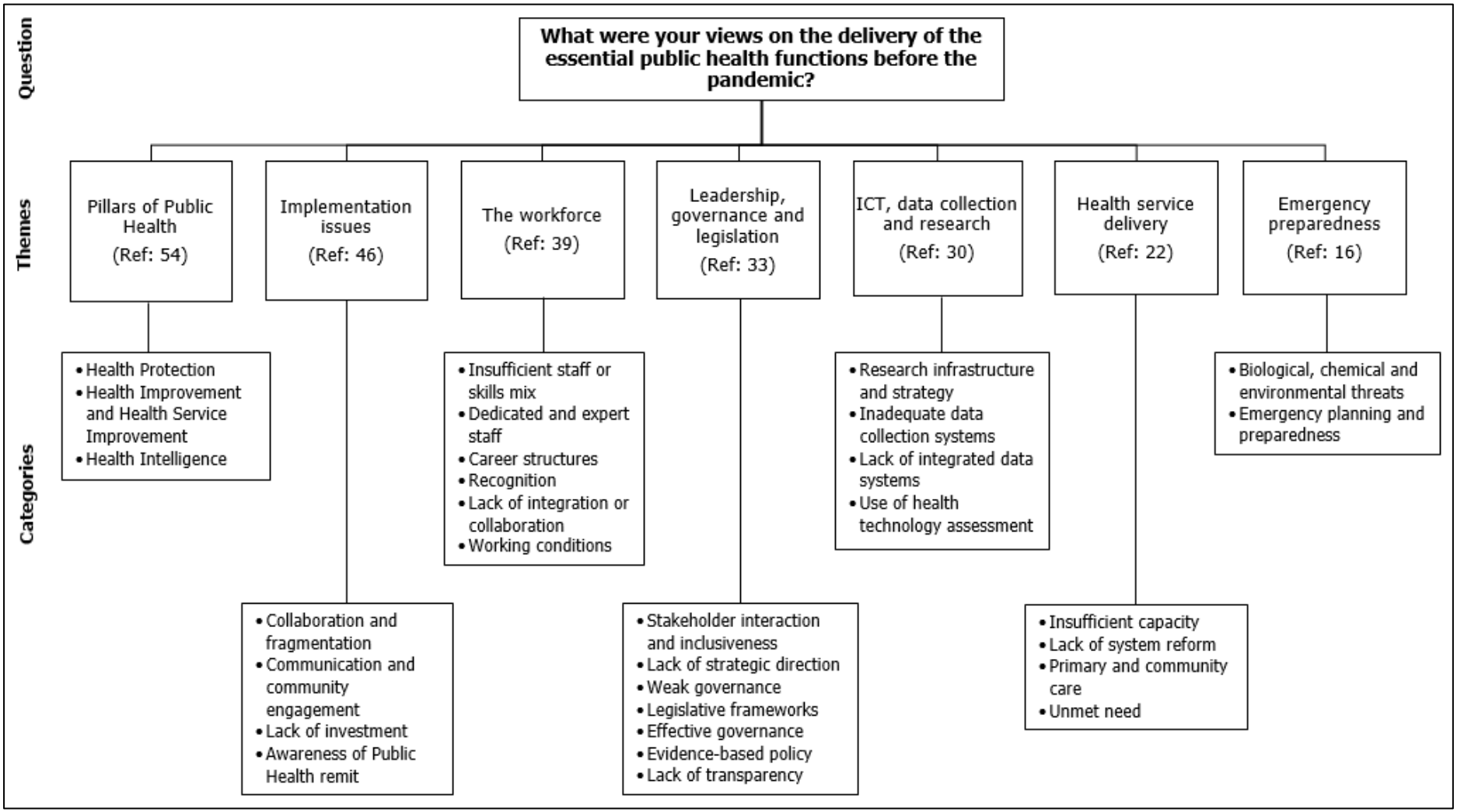
3.1 Delivery of EPHF – before the pandemic

In response to question one "What were your views on the delivery of the Essential Public Health Functions before the pandemic?" seven themes were identified (Figure 1):

- pillars of public health
- implementation issues
- the workforce
- leadership, governance and legislation
- ICT, data and research
- health service delivery
- emergency preparedness.

Four percent of respondents (1/28) did not answer the question (96% question response rate). Furthermore, survey responses often reflected on the functioning of the EPHFs during the pandemic (as opposed to prior to the pandemic). Although such responses did not directly address the question, effort was made to ensure that the essence of any views relevant to the delivery of EPHFs pre-pandemic were collated and included in the thematic analysis.

Figure 1. Themes and categories identified in response to question one



Key: ICT – Information and Communications Technology; Ref - number of references to this theme in the survey responses.

Pillars of public health

Three categories were identified in relation to the pillars of public health (Figure 1):

- Health Protection
- Health Improvement and Health Service Improvement
- Health Intelligence.

Survey respondents generally described the delivery of EPHFs in terms of the core, broad domains of Public Health (that is, Health Protection, Health Improvement, Health Service Improvement and Health Intelligence). Health Protection represents the prevention and control of infectious disease and environmental and radiation risks, and emergency response to major incidents and health threats. There was consensus among respondents that the Health Protection function in Ireland has been effectively delivered, noting that:

"Ireland had very efficient and effective national immunisation programmes, coordinated by the National Immunisation Office. Uptake of immunisations in Ireland was generally high when compared with other European countries and by [World Health Organization] standards. The National Immunisation Office supports the delivery of immunisation programmes in line with Department of Health immunisation policy, based on National Immunisation Advisory Committee advice. (National Immunisation Office). " [HSE Consolidated]

Although acknowledging that Health Protection delivery has been effective, the National Quality & Patient Safety Directorate described that promotion of *"...prevention and early detection of diseases including non-communicable and communicable disease tended to be ad-hoc, delivered for the most part by non-public health resources"* [HSE Consolidated] and outlined the need for a greater focus on these aspects.

"...more could also be done to promote Human Papilloma Virus (HPV), Hepatitis B (HBV) and influenza vaccination, although there was a reasonably effective campaign to encourage uptake of the influenza vaccine this year, with the cost of the vaccine being removed for children and over 50's. For future years, the economic and health service benefits of offering free vaccines, which are a clear public health good, to all should be considered." [Royal College of Surgeons in Ireland (RCSI)]

However, respondents often expressed the view that there was a disproportionate focus by organisations delivering Public Health in Ireland on Health Protection.

"…The main focus of Public Health day-to-day work in regional Departments of Public Health had been health protection, with less consistent work and use of Public Health skills, knowledge and expertise across the other domains of Public Health ([that is,] health improvement, health service improvement and health intelligence)." [Association of Public Health Registrars in Ireland, co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine]

While one survey respondent stated that *"regional public health departments were almost exclusively focused on health protection",* they also acknowledged that this was *"mainly due to staffing challenges across the full public health multidisciplinary teams. (National Cancer Control Programme)"* [HSE Consolidated]

A lack of resourcing was identified as a key obstacle that had impacted Public Health's ability to improve population health and health outcomes.

"Pockets of health service improvements, health improvement, [and] health intelligence were very effective with public health leadership [for example,] chronic disease management. Success was achieved through the allocation of dedicated resources and protected time [or] posts to enable the work to be done. Many examples of other good work being done [was] undermined by the lack of protected time and the competing demands and prioritisation of health protection work." [The Directors of Public Health group]

Concerning Health Improvement, respondents frequently outlined the need for governmental action in tackling health inequalities through the implementation of upstream approaches that focus on prevention and early detection. Welcoming the Healthy Ireland Strategic Action Plan 2021-2025, which provides a *"refreshed agenda for health improvement"* [Institute of Public Health in Ireland], the Institute of Public Health in Ireland outlined the need for:

"…a clear strategic approach to addressing health inequalities…accompanied by operational commitments that reflect the scope of health inequalities. A formal process for monitoring and reporting health inequalities would be welcomed, similar to the Northern Ireland Health and Social Care Inequalities Monitoring System." [Institute of Public Health in Ireland]

Some respondents also noted the presence of management structures that impeded progress in the area of health improvement.

"Even though the public health and health promotion services were part of the Health and Wellbeing Directorate, only a very small number of public health physicians had a role in health improvement, either at national or local levels. This

was not due to a lack of interest or commitment but rather reflected management structures and practices and inadequate and decreasing resources in regional departments." [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)]

With regards to Health Service Improvement, the lack of free access to essential care was commonly noted, particularly in the context of growing health inequalities:

"*Ireland is one of the few higher income countries in the world that requires payment at the point of access to care, for primary care, hospital care, medications and specialist care, for the majority of the population. This is a well-recognised factor leading to increased inequalities in health, also leading to delays in diagnosis and treatment resulting in poorer health outcomes. It is also an issue that is due to be addressed by Sláintecare, which remains the only overall health policy on which to platform effective population responses to public health emergencies, such as pandemics, and longstanding population health priorities.*" [RCSI]

As with Health Improvement and Health Service Improvement, respondents often stated that the Health Intelligence function had been overlooked prior to the pandemic. The Directors of Public Health group commented on the fragmented nature of the health intelligence function:

"Health Intelligence is siloed as a national function primarily serving the needs of HSE Corporate which is an important function. However, in some instances, it is difficult to obtain regional data from national. There is a big need and opportunity to deliver requirements for regional population health needs assessments and regional health intelligence. This needs to be readily available and timely [to] ensure Public Health can support Sláintecare at the area level. Surveillance, although delivering well on data collation was underserving with regards [to] modelling and intelligence." [The Directors of Public Health group]

The IMO also noted that the Health Intelligence Unit was "*being stretched across different areas of the Health Service"* and that there was *"no health intelligence function within the [eight] Departments of Public Health"* which contributed to a *"lack of integration into the wider Public Health function."* The IMO also noted that "*significant additional investment [is required] to meet the requirements of the service"* , but that despite "*the lack of resources the Health Intelligence Unit has made valuable contributions across the health service and has helped provide clear data to enable better decisions across the HSE. The function has underpinned recent improvements in [general practitioner] services to areas of high deprivation and isolated rural areas."*

Implementation issues

Four categories were identified in relation to implementation issues (Figure 1):

- collaboration and fragmentation
- communication and community engagement
- lack of investment
- awareness of Public Health remit.

Respondents frequently mentioned system fragmentation and a lack of sectoral and inter-sectoral collaboration between central and regional Public Health departments and agencies. This led to duplication of effort, reduced effectiveness of the implementation of health promotion activities and a limited influence on broader policies affecting health:

"There was insufficient integration between the health intelligence function and those working in other domains. The small number of public health physicians working with the National Clinical Programmes on health service improvement were based in regional departments (mainly in the East), under the management of the [Departments of Public Health]. While contributing to health protection and out of hours locally, their work was not included in the annual public health Service Plan. Their work at national level was not linked to regional departments, resulting in loss of input to service planning in the hospital groups." [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)]

Respondents also noted that there was strong collaboration between the Health Protection Surveillance Centre (HPSC) and regional departments of Public Health regarding the delivery of the Health Protection function. However, there was only limited interaction between Public Health and other clinical specialities leading to a lack of awareness of the role Public Health physicians.

"In relation to the provision of services and day-to-day work, most interaction between Public Health and colleagues in other medical specialties was in relation to health protection... There was interaction with consultants in infectious diseases on management of outbreaks across hospital and community settings, as well as with occupational medicine on hospital acquired infections and with all specialties on antimicrobial resistance and vaccination programmes... Overall, for specialties which did not have interaction with Public Health physicians in advance of the pandemic, there was a low level of awareness of the latter's domains of practice apart from health protection. However, where there was collaboration with colleagues in other specialties, the expertise of Public Health physicians was recognised and valued, as

was their contribution to and collaboration with the range of activities within the RCPI." [RCPI]

According to respondents, there was a lack of investment across a wide range of areas (including clinical leadership, workforce funding, training, research, and health intelligence), which led to a lack of national coordination and created challenges in implementing health policy.

"There was a lack of investment in clinical leadership of Public Health Emergency Management [and] Health Threats Preparedness. Good practice occurred in silos with limited national co-ordination. Resourcing gaps within the Public Health Workforce, competing priorities and lack of training and exercise opportunities for existing Public Health Teams, compounded Public Health Emergency Preparedness and Response. There was little opportunity for cross divisional working such as with emergency planning, environmental health, or other services. (Health Protection Surveillance Centre (HSPC))" [HSE Consolidated]

Further categories related to implementation issues included communication and community engagement and awareness of Public Health remit (Appendix 1).

The workforce

Six categories were identified in relation to the workforce (Figure 1):

- insufficient staff or skills mix
- dedicated and expert staff
- career structures
- recognition
- lack of integration or collaboration
- working conditions.

Respondents frequently commented on the high calibre and dedicated nature of Public Health staff. However, the need for the recruitment of additional staff to cope with growing health service demand was the predominant finding:

"The IMO HSE 2003 agreement set out a minimum of 52 WTE [whole time equivalent] SPHMs [specialist in public health medicine] and [eight] Directors of Public Health (DPHs) that were required at that time solely to staff the [eight] departments. Despite the population growing by over 20% in the intervening period numbers were consistently well below what was required even in 2003. In 2019 there were just 32 WTE SPHMs working in the 8 public health departments and 28 WTE [Senior Medical Officers]. Well below the numbers set out even in the 2003

agreement… There were a further 5 WTE Specialists (on DPH contracts) and 16 SPHMs working in areas outside of the Department of Public Health Medicine at that time…. There was a clear pattern of understaffing with recruitment posing significant difficulties. In many cases as a new post was filled it was staffed from the existing workforce leading to a gap in the area where the Specialist had left which was not filled." [Irish Medical Organisation (IMO)]

"Owing to a lack of appropriate healthcare reform pre-pandemic, the reality has been a busier and growing health service with fewer staff to deliver it. The recruitment pause introduced in 2007 placed immense pressure on an already struggling workforce… The continued lack of an annual funded workforce plan contributed to problems…" [Irish Nurses and Midwives Organisation (INMO)]

Respondents praised the quality of higher specialist training in Public Health and affirmed that amending the entry criteria for higher specialist training programmes (by removing the prior need to have passed part one of the Membership of the Faculty of Public Health Medicine examination) enhanced the competitiveness of higher specialist training and increased the quality of applicants. However, the need for staff with non-medical expertise (such as biostatistics, infectious disease modelling and other multidisciplinary staff) and defined career structures was also highlighted:

"The focus on appointing only people with a medical degree and only people who are accredited specialists in public health from the Faculty of Public Health Medicine, to public health workforce roles, remains a limiting problem in Ireland, which now needs to be addressed. There is an absolute lack of career structure available for non-medical professionals who have important skills urgently required by public health teams, such as epidemiologists, community health specialists, data experts, communication experts, IT leaders, and business managers. This needs to be addressed urgently to ensure Directors of Public Health, have access to a diverse range of public health skills within their teams." [Royal College of Surgeons in Ireland (RCSI)]

Further to this, the lack of a consultant grade in Public Health Medicine and thus potentially lower salaries for senior staff compared to other medical disciplines were identified as factors that impeded the recruitment process for senior posts in Public Health. Respondents regularly highlighted the lengthy recruitment process involved with appointing the Director of the HPSC as an example of this shortcoming:

"In contrast to many other jurisdictions Ireland did not recognise or have a grade of Consultant in Public Health Medicine despite the speciality requiring similar Higher

Specialist Training to other specialties and completion of such training entitling the doctor to placement on the Specialist Register of the Medical Council…. The poor remuneration on offer and lack of consultant status made recruitment difficult for all posts and this was particularly acute for senior posts. The Director of the HPSC post was not filled on a permanent basis for some time. Posts across all departments were often unfilled, with long delays in recruitment." [IMO]

Further categories related to the workforce included recognition and a lack of integration or collaboration (Appendix 1).

Leadership, governance and legislation

Seven categories were identified in relation to governance, legislation and leadership (Figure 1):

- stakeholder interaction and inclusiveness
- lack of strategic direction
- weak governance
- legislative frameworks
- effective governance
- evidence-based policy
- lack of transparency.

From the survey responses, governance structures were generally perceived as weak and lacking transparency, including in terms of data and information governance.

"The public health system was poorly served by weak governance structures which were not well aligned with the wider governance structures of the health services, meaning that the discipline of public and population health was not as influential as it should be in health policy and the organisation and delivery of health services."
[Irish Epidemiological Modelling Advisory Group (IEMAG)]

The National Screening Advisory Committee (NSAC) commented that, prior to the pandemic, public trust in population-based screening programmes had been *"dangerously undermined"* following the Cervical Check scandal, but that *"strenuous efforts were made to address and rectify the deficiencies in governance, areas of responsibility and communication issues."* HIQA commented on improved governance that has taken place since the establishment of NSAC:

"With regard to screening, progress has been made in ensuring the effective governance of recommendations through the establishment of the National Screening Advisory Committee. Similarly, the grouping of the four major adult

population-based screening programmes under the National Screening Service has improved governance of the delivery of screening, though the Scoping Inquiry into the CervicalCheck Screening Programme (the Scally report) has indicated specific issues which require improvement and were undergoing reform prior to the onset of the pandemic." [Health Information and Quality Authority (HIQA)]

Other responses stated that strategic decision-making processes lacked inclusiveness and recognition of the Public Health voice:

"There has been a lack of recognition of the public health voice and approach within the system, with a lack of representation at the highest level including the HSE Board or Executive team and a lack of representation within the implementation of Sláintecare." [Irish Society of Specialists in Public Health Medicine]

Some respondents commented on the overall strategic direction of Public Health, identifying a misalignment between strategic objectives and coordination that resulted in poor implementation and or integration with Departments of Public Health work programmes:

"The delivery of EPHFs within the Irish system was fragmented leading to diffusion of effectiveness, duplication of effort, and gaps; due in part to the lack of national coordination and governance, with limited national leadership roles, no strategy for the delivery of public health services and a lack of clarity around roles, responsibilities and relationships that support the delivery of EPHFs at all levels. Most public health expertise was concentrated within the health sector, with the lack of an intersectoral approach to public health functions." [Irish Society of Specialists in Public Health Medicine]

Further categories related to leadership, governance and legislation included evidence-based policy and legislative frameworks (Appendix 1).

ICT, data collection and research

Four categories were identified in relation to ICT, data collection and research (Figure 1):

- research infrastructure and strategy
- inadequate data collection systems
- lack of integrated data systems
- use of health technology assessment.

Respondents described a lack of infrastructure, including the lack of a Unique/Individual Health Identifier (UHI/IHI), insufficient data collection and

availability, and a lack of research specialities, as a limiting factor in facilitating Public Health research:

"While there have been examples of excellent research within the system, and an appropriate research culture exists, [a] lack of resources and research infrastructure (including data and information infrastructures), meant that many research opportunities could not be realised, and the benefits for population health and workforce development were lost." [Irish Epidemiological Modelling Advisory Group (IEMAG)]

Respondents also outlined that *"some of the core elements of a highly functioning public health research infrastructure have been addressed over the past two decades, primarily by the HRB through a wide range of programme, project and fellowship funding schemes."* [School of Public Health, University College Cork (UCC)] In particular, investment in doctoral and post-doctoral training programmes and fellowships in Public Health and Health Services research and the Health Research Board Research Leader Awards programme were highlighted as making significant contributions to Public Health, Health Systems and Health Services research. However, the scale of investment in Public Health research infrastructure, capacity and projects was labelled as *"extremely limited relative to the level of investment in traditional STEM (science, technology, engineering and mathematics) disciplines."* [School of Public Health, UCC] Furthermore, respondents frequently outlined that a research strategy was needed to ensure that research activities were aligned with Public Health priorities:

"There is no overarching strategy which aligns research capacities with strategic priorities and goals including evaluation of programmes; no structured mechanism for the HSE to commission research, a lack of public health input into research funding mechanisms and failure to leverage the existing joint academic/clinical appointment system of all other clinical specialties. This has contributed to a lack of evidence in relation to public health interventions that hinders response efforts." [Irish Society of Specialists in Public Health Medicine]

It was clear from the respondents that Public Health organisations generally viewed existing data information systems as inadequate, with the lack of a UHI/IHI and a lack of data integration across information systems perceived as key obstacles.

"Antiquated information systems, poor integration of different information systems, and the lack of a unique health identifier and an electronic health record made it extremely difficult to monitor and evaluate population health status, health service utilisation and risk factors and threats to health especially in an emergency scenario,

where multiple indicators from disparate sources are required to assess risk and the adequacy of responses." [IEMAG]

Respondents noted that there has been a lack of data collection on *"population health indicators ([for example,] obesity) and a lack of registry data for important conditions indicative of public health ([for example,] diabetes)."* [Health Information and Quality Authority (HIQA)]. Where data were available, it was often reported that these data were siloed and not readily available for sharing across organisations thus limiting evidence-based policy decisions. The Irish Society of Specialists in Public Health Medicine stated that available health information often *"focused on the delivery of corporate and managerial need rather than being accessible to and serving public health"* with the HPSC (HSE Consolidated) noting there was still a reliance on paper-based data collection or spreadsheet data which could not easily be integrated with other data systems.

Respondents also reported that systems for better data collection, integration and sharing were required in order to identify current unmet needs, facilitate Public Health research, inform health policy and planning, and to evaluate health policy.

"Access to local area health data is essential for assessing the health needs of local populations, and for the planning of health services which are tailored to meet those needs. In Ireland, there is a lack of access to local health data and a lack of integration with the Central Statistics Office and data strategies led by other departments. A need for investment in e-health has been longstanding..." [Institute of Public Health in Ireland]

A further category related to ICT, data collection and research was the use of health technology assessment (Appendix 1).

Health service delivery

Four categories were identified in relation to health service delivery (Figure 1):

- insufficient capacity
- lack of system reform
- primary and community care
- unmet need.

Respondents highlighted that the COVID-19 pandemic exposed failings over many years to adequately invest in capacity and staffing.

"Governments and the HSE over several years have many reports indicating the staffing and capacity pressures of the health service. Unfortunately, these reports

were ignored, and as a result, this left the Irish health care service vulnerable when faced with a global pandemic." [Irish Nurses and Midwives Organisation (INMO)]

"Prior to the COVID-19 pandemic Public Health as a medical speciality was not well recognised by the public and was chronically underfunded. The lack of consultant posts, gender imbalance in the workforce and the absence of non-medical career pathways are also weaknesses in the system." [University of Limerick School of Medicine (UL)]

"Prior to the pandemic, Regional Departments of Public Health would have had to varying degrees carried out a population health needs assessment to determine the health needs of the population including their specific health protection needs. The development of these population needs assessments was challenged by capacity issues within the Departments of Public Health – although their importance was always understood. (Health Protection Surveillance Centre (HPSC))". [HSE Consolidated]

Respondents commented on a lack of health system reform before the pandemic, often referring to the limited implementation of Sláintecare and a lack of ring-fenced funding for transitioning towards a single-tier health service. Respondents stated that the lack of universal health coverage and the presence of financial barriers have impeded access to healthcare services, particularly for disadvantaged and vulnerable groups.

"Access to healthcare services in Ireland, particularly amongst disadvantaged and vulnerable groups, has been impeded by the lack of universal health coverage (UHC). Financial barriers to healthcare access exist, and current schemes such as the Medical Card are not sufficiently designed with public health goals in mind. For example, health promotion provisions within the Maternity and Infant Care Scheme are limited and do not include evidence-informed approaches to behaviour change or consider wider issues such as mental health. A review and reorientation of schemes is needed to ensure adequate reflection of public health evidence in line with health needs." [Institute of Public Health in Ireland]

Respondents also stated that existing primary and community care services were inadequate and needed to be addressed.

"A robust primary healthcare system is key to improving the health and wellbeing of people. However, there was a significant challenge in delivering Sláintecare pre-pandemic due to the under-developed and under-funded primary and community care services. There is now an urgent requirement to consistently deliver these

essential services, develop new care pathways, and ensure adequate staffing for these services are secured, including increasing the numbers of public health nurses and community registered general nurses. There must be an expansion of diagnostic services within the primary health care services and nurse-led care development to deal with chronic disease management." [INMO]

The RCSI described primary care in Ireland as a *"curate's egg"* in that primary care is delivered by *"highly skilled, and trusted practitioners"* who have received excellent training, but that *"there are essentially two thousand competing small businesses."*

Further categories related to health service delivery included unmet need (Appendix 1).

Emergency preparedness

Two categories were identified in relation to emergency preparedness (Figure 1):

- biological, chemical and environmental threats
- emergency planning and preparedness.

Respondents noted that the health system needs to be prepared for potential biological, chemical and environmental threats, but that pre-pandemic planning lacked focus in these areas. The Irish Society of Specialists in Public Health Medicine stated that there had *"been limited commitment to environmental quality and the climate change agenda to date"* while the Directors of Public Health group called for a *"Public Health All Hazards approach including environmental quality improvement and the climate change agenda."* The HSPC noted that there was *"...no national centre charged with the coordination of the prevention and response to environmental, chemical and radiological hazards. The systems for all hazards approach were less developed for non-communicable disease hazards, than they were for communicable disease hazards. (Health Protection Surveillance Centre (HPSC))".* [HSE Consolidated]

Another response emphasised that the Public Health research infrastructure needed to reflect responsiveness to Public Health emergencies:

"We need a research infrastructure that promotes excellence in public health practice and supports a multidisciplinary public health workforce with the technical capacity and leadership skills to respond to public health emergencies and disasters and address the broad range of biological, behavioral, social and environmental determinants of health. Just as we regard a strong research infrastructure as the bedrock of excellence in clinical practice, we need to consider how we can

strengthen Ireland's public health research capacity to ensure that we respond to the current and future pandemics and other crises including those linked to climate change." [School of Public Health, University College Cork (UCC)]

In relation to other aspects of emergency planning and preparedness, responses described a lack of investment in clinical leadership to support Public Health Emergency Management and Health Threats Preparedness. While acknowledging that a pandemic plan was in place, respondents stated that it lacked robustness with regards to the rapid upscaling of Public Health testing and contact tracing, and that there was insufficient focus on effective communication within the health system.

"Before the advent of COVID-19, there was a brief pandemic influenza emergency plan, which was partially helpful, as it indicated the need to support vital systems, such as water, food supplies, and energy for example. However, there had been little planning, such as scenario planning, to ensure appropriate responses to other pandemics or major outbreaks such as avian influenza. Unfortunately, the transmission characteristics of the first wave of SARS-COV-2 were very different from influenza, and thus the plan was fundamentally unsuitable, as it switched our national response too quickly to mitigation of an infection that was incorrectly assumed to be already widespread, and away from an emphasis on stronger control of transmission and spread, which we eventually achieved in the fourth week in March 2020. The UK also made the same mistake, while delaying longer in making a corrective response, which resulted in an estimated additional 30,000 avoidable deaths. Only when [European Centre for Disease Prevention and Control] advised tighter control measures did Ireland adopt the correct approach. For the future, we should have detailed plans, with training, rehearsals, and funding and staffing plans for a range of different kinds of public health emergency, including for example, cryptosporidia in Blessington reservoir, or a nuclear detonation. The current Ukraine crisis, with threats of chemical, biological and nuclear warfare heighten this need"
[Royal College of Surgeons in Ireland (RCSI)]

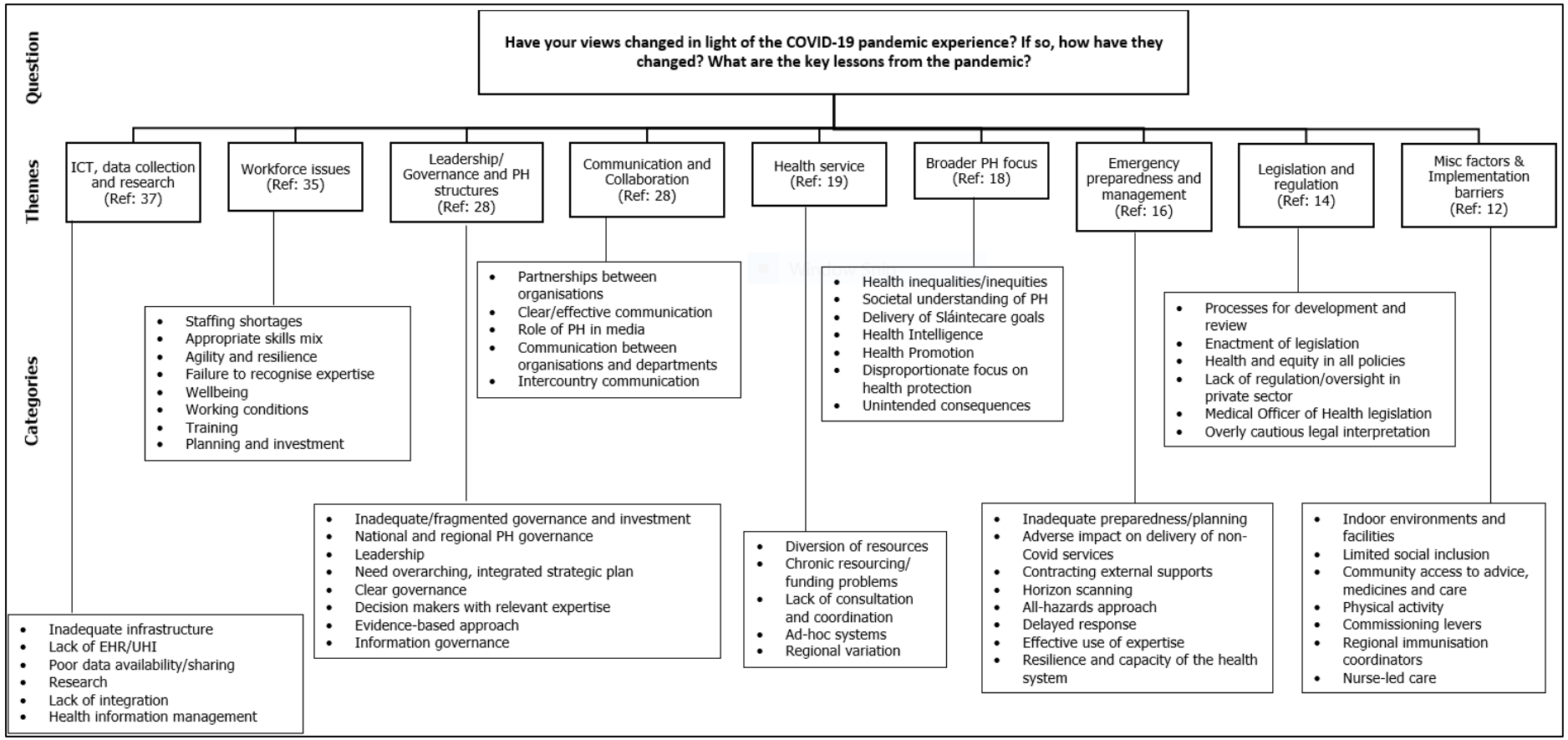
3.2 Delivery of EPHF and key lessons learned in light of the pandemic

In response to question two "Have your views changed in light of the COVID-19 pandemic experience? If so, how have they changed? What are the key lessons from the pandemic?" nine themes were identified (Figure 2):

- ICT, data collection and research
- workforce issues
- communication and collaboration
- leadership/governance and Public Health structures
- the health service
- broader Public Health focus
- emergency preparedness and management
- legislation and regulation
- miscellaneous factors and implementation barriers.

All respondents answered this question (100% question response rate). The majority of survey responses detailed the specific adaptations that organisations had made during the pandemic response or highlighted areas for future development. As such if responses did not directly address the question, efforts were made to ensure that the essence of any views relevant to the delivery of EPHFs and key lessons learned in light of the pandemic were collated and included in the thematic analysis.

Figure 2. Themes and categories identified in response to question two



Key: EHR – Electronic Health Record; ICT – Information and Communications Technology; PH – Public Health; UHI – Unique Health Identifier; Ref - number of references to this theme in the survey responses.

ICT, data collection and research

Six categories were identified in relation to ICT, data collection and research (Figure 2):

- inadequate infrastructure
- lack of an electronic health record or unique health identifier
- poor data availability/sharing
- research
- lack of integration
- health information management.

Respondents frequently highlighted the inadequate nature of the ICT infrastructure. The pandemic *"highlighted critical deficits in Ireland's health information systems"* [School of Public Health, University College Cork, (UCC)] and further *"demonstrated the importance of interoperable, connected IT systems"* [Irish Pharmacy Union]. The inadequacies of the ICT infrastructure were frequently mentioned, with technologies being referred to as *"out-dated, inadequate and unintegrated"* [Irish Epidemiological Modelling Advisory Group (IEMAG)]. The impact that these deficits had on the Public Health response to the pandemic were mentioned repeatedly, and the urgent need to improve these systems was a common theme in responses.

"The IT system for managing contacts and calls to people with infections is also not scalable or robust. In tandem with this, the Computerised Infectious Diseases Reporting (CIDR) outbreak management IT system is also old, cumbersome and not fit for purpose. It is widely recognised that these systems require a major upgrade or replacement." [Royal College of Surgeons in Ireland (RCSI)]

The lack of electronic health record and a UHI/IHI were also commonly mentioned as a key lesson to be taken from the pandemic response. This was reported to be an *"inherent deficiency in the national approach to healthcare"* [Health Information and Quality Authority (HIQA)] and a contributory factor in the *"lack of case management system, lack of timely surveillance data, lack of integration between information systems"* [Irish Society of Specialists in Public Health Medicine].

"Although there is much excellent health research taking place across the country, public health and health service research is seriously challenged by the lack of a unique health identifier in Ireland, precluding linking patients' attendances at the variety of primary care and specialised hospital settings in both the public and private sectors." [RCSI]

Difficulties with research and the resulting impact on the pandemic response were highlighted by respondents, with the School of Public Health, UCC reporting that the

"response to the pandemic was hampered by the limited quality of evidence on core issues of direct relevance to the management of the pandemic".

"The poor resourcing and structure of the public health system mean there is little time or capacity for research (though there are some excellent examples of research activity), bad data infrastructure limits the scope and scale of research, and collaboration with academic colleagues is limited" [IEMAG]

Research and data sharing capacity did improve during the course of the pandemic, as although *"[data] access was initially limited to a very narrow group of researchers, it was ultimately extended to a wider group that enabled a broad range of analyses to be carried out encompassing many different methodologies"* [HIQA], though this was hampered by organisational issues – with the *"lack of clarity around data governance, data ownership and data sharing created challenges in generating analyses across multiple datasets"*[IEMAG].

Further categories related to ICT, data collection and research included the lack of integration between systems and the importance of managing health information correctly (Appendix 2).

Workforce issues

Eight categories were identified in relation to workforce issues (Figure 2):

- staffing shortages
- appropriate skills mix
- agility and resilience
- failure to recognise expertise
- wellbeing
- working conditions
- training
- planning and investment.

A lack of staff was frequently cited by respondents as a problem in the pandemic response, while ensuring that there was adequate recruitment was recorded as a key lesson in multiple responses. Staff that are in post are regarded positively, though respondents see a need for more of them. The UCD NVRL reported that the *"quantity of the public health workforce is massively inadequate [but] would have no concerns about the quality of same"*. This is regarded as a long-standing issue as *"even before the pandemic commenced the medical discipline of public health as well as the wider health service was facing shortages of human resources resulting in reduced service availability"* [University of Limerick School of Medicine (UL)]. This burden was not shared equally, with *"areas that were more understaffed than others*

at the outset [being] particularly challenged." [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)].

In addition to there being insufficient numbers of staff, there were several responses indicating that a *"sufficient level of expertise for data analysis, reporting and action based on information generated"* [Association of Public Health Registrars in Ireland (APHRI), co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine] was also required. As well as the recognition that *"skills to develop and run these services must be part of PH training, [including] leadership programmes and placements"* [UCD School of Public Health, Physiotherapy and Sports Science, University College Dublin], it was also recognised that the *"issue of the diversification of the public health workforce needs to be considered in the context of the ongoing management of the Covid-19 pandemic, preparedness for future pandemics and the need to maintain and augment other core PH work, including health intelligence, health improvement and health promotion"* [School of Public Health, University College Cork (UCC)].

"There needs to be recognition of the public health workforce and the expertise required to deliver the recognised remit. This includes statistical, modelling, epidemiological, economic, behavioural science expertise, etc. Consideration needs to be given as to whether this can be achieved within current recruitment processes which reflect the generic skill set of the Civil service rather than that of an expert workforce." [Irish Society of Specialists in Public Health Medicine]

Despite the challenges reported in staff and skill shortages, the resilience of staff was regarded as an important aspect of the pandemic response with *"the ability to change gear quickly to respond to pressures brought on by the pandemic and its evolving epidemiology [being] of crucial importance to ensure the best response to emerging priorities."* [HSE Health Intelligence Unit].

"The dedication, experience, expertise and professionalism of colleagues in Regional Departments of Public Health, the Health Protection Surveillance Centre (HPSC) and other elements of the public health system was extraordinary" [Irish Epidemiological Modelling Advisory Group (IEMAG)]

Further categories related to workforce issues included the failure to recognise expertise, wellbeing, working conditions, training, and planning and investment (Appendix 2).

Leadership, governance and Public Health structures

Eight categories were identified in relation to leadership, governance and Public Health structures (Figure 2):

- inadequate/fragmented governance and investment

- national and regional PH governance
- leadership
- need overarching, integrated strategic plan
- clear governance
- decision makers with relevant expertise
- evidence-based approach
- information governance.

The inadequacies of pre-existing governance structures and the difficulties that these caused during the pandemic were the most frequently reported issues, in this theme. Additionally, governance structures were also identified as an area for future development. The *"inadequate governance and investment resulted in severe pressure on the public health service during the pandemic"* [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)].

"NPHET, with its very wide representation from across the health system, addressed, albeit in an ad-hoc manner, many of the weaknesses in governance and organisational structure within the system; by simply having everyone in the (virtual) room, and then making and clearly communicating a set of recommendations, disparate parts of the system could be brought to common purpose" [Irish Epidemiological Modelling Advisory Group (IEMAG)]

The differing and changing roles of national and regional Public Health governance was reported as an aspect of pandemic response that caused some difficulties, with *"the expansion of national Public Health structures during the pandemic caus[ed] some challenges in aligning national and regional public health actions. (Health Protection Surveillance Centre (HPSC))".* [HSE Consolidated]. Suggestions for improving this included developing *"better communication channels between national and regional health structures and settings"* [Royal College of Surgeons in Ireland (RCSI)]. The need to increase the role or involvement of regional Public Health units was highlighted consistently.

"We should aspire to a regional public health model so the regional Director of Public Health bears responsibility (and accountability) for their region" [UCD National Virus Reference Laboratory (NVRL), University College Dublin]

The leadership demonstrated by Public Health doctors working in the Department of Health and in Public Health Departments was reported as being effective, and maintained the support of the general public.

"Public health physicians provided leadership at all levels of the response and public health teams showed commitment and dedication, working long hours for extended periods" [Faculty of Public Health Medicine (RCPI)]

However, corporate leadership was highlighted by some respondents, as being less effective than its regional counterparts.

> *"Failure of central leadership contributed to the proposal by Regional PH Departments for autonomy in management of the Covid cases in their regions. Ireland is too small, movement of people between regions and the existence of national institutions (prisons, asylum centres) for there to be regional autonomy in such services, What was (and is) required is strong, available, credible leadership and decision-making with unified policies"* [UCD School of Public Health, Physiotherapy and Sports Science, University College Dublin]

Further categories related to leadership, governance and Public Health structures included the need for an overarching/integrated strategic plan, clear governance, decision-makers with relevant expertise, use of an evidence-based approach, and addressing deficiencies in information governance (Appendix 2).

Communication and collaboration

Five categories were identified in relation to communication and collaboration (Figure 2):

- partnerships between organisations
- clear/effective communication
- role of PH in media
- communication between organisations and departments
- intercountry communication.

The importance of partnerships and close collaboration between different departments and agencies was frequently highlighted with *"linkages between Departments of Public Health and regional Community Healthcare Organisation offices and teams strengthened in responding to the COVID-19 pandemic"* [Association of Public Health Registrars in Ireland (APHRI), co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine]. The formation of *"local partnerships and engagement enable[d] effective response[s] by obtaining key information and enable[ing] timely and effective response to outbreaks"* [Irish Society of Specialists in Public Health Medicine].

> *"The COVID-19 pandemic experience has demonstrated the value of enhanced collaboration across the health system. This has been evident in the significant achievements of groups such as NPHET, the high level task force on COVID-19 vaccination and NIAC in addressing the considerable public health challenges posed by the pandemic."* [Health Products Regulatory Authority (HPRA)]

"There was effective collaboration between medical colleagues in specialties such as infectious diseases, virology, immunology, microbiology, occupational medicine, general practice and Public Health medicine. No one specialty or discipline could have managed the pandemic singlehandedly and it was essential that there was an interdisciplinary approach to decision making that included the work of frontline in medicine and Public Health medicine." [Royal College of Physicians of Ireland (RCPI)]

This collaborative approach was also beneficial when dealing with other jurisdictions as the *"pandemic response required regular communication between public health teams in NI and Ireland; to facilitate contact tracing, share learning and to enable strategic cooperation which was enhanced by the development of a Memorandum of Understanding."* [Institute of Public Health in Ireland]

The clear communication that accompanied the national response to the pandemic was highlighted as a key component of the response, as *"clear, concise, regular communication through trusted channels is essential – particularly for the public"* [HSE Environmental Health Service]. This clear communication was regarded positively by the UCD NVRL who sought to *"compliment both the HSE and the [Department of Health] on their communication strategies in relation to empowering the public to protect themselves and others by preventing the transmission of SARS-CoV-2, thereby preventing infections"*.

"The provision of easily-accessible statistics and information on COVID-19 presents a model for how data on quality and access to health services could be published. The public had access to the data and were empowered to understand how Ireland was reacting to the pandemic in comparison to other countries" [Health Information and Quality Authority (HIQA)]

The importance of clear communication was further demonstrated by instances where communication was unclear, such as *"the inconsistencies in mask wearing requirements between different public health information sites"* [HIQA]. A contributory factor to this unclear communication was reported as being due to *"Directors of Public Health and other public health physicians not [being] facilitated to respond to media requests about the level of illness in their area"* [Faculty of Public Health Medicine (RCPI)].

"Current communications structures do not support the input of the public health voice into discourse. Within the context of COVID-19, this vacuum was filled with misinformation and half-truths, confusing the public" [Irish Society of Specialists in Public Health Medicine]

Inadequate communication between organisations was also reported, with adverse impacts on the pandemic response due to this failing.

"No dedicated contact lines in hospitals to provide assistance to contact tracing. Depended on goodwill and cooperation of nursing and patient records staff. Difficult when hospitals were overburdened with Covid patients." [UCD School of Public Health, Physiotherapy and Sports Science, University College Dublin]

Further categories related to communication and collaboration included the role of Public Health in media, and intercountry communication. (Appendix 2).

The health service

Five categories were identified in relation to the health service (Figure 2):

- diversion of resources
- chronic resourcing/ funding problems
- lack of consultation and coordination
- ad-hoc systems
- regional variation.

The diversion of resources within the health service to respond to the pandemic was reported to have caused adverse impacts within other parts of the health service. An immediate issue is that *"waiting lists are significantly longer now than they were before the pandemic. This could be the true legacy of Covid"* [UCD National Virus Reference Laboratory (NVRL), University College Dublin].

"Redirection of staff to assist with contact tracing, testing, and subsequently vaccine rollout also had the knock-on effect of creating delays in clinic waiting lists, and availability of some key public health provisions such as infant developmental checks were also impacted" [University of Limerick School of Medicine, (UL)]

Respondents reported that the pre-existing resourcing and funding problems in Public Health were a cause of difficulties in deploying an effective response. This was an issue in the beginning of the pandemic as the *"poor governance structures and lack of investment meant that as the pandemic arrived, Ireland was not sufficiently resourced or prepared to deal with same"* [Irish Medical Organisation (IMO)] and throughout the pandemic as *"it became obvious that resources in the Public Health service were inadequate to address the many challenges which emerged as the pandemic unfolded"* [Royal College of Physicians of Ireland (RCPI)].

"Sustainable resourcing of regional departments from the outset of the pandemic would have enabled a more effective response, potentially reducing the reliance on long, recurrent and costly lockdowns" [Irish Society of Specialists in Public Health Medicine]

A lack of consultation and coordination was reported to cause issues with the effectiveness of the pandemic response. *"Regional public health practitioners*

seemed to be somewhat quite isolated – there did not seem to be effective national support for, co-ordination or communication around their efforts" [Department of Agriculture] and workers *"were regularly hearing announcements about their role in new legislation/functions on the media before there was any agreement or discussion"* [HSE Environmental Health Service].

"Within HSE PH there appears to have been a vacuum in leadership, resulting in a degree of regional autonomy re certain policies relating to testing, tracing, investigation and risk assessment." [School of Public Health, Physiotherapy and Sports Science, University College Dublin (UCD)]

Further categories related to the health service included ad-hoc systems and regional variation (Appendix 2).

Broader Public Health focus

Seven categories were identified in relation to a broader Public Health focus (Figure 2):

- health inequalities/inequities
- societal understanding of PH
- delivery of Sláintecare goals
- Health Intelligence
- Health Promotion
- disproportionate focus on Health Protection
- unintended consequences.

The impact of inequalities and inequities in Ireland were reported by respondents to be a contributory factor to the spread of COVID-19, with respondents also noting that these have not been addressed.

"Health Inequity / Inequalities in Ireland increased our Covid-19 transmission, morbidity and mortality in Ireland. Inequities have not been resourced or addressed" [The Directors of Public Health group]

"People can be vulnerable to the impact of infectious diseases by virtue of their age, gender, ethnicity and socioeconomic circumstances which was evident during the pandemic. Learning from the pandemic must include how to best avoid widening the health inequality gap in future epidemics" [Institute of Public Health in Ireland]

While the pandemic brought better awareness among the public about the practice of Public Health as *"COVID-19 has brought the specialties of epidemiology & public health to the fore."* [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)], the full sphere of activity of Public Health practice is still not fully understood as *"in the eyes of the public it is now also synonymous with infectious*

diseases and there is still a lack of understanding of the broad remit of the work involved in the field" [University of Limerick School of Medicine (UL)].

"Medical colleagues, but also the public at large, got to know Public Health leaders, such as the Chief Medical Officer (CMO) and the Deputy CMO who had public facing roles. It is now widely appreciated to be a highly specialised discipline of medicine, by fellow medical practitioners" [Royal College of Physicians of Ireland (RCPI)]

The importance of the implementation of Sláintecare in the context of reducing the harms from the pandemic and improving health in general was also reported by respondents.

"... Sláintecare, which remains the only overall health policy on which to platform effective population responses to public health emergencies, such as pandemics, and longstanding population health priorities." [Royal College of Surgeons in Ireland (RCSI)]

Further categories related to the broader Public Health focus included Health Intelligence, Health Promotion, disproportionate focus on health protection, and unintended consequences (Appendix 2).

Emergency preparedness and management

Eight categories were identified in relation to emergency preparedness and management (Figure 2):

- inadequate preparedness/planning
- adverse impact on delivery of non-COVID services
- contracting external supports
- horizon scanning
- all-hazards approach
- delayed response
- effective use of expertise
- resilience and capacity of the health system.

Respondents identified that Public Health must learn from their inadequate preparedness for a pandemic. There was *"inadequate Public Health preparedness over the medium to longer term prior to the onset of the Covid pandemic"* [School of Public Health, Physiotherapy and Sports Science, University College Dublin (UCD)] and *"there had been little planning, such as scenario planning, to ensure appropriate responses to other pandemics or major outbreaks such as avian influenza"* [Royal College of Surgeons in Ireland (RCSI].

"There was NO attention early on to protecting vulnerable groups such as residents of LTRCFs, and no attention to contact tracing until mid-March 2020, all pointing to

total lack of preparedness relating to the pillars of health protection" [School of Public Health, Physiotherapy and Sports Science, University College Dublin (UCD)]

The impact of emergency plans and response on other parts of the health service were also highlighted as areas for future caution. The INMO highlighted one group when reporting that the *"reduction of disability services during the crisis has had a profound effect on people with a disability"*.

"Because of COVID-19, delays in screening times and in availability of post-screening diagnostic and treatment services continue to place an enormous burden on a secondary care system which was already under serious strain. Thus, chronic systemic shortages of staff and facilities have been rendered acute" [National Screening Advisory Committee (NSAC)]

Though the *"overall response benefited from the contracting in of outside support systems and consultancies"* [Department of Agriculture], it was also reported that *"the out-sourcing of contact tracing to non-public health trained individuals was far from ideal"* [UCD National Virus Reference Laboratory (NVRL), University College Dublin].

A key lesson from this aspect of the emergency response would be that *"the learnings from engagement with these services will be institutionalised/retrofitted into the public health emergency planning and management"* [Department of Agriculture].

Further categories related to emergency preparedness and management included horizon scanning, an all-hazards approach, delayed response, the effective use of existing expertise, and the resilience and capacity of the health system (Appendix 2).

Legislation and regulation

Six categories were identified in relation to legislation and regulation (Figure 2):

- processes for development and review
- enactment of legislation
- health and equity in all policies
- lack of regulation/oversight in private sector
- Medical Officer of Health legislation
- overly cautious legal interpretation.

While *"multiple policy, legislative and regulatory tools were used to create and reinforce environments supportive of the desired public health outcome"* [Obesity Policy Oversight and Implementation Group], it was reported that the *"powers exercised by government to impose regulations under the current health legislative framework illustrated a lack of appropriate legal powers which led to provisions*

being made rapidly with limited scrutiny" [Institute of Public Health in Ireland]. A key lesson from this is that a *"review of Public Health Legislation would be useful post pandemic with drawing on international experience"* [The Directors of Public Health group].

"Legislation is an effective tool for public health, when used judiciously. A review of existing Infectious Disease legislation, with a view to introducing a risk based nuanced approach to managing Public Health threats, including case and contact management should now be undertaken (Health Protection Surveillance Centre)" [HSE Consolidated]

The pandemic *"highlighted that legislation in Ireland can be passed relatively quickly"* [Road Safety Authority of Ireland (RSA)]. A key lesson from the pandemic is that the *"timeliness of legislation is crucial and delays- such as those in progressing alcohol and gambling legislation- should be avoided"* [Institute of Public Health in Ireland]. That is, the efficiency of the response to the pandemic could be applied to other Public Health issues.

The response to the pandemic was reported by respondents to highlight the importance of the *"consistent consideration of the social determinants of health in all public health policy and action, nationally and regionally"* [Association of Public Health Registrars in Ireland (APHRI), co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine].

"Public health control measures- such as self-isolation- could not have been achieved without the assistance of policy sectors outside of health to ensure that people received adequate social and economic support. This was a prime example of the value of the World Health Organization recommended Health in All Policies approach, and a learning point from the pandemic is the need to improve mechanisms for sectoral collaboration towards mutually beneficial goals" [Institute of Public Health in Ireland]

Further categories related to legislation and regulation included the lack of regulation/oversight in private sector, Medical Officer of Health legislation, and overly cautious legal interpretation (Appendix 2).

Miscellaneous factors and implementation barriers

Seven categories were identified in relation to miscellaneous factors and implementation barriers (Figure 2):

- indoor environments and facilities
- limited social inclusion
- community access to advice, medicines and care
- physical activity

- commissioning levers
- regional immunisation coordinators
- nurse-led care.

The importance of indoor environments and their role in the pandemic was reported by respondents, and key lessons included that *"health employers across the public and private settings must introduce air filtration systems where there could be infected air and where there is not inbuilt or adequate ventilation and filtration"* [Irish Nurses and Midwives Organisation (INMO)].

"Learnings with regard to necessary ventilation levels, air filtration and the need for more interpersonal distance indoors to reduce infection levels could be considered with respect to new build & renovation standards for sports facilities and within schools." [National Physical Activity Plan Implementation Group]

Limitations in social inclusion were reported that made responding to the pandemic more challenging, specifically, the *"limited social inclusion staff [made] it difficult to target harder to reach groups with effective interventions (National Immunisation Office)".* [HSE Consolidated].

"COVID-19 has brought greater recognition of the need for social inclusion services and a social determinants approach, though much of this was driven regionally with a lack of resourced national support and strategic direction, and much of the funding to provide these services is transient. Dedicated public health resources with responsibility, authority and accountability for vulnerable populations is required at national and regional levels" [Irish Society of Specialists in Public Health Medicine]

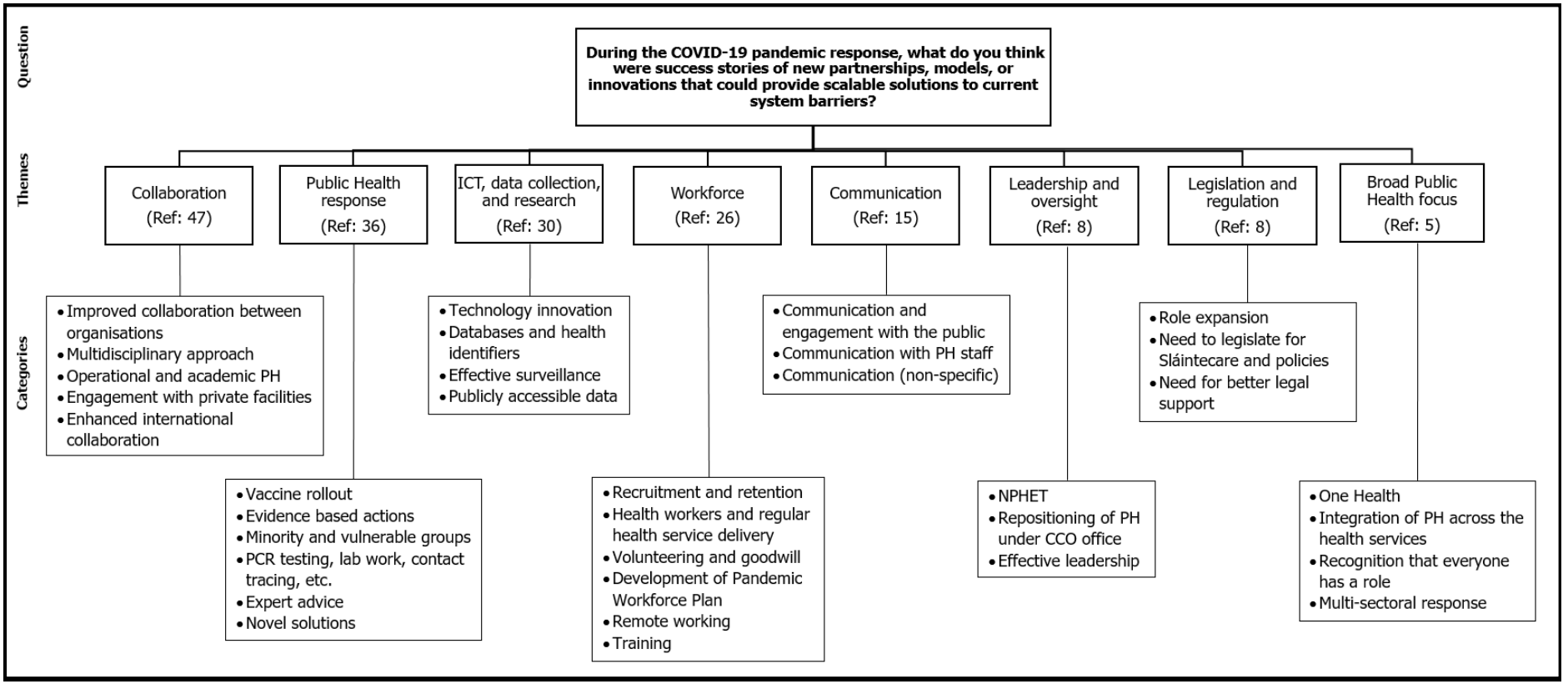
Further categories related to miscellaneous factors and implementation barriers included community access to advice, medicines and care, physical activity, commissioning levers, regional immunisation coordinators, and nurse-led care (Appendix 2).

3.3 Success stories during the pandemic

In response to question three "During the COVID-19 pandemic response, what do you think were success stories of new partnerships, models, or innovations that could provide scalable solutions to current system barriers?" eight themes were identified (Figure 3):

- collaboration
- Public Health response
- ICT, data, and research
- workforce
- communication
- leadership and oversight
- legislation
- broad public health focus.

Figure 3. Themes and categories identified in response to question three



Key: CCO – Chief Clinical Officer; ICT – Information and Communications Technology; NPHET – National Public Health Emergency Team; PCR – polymerase chain reaction; PH – Public Health; Ref - number of references to this theme in the survey responses.

Collaboration

Five categories were identified within the collaboration theme (Figure 3):

- improved collaboration between organisations
- multidisciplinary approach
- operational and academic Public Health
- engagement with private facilities
- enhanced international collaboration.

The most commonly mentioned success story of the COVID-19 pandemic response in the collaboration theme was increased and improved collaboration within and across disciplines. Many specific collaborations were mentioned, facilitating Public Health interventions (for example, the vaccine rollout), testing and laboratory work, support of vulnerable and minority groups, communication with the public and Public Health workers, Public Health research, outbreak management, and evidence-based actions and responses.

"Close alignment of Public Health Departments with Community Healthcare Organisations (CHOs) led to good local management of outbreaks in congregated settings and these links as well as enhanced relationships with hospitals and other civil organisations should be maintained and enhanced." [Irish Medical Organisation (IMO)]

"The COVID-19 Data Research Hub established by the [Central Statistics Office] in collaboration with the Health Research Board (HRB), Department of Health (DoH) and the Heath Service Executive (HSE) represents a significant advance for public health research in Ireland." [School of Public Health, University College Cork (UCC)]

"The CMO [Chief Medical Officer], supported by NPHET and HIQA (the role and quality of up-to-date evidence from the latter has perhaps not been fully appreciated) succeeded in providing valid, reliable, scientifically-based and consistent advice to the government as well as being seen by the public as a competent and trustworthy voice." [Royal College of Surgeons in Ireland (RCSI)]

"Partnerships between the Department of Health (and other groups tasked with the pandemic response) with agencies involved in health research (e.g. HIQA, ESRI [Economic and Social Research Institute], HSE Library Service) permitted the delivery of data and evidence to support the multi-faceted policy response to the pandemic. In turn, collaborations between such agencies helped to enhance the evidence base provided to inform policy." [Health Information and Quality Authority (HIQA)]

These collaborations were made possible by a shared focus and common goals across organisations, despite having different mandates, and *"the setting of clear strategic priorities at department level and the establishment of multi-stakeholder groups tasked with the identification and implementation of actions to address those priorities"* [Health Products Regulatory Authority (HPRA)]. It was recognised that many of these collaborations were formed and exist solely in the context of COVID-19. It was commonly mentioned that these collaborations need to be maintained post-COVID and expanded to address other issues.

"There was a significant increase in and reduction in the barriers associated with cross sectoral and cross department working, with huge benefits during the pandemic. These collaborations should be formalised and maintained post pandemic, leveraging the benefits in support of other public health issues including chronic disease prevention, climate change response, health inequalities, etc." [Irish Society of Specialists in Public Health Medicine]

"Cross sectoral and cross department working – huge benefits during the pandemic should be maintained beyond COVID and harnessed for other problems, e.g. chronic disease prevention, climate change response, health inequalities; NGOs [non-governmental organisations] & schools/education" [The Directors of Public Health group]

"The NPHET is an example of a collaborative regional and national level. This model could provide lessons adapted and adopted in other public health programmes" [University of Limerick School of Medicine (UL)]

A particular benefit of the increased collaboration was the multidisciplinary approach it fostered, with the pandemic demonstrating *"the capacity to deliver public health interventions by a multidisciplinary workforce, e.g. contact tracing, vaccination, evidence synthesis and the development of evidence-based guidance"* [HIQA] and *"the multi-disciplinary skills and competences that comprise a strong public health resource."* [Institute of Public Health in Ireland].

The importance of fostering collaborations between academic and service oriented Public Health going forward was also mentioned. The Irish Epidemiological Modelling Advisory Group (IEMAG) participated in a study that consisted of benchmarking exercises of infectious disease modelling capacity and processes in six countries. The study noted that *"the linkages between public health agencies and universities are important to ensure high quality outputs and to facilitate collaboration on research projects. The integration of work with research institutes and establishment of placements allows involvement of postgraduate students and researchers on joint*

projects, provides access to research funding, and provides additional expertise during an epidemic or pandemic. Public health agency staff benefit from expertise in complex epidemiological methods and academics benefit from the involvement in policy setting."

The importance of promoting academic and service-oriented Public Health collaboration going forward was also highlighted by the RCSI:

"During COVID-19, some new partnerships were formed with Irish Universities, e.g., for members of NPHET, working groups, advisory groups, and this could be increased in the future. Many colleges already manage large population health programmes in Ireland and also abroad. The model of rapidly sub-contracting a defined piece of work out to a college should be expanded. Examples include: a rapid review of interventions to manage a new condition, development and validation of a new diagnostic test, rapid assessment of the best practices abroad, and synthesis of current knowledge on a new topic, or a public policy options paper could be a useful integration of evidence based academic expertise into national health policy. The universities can and should work more closely with HIQA on an ongoing basis when developing and providing the latest scientific data to informing public health policy and strategy." [RCSI].

International collaboration was also reported as a success. For example, the NSS [HSE Consolidated] highlighted that *"the international linkages through the 5-Nation relationships were important to understand how others delivering screening programmes were coping and responding to the pandemic"* and the Institute of Public Health in Ireland noted that *"the North South [Memorandum of Understanding] was an important and critical measure supporting an all-island COVID-19 response."* Going forward, the Institute of Public Health in Ireland *"would welcome a formal MOU process for current and emerging transboundary public health issues, with a long-term goal of harmonising public health legislation and government policy on some shared challenges; for example, road safety, climate change, air pollution, tobacco control, and minimum unit pricing of alcohol. Given the nuances of our local population demographics, as well as important cultural and political factors, a formalised structure to facilitate collaboration is important and mutually beneficial. As an all-island body, the Institute could facilitate all-island collaboration on behalf of both departments."*

Public Health response

Six categories were identified within the Public Health response theme (Figure 3):

- vaccine rollout

- evidence-based actions
- minority and vulnerable groups
- polymerase chain reaction (PCR) testing, lab work, contact tracing, etc.
- expert advice
- novel solutions.

Different elements of the Public Health response were identified as success stories. For example, numerous respondents highlighted the success of the vaccine rollout, testing, lab work, and contact tracing.

"The mass vaccination operational programme – once it got up and running - was a tremendous success." [Department of Agriculture]

"We also believe that the effective, efficient and timely implementation of national programmes requiring multi-agency involvement and support such as [polymerase chain reaction] testing, contact tracing and the vaccine roll-out were significant success stories." [Health Products Regulatory Authority (HPRA)]

"From a laboratory medicine perspective, I believe the HSE laboratory task force was a genuine success story, although in the interest of full disclosure, I was, and am a member of that group." [National Virus Reference Laboratory (NVRL), University College Dublin (UCD)]

A number of factors were identified as contributing to the success of these Public Health responses. As identified in the previous section, collaboration played an important role. HIQA identified *"the mobilisation of pharmacists for the provision of vaccinations"* as a major success story, while the Pharmaceutical Society of Ireland (PSI) highlighted the success of the HSE-formed *"subgroup comprising the HSE, PSI and [Irish Pharmacy Union] to address the roll-out of the COVID-19 vaccination programme to community pharmacies."* The success of *"public-private partnerships to effectively outsource and massively increase (vaccination) capacity"* was identified by HIQA. Additionally, referring to clear strategic priorities identified at departmental level, the HPRA highlighted the success of *"access to the necessary resources and expertise needed to deliver on these complex projects within a short timeframe and facilitated close cooperation and aligned actions between relevant agencies and stakeholders."*

The importance of following scientific evidence and advice from expert groups was identified as a contributing factor to the success of the Public Health response.

"The roll out of vaccination, with clear decision making from NIAC was a success because it was clear that the government was following scientific advice." [Royal College of Surgeons in Ireland (RCSI)]

"IEMAG also notes the value, in the course of the pandemic, of formal evidence synthesis approaches as conducted by the Health Information and Quality Authority (HIQA), the Expert Advisory Group (EAG) to NPHET, and by the UCD Centre for Veterinary Epidemiology and Risk Analysis, and notes the importance of the Health Research Board (HRB) funded Structured Population and Health Services Research Education doctoral programme (SPHeRE) in supporting and training doctoral graduates in such work." [Irish Epidemiological Modelling Advisory Group (IEMAG)]

"IEMAG (the NPHET modelling group led by Professor Philip Nolan) was superb during the course of the pandemic" [UCD NVRL]

"NIAC (led by Professor Karina Butler) performed excellently during the pandemic, as did the National Immunisation Office. However, NIAC is largely comprised of a group of dedicated individuals giving up their own time (meeting before or after the normal work day), and with limited administrative or academic support." [UCD NVRL]

The identification and implementation of novel solutions, such as *"allowing members of the public to access and report self-administered tests,"* [UCD NVRL] *"the rapid development and scale up of flexible and innovative testing services using innovative approaches including drive in and later walk in centres,"* [Irish Society of Specialists in Public Health Medicine] and *"The Contact Management Programme"* [Health Promotion and Improvement (HSE Consolidated)] also underpinned the success of the Public Health response. Additionally, the RCSI noted that *"Ireland benefited from our people's willingness to take advice from authoritative sources – independent public health and other scientific experts, as well as from government, NPHET and HSE – rather than from dubious social media sources."*

A number of scalable solutions for the future were identified. HIQA noted that the work conducted by agencies involved in health research and evidence synthesis (for example, HIQA, Economic and Social Research Institute (ESRI), or the HSE Library Service) that supported the Public Health response in Ireland is scalable, *"subject to sufficient resourcing of staff."* HIQA also reported that the pandemic highlighted the *"potential for more community-driven models of delivering public health services…particularly by allied healthcare professionals"* such as "*the mobilisation of pharmacists for the provision of vaccinations."*

Further suggestions regarding vaccinations were also made.

"The vaccinator workforce for routine immunisation programmes should be expanded to ensure equity of delivery of immunisation programmes across the country. This should include clinical staff as well as administrative staff. Trained vaccinators from the COVID-19 vaccination programme could be part of this workforce and others should retain their training to allow them to support the programme in future if the workforce needs to be boosted at short notice. Nurse-led vaccination programmes at [centralised vaccination clinics] have been successful and should continue in school vaccination programmes to free up community medical staff for clinical roles. Administration staff should also be maintained to ensure timely reporting of all national immunisation programmes and follow-up of defaulters. In the longer term, consideration should be given to a comprehensive Medicines Act to secure the legal basis of vaccine supply and administration going forward. (National Immunisation Office (NIO))." [HSE Consolidated]

The Royal College of Surgeons in Ireland (RCSI) noted the success of the vaccination campaign but cautioned that *"more attention needs to be given to those sub-groups who were resistant to the advantages of vaccination and to explore further how this could be improved."*

The National Virus Reference Laboratory (UCD) stated that the *"...for the first time in my memory, in laboratory medicine in Ireland - there was a national approach to the allocation of resources, in addition to centralised procurement, for the provision of diagnostic services. This should provide a model for the future so that services can be provided in the most efficient - and convenient, for the patient - way possible."* They also believed that the IEMAG *"was superb during the course of the pandemic, and some iteration of that group should be established as a permanent fixture for the HSE and [Department of Health]."* Regarding novel solutions, they also noted that *"the approach of allowing members of the public to access and report self-administered tests was novel in the context of infectious diseases and could inform policy in other infections or indeed other areas of medicine in the future."* Health Promotion and Improvement [HSE Consolidated], referring to the Contact Management Programme, stated that *"there is the potential to explore similar new models of care delivery such as [general practitioner] community hubs."*

There were mixed reports regarding the success of Public Health responses around vulnerable and minority groups. The NIO [HSE Consolidated] noted that *"targeted efforts to provide vaccination in readily accessible ways really helped reduce health impact among the most vulnerable in society."* While others noted the role of collaboration in reaching these groups.

"Accessibility to the most vulnerable and those who were vaccine-hesitant in the community was facilitated by including pharmacists in the vaccination drive." [Irish Pharmacy Union]

"The work engaging vulnerable and marginalised groups ([Direct Provision Centres], homeless and addiction populations, Travellers, vulnerable migrants) at regional level using a social determinants approach to preparedness and response in collaborations involving public health, the Traveller Health Unit, [Community Healthcare Organisation] Social Inclusion, Health Promotion, [Public Health Nursing and Administration], Local Authorities, Primary Care, [non-governmental organisations], etc working in partnership with the identified communities. While driven locally, this work was supported by the convening of a national SPHM group for Social Inclusion, which provided a forum for information sharing, sharing models of practice, learning, etc." [Irish Society of Specialists in Public Health Medicine]

On the other hand, the APHRI and lead NCHD for Public Health Medicine believed that *"greater collaboration between Departments of Public Health and social inclusion-specific organisations on targeted PH interventions and community engagement (was) needed"* while the UCD School of Public Health, Physiotherapy and Sports Science highlighted issues that arose at the start of the pandemic *"there was NO attention early on to protecting vulnerable groups such as residents of [long-term residential care facilities]"*.

ICT, data collection, and research

Four categories were identified within the ICT, data collection, and research (Figure 3):

- technology innovation
- databases and health identifiers
- effective surveillance
- publicly accessible data.

The most commonly mentioned success story in this theme was technological innovation throughout the pandemic. This encompassed a wide variety of innovations, including:

- the COVID Tracker app
- the COVID Care Tracker system
- robotic CIDR updates
- the Contact Management Programme
- COVAX (COVID-19 Vaccines Global Access)

- the ability to track SARS-CoV-2 samples taken in the community
- text messaging close contacts
- online systems for vaccination registration
- telehealth and or telemedicine
- ePrescribing (electronic prescribing)
- webinars and other forms of online communication.

These innovations were reported as a success throughout the pandemic and were noted to have the potential to be impactful in healthcare going forward. For example, the INMO noted that telehealth *"has the potential to alleviate pressure on the acute hospital system as well as reduce hospital-acquired infection. Clear guidance on telehealth is required to ensure that it is equitably deployed and available for patients. A review of changes to work practices, as well as health care policies, must be completed to identify the practices that should be further established and continued in a COVID and non COVID healthcare environment. For example, clinical leadership teams, care delivery based on clinical need on presentation, care triage and stepdown care in the community in the post-acute phase."* Physiotherapy and Sports Science, School of Public Health (UCD) noted that the COVID Care Tracker system *"could be leveraged for future monitoring and surveillance of health threats."* The ability to track SARS-CoV-2 samples taken in the community was *"a superb innovation"* according to the UCD NVRL and *"should be the new norm to which we should aspire, from the laboratory medicine perspective at least."* Additionally, the control given to the public to book COVID-19 tests and vaccinations through the HSE COVID Tracker App *"could be leveraged to encourage future engagement around other aspects of healthcare or illness prevention… (and) also be used to host care experience surveys on an ongoing basis, which would provide real-time feedback to the health service and be used to identify problems and improve care."* [Health Information and Quality Authority (HIQA)].

Although there were major successes in this area, some areas that need to be strengthened going forward were noted. The School of Medicine (UL) highlighted that *"a serious and ongoing systems barrier is Ireland's lack of a proper national electronic health record. Having such a system in place would greatly facilitate contact tracing and tracking of vaccination or treatment status for future outbreaks, in addition to the everyday benefits of having a single point of contact for health records."* Additionally, the Institute of Public Health in Ireland sounded a note of caution *"against techno-optimism as technology can assist but not solve the structural challenges, we face within the public health system. Increasing reliance on technology can also exacerbate the 'digital-divide' and perpetuate health inequalities. Increasing reliance on technology in public health can also exacerbate the 'digital-*

divide' and perpetuate health inequalities; for example, 29% of 60-74-year-olds in Ireland have never used the internet…The Institute would support many of the recommendations set out in Riyadh Declaration on Digital Health, including the need for evidence-based protocols for public health messaging, robust data governance and regulation, and for digital technology to be designed and implemented to maximise data quality and access for clinicians and patients … To safeguard the rights of users, the roll-out of digital technologies in public health must be supported by legislation governing its use. The HSE cyber-attack during the pandemic highlighted the fragility of health cyber-security in Ireland, and so expanding the role of digital technology requires the strengthening of security."

Several success stories regarding databases and the use of health identifiers were also noted. The School of Public Health (UCC) highlighted that *"the COVID-19 Data Research Hub established by the [Central Statistics Office] in collaboration with the Health Research Board (HRB), Department of Health (DoH) and the Health Service Executive (HSE) represents a significant advance for public health research in Ireland"* and expressed the desire that *"post pandemic, this facility should be retained, enhanced and extended to inform evidence-based decision-making across the full spectrum of conditions and issue within the scope of public health /population sciences research in Ireland."* Successful usage of the UHI/IHI was highlighted by the Health Intelligence Unit [HSE Consolidated], the APHRI and lead NCHD for Public Health Medicine, and the Faculty of Public Health Medicine (RCPI). The Health Protection Surveillance Centre [HSE Consolidated] expanded that *"if use of [Individual Health Identifiers] were mandated for every healthcare interaction, and incorporated into every healthcare IT system, this would transform the capacity of the system to use information for public health purposes. Scotland, which mandated use of the Community Health Index number, was able to undertake rapid analysis of data from multiple sources to inform [Public Health] responses on a real time basis. We need to be ambitious and strive to do the same."*

Further categories related to ICT, data collection and research included effective surveillance and publicly accessible data (Appendix 3).

Workforce

Six categories were identified within the workforce theme (Figure 3):

- recruitment and retention
- health workers and regular health service delivery
- volunteering and goodwill
- development of Pandemic Workforce Plan

- remote working
- training.

Rapid recruitment was a commonly cited success story within this theme, with the need to retain these staff and hire further staff also highlighted. The decision to create 84 consultant posts in Public Health medicine was highlighted as a positive by the Irish Medical Organisation (IMO), Faculty of Public Health Medicine (RCPI), and the National Screening Service [HSE Consolidated]. The National Immunisation Office [HSE Consolidated] highlighted that they had *"received additional staff to support the rollout of the COVID-19 vaccine and have built up further expertise"* and reported that *"Administration staff should also be maintained to ensure timely reporting of all national immunisation programmes and follow-up of defaulters."*

The role of frontline workers who maintained the provision of healthcare services was acknowledged: *"Their skill and dedication have been remarkable"* [National Screening Advisory Committee (NSAC)]. Respondents noted that a high standard of care was maintained by the screening services and community cancer support centres. The National Cancer Control Programme [HSE Consolidated] further noted that the scalability of these community cancer support centres are *"dependent on local leadership – regional public health can play a key role here in maximising existing networks, considering seldom heard populations, planning and evaluating."* Furthermore, the IMO noted that *"the introduction of a community based Chronic Disease Programme for all medical card and doctor only visit card patients has been led by a Public Health clinical lead and has been a significant achievement in Health Improvement."* The IMO and the Directors of Public Health group noted that this was facilitated by the development of the pandemic workforce plan.

"Another significant success has been the pandemic workforce plan implemented by the HSE under the [Chief Clinical Officers] office which has seen staffing levels in the other essential public health team members significantly increased and resourced. These staffing increases must be a permanent feature of the future public health workforce and will be essential to the success of consultant led multi-disciplinary teams envisioned under the IMO agreement." [IMO]

Going forward, RCSI believed that *"the pandemic has also helped those working in hospitals, [General Practitioner] practices and in nursing homes to have early detailed and consensus-based end of life care plans for each patient. This could develop into better palliative care for those dying in the future."*

Respondents also noted the importance of the charity sector, volunteering, and goodwill throughout the pandemic.

"The strong charity and voluntary sector in Ireland, such as sports clubs and parishes, also took leadership roles in providing practical community supports during the COVID-19 restrictions. The charity sector should be included as partners in strategic planning of population health activities, and in sub-contracting for taking responsibility for delivering parts of it that they are able to deliver." [RCSI]

"Local volunteer and professional sports resources were mobilised during the pandemic to coordinate with Local Authorities in providing physical activity, social and community supports across Ireland.

These collaborations were very successful in mobilising both support and information, and could be built on in future, where necessary." [National Physical Activity Plan Implementation Group]

The success of remote working was also highlighted by several respondents. It was noted that effective and efficient work continued throughout the pandemic while the RSA noted the reduced car emissions and road traffic accidents as the number of people commuting to work decreased. The possibility for positive lifestyle changes when remote working was also highlighted.

"The increase in cycling has been positive from both a health and environmental perspective, and hopefully will continue to yield positive public health benefits, although more stull need to be done nationally to ensure safer cycling. However, there is also evidence that these increases were not uniform among the population, with some sectors exercising less and with weight gain being seen across some sectors of the population. Similarly, while some embraced healthier lifestyles, alcohol intake increased for others." [RCSI]

Respondents also mentioned training as a success story throughout the pandemic (Appendix 3).

Communication

Three categories were identified within the communication theme (Figure 3):

- communication and engagement with the public
- communication with Public Health staff
- communication (non-specific).

The primary success story within this theme was communication and engagement with the public. This was facilitated by several factors. Continuing the theme of effective collaboration throughout the pandemic, several respondents highlighted the important role played by creating new or using existing links with organisations.

"The "In This Together" and "Keep Well" citizen engagement campaigns, during different phases of the pandemic, built on the existing links forged by Healthy Ireland and the HSE with stakeholders such as Sport Ireland, local authorities and [Non-Governmental Organisations]." [Obesity Policy Oversight and Implementation Group]

"Sponsorship of the national television programme Operation Transformation; working with the producers enabled weaving in themes and messages on varied health topics (Jan-Feb, 2021 and 2022)." [National Physical Activity Plan Implementation Group]

The NVRL (UCD) highlighted that involving experts, specifically the ESRI's behavioural research unit led by Professor Pete Lunn, *"was incredibly important in communicating the NPHET messages to the general public."* This important role played by the ESRI's behavioural research unit was echoed by RCSI. Additionally, several respondents highlighted the benefits of having Public Health professionals at the fore of public communications, as well as the regularity of this communication via press briefings.

Going forward, the Institute of Public Health in Ireland supports building on key pandemic learnings, specifically the success of population-wide media campaigns to disseminate Public Health advice and legal restrictions and having Public Health professionals to the fore in translating key Public Health messages to the public. The School of Medicine (UL) cautioned that the success of public communications was hampered by the prevalence of misinformation in both mainstream and social media. The Faculty of Public Health Medicine RCPI noted that *"We should take opportunity of pandemic experience to strengthen community engagement, participation and social mobilisation for health and well-being. The media are now more aware of the role of public health physicians which will facilitate advocacy for changes to improve the health of the population."*

Further categories related to communication included communications with public health staff and communications in general (i.e., no specific audience identified) (Appendix 3).

Leadership and oversight

Three categories were identified within the leadership and oversight theme (Figure 3):

- NPHET
- repositioning of Public Health under Chief Clinical Officers office

- effective leadership.

Several respondents noted effective leadership as a success story throughout the pandemic.

"Leadership at Regional and National level by Public Health Directors and [Consultants in Public Health Medicine] was successful in managing the pandemic." [The Directors of Public Health group]

"The leadership role of a public health physician in the Health and Wellbeing Directorate is also welcome. This will facilitate expansion of the involvement of public health physicians in health improvement, to collaborate with staff in that service and engage with disadvantaged communities." [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)]

The successful role of NPHET was also highlighted and the School of Medicine (UL) proposed that *"this model could provide lessons adapted and adopted in other public health programmes."*

"The mobilisation of the National Public Health Emergency Team (NPHET) itself established an innovative partnership model to monitor the pandemic, co-ordinate the health system response, advise Government, and inform the public. NPHET in part compensated for weaknesses and inadequacies in the governance and structure of the public health system and the health system more generally, and provides valuable lessons as to how that governance structure could be strengthened, simplified and improved, and made more resilient for future emergencies. Furthermore, lessons can also be learned from the manner in which NPHET established clear and separate lines of communication with government and with the public, and ultimately how NPHET and wider Government communications were aligned to provide clear information, guidance and messaging to the public." [Irish Epidemiological Modelling Advisory Group (IEMAG)]

Furthermore, the APHRI and lead NCHD for Public Health Medicine stated that *"re-positioning of public health and the Office of the National Clinical Director of Health Protection under the Chief Clinical Officer's office strengthened and maximised the public health pandemic response."* This was echoed by the Faculty of Public Health Medicine (RCPI).

Legislation and regulation

Three categories were identified within the legislation and regulation theme (Figure 3):

- role expansion
- need to legislate for Sláintecare and policies
- need for better legal support.

The most commonly noted success story in this theme was around the change in roles and permitted tasks of some staff during the pandemic. For example, the Irish Nurses and Midwives Organisation (INMO) highlighted *"the provision of guidelines on the pronouncement of death by a registered nurse."* They explained that *"this expansion of the nurse's role was agreed by the INMO in 2017 but not actioned by the HSE"* and that, going forward, *"further expansion is required. Removing practice barriers at a local and national level is key to the nursing profession reaching its full potential working within their full scope of practice beyond COVID-19.[8]"*

The Irish Pharmacy Union stated that *"innovations in the legislative landscape enabled community pharmacists to realise their potential in responding to the national response to a pandemic."* The legislative amendments and main changes introduced by these amendments are detailed in Appendix 3, as reported by the Irish Pharmacy Union. Going forward, they state that *"it is essential that we develop disease registers so that all healthcare providers can be utilised in any future pandemics."* The Health Information and Quality Authority (HIQA) noted that *"emergency legislation was enacted to facilitate e-Prescribing"* and recommended that *"such advancements should not be limited to times of crises."*

Further categories related to legislation and regulation included the need to legislate for Sláintecare and for better legal support (Appendix 3).

Broad Public Health focus

Four categories were identified within the broad public health focus theme (Figure 3):

- One Health
- integration of Public Health across health services
- recognition that everyone has a role
- multi-sectoral response.

There were few and varied comments on success stories within this theme. Firstly, respondents commented on successes that should be built upon in the context of One Health.

"The Department of Agriculture, Food, and the Marine worked with the HSE and UCD [National Virus Reference Laboratory] to provide laboratory space at

Backweston. This facilitated high volume public sector testing in the community and has proven to be a very successful partnership. Hopefully, it will continue for many years as we move into the era of One Health and enhanced surveillance for potential zoonotic infections." [UCD National Virus Reference Laboratory (NVRL), University College Dublin]

"The rapid response by the National Virus Reference Laboratory (NVRL) to ensure quality control and expand the virus testing capacity was led by Prof Cillian De Gascun, who was also the National Specialty Director for Microbiology in the Faculty of Pathology. The capacity for genome sequencing was also expanded and it is intended to maintain that in the future, including for other viruses. This will support hospital-based and Public Health physicians in outbreak investigation. Consideration should be given to strengthening this to beyond human health to One Health given that the source of most new infections is from animals." [Royal College of Physicians of Ireland (RCPI)]

The Health Protection Surveillance Centre [HSE Consolidated] wished to see the integration of Public Health across the HSE, stating that *"new relationships that integrate PH functions within HSE should be maintained and developed further. (Health Protection Surveillance Centre)."* The HSE Environmental Health Service (EHS) believed that the multi-sectoral focused effort around COVID-19 *"should be harnessed and translated to health risks of a more chronic nature such as tobacco and alcohol and acute risks such as [Antimicrobial Resistance]."* Finally, the HSE EHS recognised *"that no individual or service or profession or group has a monopoly on protecting public health. Everyone has a role to play most of all the public themselves."*

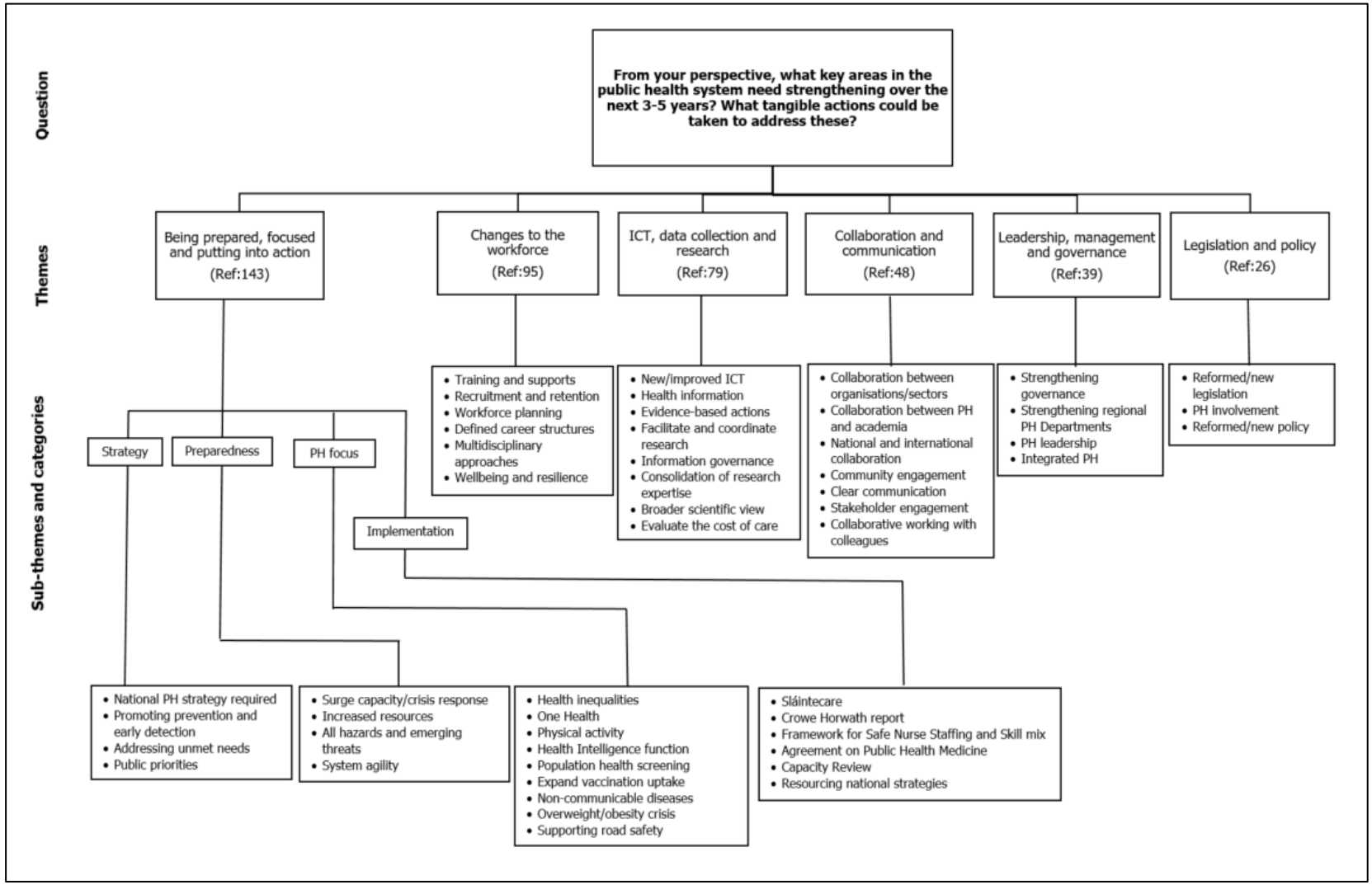
3.4 Key areas for strengthening, and actions to address weaknesses

In response to question four "From your perspective, what key areas in the public health system need strengthening over the next 3-5 years? What tangible actions could be taken to address these?" six themes, and four subthemes were identified (Figure 4):

- being prepared, focused and putting into action
  — strategy
  — preparedness
  — Public Health focus
  — implementation
- changes to the workforce
- ICT, data collection and research
- collaboration and communication
- leadership, management and governance
- legislation and policy.

All respondents answered the question (100% question response rate). As respondents regularly combined their responses to include the key areas, and the actions to address weaknesses, themes were derived from encapsulating respondents' overall responses. Where respondents explicitly identified an action, this was identified.

Figure 4. Themes, subthemes and categories identified in response to question four



Key: ICT – Information and Communications Technology; PH – Public Health; Ref - number of references to this theme in the survey responses.

Being prepared, focused and putting into action

Four sub-themes were identified in relation to being prepared, focusing and putting into action (Figure 4):

- strategy
- preparedness
- Public Health focus
- implementation.

Strategy (Sub –theme)

Four categories were identified in relation to strategy (Figure 4):

- national Public Health strategy required
- promoting prevention and early detection
- addressing unmet needs
- public priorities.

Respondents identified that a national Public Health strategy was required, and this should be *"underpinned by an evidence base*" [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)], and *"set out the Priorities for PH across the EPHFs"* [The Directors of Public Health group]. The Royal College of Surgeons in Ireland (RCSI) outlined that this strategy should be developed cross-governmental and should complement the work proposed by Sláintecare.

"In terms of national strategy development, RCSI would be willing to work with the HSE and a coalition of relevant organisations and health professionals across Ireland, to develop a cross-governmental strategy, complementing the work of Sláintecare on reducing health inequity. Such a coalition could contribute to raising awareness of the impact of inequalities on health and healthcare more broadly, and ensuring a coherent approach across government departments to addressing the problem."
[RCSI]

Respondents also regularly commented on a need for Public Health to focus on prevention and early detection, as opposed to treatment, particularly in terms of chronic disease. Respondents were aware, however, that this would require further resources and long-term investment in prevention was required.

"Population health gains can be made in prevention and early detection but this needs enough workforce/capacity behind it to deliver. (The Directors of Public Health)" **[ACTION]** [HSE Consolidated]

"There needs to be more resources nationally within the Health Service Improvement pillar as this is where early detection work happens. The national clinical programmes drive early detection and prevention; there is a clear need for [Public Health] Consultants/Specialists involved in these chronic disease programmes. (NCAGL Prevention and Management of Chronic Disease)" **[ACTION]** [HSE Consolidated]

Further categories related to strategy included addressing unmet needs and public priorities (Appendix 4).

Preparedness (Sub-theme)

Four categories were identified in relation to preparedness (Figure 4):

- surge capacity/crisis response
- increased resources
- all hazards and emerging threats
- system agility.

The ability to respond to any future crises, and to cope with surges within the Public Health system, was commented on regularly by respondents. Respondents suggested specific actions to ensure preparedness were the creation of emergency plans and scenarios with associated emergency drills, the creation of a Public Health Reserve Corp, recruitment of an adequate workforce and strengthened contact tracing capabilities. Additionally, the IEMAG recommended that we maximise collaborations between science, academia and Public Health, to manage possible future threats, while including all possible perspectives.

"We recommend that a broader view be taken of the type of scientific and academic advice that might be of value in the management of a major infectious disease outbreak in the future, finding new and additional ways to include the perspectives of social sciences and humanities in our understanding of the outbreak and our individual and collective responses." **[ACTION]** [Irish Epidemiological Modelling Advisory Group (IEMAG)]

Respondents also acknowledged that to strengthen the Public Health systems ability to cope with future crises, increased resources are required. The majority of respondents spoke generally when referring to "resources", with only increased workforce and increased budget explicitly identified. The Directors of Public Health group also identified that strengthened resources allocated to emergency management was required as *"currently there is limited capacity and few incentives"* [HSE Consolidated].

"Each domain of Public Health requires strengthening and resourcing over the next number of years. We must never again return to a situation where there were significant staffing deficits, lack of resources and lack of understanding of the value of the work of public health medicine." [Irish Medical Organisation (IMO)]

Further categories related to preparedness included all hazards and emerging threats and system agility (Appendix 4).

Public Health focus (Sub-theme)

Nine categories were identified in relation to Public Health Focus (Figure 4):

- health inequalities
- One Health
- physical activity
- Health Intelligence function
- population health screening
- expand vaccination uptake
- non-communicable diseases
- overweight/obesity crisis
- supporting road safety.

Addressing health inequalities was regularly identified by respondents, with the National Quality & Patient Safety Directorate identifying that while health inequalities drew many into working in Public Health, unfortunately it was only a small part of their work. Conversely, the Directors of Public Health group stated that *"It is unfair to say not much has been done on health inequalities. At least 25% of time is dealing with excluded groups in day-to-day [Public Health] roles."*

More generally, respondents regularly emphasised the need for appropriate data in addressing health inequalities, with the National Screening Service (NSS) [HSE Consolidated] identifying the need for a national health inequalities strategy and data, stating that *"We need a national health inequalities strategy and adequate data to ensure this informs all public health decision-making. This is a crucial area for an effective health service and could be much strengthened".*

Opportunities for undertaking a One Health approach was also commented on by respondents with the IEMAG identifying that there is a need bring together *"human and animal health perspectives in a broader ecological response"*. This was further supported by the Department of Agriculture who support the development of an

"overarching cross departmental One Health, One Welfare initiative with an agreed scope and range of priorities…This would provide direction and oversight and a structured mechanism for direct engagement between Departments and agencies on issues where coordination and collaboration is necessary, while ensuring that appropriate governance and coordination mechanisms are in place to address multiple One Health and One Welfare issues. The Committee could include representation from [Department of Agriculture, Food and the Marine], Department of Health, as well as the Department of Environment, Climate and Communications, the Department of Housing, Local Government and Heritage and the Department of Education. Matters suggested that fall within the scope of this Committee could include matters such as Zoonoses, [Antimicrobial Resistance], Water Quality and Health & Wellbeing." **[ACTION]**

Respondents also commented on the need to support physical activity, and the role which this plays in improving Public Health as a whole. Respondents identified specific actions to support physical activity, including strengthening active transport, integrating the promotion of physical activity into local planning processes and using the education sector as a facilitator for physical activity.

"The education sector is also a vital partner in promoting physical activity for children and young people which has been identified as a priority for action in the coming years. The Active School Flag programme is a flagship physical activity programme with proven benefits for schools participating and it is intended to build on this and expand the pilot programme currently being developed for the secondary school sector." **[ACTION]** [National Physical Activity Plan Implementation Group]

Further categories related to Public Health focus included the Health Intelligence function, population health screening, expanded vaccination uptake, non-communicable diseases, overweight/obesity crisis and supporting road safety (Appendix 4).

Implementation (Sub-theme)

Six categories were identified in relation to implementation (Figure 4):

- Sláintecare
- Crowe Horwath report
- Framework for Safe Nurse Staffing and Skill Mix
- Agreement on Public Health medicine.
- capacity review
- resourcing national strategies.

Respondents regularly identified the need for the full implementation of Sláintecare, and supported all of the initiatives proposed within the Sláintecare report including universal healthcare, investment in health provision of services, investment in eHealth, patient-centred care and the importance of prevention and public health.

"Full implementation of Sláintecare is required to ensure equitable, population informed, health system financing, with access based on need rather than existing level of service and short term management." **[ACTION]** [Association of Public Health Registrars in Ireland (APHRI), co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine.]

"eHealth has been identified as a critical enabler of Sláintecare and we believe that the experience during the pandemic has emphasised the need to accelerate progress in this area. In particular, it is suggested that the implementation of electronic health records on a national basis could be identified as a public health priority and that there should be a renewed focus on this area as part of the implementation of Sláintecare." **[ACTION]** [Health Products Regulatory Authority (HPRA)]

Implementation of Crowe Horwath report recommendations was also commented on by respondents with both RCSI and RCPI supporting the implementation of a hub and spoke model of Public Health. However, RCPI stated in model implementation there should be *"collaboration between national teams and their regional counterparts. However, in accordance with the Medical Officer of Health legislation and in the interests of governance and efficiency, regional teams should retain responsibility and autonomy for their work."*

The INMO also identified the need for full implementation of the Framework for Safe Nurse Staffing and Skill Mix, to ensure the safety and protection of the nursing workforce, particularly if another pandemic surge was to occur.

"As well as dealing with the current challenges arising from nurse and midwife staffing, protection for frontline nurses and midwives must be achieved through short, medium and long term workforce planning, investing in public health provision of services as set out in Sláintecare, appropriate recruitment and retention policies and implementing fully the Framework for Safe Nurse Staffing and Skill Mix. The Government must prioritise these investments to ensure that when the country is faced with new surges or another pandemic that it can adequately plan and respond." **[ACTION]** [Irish Nurses and Midwives Organisation (INMO)]

Further categories related to implementation included the Agreement on Public Health Medicine, the Capacity Review and resourcing national strategies (Appendix 4).

Changes to the workforce

Six categories were identified in relation to changes to the workforce (Figure 4):

- training and supports
- recruitment and retention
- workforce planning
- defined career structures
- multidisciplinary approach
- wellbeing and resilience.

Firstly, respondents regularly identified that workforce training and supports should be implemented, with RCSI stating that Public Health staff need to be *"scientifically literate, highly numerate, agile with statistics and data handling, and good communicators".* Respondents also identified that while staff recruited within the last year were trained in COVID work, Public Health training for these staff was now required.

"A large majority of the new workforce have had no formal public health training when they joined Public Health over the last year – they are very well trained in Covid work– therefore need a very robust training plan in line with [Public Health] Strategy." **[ACTION]** [The Directors of Public Health group]

Public Health workforce recruitment and retention were also regularly identified, with specific mention made to the recruitment of nurses and midwives, joint academic/Public Health posts, a permanent HSPC director, and Public Health consultants, along with the broader Public Health workforce. The potential detrimental effect of not investing in nursing and midwifery recruitment was also outlined.

"Substantial evidence exists associating positive patient outcomes with a higher number of registered nurses, increased patient safety and a lower staffing ratio is directly associated with higher mortality rates… Lower staffing levels are associated with adverse outcomes in terms of safety and experience. Investment in the nursing and midwifery workforce must be prioritised." **[ACTION]** [Irish Nurses and Midwives Organisation (INMO)]

The development of defined career structures (Appendix 4), along with making posts permanent, were identified as actions to support workforce retention.

Furthermore, workforce planning was identified by respondents as *"essential to assess current staffing levels, project future needs and plan to address the deficits"*,

[Royal College of Physicians of Ireland (RCPI)] with the suggestion that we look to countries such as the UK in terms of their ongoing workforce planning.

"Need ongoing Public Health workforce planning such as occurs in UK, Scotland – it is not a one off event – the lead in time for Public Health staff is long." **[ACTION]** [The Directors of Public Health group]

Respondents also suggested actions, such as the development of a Public Health Reserve Corp, which could be incorporated to this planning.

"The creation of a Public Health Reserve Corp comprised of former and retired health professionals who are willing to be trained and be available for call up in emergency situations should be considered." - **[ACTION]** [Physiotherapy and Sports Science, School of Public Health, University College Dublin (UCD)]

Further categories related to changes to the workforce were defined career structures, a multidisciplinary approach wellbeing and resilience (Appendix 4).

ICT, data collection and research

Eight categories were identified in relation to ICT, data collection and research (Figure 4):

- new/improved ICT
- health information
- evidence-based actions
- facilitate and coordinate research
- information Governance
- consolidation of research expertise
- broader scientific view
- evaluate the cost of care.

The need for new and or improved ICT was regularly identified by respondents, with RCSI stating that in general *"the public health agency should have accountability for developing robust IT systems to advance population health"*. More specifically, respondents identified that ICT should be integrated, with the need for a case and incident management system and integrated national immunisation system explicitly identified.

"IT systems require significant strengthening. Specifically, an integrated system which fully integrates outbreak, case and incident management with national indicator and molecular based surveillance, for [European Centre for Disease

Prevention and Control]-standard surveillance and control of [communicable diseases]." **[ACTION]** [Association of Public Health Registrars in Ireland (APHRI), co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine]

"Investment in a modern, fit-for-purpose national immunisation system to support delivery of immunisation - one of the most effective public health interventions - would significantly improve population health - (National Immunisation Office, Health Protection Surveillance Centre)." **[ACTION]** [HSE consolidated]

When referencing the CIDR, while the UCD NVRL suggested it should be upgraded, further respondents identified a need for a full review of the system.

"If [Computerised Infectious Disease Reporting] (developed 2004) is to be retained as a surveillance tool for Public Health, an in-depth review is needed to identify fixes for its inherent technological weaknesses and operational limitations, as evidenced by consistent suboptimal performance during the pandemic. This is also needed to justify the cost-effectiveness and sustainability of its retention and integration with a modern outbreak, case and incident management system, which could alternatively include an inbuilt functioning surveillance component." **[ACTION]** [APHRI, co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine]

Additional ICT systems which were suggested for upgrade, development or implementation were ePrescribing, Electronic Health Records, a national laboratory management system, a national diseases register, and a national emerging threats register.

Health information improvements were also regularly identified by respondents, with the implementation of UHI/IHI and equity stratifiers identified as *"vital"* [University of Limerick School of Medicine (UL)] and *"essential"* [HSE consolidated] to enable data linkages and address health inequalities.

"A wider and comprehensive project to fully implement a unique health identifier and progressively integrate key health systems to provide connected data on notifiable infectious diseases, hospital admissions and outcomes, and vaccination status, and ultimately the wider integration of epidemiological and health services data." **[ACTION]** [Irish Epidemiological Modelling Advisory Group (IEMAG)]

"Data is essential to addressing inequality. The service needs to be able to better access and use equity stratifiers including Ethnic identifiers. (National Screening Service)." **[ACTION]** [HSE Consolidated]

Respondents also stated the need for evidence-based actions, particularly in relation to underpinning Public Health policy, informing regulatory decisions, being integrated into training and service delivery, and for identifying hard to reach groups.

"Timely public health research is needed to inform policy and practice in the context of a dearth of evidence for public health interventions…This can be achieved through partnership with existing academic departments of public health and regional departments of public health solidified using joint academic and clinical posts. This would leverage existing capacity and support the development of specialisation within public health without undermining surge capacity or requiring significant investment.(EPHF9; EPHF11; supporting other EPHFs)." **[ACTION]** [Irish Society of Specialists in Public Health Medicine]

Lastly, respondents identified a greater need for facilitated and coordinated public health research, perhaps with the development of a Public Health research strategy or the establishing of national and regional research priorities.

"Establishing national and regional research priorities to inform evidence-based solutions to wicked problems." **[ACTION]** [School of Medicine (UL)]

"…there is a need for greater coordination of clinical research at a national level to ensure appropriate alignment of research priorities, maximise the benefits from clinical research within the Irish health system and inform public health decision making…It is suggested that the establishment of a [similar organisation to the National Institute for Health Research] in Ireland, which brings together and builds on the excellent work of existing organisations focussed on clinical research would help encourage more clinical research and better alignment of clinical research in Ireland to address public health priorities." **[ACTION]** [Health Products Regulatory Authority (HPRA)]

Further categories related to ICT, data collection and research were information governance, consolidation of research expertise, broader scientific view and evaluate the cost of care (Appendix 4).

Collaboration and communication

Seven categories were identified in relation to collaboration and communication (Figure 4):

- collaboration between organisations
- collaboration between Public Health and academia
- national and international collaboration

- community engagement
- clear communication
- stakeholder engagement
- collaborative working with colleagues.

Respondents regularly commented on the need for collaboration between organisations and sectors, to ensure a coordinated response to any emerging Public Health threats is possible. Specifically, increased collaboration with community pharmacies was identified, given the important role which they played during the pandemic.

"Pharmacies played an essential role in the delivery of health care throughout the pandemic and were a key vaccination provider during the COVID-19 vaccination programme. Pharmacists are one of the most accessible health care professionals and further consideration should be given to the planning and delivery of health services in community pharmacies as part of an integrated primary care system…As the pharmacy sector was able to demonstrate its resilience during the pandemic, further integration of pharmacy services to support other primary care health initiatives should be continued and supported by government." **[ACTION]**
[Pharmaceutical Society of Ireland (PSI)]

Inter-sectoral or inter-agency collaboration was also identified as *"of crucial importance"* [National Health Intelligence Unit, HSE Consolidated)] with the COVID-19 pandemic showcasing the importance of collaborative working in Public Health. A need to build on these pandemic relationships was also identified by respondents.

"Essential to have a joined-up approach particularly between Environmental Health, Public Health, and HSE Emergency Management. Pre-pandemic this was a 'nice to have' and did happen from time-to-time, but the pandemic has taught us that collaborative working is essential. Collaborative relationships are forged in peacetime. (Directors of Public Health)" [HSE Consolidated]

Increased collaboration and the strengthening of links between academic institutions and Public Health was also emphasised by respondents, with suggested actions including joint academic/Public Health posts, the training and deployment of health-related graduate students into Public Health and the co-location of academic and service oriented Public Health units in dedicated facilities that support porous interfaces between Public Health research, policy and practice.

"Consider linking public health areas with academic institutions. Evaluate the Canadian model of Public Health Collaborating Centres to determine its fit within the

Irish health system. With this model, there could be opportunities for practitioners to bring problems/questions to academics, who could then provide research and evidence. (Directors of Public Health, National Screening Service)" **[ACTION]** [HSE Consolidated]

National and international collaboration was also commented on by respondents, with the Institute of Public Health in Ireland stating that *"whilst not all public health objectives require an all-island approach... the benefit of collaborative working has been unquestionably demonstrated...The development of a North South Leadership Forum on public health could be a first step towards identifying areas for future collaboration on an all-island basis, and the Institute would be happy to facilitate this as an all-island body."*

Furthermore, to enhance the quality of care provided by Public Health, and to extend Ireland's influence in global Public Health, international collaboration through training, knowledge exchange and research were explicitly identified.

"Strengthen global health functions in the [Department] of Health and HSE to achieve greater global coordination and collaboration in pandemics and other [Public Health] threats, and to learn from [Public Health] approaches in other countries." [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)]

Further categories related to collaboration and communication were community engagement, clear communication, stakeholder engagement and collaborative working with colleagues (Appendix 4).

Leadership, management, and governance

Four categories were identified in relation to leadership, management and governance (Figure 4):

- strengthening governance
- strengthening regional Public Health Departments
- Public Health leadership
- integrated Public Health.

Respondents regularly commented that Public Health governance needed to be reviewed and strengthened with the Directors of Public Health group acknowledging that the current Public Health reform should *"go some way to address current governance deficits; address parallel structure of [contact management programme] and align with national [Public Health] governance".* Respondents also stated that the establishment of a National Institute of Public Health would allow for the

restructuring and strengthening of Public Health governance, while also leading on Public Health policy, information, data collection and surveillance.

"IEMAG would support the establishment of a National Institute for Public Health, to include the functions of the Health Protection Surveillance Centre, a new National Health Data Centre, and other components of the public health system with a national remit, providing support for and governance oversight of strong Regional Departments of Public Health." **[ACTION]** [Irish Epidemiological Modelling Advisory Group (IEMAG)]

"There is an urgent need to review current (new model) governance structures for the delivery of public health within the context of lessons learned from experience with COVID-19. Public health governance needs to be strengthened through the establishment of a strong national function with a single line of governance across all domains of practice from national to regional levels with local intelligence and experience being fed up to national structures to support national policy and strategy." **[ACTION]** [Irish Society of Specialists in Public Health Medicine]

Respondents also identified that the strengthening of regional Public Health Departments, through increased supports and autonomy, was key to engaging with local communities, expanding health education, facilitating multi-sectoral action and increasing multidisciplinary collaboration.

"Strengthened regional departments of Public Health with autonomy to protect the health of their population would increase capacity to collaborate with colleagues in other disciplines, including infectious diseases, paediatrics, pathology, obstetrics, occupational health and general practice. The transfer of knowledge and skills would be increased by cross-disciplinary training, and involvement of the range of specialties in grand rounds and continuing professional development." [Royal College of Physicians of Ireland (RCPI)]

Lastly, the strengthening of Public Health leadership, both *"within and beyond the health service"* [Irish Society of Specialists in Public Health Medicine] was identified by respondents, with respondents explicitly identifying leadership of Regional Health Areas (RHA), at operational level and at local Public Health physician level.

"There needs to be public health leadership within and beyond the health service with the need to develop multisectoral partnerships for health and wellbeing driven by a national strategy for the delivery of the EPHFs. Whether this leadership is best placed within the HSE or in an independent body remains for discussion. (EPHF3; EPHF4 supporting all EPHFs)." [Irish Society of Specialists in Public Health Medicine]

The need for integrated Public Health was also identified as a category in relation to leadership, management and governance (Appendix 4).

Legislation and policy

Three categories were identified in relation to legislation and policy (Figure 4):

- reformed/new legislation
- Public Health involvement
- reformed/new policy.

Respondents stated that a review and reform of the current Public Health legislative framework is required, with suggestions that this should focus on emergency preparedness, the role of the State in health improvement, health inequalities, the implementation of eHealth and the secondary use of health information.

"Ireland's public health legislative framework is in need of reform. A new legislative framework and a Healthy Ireland Act must clearly underline the role of the State in health improvement and ensure that the social and economic determinants of health are explicitly recognised." **[ACTION]** [Institute of Public Health in Ireland]

Furthermore, respondents identified that new legislation is required on a vaccine compensation scheme, and to support physical activity.

"New legislation is also required to encourage a new way of planning of housing in areas that are in the living hubs to allow for a walkable and cyclable city."
[ACTION] [Royal College of Surgeons in Ireland (RCSI)]

Public Health should also be involved in the development of policy which impacts public health, with the Irish Pharmacy Union stating that representation of pharmacists across all working groups was not apparent.

"Involve local community pharmacies in policy and service development. Many of the working groups did not have adequate pharmacist representation which rendered them blind to the potential for pharmacists to support achievement of objectives."
[ACTION] [Irish Pharmacy Union]

The involvement of Public Health researchers to identify research gaps for policy development, and estimate the impacts of policy on public health, was also identified by respondents.

"Health Impact Assessment as a statutory requirement in policy-making would help non-health sectors to develop an understanding of the impact that policies and

legislation can have on health and health inequalities and bolster legislative reform." **[ACTION]** [Institute of Public Health in Ireland]

Lastly, respondents identified the need for new or reformed policy, with suggestions including the development of a national medicines policy, the integration of the national policy to promote physical activity with local planning processes and policy adaption to account for the impact of planetary health changes (global warming, biodiversity crises etc.).

"...the World Health Organisation has declared climate change to be the single biggest health threat facing humanity. Responses to [issues such as air pollution, food and water insecurity, expanding ranges of infectious disease vectors, extremes of temperatures, extreme weather events and natural disasters] all form part of the public health function, and public health teams need to be at the centre of mitigation and adaptation policy response development representing the health needs of their populations." **[ACTION]** [RCSI]

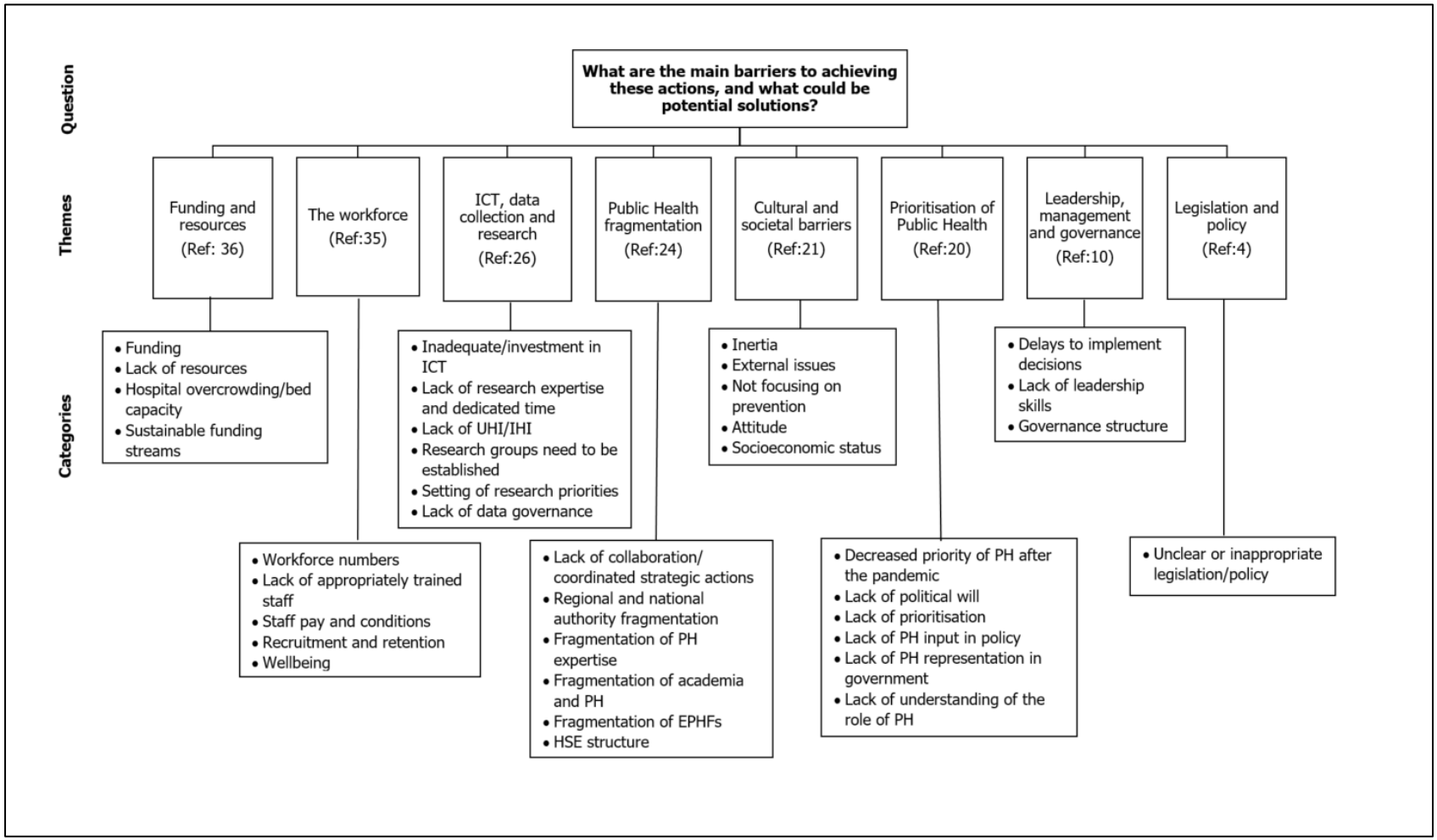
3.5 Barriers to achieving actions, and solutions to overcome them

In response to question five "What are the main barriers to achieving these actions, and what could be potential solutions?" eight themes were identified (Figure 5):

- the workforce
- funding and resources
- ICT, data collection and research
- Public Health fragmentation
- cultural and societal barriers
- prioritisation of Public Health
- leadership, management and governance
- legislation and policy.

Seven percent of respondents (2/28) did not answer the question (93% question response rate). As respondents regularly combined their responses to include both the barrier, and the solution to overcome this barrier, themes were derived to encapsulate respondents overall responses. Where respondents explicitly identified a solution, this was identified.

Figure 5. Themes and categories identified in response to question five



Key: EPHF – Essential Public Health Function; ICT – Information and Communications Technology; PH – Public Health; Ref - number of references to this theme in the survey responses; UHI/IHI – Unique Health Identifier/Individual Health Identifier.

The workforce

Five categories were identified in relation to the workforce (Figure 5):

- workforce numbers
- lack of appropriately trained staff
- staff pay and conditions
- recruitment and retention
- wellbeing.

Lack of staff, particularly in consultant roles, Senior Area Medical Officer roles and senior supporting staff roles were identified by respondents. A *"chronic consultant shortage"* [National Virus Reference Laboratory (NVRL), University College Dublin (UCD)] was identified, however respondents stated that until this was recognised as an emergency it would be slow to change. While workforce planning and workforce agreements are possible solutions to increase workforce numbers, lessons should be learned from previous agreements.

"The Public Health Workforce Plan is very welcome and was a remarkable achievement... Ongoing Public Health workforce planning, such as occurs in UK and Scotland, is vital as the lead-in time for Public Health staff is significant. There is also a need to agree public health specific skills and competencies similar to international models. (Directors of Public Health)" **[SOLUTION]** [HSE Consolidated]

"Previous agreements reached on workforce numbers such as the 2003 agreement did not have regard to increases in the population. As the population increases the workforce must also increase correspondingly." **[SOLUTION]** [Irish Medical Organisation (IMO)]

The consideration of population demographics when workforce planning was also further supported.

"There are significant demographic considerations. Departments of Public Health without sufficient Consultants for population – match numbers to population." **[SOLUTION]** [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)].

While respondents commented on lack of staff, this was further emphasised by comments around the need for appropriately trained staff, with an emphasis on staff with the right skills mix. Both RCSI and RCPI identified the need for a skills review, particularly to develop multidisciplinary Public Health teams.

"As previously noted, effective public health function is dependent on adequate, well trained and well organised staff. There needs to be a review of the skill mix required at every level and proper recognition and value for multidisciplinary public health within local teams. These staff should be working in teams with General Practice, community care staff, hospital staff, social care staff, local planners, developers, educationalist, and civic leaders." **[SOLUTION]** [Royal College of Surgeons in Ireland (RCSI)].

Furthermore, there was an acknowledgement that staff recruited during the pandemic have little formal Public Health training, and this should be addressed.

"A large majority of the new workforce have had no prior formal public health training when they joined Public Health teams over the last year – they were trained in the Covid response and became very proficient. In order to broaden their scope of activity, there is a need for a robust training plan is in line with Public Health Strategy." **[SOLUTION]** [The Directors of Public Health group]

Respondents also identified the need for improved staff contracts, in terms of overtime pay, on call arrangements and base pay. In regards to overtime pay, the HSE Environmental Health Service (EHS) stated that due to low pay, EHS staff more frequently take time in lieu over payment, for overtime completed.

"Particular barrier for EHS is lack of a formalised on call arrangement out of hours and a very poor overtime payment scheme (paid overtime is paid only at Grade V salary regardless of [Environmental Health Officer] grade) which means most EHS staff will seek Time off in lieu instead of payment. This then acts a further barrier to the protection of public health as it constrains the completion of routine core functions and meeting of [Key Performance Indicators]. All on call arrangements in EHS at present at on a 'good will' basis. Solution: additional resources to establish an on-call system with enhanced out of hours payments." **[SOLUTION]** [EHS]

Additionally, IMO identified that there may be future issues regarding the Public Health Medicine consultants roles.

"While the agreement for the establishment of the 84 Consultant in Public Health Medicine posts is welcome, there are some key deficits which must be addressed. All posts currently are paid on the same scale without any clinical director or leadership allowances. The initial uptake of leadership positions will be positive as these posts are the first consultant posts available, over time as more consultant posts come on stream at the same salary level it will be difficult to maintain the attractiveness of senior positions. It is not hard to envision a scenario whereby a consultant in a national leadership position applies for another consultant role given that it is on the

same salary but may not have the same leadership requirements. An obvious solution would be for the state to introduce a leadership allowance akin at a clinical director allowance which hospital consultants who take on such leadership roles hold. This will ensure that the most important positions in the structure are attractive relevant to other posts and will retain doctors in such roles."
[SOLUTION] [IMO]

Further categories related to the workforce included recruitment and retention, and wellbeing (Appendix 5).

Funding and resources

Four categories were identified in relation to funding and resources (Figure 5):

- funding
- lack of resources
- hospital overcrowding/bed capacity
- sustainable funding streams.

The provision of funding was regularly identified by respondents as a barrier, with the RSA acknowledging that an increase in funding may be *"particularly challenging to maintain in the aftermath of the pandemic".* When explicitly identifying areas which require funding, respondents mentioned: expansion of the public health workforce, communication, development of electronic health records, National Reference Laboratories, prevention, children's health and mental health. Respondents also identified that prioritised funding should be guided by a Public Health strategy.

"Many of these barriers are funding dependent; prioritisation of actions for investment should be guided by a Public Health Strategy, which is a priority deliverable for incoming Public Health Consultant leadership at national and area level." **[SOLUTION]** [HSE Consolidated]

A lack of resources was inherently tied to funding, as a barrier for implementing actions within Public Health. While respondents acknowledged that there is currently a lack of resources within Public Health to deliver the reform, they also noted the impact of further global issues such as the war in Ukraine.

"The main barriers at present are the inadequate resources to deliver the reform across all domains of practice, especially since Public Health continues to be heavily involved in managing COVID-19 outbreaks and its other health protection roles. It is now rapidly adapting to the humanitarian crisis in Ukraine that is resulting in the

influx of refugees. The transition will therefore need to be carefully managed, to retain the skills of those transferring to other domains, to ensure flexibility in the event of emergencies, and back up if required out of hours." **[SOLUTION]** [Royal College of Physicians of Ireland (RCPI)]

"Resources are the greatest challenge, and at the political side the problem may be worsened by the public perception of the overall health service as having a paradoxical abundance of middle management with simultaneous shortage of front-line workers. Good stakeholder engagement and clear communications of public health benefits will make the resourcing process easier, and having proposal-writing and communications professionals on-board to assist with advocating for funding will be useful in this area." **[SOLUTION]** [University of Limerick School of Medicine (UL)]

Respondents also identified that hospital overcrowding and limited bed capacity, presents a significant strain on the current healthcare system and that "*it is indicative of the deterioration in health service provision with the numbers of patients without access to beds for growing daily. A whole-system approach is required to tackle the key challenges affecting health service delivery."* [Irish Nurses and Midwives Organisation (INMO)].

The Institute of Public Health in Ireland also identified that to attain funding to invest in public health interventions *"fiscal measures to regulate industry compliance to legislation, such as industry levies, can be used... For example, the Soft Drinks Industry Levy returned £336m to the UK Treasury in the financial year 2019/20. Ring-fenced funding for public health interventions can be enhanced through hypothecation of taxation on tobacco products, sugar sweetened drinks and other unhealthy commodities."*

ICT, data collection and research

Six categories were identified in relation to ICT, data collection and research (Figure 5).

- inadequate/investment in ICT
- lack of research expertise and dedicated time
- lack of UHI/IHI
- research groups need to be established
- setting of research priorities
- lack of data governance.

Respondents regularly identified that a historical lack of investment in ICT, infrastructure and personnel, has led to an ICT deficit in the healthcare system. Respondents specifically identified the need for public interaction ICT, a review of the National Laboratory Information Management System and ICT to support the implementation of electronic health records. The Directors of Public Health group also identified the need for ICT to support workforce development with the Case and Management System identified as a possible support tool.

"Public Health staff of all grades and disciplines worked incredibly hard during the pandemic, did huge preventative work, but the current IT systems are such that it is not possible to produce timely regular reports on Public Health activities. Development of ways to measure and value the work done in preventing transmission, preventing serious illness and deaths are needed, and need to be attributed to public health work done. The solution is to continue to prioritise the work that is underway in relation to the Case and Incident Management system for Public Health. This will enable the development of [Key Performance Indicators] for Health Protection work and support regular reporting on Public Health service activity. This should support development of the workforce". **[SOLUTION]** [The Directors of Public Health group]

A lack of research expertise, and or dedicated time for research was also commented on by respondents. In regards to research expertise the National Screening Service [HSE Consolidated] stated there was a lack of staff skilled in mathematical or disease modelling, while commentary around the misinterpretation of GDPR indicated the need for data protection expertise. Respondents also identified that capacity was needed to allow for time to conduct research with the HPRA stating "*...in relation to the proposed initiative relating to clinical research, while significant work has been undertaken within the HSE to promote clinical research within the health system, the absence of ring-fenced time for appropriately experienced medical practitioners to conduct research has been a significant challenge and this would need to be addressed. However, we believe that the multi-agency approaches envisaged in these actions have the potential to deliver significant efficiencies in the medium to long-term by ensuring aligned actions between different stakeholder groups which will help to deliver outcomes that will benefit all involved and the health system as a whole.".*

Respondents also identified that while general improvements and investment in ICT were required, without the UHI/IHI Ireland would not have *"even an adequate, let alone, world class public health system"* [Royal College of Surgeons in Ireland (RCSI)]. Furthermore, HIQA emphasised that without UHI//IHI data linkage is not routinely possible, and that while there would be a cost to implementing the correct

data collection and management processes, this would positively impact future evidence based decision making.

"A major issue is that data are often available only for a subgroup of the population, such as those with medical cards, meaning that the data are not nationally representative. In the absence of unique health identifiers, data linkage is not routinely possible…While there are costs associated with prospective data collection and management, the benefits are the ability to analyse relevant data in a timely manner to inform decision-making rather than making inferences using a range of datasets that are mismatched in terms of timing and population." [Health Information and Quality Authority (HIQA)]

Further categories related to ICT, data collection and research included research groups need to be established, setting of research priorities and the lack of data governance (Appendix 5).

Public Health fragmentation

Six categories were identified in relation to Public Health fragmentation (Figure 5):

- lack of collaboration/coordinated strategic actions
- regional and national authority fragmentation
- fragmentation of Public Health expertise
- fragmentation of academia and Public Health
- fragmentation of EPHFs
- HSE structure.

Respondents identified that a lack of collaboration or coordinated strategic actions acts as a barrier within the healthcare system, with RCPI identifying that *"Integration of [regional] multidisciplinary teams in terms of the key Public Health pillars of health protection, health improvement and health service improvement, underpinned by excellent health intelligence"* as a key enabler to strengthening regional authorities.

Additionally, the IEMAG identified the need for a follow-up group, after the completion of the PHR EAG.

"With regard to collective strategic action, we recommend that the Public Health Reform Expert Advisory Group process be succeeded by a high-level implementation group, empowered to bring the relevant Government departments and state agencies together to implement an agreed set of recommendations." **[SOLUTION]** [Irish Epidemiological Modelling Advisory Group (IEMAG)]

The strengthening of regional authorities was regularly identified by respondents, with the establishment of Regional Health Areas (RHAs) and regionalisation as agreed in the Sláintecare policy supported. However, respondents emphasised that with *"stronger and clear governance and structures at national and regional level and across government"* [National Screening Advisory Committee (NSAC)] was required for successful regionalisation. The School of Medicine (UL) stated that currently *"The Structure of Public Health Services at the regional and national levels is not allowing autonomy, coordination, and efficiency. Reforming health services to enable better coordination and collaboration between different departments at the regional and national level."* The Directors of Public Health group also supported this regionalisation, but stated the need for balance.

"Getting the balance right between Regional and National Public Health. The learning from the Pandemic has been that strengthening Regional Public Health is key. (Mike Ryan WHO). Need strong National and Regional Public Health for the future." [The Directors of Public Health group].

Respondents also commented on the fragmentation of Public Health expertise, explicitly mentioning the exclusion of pharmacists in relation to Public Health policy and the division of Public Health and health promotion expertise. More generally, the Irish Society of Specialists in Public Health Medicine identified that this fragmentation of expertise impacts overall EPHF delivery.

"The fragmentation of public health expertise within HSE infrastructure, diminishes the effective and efficient delivery of the EPHFs as well as reducing the ability of public health to create and sustain strong multisectoral partnerships for health and wellbeing. Strong national level leadership and representation of the public health voice at the highest levels will be necessary to prevent this from further eroding public health capacity and maintaining the focus on expensive hospital centric care. Whether this leadership will be most effective within the HSE or independent of the HSE remains for discussion." **[SOLUTION]** [Irish Society of Specialists in Public Health Medicine]

Fragmentation of EPHFs was also identified by respondents as a possible barrier, with the Directors of Public Health group stating that it impacts the efficiency with which EPHFs are delivered.

"Fragmentation of Essential Public Health functions is the main barrier to achieving efficient and effective public health responses. With fragmentation comes duplication and inefficiency and decreased effectiveness. The solution is a unified Public Health function." **[SOLUTION]** [The Directors of Public Health group]

Lastly, it was identified that HSE structures could be improved upon, and "*there is a need for a Public Health Directorate / National Service. (Health Protection Surveillance Centre)."* **[SOLUTION]** [HSE Consolidated].

Fragmentation of academia and Public Health was also identified in relation to Public Health fragmentation (Appendix 5).

Cultural and societal barriers

Five categories were identified in relation to cultural and societal barriers (Figure 5):

- inertia
- external issues
- not focusing on prevention
- attitude
- socioeconomic status.

Respondents commented that as a whole the healthcare system can be resistant to change, particularly in instances where stakeholders are effected. Respondents did however, acknowledge that this may be influenced by high workforce pressure.

"Across the whole spectrum, there may also be institutional barriers such as slow change processes, unwillingness to engage with new initiatives due to workload pressures – in all these aspects it would be beneficial to add change management professionals to ensure fidelity of implementation, as well as engagement at different levels and cadres to maintain stakeholder relationships and build common understanding" **[SOLUTION]** [University of Limerick School of Medicine (UL)]

However, RCPI stated that the pandemic may have a positive impact on our ability to *"to embrace change and innovation rapidly. Change is not always easy but the last 2 years has taught us as a profession it is possible. This is evidenced by the submissions of the Faculty to the Crowe Horwath review, based on consultation with Members and Fellows, which advocated for the 'hub and spoke' model of service."*

Additionally, the School of Medicine (UL) suggested that while institutional inertia and a culture that is resistant to reform is apparent, "*A potential solution in a female dominated workforce may lie in enforcing equality, diversity and inclusion policies."*

Respondents also identified the impact that external issues have on the healthcare system, with issues such as the war on Ukraine (and the associated influx of refugees), inflation, the obesity crisis, the possible reoccurrence of a pandemic, and

cyber security threats all identified as possible barriers or challenges which Public Health will be met with.

"The war in Ukraine and the substantial influx of refugees will present additional challenges to the health system and planning and resource will be needed to address the health needs of a displaced and traumatised population. It will bring an influx of new needs, such as mental ill-health, and possible challenges to recent successes, such as high vaccination coverage levels for COVID-19. Inflation and potential food and energy shortages will affect the most vulnerable of the existing population and will need to be addressed adequately in government planning. However, some lessons learned and the partnerships developed during the pandemic will be useful in rising to these challenges." [Royal College of Surgeons in Ireland (RCSI)]

Respondents also identified that the current Public Health system focuses on treatment rather than prevention, and aligned with Sláintecare, a move towards prevention and health promotion should be prioritised at primary, secondary and tertiary level.

"There is an enormous focus by our society (and therefore by healthcare practitioners) on hospital-based, individual patient care with consequent allocation of most resources to the treatment of the sick. A renewed focus on promotion of good health and wellbeing is a most logical approach – prevention is better than cure. Unfortunately, this is much more difficult to resource – it lacks the 'burning bridge' which often influences resourcing decisions." [Department of Agriculture]

Further categories related to cultural and societal barriers included attitude and socioeconomic status (Appendix 5).

Prioritisation of Public Health

Six categories were identified in relation to the prioritisation of Public Health (Figure 5):

- decreased priority of Public Health after the pandemic
- lack of political will
- lack of prioritisation
- lack of Public Health input into policy
- lack of Public Health representation
- lack of understanding of the role of Public Health.

While Public Health was provided with increased resources (workforce, budget etc.) during the pandemic, respondents commented that it was important this prioritisation of Public Health continued post-pandemic and that we *"take the opportunity to strengthen and develop our public health workforce allowing all four domains to flourish and deliver the essential public health functions in a world class manner"* [Irish Medical Organisation (IMO)]. More specifically, respondents said that the risk of decreased investment in Public Health could be offset by the Public Health reform and continued engagement with the government and HSE.

"Risk of decreased focus on / investment in public health issues once immediate crisis e.g. the pandemic, is dealt with. Solution to this is continuing with HSE [Public Health] reform and building on this, together with advocacy, lobbying, publications, communications, and place on the HSE leadership team... (Directors of Public Health)" **[SOLUTION]** [HSE Consolidated]

Respondents also identified that a lack of political will, to invest in and support Public Health, may present a barrier to strengthening Public Health. While respondents acknowledged that the pandemic has led to increased investment in health protection and infectious disease control, the broader Public Health agenda has not been supported.

"Public health has been hindered by inadequate investment and prioritisation of its agenda, particularly in respect of health improvement. Whilst the pandemic raised the profile of public health, it did so in terms of health protection and infectious disease control rather and the long-standing pandemics of tobacco, alcohol and diet related diseases remain under-recognised. There is no high-level Ministerial Group on Public Health – a forum for high level Departmental cooperation on the Healthy Ireland agenda was proposed but never progressed." [Institute of Public Health in Ireland]

"Political will and resourcing are a huge barrier, and while there is current recognition and global political momentum towards improving public health capacities, this will rapidly fade. Any proposed solutions must come with an implementation plan, identification of needed resources and a commitment from the highest political level to ensure implementation proceeds in a timely manner." [Irish Society of Specialists in Public Health Medicine]

Public Health not being prioritised was also identified as a barrier by respondents, with the development of a national Public Health strategy suggested as a guide for the *"prioritisation of actions for investment"* [HSE Consolidated]. Furthermore, HIQA

suggested that difficulties around the evaluation of EPHF outcomes, has impacted the prioritisation of the development of a public health model.

"The development of a public health model has generally been considered a lower priority than acute care, likely because the prospective benefits of EPHFs are more difficult to gauge compared to tangible outcomes in acute or community care. In order to address this, the following is needed: political commitment and leadership, adequate funding and resourcing of a public health model based on the needs of the population, fit-for-purpose health information legislation and a health information strategy, a national, independent agency for health information, the implementation of regional models of health provided in the community, as outlined in the Sláintecare reform programme" **[SOLUTION]** [Health Information and Quality Authority (HIQA)]

Further categories related to the prioritisation of Public Health included the lack of Public Health input in policy, lack of Public Health representation in government and lack of understanding of the role of Public Health (Appendix 5).

Leadership, management and governance

Three categories were identified in relation to leadership, management and governance (Figure 5):

- delays to implement decisions
- lack of leadership skills
- governance structure.

Respondents commented that delays to implement decisions *"are grave impediments to public morale and public support"* [National Screening Advisory Committee (NSAC)] and that we should learn from the implementation of Sláintecare, how difficult it is to implement new strategies within the Irish health service. It was also noted by the INMO that during the pandemic, delays in applying the precautionary principle may have risked worker safety.

"Throughout successive waves of the pandemic, nurses, midwives, and other healthcare workers were put at risk due to poor decision-making on the employer's side. The HSE was too slow in applying the precautionary principle, and unless it is pressured into doing so, worker safety is delayed. International evidence from this, and previous epidemics and pandemics are clear. Where employers fail to follow the precautionary principle and instead insist on scientific certainty to guide workers' protection, workers are at greater risk and are harmed." [Irish Nurses and Midwives Organisation (INMO)]

Additionally, respondents identified a lack of leadership as a possible *"huge barrier"* [HSE Environmental Health Service (EHS)], but noted that this should improve when the National Public Health Lead is in post. Furthermore, training in leadership should be provided to ensure those with good technical skills, are supported in being leaders.

"Just because one is technically good as a clinical/allied health professional does not mean that one is automatically good at strategically leading or operationally managing a service/system. Solution: Invest in leadership development and workforce succession planning." **[SOLUTION]** [HSE EHS]

Respondents also commented that governance structures or lack of, could act as a barrier to actions, particularly if clear governance between national and regional authorities is not established.

"The main concern is that regional authorities would operate as independent agencies. Stronger and clear governance and structures at national and regional level and across government will be obligatory. Decisions are needed as to how this will function when the HSE moves to regional areas but models from other countries exist." **[SOLUTION]** [NSAC]

Legislation and policy

One category was identified in relation to legislation and policy (Figure 5):

- unclear or inappropriate legislation/policy.

Respondents identified that governmental policy development can often conflict with health improvement, and that having clear legislation and policy, that supported and prioritised Public Health, and that was developed with stakeholder engagement, was key to enhancing Public Health delivery.

"The key to a successful public health system in Ireland is having clear policy and legislation which is implemented and enforced as necessary by National Public Health teams. Such teams need to have a regional footprint and be resourced with both medical and non-medical experts. In addition to working on promotion, prevention, monitoring of public health, these teams should also have a role in addressing infectious disease outbreaks and taking inspection and enforcement action as necessary." **[SOLUTION]** [Health and Safety Authority (HSA)]

4 Discussion

The current report aimed to summarise and present public consultation survey data, gathered by the Department of Health, to inform the work of the PHR EAG. Twenty-eight organisations working in the Public Health domain in Ireland provided feedback on the delivery of EPHFs before and considering the COVID-19 pandemic. In addition, respondents identified what they believed were the key lessons learned and success stories as a result of the pandemic, the key areas for strengthening and tangible actions, and the barriers to these actions along with proposed solutions. Common themes across respondent feedback related to the workforce; leadership, management and governance; ICT, data collection and research; and preparedness. Additionally, major success stories of the pandemic as identified by respondents were improved and increased collaboration across organisations; technological innovation; and more broadly the Public Health response, particularly the vaccination rollout. These findings identify key learnings from the COVID-19 pandemic that may have implications for enhanced health protection and preparedness for future public health crises.

In relation to the workforce, respondents identified that long-term issues with staff shortages and resourcing resulted in significant challenges in responding to the pandemic. Additionally, the wide skillset required to deliver the full remit of the EPHFs, and difficulties in ensuring that individuals with these skills are recruited, were highlighted. These issues were reported to be long-standing, with significant pre-pandemic challenges in terms of staff shortages and inadequate skill-mix highlighted. The need for investment along with ongoing workforce planning was consistently reported by respondents as a possible solution. Workforce planning is deemed essential to the healthcare system, as it allows the system to meet patient needs, ensures tax payers money is not wasted on training surplus staff, and allows for staff training time.[9] Respondents often cited the UK model of workforce planning as something which could be built upon; this model uses skills-based planning to ensure recruitment of the correct skills mix. Building upon this, the "Horizon 2035 health and care workforce futures - Future demand for skills: Initial results" report identified that a different skill profile will be required in the public health workforce in England in 2035, with the demand for "lower" levels of skill (for example, those working in unpaid care, support carers and National Health Service (NHS) bands 1-4) substantially outnumbering the demand for those higher skill levels associated with medical and dental professions.[10] Furthermore, in the UK a Workforce Review Team, supports workforce decisions through advising managers and policy makers on effective working strategies and influencing workforce planning priorities.[9] This team is central to NHS England's workforce planning system. It was

highlighted that Ireland will need to place considerable emphasis on workforce planning in order to ensure that the Public Health system is fit-for-purpose and can withstand future threats or crises. The planning needs to consider the required skills mix and the means to support the recruitment and retention of these staff.

Leadership, management and governance was also identified as a reoccurring theme across respondents' comments. Governance and leadership before the pandemic was characterised as poor by many respondents and this was identified as a contributing factor to the difficulties and inefficiencies experienced in the pandemic response. It is well recognised that strong Public Health governance and the alignment of Public Health systems and political leadership are required in the face of a Public Health crises.[11] This was supported by respondents who identified the strengthening and formalising of official structures to prevent difficulties from arising in future, as a key lesson learned from the pandemic. Furthermore, it was suggested that a new mode of crisis management should be undertaken in regards to public governance, to allow for the "formation of a response network that can adapt and innovate in response to a crisis".[12] It is suggested that public governance, much like the delivery of Public Health, should be undertaken using a whole of society approach.[12]

ICT, data collection, and research capabilities were reoccurring, interlinked themes across respondents' comments, with respondents consistently reporting inadequate and outdated technology that was not fit for purpose. Respondents specifically identified the need for a case and incident management system and an integrated national immunisation system. In Ireland, at the onset of the COVID-19 pandemic, the national contact management programme combined with the CovidCare Tracker (CTT) were used to support Public Health teams in monitoring COVID-19.[13] While successfully implemented, this case management system response was developed reactively, with limited stakeholder consultation and may therefore not meet the demands of future Public Health threats. In 2010, the UK deployed a case and incident management system, Health Protection zone (HPZone), to provide Health Protection Professionals with comprehensive information on threats, incidents and enhanced intelligence, at a local level.[14] Developed over a five-year period in conjunction with stakeholders, HPZone was successfully used to provide information on COVID-19 cases, contacts and communications to local Health Protection Teams throughout the pandemic.[15, 16] Implementation of a case and incident management system similar to HPZone may assist Public Health in the management of future health threats. In relation to an integrated national immunisation system, national vaccine registers have been identified as key to vaccine programme monitoring,[17] with the UK accelerating their development and implementation of the National Immunisation Management System in response to the COVID-19 pandemic and

associated vaccine rollout.[18] In Ireland in 2011, the NIO coordinated the implementation of the first national IT immunisation system recording human papilloma virus (HPV) vaccination[19] and, while implementation of a National Immunisation Information System was to follow, this progress was hampered due to the COVID-19 pandemic. Furthermore, while funding and resource availability were identified as barriers to improving ICT deficits, it would be expected that increased budget and resourcing will be allocated as part of the eHealth agenda within Sláintecare reform, which includes the intended rollout of eHealth initiatives such as unique/individual health identifiers (UHI/IHIs) and electronic health records.[20] The introduction of UHI/IHIs in Ireland has long been recommended[21] and COVID-19 facilitated their introduction with anyone who received a COVID-19 test, was contact traced, or signed up for a vaccine allocated an UHI/IHI.[22] However, progress on much of the Sláintecare eHealth rollout has been negatively impacted by the need to prioritise eHealth solutions focussed on the pandemic and recovery from the cyber-attack in May 2021.[20]

Preparedness was also identified as a reoccurring theme across respondents' comments. While the Department of Health Statement of Strategy 2021-2023 identifies Public Health as a priority within *Strategic Priority 1: Manage COVID-19 and promote public health*, as of May 2022, there is no national Public Health strategy in Ireland. Respondents identified that the development of a national Public Health strategy would encourage coordinated, strategic, Public Health actions, particularly in relation to any future Public Health threats. The World Health Organisation's *Action plan to improve public health preparedness and response in the WHO European Region 2018–2023*[23] identifies the need for individual country ownership of a needs-based approach to capacity development and outlines three Strategic pillars:

1 - Build, strengthen and maintain States Parties' core capacities required under the International Health Regulations (IHR) (2005)

2 - Strengthen event management compliance with the requirements under the IHR (2005)

3 - Measure progress and promote accountability.[23]

These pillars may aid in the development of a national Public Health strategy, keeping Public Health preparedness at the core. Additionally, the need to be able to respond to crises and cope with surges in healthcare demand was linked to preparedness, with addressing workforce shortages regularly highlighted by both respondents and in the literature[24] as a priority in emergency preparedness. To

strengthen preparedness, respondents identified the need to ensure full implementation of Sláintecare is undertaken, particularly in relation to eHealth implementation, the increased focus on public health and health promotion, the expansion of a multidisciplinary workforce, and the implementation of universal healthcare. Indeed, it has been reported elsewhere that universal health systems that ensure better access for all are more resilient to shocks.[25] While it is widely acknowledged that Sláintecare implementation has made limited progress,[26] the COVID-19 pandemic has renewed focus on the public health system in Ireland and may offer an opportunity to embed pandemic learnings into Sláintecare, particularly via the HRB funded project, "Health system foundations for Sláintecare implementation in 2020 and beyond – coproducing a Sláintecare Living Implementation Framework with Evaluation: Learning from the Irish health system response to COVID-19".[27]

Success stories of the COVID-19 pandemic were also identified by respondents with the most commonly reported being the increased and improved collaboration within and across disciplines. A wide variety of newly formed collaborative relationships were highlighted, each contributing to various elements of Public Health interventions, communications, and support measures for individuals. The two other most frequently mentioned success stories were the Public Health response itself, in particular the vaccine rollout and the effective use of evidence (from expert advisory groups and evidence synthesis teams) and technological innovation (for example, telehealth, the COVID Care Tracker system, and the HSE COVID Tracker App). The success of the vaccine rollout represents a major success in terms of the vaccine technology, logistics, and effective communication to ensure confidence in, and uptake of, the vaccine by the vast majority of the population.[28] Additionally, sentiment analysis of user feedback on the HSE COVID Tracker App revealed a largely positive sentiment towards the app and a general satisfaction with how it handled data protection and transparency aspects.[29] However, these successes were also underpinned by the effective collaboration and multidisciplinary work mentioned above. For example, groups tasked with the pandemic response were provided with evidence to underpin their decisions by various health research agencies (for example, HIQA, ESRI and the HSE Library Service) and collaborations between the Irish Government, HSE, NearForm and Science Foundation Ireland facilitated the development of the COVID Tracker app. Respondents recognised that many collaborative relationships were formed and now exist solely in the context of COVID-19 and, going forward, these relationships should be maintained and expanded to address other issues such as chronic disease prevention, climate change response, and health inequalities. This view was also commonly reported in

response to the question “What key areas in the public health system need strengthening over the next 3-5 years?”.

4.1 Limitations

Due to the voluntary nature of the study, the results presented are reflective of the organisations who chose to submit a response and therefore may differ from the opinions of those who did not. While it is noted that most of the relevant sectors and large Public Health organisations in Ireland are represented within this report (with medical, academic, scientific, environmental and governmental sectors of Public Health included), it is possible that a specific sector was omitted. Therefore, the organisations who responded are potentially not fully representative of the entire community of organisations working in Public Health, in Ireland.

Within the survey, while five questions, focusing on specific topics (EPHF delivery before the pandemic, success stories from the pandemic, etc.) were outlined, many survey responses provided information outside the scope of the question asked, creating difficulties in the interpretation and analysis of the responses. There were a number of issues that contributed to this extended scope. Organisational responses were submitted in one of two ways: 17/28 (61%) of responses were submitted via the EUSurvey online portal, and the remaining 11 submitted via email. While the EUSurvey online portal limited respondents’ answers to each question via a character limit, this restriction did not apply to email submissions and may therefore have allowed for extended scope. Additionally, the survey question design resulted in three of the five open-ended questions investigating two dimensions within the one question (for example, question 5 asked for barriers and possible solutions). This may have contributed to individual question responses frequently touching on multiple areas of Public Health, causing a duplication of findings across questions. Where more than one dimension was presented in a question, there was a greater risk that respondents would answer out of scope or that they would fail to address both dimensions. To ensure survey respondents provide a truthful and accurate response, it is generally recommended in survey design that an individual question should seek only one answer on one dimension.[30]

Lastly, thematic analysis in itself is not without its limitations, as there is subjective input from the researcher when identifying and developing themes and codes from the provided text.[31] To limit this subjective bias, each question was initially coded by a minimum of two researchers, a draft codebook was developed and this was refined iteratively using a flexible approach, where researchers discussed their understanding and interpretation of the codes. Themes were also developed and refined through researcher discussion.

5 Conclusion

Organisations working within the Public Health domain in Ireland are well placed to provide valuable information around the delivery of EPHFs, success stories from the pandemic, and the key areas of Public Health which require strengthening. These organisations have experienced many difficulties when delivering change in Public Health and therefore can provide insight into how these can be overcome. The current report identified recurring themes around: the workforce; leadership, management and governance; ICT, data collection and research; and preparedness across respondents' comments. These themes may be key areas for consideration when guiding the work of the Public Health Reform EAG. Noting that collaboration was reported as a success story of the Public Health response to COVID-19, the Public Health Reform EAG may also want to consider initiatives that could support collaborative working and harness the multidisciplinary expertise of those working in Public Health in order to strengthen Public Health in Ireland.

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Appendix 1. Additional categories identified in response to question one (delivery of EPHF before the pandemic)

Theme	Category	Representative respondent quote
Implementation issues	Communication and community engagement	*"There has been a failure to systematically and meaningfully engage communities in health system planning and transformation. Community engagement at regional level has been ad hoc, unstructured and unsupported. Work in the area of health inequity, social determinants and the engagement of vulnerable populations has been under resourced without meaningful corporate support."* [Irish Society of Specialists in Public Health Medicine]
	Awareness of Public Health remit	*"Overall, for specialties which did not have interaction with Public Health physicians in advance of the pandemic, there was a low level of awareness of the latter's domains of practice apart from health protection. However, where there was collaboration with colleagues in other specialties, the expertise of Public Health physicians was recognised and valued, as was their contribution to and collaboration with the range of activities within the RCPI."* [Royal College of Physicians of Ireland (RCPI)]
The workforce	Recognition	*"The ability to change gear quickly to respond to pressures brought on by the pandemic and its evolving epidemiology has been of crucial importance to ensure the best response to the emerging priorities. This has created a backlog of work/pent up demand – but this was to be expected and fully understandable. Staff at all levels stood together and worked the hours and across weekends as necessary to make sure we continued to meet priority demands when the pressure was on. Such an environment helped to strengthen team relationships which will endure (Health Intelligence Unit)."* [HSE Consolidated]
	Lack of integration or collaboration	*"There was insufficient integration between the health intelligence function and those working in other domains. The small number of public health physicians working with the National Clinical Programmes on health service improvement were based in regional departments (mainly in the East), under the management of the [Directors of Public Health]. While contributing to health protection and out of hours locally, their work was not included in the annual public health Service Plan. Their work at national level was not linked to regional departments, resulting in loss of input to service planning in the hospital groups."* [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)]
Leadership, governance and legislation	Legislative frameworks	*"There is an absence of a clear legislative framework supporting emergency response. There is a lack of recognition of the role of global health within public health emergency management specifically and health protection broadly."* [Irish Society of Specialists in Public Health Medicine]

	Evidence-based policy	*"There is a need for evidence-based health promotion policies and programmes. With regard to prevention, screening acquired a public health function (with a [Director of Public Health] and [two] specialists) post publication of the Scally report into the cervical screening service."* [Faculty of Public Health Medicine, Royal College of Physicians of Ireland (RCPI)]
ICT, data collection and research	Use of HTA	*"Ensuring equitable access to and the rational use of essential medicines and other health technologies is also challenged when medicines are made available for reimbursement without prior assessment of the cost- and clinical effectiveness. While the process of pharmacoeconomic evaluation and health technology assessment assists in demonstrating the potential value of making such technologies available, the corresponding tools for decision-making regarding their reimbursement are relatively blunt. For many recently-licensed pharmaceuticals, limited evidence is available at the time of decision-making to support their value in the real-world setting. Mechanisms of post-reimbursement surveillance such as 'pay-for-performance' would enable more rational use of medicines by evaluating their use in practice."* [Health Information Quality Authority (HIQA)]
Health service delivery	Unmet need	*"Ireland's experience of unmet need has been identified as a serious challenge to equity of access to health care. Ireland has been identified as having the second-highest share of persons reporting unmet health needs for health care and there is a strong correlation between unmet need and the socio-economic status of specific cohorts in our society. Funding and waiting lists have been identified as the main reasons for unmet needs."* [Irish Nurses and Midwives Organisation (INMO)]

Appendix 2. Additional categories identified in response to question two (delivery of EPHF and key lessons learned in light of the pandemic)

Theme	Category	Representative respondent quote
	Lack of integration between systems	*"It was not possible to interrogate the CCT (Covid Care Tracker). Data collected and entered could not be used to inform public health actions for many months, then only on a very limited basis. Any analysis carried out was not primarily by public health"* [UCD School of Public Health, Physiotherapy and Sports Science, University College Dublin]
	Management of health information	*"Awareness among healthcare organisations and professionals of the importance of health information and good information management practices to support the effectiveness and efficiency of the Irish health system appears to have increased. Key lessons from the pandemic include the need for leadership and a clear strategy at the national level in relation healthcare information management."* [Health Information and Quality Authority (HIQA)]
Workforce issues	Failure to recognise expertise	*"The focus on appointing only people with a medical degree and only people who are accredited specialists in public health from the Faculty of Public Health Medicine, to public health workforce roles, remains a limiting problem in Ireland, which now needs to be addressed. There is an absolute lack of career structure available for non-medical professionals who have important skills urgently required by public health teams, such as epidemiologists, community health specialists, data experts, communication experts, IT leaders, and business managers."* [Royal College of Surgeons in Ireland (RCSI)]
	Wellbeing	*"Consideration needs to be given to workforce wellbeing and resulting requirements e.g. flexible training. Directors of Public Health"* [HSE Consolidated]
	Working conditions	*"Consultant posts need to be filled as matter of urgency and improved working conditions for doctors to prevent loss to emigration."* [University of Limerick School of Medicine (UL)]
	Training	*"Training our future Public Health workforce is fundamental to preparing for the next pandemic"* [Royal College of Physicians of Ireland (RCPI)]
	Planning and investment	*"A well-resourced, well- trained, well equipped, well managed, highly motivated, solution driven, engaged work force is essential in a crisis situation"* [HSE Environmental Health Service (EHS)]
Leadership, governance and Public Health structures	Overarching & integrated strategic plan	*"There is a need for national coordination and integration of EPHFs within an overarching, integrated strategic plan supported by appropriate resourcing"* [Irish Society of Specialists in Public Health Medicine]
	Clear governance	*"Structures and governance of public health are opaque. This impacts on responsibility, decision-making, the profile and authority of public health."* [UCD School of Public Health, Physiotherapy and Sports

		Science, University College Dublin]
	Evidence-based approach	*"The pandemic demonstrated the need to have access to rapid evidence synthesis and modelling to inform policy decisions in real time."* [Health Information and Quality Authority (HIQA)]
	Decision makers with relevant expertise	*"In terms of the membership of NPHET, despite nursing and midwifery making up a third of the total health workforce, it took a full year before the Chief Nursing Officer (CNO) was appointed. Poor decisions such as these lead to a loss of expertise at the decision-making table and undermine the nursing and midwifery professions"* [Irish Nurses and Midwives Organisation (INMO)]
	Information governance	*"Lack of clarity around data governance, data ownership and data sharing created challenges in generating analyses across multiple datasets"* [Irish Epidemiological Modelling Advisory Group (IEMAG]
Communication and collaboration	Role of Public Health in media	*"Relatively little public health communications work prior to the pandemic – this is an area with huge potential now with some professional comms support at regional level, enabling public health advocacy, prevention, early detection in communicable and non-communicable disease work. Public Health needs dedicated local Comms support in each Department of Public Health"* [The Directors of Public Health group]
	Intercountry communication	*"The pandemic response required regular communication between public health teams in NI and Ireland; to facilitate contact tracing, share learning and to enable strategic cooperation which was enhanced by the development of a Memorandum of Understanding"* [Institute of Public Health in Ireland]
Health service	Ad-hoc systems	*"This service (medication delivery for vulnerable patients) was an ad hoc arrangement with volunteer groups and local support networks working to agreed protocols, and as such would benefit from a more formalised approach."* [Irish Pharmacy Union]
	Regional variation	*"The lack of a systematic approach to capture local innovation and learning, means that many of these innovations remain local rather than system-wide. This is reflective of the health system pre-pandemic, with isolated pockets of excellence or successful pilots remaining local demonstration projects"* [Irish Society of Specialists in Public Health Medicine]
Broader Public Health focus	Health Intelligence	*"Requirement for developing Health Intelligence function so that it is integrated to support Public Health both nationally and regionally. Health Intelligence capacity regionally is deficient"* [The Directors of Public Health group
	Health Promotion	*"looking at the links between obesity and the health consequences of same from certain communicable and most non-communicable diseases, a strong prevention-based approach in terms of the many factors that influence obesity levels is required"* [Obesity Policy Oversight and Implementation Group]
	Disproportionate focus on health protection	*"As a result of the particular focus in the 1947 Health Act on health protection, there were a number of additional and important aspects of the public health function that were not being adequately addressed."* [Royal College of Surgeons in Ireland (RCSI)]
	Unintended consequences	*"Whilst population-wide control measures such as social distancing and self-isolation were essential to*

		limit infection spread, there were unintended consequences which particularly impacted vulnerable groups" [Institute of Public Health in Ireland]
Emergency preparedness and management	Horizon scanning	*"Focus of preparation will be very much built on what worked this time – the new event is likely to pose different changes and thus preparation needs to anticipate this and not be anchored by recency bias."* [Department of Agriculture]
	All-hazards approach	*"There is a need health security preparedness for non-CD hazards such as chemical and radiation hazards. The establishment of the Health Threats Preparedness Programme is a welcome development."* [Association of Public Health Registrars in Ireland]
	Delayed response	*"While recognising the importance of political and other contextual differences – the response to COVID-19 could have been faster in Jan, Feb and March 2020. Therefore, new structures to enable more rapid decision-making are needed."* [Royal College of Surgeons in Ireland (RCSI)]
	Effective use of existing expertise	*"Requirement for wider stakeholder engagement when identifying and implementing public health initiatives and in particular a need for non-medical inputs"* [Health and Safety Authority (HAS)]
	Resilience and capacity of the health system	*"COVID-19 has added to the strain on services to such an extent as to threaten the ability of the system to cope"* [National Screening Advisory Committee (NSAC)]
Legislation and regulation	Lack of regulation/ oversight in private sector	*"Over the longer period the systems of NH ownership, governance, regulation, monitoring and sanction that have evolved in Ireland made a significant contribution to the devastating impact of Covid in NH populations. These include staffing levels; contractual arrangements; movement of staff between facilities; infrastructural issues; failure to regulate facility capacity; movement of patients from acute hospitals to NHs to create space; complete lack of isolation spaces in NHs; failure of IPC and PPE training and implementation; and later, recruitment of inexperienced and unvaccinated staff from elsewhere to work in NHs. In this respect PH failed completely. There is an obligation on PH to attend to the care of ALL the people, yet the responsibility for residents of LTRCFs has been completely abdicated largely to the private sector or to the HSE administrative structures. There is an urgent need for meaningful and effective PH engagement and oversight in this space"* [UCD School of Public Health, Physiotherapy and Sports Science, University College Dublin]
	Medical Officer of Health legislation	*"The importance of the MOH legislation in implementing health protection actions, and of understanding and applying other relevant legislation to non-CD threats to population health"* [Association of Public Health Registrars in Ireland]
	Overly cautious legal interpretation	*"Ireland's excessively conservative and legalistic interpretation and application of the EU's General Data Protection Regulation"* [School of Public Health, University College Cork (UCC)]
Miscellaneous factors and implementation barriers	Community access to advice, medicines and care	*"Pharmacies provided reliable information about COVID-19, how it spreads, how to prevent spread, how to test for COVID-19, provision of COVID-19 antigen testing and how to protect the public through the national vaccination programme. Pharmacists also supplied essential infection prevention and control*

		items, including PPE and hand sanitiser" [Irish Pharmacy Union]
	Physical activity	*"Regular physical activity can boost positive immune responses while reducing markers of inflammation and is also effective in reducing the severity of symptoms associated with anxiety and depression"* [National Physical Activity Plan Implementation Group]
	Commissioning levers	*"There were significant challenges prior to the pandemic including the lack of commissioning levers within the immunisation programmes to ensure accountability by vaccine provider organisations and quality improvement (National Immunisation Office)"* [HSE Consolidated]
	Regional immunisation coordinators	*"Regional immunisation coordinators are not in place in all regions making it difficult to implement national standards or target interventions. (National Immunisation Office)"* [HSE Consolidated]
	Nurse-led care	*"Any new care model must include nursing at its core, maximising the contribution of the profession in providing care excellence. Clinical care provision must be nurse-led."* [Irish Nurses and Midwives Organisation (INMO]

Appendix 3. Additional categories identified in response to question three (success stories during the pandemic)

Theme	Category	Representative respondent quote
ICT, data, and research	Effective surveillance	*"The Health Protection index and local geocoding were used very effectively for population profiling during the pandemic and these techniques could be applied to the other pillars of public health. (Health Intelligence Unit)".* [HSE Consolidated]
	Publicly accessible data	*"The use of GeoHive to make public health data and metrics available to the public was a success. The dashboard style interface and retention of historical data made it easy for people to monitor the public health situation. We acknowledge that the nature of the epidemic was such that it facilitated a dashboard with a daily update unlike many other public health concerns, where data may only be updated on an annual basis. However, the concept of a one-stop shop to access information was very successful."* [Health Information Quality Authority (HIQA)]
Workforce	Workforce training	*"Public Health leadership of workforce expansion and training with rapid scale up."* [Association of Public Health Registrars in Ireland (APHRI)]
Communication	Communication (general)	*"The resources developed and during the pandemic (clear communications, the COVID app, vaccine passport, etc) were a big success."* [Obesity Policy Oversight and Implementation Group]
	Communication with PH staff	*"Due to the evolving nature of the pandemic, the PSI identified the need for a dedicated information resource for pharmacists and requested that this be developed and hosted by the Irish Institute of Pharmacy (IIOP). The intention of the hub was to provide a single source 'one-stop location' of up-to-date and comprehensive information on COVID-19 for pharmacists, to simplify access to key evidence-based information in a streamlined manner. This measure proved to be very useful in reducing the burden of information on registrants, and also placed significant focus on providing information and signposting on mental health and wellness resources for pharmacists. A 'return to practice' resource was also developed to support those who were returning to the register under 'Section 77' provisions. The IIOP also developed and delivered a series of webinars for the first time, initially on topics specific to the pandemic, with these expanding over time to other topics of interest and relevance to pharmacists. This has proved to be a popular format of delivering information and training, and will likely continue to be a format that will be utilised post-pandemic.* *The PSI also had a dedicated COVID-19 section on our website to gather all information in one place for registrants and the public to access."* [Pharmaceutical Society of Ireland (PSI)]

Legislation and regulation	Need to legislate for Sláintecare or policies	*"The COVID-19 response provided evidence that the public health system must be the delivery mode for all health services, including nursing home and disability care services. For Sláintecare to deliver a universally accessible health care service for all, it must be enshrined in legislation. The Government's commitment to real reform must be led by basing the Sláintecare Implementation Office in the Department of the Taoiseach and committing to full transitional funding in this budget. Ad hoc changes are happening, but there is no national plan. There is now a real danger that we will develop a new system, but efficiencies will not improve."* [Irish Nurses and Midwives Organisation (INMO)]
	Need for better legal support	*"3.4 Public health in Ireland in an increasingly digital world – need for skills, resources, data protection, legal support* *Technology and innovation played an important role in many aspects of public health during the pandemic by improving access to health services, particularly for those facing economic, logistic, and social barriers. With the expansion of artificial intelligence in healthcare, technology is likely to play an increasing role. However, we would caution against techno-optimism as technology can assist but not solve the structural challenges, we face within the public health system…The Institute would support many of the recommendations set out in Riyadh Declaration on Digital Health, including the need for evidence-based protocols for public health messaging, robust data governance and regulation, and for digital technology to be designed and implemented to maximise data quality and access for clinicians and patients (16). To safeguard the rights of users, the roll-out of digital technologies in public health must be supported by legislation governing its use. The HSE cyber-attack during the pandemic highlighted the fragility of health cyber-security in Ireland, and so expanding the role of digital technology requires the strengthening of security. EPHF 12"* [Institute of Public Health in Ireland]

Appendix 4. Additional categories identified in response to question four (key areas for strengthening, and actions to address weaknesses)

Theme	Subtheme	Category	Representative respondent quote
Being prepared, focused and putting into action	Strategy	Address unmet needs	*"…Ireland needs to urgently address the two-tier system of access to healthcare and the equity impact on those without health insurance, in relation to delays to accessing care including, diagnosis and treatment, but also unmet health need."* [Royal College of Surgeons in Ireland (RCSI)]
		Public priorities	*"The public priorities of health and education should be at the forefront of our local, and national planning review process for new buildings, transport infrastructure, and communications and power infrastructure. Publicly-funded population health organisations should be powerfully and forcefully involved in creating our built environment. Publicly-funded educational organisations should equally be empowered and central in creating our built environment, to prioritise the education, formation, and challenging development of the young here, at pre-school, primary, secondary and at third level."* **[ACTION]** [Royal College of Surgeons in Ireland (RCSI)]
	Preparedness	All hazards and emerging threats	*"There is a need to strengthen the health protection function to include all hazards preparedness with dedicated national public health office/programme for emergency management/health threats preparedness. The establishment of the Health Threats Preparedness Programme is a welcome development."* **[ACTION]** [Association of Public Health Registrars in Ireland (APHRI), co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine.]
		System agility	*"During pandemics, the ability to produce rapid guidance and develop new pathways - need to continue to be agile in this way. (National Cancer Control Programme)"* [HSE Consolidated]
	Public Health focus	Health Intelligence function	*"There is an urgent need for the development of a public health intelligence function to enable [Public Health Nursing and Administration] based prioritisation nationally and regionally and to support the work across all domains of practice.(EPHF1 underpinning all other EPHFs)".* [Irish Society of Specialists in Public Health Medicine]
		Population health screening	*"A baseline risk assessment/analysis of non-NSS 'screening' programmes currently operating across the HSE benchmarked against established population screening programme e.g. fetal anomaly screening/testing; infectious diseases in pregnancy screening/testing; newborn and infant physical examination screening/testing; Developmental Dysplasia of the Hips targeted*

			ultrasound screening; newborn blood spot screening programme; and newborn hearing screening programme. (National Screening Service)" **[ACTION]** [HSE Consolidated]
		Expand vaccination uptake	*"One key aspect of disease prevention is immunisation. Immunisation coordinators should be appointed to each local area to act as the lead for immunisations. These should work with GPs, practice nurses, regional public health departments to maximise uptake. (National Immunisation Office)"* **[ACTION]** [HSE Consolidated]
		Non-communicable diseases	*"EPHF 10: The Public Health role in monitoring and evaluation of NCD-specific health services needs to be strengthened at local and national levels."* [Association of Public Health Registrars in Ireland (APHRI), co-submitted with the Lead Non-Consultant Hospital Doctor for Public Health Medicine.]
		Overweight/obese crisis	*"Overweight and obesity is an area which would benefit from increased attention and resourcing over the coming years."* [Obesity Policy Oversight and Implementation Group]
		Supporting road safety	*"Ireland's Post-Crash Response needs to be strengthened over the next 3-5 years. This can be achieved by implementing the recommended Trauma System for Ireland, and by delivering the high-impact and support Post-Crash Response actions as part of the Phase 1 Action Plan of the Government Road Safety Strategy (2021-2030)."* **[ACTION]** [Road Safety Authority of Ireland (RSA)]
	Implementation	Agreement on Public Health Medicine	*"Full implementation of the IMO, HSE and DoH agreement on Public Health Medicine."* **[ACTION]** [Irish Medical Organisation (IMO)]
		Capacity Review	*"To date, the implementation of the Capacity Review has been slow, and this must change in order to meet the demands on the health service."* [Irish Nurses and Midwives Organisation (INMO)]
		Resourcing national strategies - National Maternity Strategy - National Intercultural Health Strategy and Traveller Health Strategy - Model of Care for the Management of Overweight and	*"The midwife-to-birth ratio recommended in the National Maternity Strategy (1:29.5) has never been realised, and midwife-led units have never grown beyond the original two. Ireland's maternity service offers little choice beyond hospital births to women impeding their right of choice."* [Irish Nurses and Midwives Organisation (INMO)] *"There is a need for data collection to include ethnic identifiers and for policies such as the National Intercultural Health Strategy and Traveller Health Strategic to be re-established with dedicated resource for implementation".* **[ACTION]** [Institute of Public Health in Ireland] *"Overweight and obesity is an area which would benefit from increased attention and resourcing over the coming years. The Model of Care for the Management of overweight and obesity, launched in 2021, sets out how healthcare for children, young people and adults living*

		Obesity	*with overweight and obesity in Ireland should be organised and resourced now and into the future. The Model of Care covers the whole spectrum of care for overweight and obesity, from prevention in the community, through primary and secondary care on to specialist treatment including surgery. Fully resourcing the various levels of the Model of Care would greatly enhance the capacity to address the obesity crisis."* **[ACTION]** [Obesity Policy Oversight and Implementation Group]
Changes to the workforce	N/A	Defined career structures	*"Clear career pathways and progression for those working within public health, not aligned with the Health Protection pillar, would better support these resources and provide greater PH leadership opportunities. (National Screening Service)"* **[ACTION]** [HSE Consolidated]
		Multidisciplinary approach	*"Recruitment to positions in the public health workforce could be greatly expanded to include high-quality talent from allied healthcare disciplines. Models exist for this kind of reform in other countries, e.g. UK. Not only would this address recruitment gaps, it would also enhance the breadth of expertise and experience in the workforce."* **[ACTION]** [Health Information and Quality Authority (HIQA)]
		Wellbeing and resilience	*"Health workers' quantity and quality and wellbeing. Building a resilient health system will not be achieved without resilient and responsive health workers. Resilient health workers could be promoted by creating an enabling working environment that promotes a high quality of care considering the physical and mental wellbeing of both patients and health workers."* [University of Limerick School of Medicine(UL)]
ICT, data collection and research	N/A	Information governance	*"It would also be of benefit to ensure that there is greater linkage between policy makers, healthcare workers and researchers to ensure that evidence gaps are recognised, and that they can be addressed by ensuring the correct data are collected and shared with those who can appropriately analyse the data. A governance structure that would permit researcher access to anonymised versions of, e.g. HSE Primary Care Reimbursement Service (PCRS) data, would greatly enhance research capabilities to address key public health research questions."* **[ACTION]** [Health Information and Quality Authority (HIQA)]
		Consolidation of research expertise	*"The work of IEMAG should be transferred to HPSC, with a dedicated biostatistics and modelling unit established that is adequately resourced. This is an essential component to ensure adequate preparedness and response for future threats. (Health Protection Surveillance Centre)"* **[ACTION]** [HSE Consolidated]
		Broader scientific view	*"We recommend that a broader view be taken of the type of scientific and academic advice that might be of value in the management of a major infectious disease outbreak in the future, finding new and additional ways to include the perspectives of social sciences and humanities in our understanding of the outbreak and our individual and collective responses."* [Irish

			Epidemiological Modelling Advisory Group (IEMAG)]
		Evaluate the cost of care	*"In particular, the cost of care has been mostly uncounted during the COVID-19 pandemic, and this will need to change."* **[ACTION]** [Royal College of Surgeons Ireland (RCSI)]
Collaboration and communication	N/A	Community engagement	*"The value of engaging with local communities and the powerful energy of local and regional efforts has been demonstrated repeatedly in Ireland, for example in charitable donations and contributions to local health matters. Devolving local and regional health services and budgets in an accountable way that is integrated with national specialty services can allow excellence to be developed and instil local pride."* [National Screening Advisory Committee (NSAC)]
		Clear communication	*"A clear communication strategy is needed for any emergency response situation – need for a clear informative 'One Voice' and to avoid mis-messaging."* [Department of Agriculture]
		Stakeholder engagement	*"Ensure that there is an understanding, acceptance and recognition across the system that everyone has unique and specific roles and responsibilities to play in the protection of public health. To address this it is imperative that all stakeholders are engaged and consulted very early on in any significant proposed changes to legislation, functions or structures which may fundamentally change the provision of public health or population health services in Ireland."* [HSE Environmental Health Service (EHS)]
		Collaborative working with colleagues	*"Strengthened regional departments of Public Health with autonomy to protect the health of their population would increase capacity to collaborate with colleagues in other disciplines, including infectious diseases, paediatrics, pathology, obstetrics, occupational health and general practice. The transfer of knowledge and skills would be increased by cross-disciplinary training, and involvement of the range of specialties in grand rounds and continuing professional development."* [Royal College of Physicians of Ireland [RCPI)]
Leadership, management and governance	N/A	Integrated Public Health	*"Integrated regional and national multidisciplinary Public Health - need to ensure that full breadth of PH including specialist areas is represented at national leadership team for integrated PH service. (National Screening Service)."* [HSE Consolidated]

Appendix 5. Additional categories identified in response to question five (barriers to achieving actions, and solutions to overcome them)

Theme	Category	Representative respondent quote
The workforce	Recruitment and retention	*"Throughout the pandemic, there were repeated calls for the expansion of the public health workforce, but also repeated concerns raised regarding the ability to fill such posts. It is important to note that Ireland currently follows a model of public health in which public health consultants and leadership positions are restricted to staff with a medical degree qualification; this presents a barrier to recruitment. This differs from models used in countries such as the UK, where public health consultants include staff with postgraduate qualifications in public health but whose undergraduate degree may have comprised training in allied disciplines of public health other than medicine (for example, social work, pharmacy, occupational therapy). Given that public health is a multidisciplinary field requiring a broad range of perspectives, and considering the high resource costs and limited availability of medically-trained professionals entering the field, it would seem prudent for a modern service to expand access to leadership roles in Ireland's public health workforce to high-quality, experienced talent from allied healthcare disciplines."* **[SOLUTION]** [Health Information and Quality Authority (HIQA)]
	Wellbeing	*"The COVID-19 pandemic has been extremely challenging for healthcare professionals including pharmacists and pharmacy teams. Consideration needs to be given to the impact of the pandemic on the healthcare workforce and the retention of staff in frontline roles."* [Pharmaceutical Society of Ireland (PSI)]
ICT, data collection and research	Research groups need to be established	*"EPHF 12 Need a Health Technology Assessment Unit - properly funded and resourced and not drawing from our current small pool of Public Health expertise - this will save HSE money in the long-term."* **[SOLUTION]** [The Directors of Public Health group]
	Setting of research priorities	*"Regarding the research partnerships that may arise between universities and Regional Departments of Public Health, one barrier may be an imbalance in setting of priorities. All partnerships of this kind must have a translational focus, with the end-goal being implementation of interventions to benefit public health*

		as well as focusing on sustainability. Partnerships should not simply focus on publication or studying an intervention due to its novelty, but should instead maintain a focus on synthesising the current evidence to inform interventions, scale them up where needed, and develop strategies to ensure their continuation." **[SOLUTION]** [University of Limerick School of Medicine (UL)]
	Lack of data governance	*"A major issue is that data are often available only for a subgroup of the population, such as those with medical cards, meaning that the data are not nationally representative. In the absence of unique health identifiers, data linkage is not routinely possible. Furthermore, a lot of potentially relevant data relate to the primary care sector, for which there is very little coordinated data collection or data governance."* [Health Information and Quality Authority]
Public Health fragmentation	Fragmentation of academia and Public Health	*"Universities do not all have sufficient resources to pay for joint appointments, which are driven by student numbers - the HSE should fund such posts. Adjunct academic appointments and stronger placement arrangements should be developed."* **[SOLUTION]** [Faculty of Public Health Medicine, Royal College of Physicians Ireland (RCPI)]
Cultural and societal barriers	Attitude	*"Prevailing culture, attitude and resistance to change among some member of the Public Health workforce."* [UCD School of Public Health, Physiotherapy and Sports Science, University College Dublin]
	Socioeconomic status	*"Socio-economic disadvantage is a major factor in determining access to opportunities to be active…disadvantaged cohorts may not have the same access to transport and may have difficulty providing co-payments for exercise classes aimed at rehabilitation, where such charges apply. Moreover, recent spikes in inflation and in the cost of living are likely to negatively affect participation in sports and physical activity, where costs apply and/or where transport, equipment or specific clothing/footwear is necessary.* *Possible solutions would include increases in provision of programmes, free of charge, and expansion in volunteer led activities and groups. The potential of incorporating physical activity opportunities into programmes such as the Sláintecare Healthy Communities Programme and expanding "free to user" programmes such as the Active School Flag are being explored."* **[SOLUTION]** [National Physical Activity Plan Implementation Group]
Prioritisation of Public Health	Lack of Public Health input in policy	*"Current Legislative Framework: Enabling legislation is needed that supports and*

		prioritises public health, such as the mandated use of IHI, and must consult public health officials in the policymaking process." **[SOLUTION]** [HSE Consolidated]
	Lack of Public Health representation in government	*"Ideally, given the workload involved, there either needs to be a Minister for pandemic preparedness, or the Office of the Taoiseach should oversee the work. As the Minister for Health who brought in the smoking ban (an impressive legacy), the current Taoiseach might be attracted to the idea of reinforcing that legacy in the area of Health Protection for Ireland."* **[SOLUTION]** [UCD National Virus Reference Laboratory (NVRL), University College Dublin]
	Lack of understanding of the role of Public Health	*"There is a longstanding lack of clarity around the role and function of public health both within and outside the health sector."* [Irish Society of Specialists in Public Health Medicine]