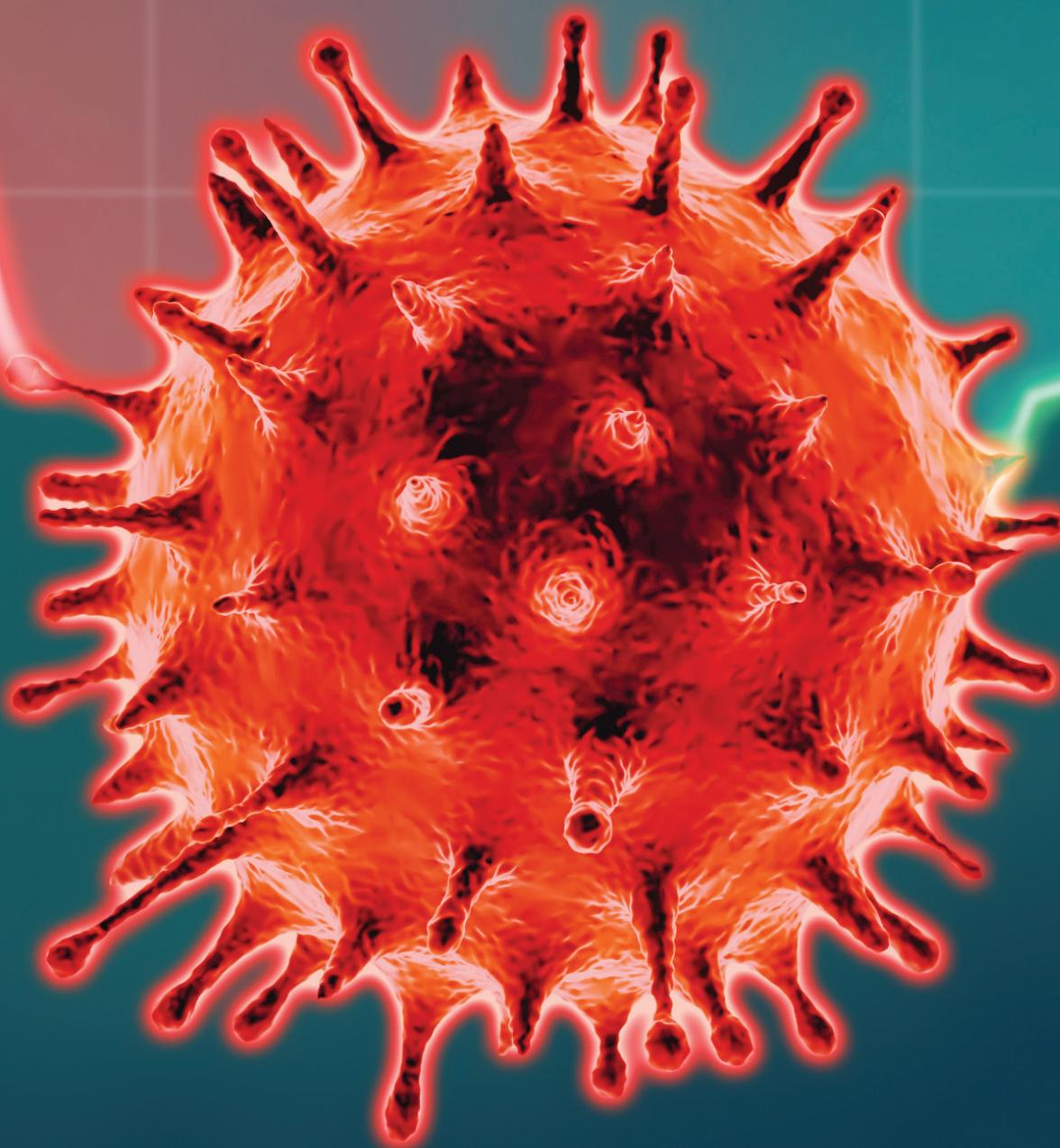


Coronavirus: the 2020 Director of Public Health Report for Northern Ireland



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 **Professor Hugo C van Woerden**

This is my first annual report since taking up the post of Director of Public Health in Northern Ireland in March 2020 and the 11th for the Public Health Agency. I could not then have imagined the magnitude of the pandemic about to grip the world and change all of our lives so dramatically.

The Faculty of Public Health defines public health as, 'The science and art of promoting and protecting health and wellbeing, preventing ill-health and prolonging life through the organised efforts of society'. This definition has never been so relevant. COVID-19 has required us all to respond together as a whole society, from key workers to community volunteers, from contact tracers to public representatives and from parents' getting to grips with home-schooling to researchers focussing on the viral genome. We have come together very quickly, in ways we may not have thought possible before the pandemic.

This report describes the public health impact of COVID-19 in Northern Ireland, how we have responded to it and what outcomes we have achieved. It covers the period between the onset of the pandemic in Northern Ireland with the first case identified on 26 February to the end of October 2020. As the situation unfolded, responses – both within public health and beyond – had to adapt at speed. The first section of the report provides an analysis of the population impact of COVID-19. Subsequent sections describe a wide spectrum of individual responses and perspectives.

Looking to the future, this will give us a stronger platform to be able to tackle some of those broader issues that have always been difficult such as health inequity, poverty, and mental wellbeing, based on a strong sense of purpose, meaning and identity. All these issues have become more visible due to the pandemic.

I am very conscious of the families that have suffered bereavement and loss as a result of the pandemic and express my condolences to all those who have been affected. The virus has taken a huge toll at every level, separating families and friends, creating fear and loneliness, stretching health and social care resources, damaging the economy, particularly small businesses and impinging on all our daily lives. The pandemic has also brought out the best in many people, who have reached out to help and support others whose needs are greater than their own.

Finally, as I depart from my role as Director of Public Health, I would like to thank the team who have supported me in bringing the report together and to all of the individual contributors. I have counted it a privilege to work with an amazing, talented and dedicated set of colleagues.

Professor Hugo C van Woerden

Director of Public Health
Public Health Agency

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COVID-19 – an emerging new disease

Introduction

On 31 December 2019, the World Health Organization (WHO) was informed of a cluster of cases of pneumonia of unknown cause detected in Wuhan City, Hubei Province, China.¹

On 12 January 2020, it was announced a novel coronavirus had been identified in samples obtained from cases and initial analysis of virus genetic sequences suggested that this was the cause of the outbreak. This virus is referred to as SARS-CoV-2 and the associated disease as COVID-19.

Up to 30 October 2020, over 45 million cases have been diagnosed globally with more than 1.1 million fatalities.² Coronaviruses are a large family of viruses with some causing less severe disease, such as the common cold, and others causing more severe disease, such as Middle East respiratory syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS) coronaviruses.

SARS coronavirus (SARS-CoV) emerged in November 2002 and caused severe acute respiratory syndrome (SARS). That virus disappeared by 2004. Middle East respiratory syndrome (MERS) is caused by the MERS coronavirus (MERS-CoV). Transmitted from an animal reservoir in camels, MERS was identified in September 2012 and continues to cause sporadic and localised outbreaks. The third novel coronavirus to emerge in this century is SARS-CoV-2, which causes coronavirus disease 2019 (COVID-19).

Transmission

SARS-CoV-2 is primarily transmitted between people through respiratory (droplet and aerosol) and contact routes. Modelling suggests transmission risk is greater where people are in close proximity. Airborne transmission can occur in health and care settings in which procedures or support treatments that generate aerosols are performed. It may also occur in poorly ventilated indoor spaces, particularly if individuals are in the same room together for an extended period of time. In addition to respiratory secretions, SARS-CoV-2 has been detected in blood, faeces and urine.

Symptoms

COVID-19 presents with a range of symptoms of varying severity. Asymptomatic infection also occurs often. A systematic review of the occurrence of asymptomatic infections concluded the summary proportion of SARS-CoV-2 that is asymptomatic throughout the course of infection was 20%, but the proportion that is asymptomatic might lie anywhere between 3% and 67%.³ In Northern Ireland (based on provisional analysis of contact tracing service data for the period 7–27 October 2020), 56% of positive cases reported having COVID-19 symptoms while 44% reported having no symptoms (not a representative sample).

The more common symptoms are fever, a new and continuous cough, anosmia (loss of smell) and ageusia (loss of taste). Non-specific symptoms include shortness of breath, fatigue, loss of appetite, myalgia (sore muscles), sore throat, headache, nasal congestion, diarrhoea, nausea and

vomiting. Less common symptoms, such as delirium and reduced mobility, can present in older and immunocompromised individuals, often in the absence of a fever.

Of the people who develop symptoms, 40% have mild symptoms without hypoxia (reduced levels of oxygen in the blood) or pneumonia, 40% have moderate symptoms and non-severe pneumonia, 15% have significant disease including severe pneumonia and 5% experience critical disease with life-threatening complications.

Critical disease includes acute respiratory distress syndrome (ARDS), sepsis, septic shock, cardiac disease, thromboembolic events, such as pulmonary embolism and multi-organ failure.

There is some evidence to suggest individuals who have suffered from both mild or severe COVID-19 can experience prolonged symptoms or develop long-term complications, provisionally called long COVID.

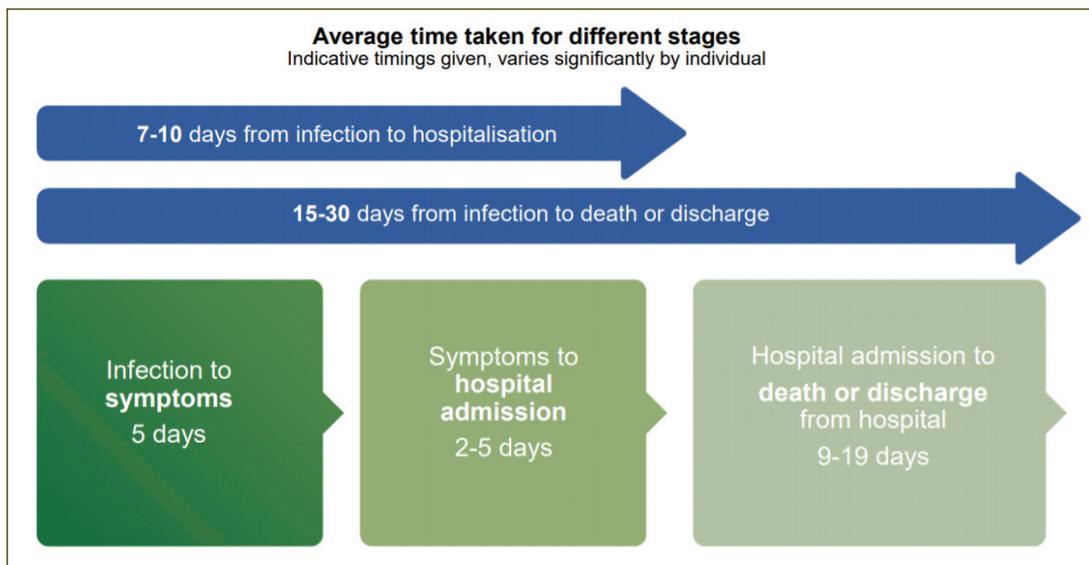
Infants and children generally appear to experience milder symptoms than adults and further evidence is needed about the association between underlying conditions and risk of COVID-19 disease in children. A rare presentation of multisystem inflammatory syndrome associated with COVID-19 in children and adolescents has been described.⁴

Variation in risk of death

COVID-19 is unique as a disease in the difference in risk it presents at different ages, which is 10,000 fold. There is no other infectious disease that demonstrates this degree of difference with age. The risk of dying from COVID-19 in one analysis varied from around 1 in 2.4 million for those aged 5 to 14 years, to 1 in 49 in those aged over 90 years.⁵ This article also states that “The true infection fatality rate remains contested, with one review claiming a global rate of 1.04%,⁶ while another has claimed a range from 0.02% to 0.4%⁷”.

Timeline of disease progression

Figure 1: Average time taken for different stages of COVID-19.



Source: NHS (https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/925811/NHS_data_briefing_slides_-_12_October_2020.pdf)

Impact of COVID-19 in Northern Ireland

Impacts of the pandemic may be direct from COVID-19, or may be indirect from changes to the healthcare system or lockdown measures. The overall harm to health is encapsulated by the following categories:

- Health impacts from contracting COVID-19.
- Health impacts from changes to health and social care made in order to respond to COVID-19, such as changes to emergency care, changes to social care, changes to elective care and changes to primary and community care.
- Health impacts from factors affecting the wider population, both from damage to the social fabric of society and the economic impacts increasing deprivation in part due to loss of employment.

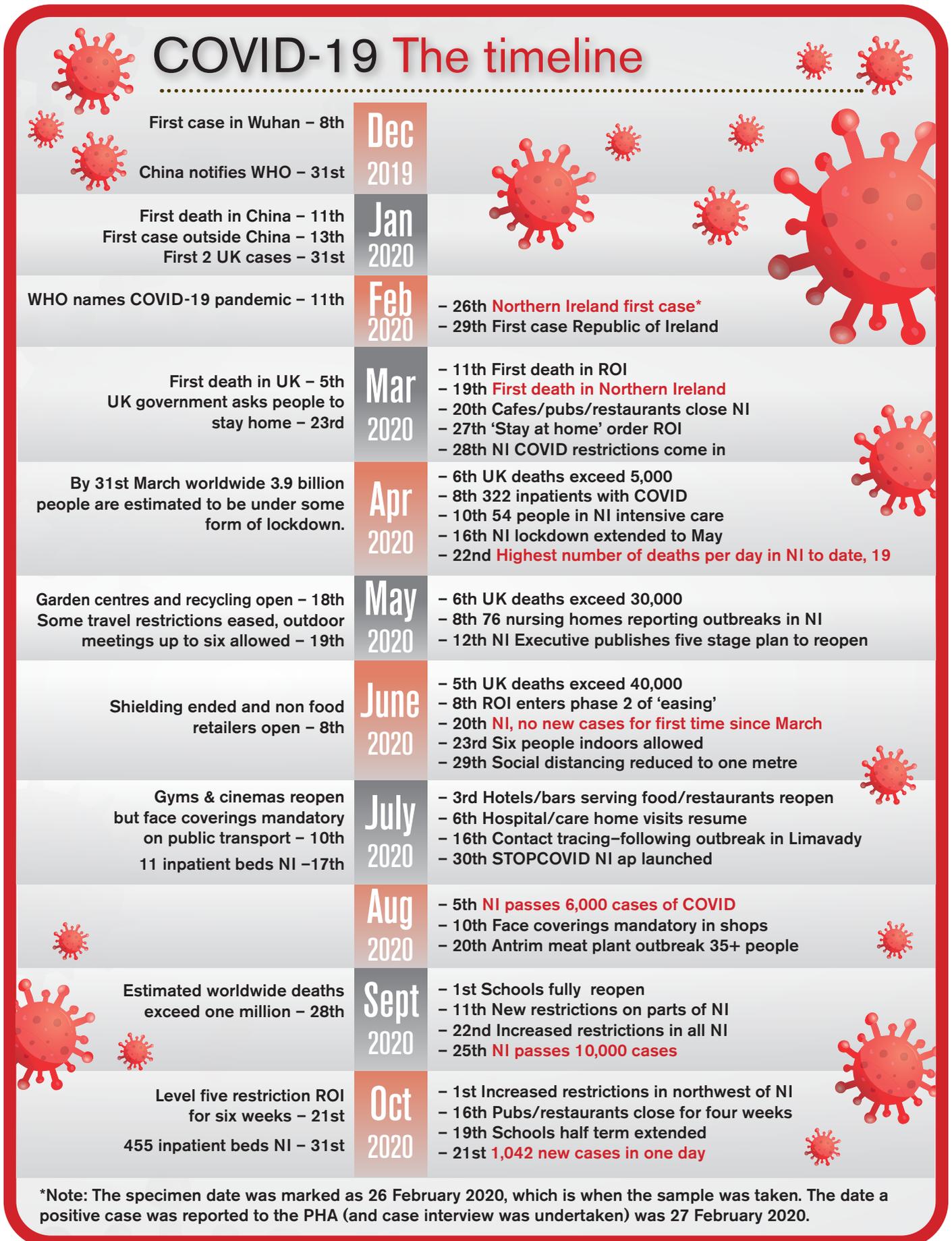
The potential for a range of indirect impacts on health and health inequalities as a result of the measures introduced to control the pandemic were described as part of a rapid health impact assessment (HIA) published in the *British Medical Journal* (BMJ).⁸ The indirect impacts were theorised to occur through a variety of pathways, including:

- Changes to employment and income, which is known to affect life expectancy.
- Access to education for children and adults.
- Social isolation, family violence and abuse.
- Changes in the accessibility and use of food, alcohol, drugs and gambling.
- Changes in physical activity and transport patterns.
- Changes in the availability and use of healthcare services.

Timeline

A brief timeline for the events that have marked the pandemic in Northern Ireland up to the end of October 2020 is given in Figure 2.

Figure 2: COVID-19 timeline.



Early in March 2020, the PHA was offering advice on COVID-19 and health protection to a range of sectors, including the public, healthcare professionals, business and councils.

COVID-19 began to have an impact, for example, at this time, St Patrick's Day parades across Northern Ireland were cancelled.

The public responded well to early advice, as is indicated by analysis of traffic patterns before formal COVID-19 restrictions came into operation on 28 March 2020. The early action may have contributed to a much lower number of deaths in the first wave of the pandemic than in most parts of the UK. Deaths in the first wave peaked at 19 deaths per day on 22 April 2020. About 300 expected deaths occur each day in Northern Ireland.⁹

A number of initiatives were developed to help fight the virus, for example, Northern Ireland was the first part of the UK to have a functioning COVID-19 app, launched on 30 July 2020.

The number of individuals with positive tests for SARS-CoV-2 fell during the summer to less than 10 per day but in the autumn, the number of cases rapidly rose in a second wave.

Reproduction Number

The Reproduction Number (R_0) is often used to characterise epidemics of infectious disease, which follow an exponential growth pattern. Governments across the world have extensively used a target of getting R under 1 as a key metric. Although the degree of dispersion of the disease, that is, the fact that the disease clusters geographically and in different social segments, makes the interpretation of the R number at regional level more challenging.

Different forms of the R value have also been used, based on ICU admissions, hospital admissions and estimates of the community rate excluding outbreaks. Other metrics such as estimated incidence, estimated prevalence, based on population surveys, and the proportion of test results that are positive, have also been used. Reporting to the Department of Health (DoH) and Northern Ireland Executive on these factors has been led by a Modelling Group, chaired by Professor Ian Young, Northern Ireland's Chief Scientific Adviser. The Chief Medical Officer for Northern Ireland (CMO) Dr Michael McBride has also received input from a Strategic Intelligence Group and from the Scientific Advisory Group for Emergencies, which advised the four UK CMOs.

Structure of this report

COVID-19 is a large and challenging topic, and this is reflected in the length of this year's DPH annual report. At the time of writing, the pandemic is ongoing and research and information is continually being developed and updated. The report's content reflects the information that was available given the demanding pressures on healthcare professionals involved in fighting the pandemic. It is hoped the report will be a useful resource now and in the future as source of a wide range of information about the response to COVID-19 in the early stages of the outbreak.

Figure 3: Overview of the actions taken by the Public Health Agency.

The report is structured around an introductory section, which covers communications, as perhaps the single most important area of action during a pandemic, and a chapter of facts and figures that help to paint the story from a health intelligence perspective. The next three chapters cover the traditional areas within public health: health protection, service development and screening, and health improvement. These sections are followed by a section summarising some of the research that has been undertaken on COVID-19 in Northern Ireland during the early months of the pandemic, followed by closing comments.

Authors



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Dr Diane Anderson, Health Intelligence Manager, PHA

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Overview

- COVID-19: the key role of communication during a pandemic
- The story of COVID-19 in Northern Ireland: facts and figures
- COVID-19 surveillance findings up to epidemiological week 47
- Mortality as a measure of the impact of the COVID-19 pandemic

COVID-19: the key role of communication during a pandemic

Communicating effectively is a key aspect of public health in any context. Within the context of a pandemic it is vital to ensure that information is shared, at the right time, to the right audience and in the most appropriate format.

From early 2020 the Public Health Agency has played a key role in communicating important health messaging to a variety of sectors including the public, those working in healthcare, business and education. We have responded to the need for trusted information about the virus using a variety of communication channels including:

- public communications
- campaigns
- media briefings
- social media
- video and design
- website
- publications

Public communications

From the outset, the PHA's Corporate and Public Affairs team has been a lynchpin in public communications around coronavirus – from hosting the press conference which confirmed the first case in Northern Ireland, raising awareness among the public about key steps to take to help protect themselves throughout the pandemic, to fronting up in the media throughout. This has ensured there has been clarity and awareness both of the risks of COVID-19, what is being done to tackle it, and what people themselves can do to help in the fight against it.

While things have moved at pace throughout the pandemic, public communications from the PHA have adapted quickly to reflect the situation and advice as it has developed, providing crystal clarity around issues such as how to reduce the risk of spread, how to access testing and when to self-isolate.

The agency also facilitated media interest of an order of magnitude that has been unprecedented, delivering a 24/7 press office service, responding quickly and effectively to media demands across all platforms.

This work has helped ensure that, despite this being a period of significant uncertainty, advice, guidance and reassurance from the PHA has been robust, and messaging to support the public on navigating their way through the pandemic has been front and centre of media coverage.

Campaigns

Mass media campaigns have played a key role in communicating with the public. This has ensured information, advice and guidance has reached a wide and diverse audience. The need to reach a mass and diverse audience quickly meant campaigns were developed and produced to extremely tight and demanding deadlines.

A wide range of media channels were deployed by the Campaigns team including TV, video on demand, radio, outdoor, press, digital and social media advertising.

The first PHA campaign went out in March just before the first lockdown as cases of COVID-19 escalated. The PHA recorded and broadcast a radio advertising campaign urging the public to keep their distance, wash hands regularly and avoid unnecessary contact with family and friends.

As cases escalated and lockdown measures were implemented, mass media campaigns were launched by the UK Government and the Executive Office. The changing campaign messaging reflected new information, advice and guidance and the PHA input to UK wide campaigns ensured messaging was appropriate for use in Northern Ireland. The PHA has also inputted and provided feedback to the Executive Office on the ongoing campaign 'We all must do it'.

As Northern Ireland moved out of lockdown, public support for testing and contact tracing was crucial. Mass media campaigns were launched to increase awareness and encourage support for testing and contact tracing.

Test Trace Protect

The Test Trace Protect campaign focused on COVID-19 symptoms, availability of free testing and encouraging support for contact tracing.

StopCOVID NI proximity app

The StopCOVID NI app has been designed to help stop the spread of COVID-19 in Northern Ireland, by anonymously contacting people who have been in close contact with someone who has tested positive for COVID-19 (you can read more about the app on page 83).

Although COVID-19 dominated 2020, the PHA's other campaigning work was also carried out in parallel. This work included information supporting mental health and also information on the flu vaccine. Living Well campaigns went out through community pharmacies and included information on looking after health and wellbeing as well as information on sources of help and support.

Engagement briefings

In March as the virus was beginning to circulate, there was a need for daily communication from the PHA. Daily briefings by health protection consultants and other experts were arranged to provide clear messaging about the virus and the steps needed to help protect the public from becoming infected.

As the pandemic has progressed, a range of briefings have continued, targeted at different sectors including the media, human rights organisations, trade unions, politicians, and other key stakeholders, to expand on understanding of the virus and the response to tackle it.

Social media

The PHA's social media channels have a significant role in communicating with the public, media and key stakeholders throughout the pandemic to date. The PHA became the go-to organisation for clear, accurate and relevant information, and this was reflected in interest in the agency's social media channels, as a through route to access the most up-to-date information.

Engagement reached such a level that individual social media posts were reaching up to 12 million people, reflecting the fact that the effectiveness of messaging and its delivery was going well beyond the boundaries of Northern Ireland.

PHA social media posts regularly outperformed posts from other branches of government and the health service across the UK, including Number 10 and the NHS.

The number of page likes for the PHA on Facebook has almost quadrupled since the start of the pandemic, and page followers are now in excess of 200,000 people. Twitter followers have also almost doubled since before the pandemic.

Video and design

To support coronavirus communications we have undertaken a significant programme of video and graphic design production throughout.

This has enabled core information, advice and guidance to be presented in clear, engaging and accessible formats to support mainstream media activity. Video and graphic content have also been translated into a range of languages to expand reach to specific audiences, and video has also integrated subtitles by default and in certain cases also included British Sign Language and Irish Sign Language signing.

This work is an example of how we have quickly and strategically expanded the communications offering to meet the demands of coronavirus by delivering messaging through a broad range of platforms to enhance engagement and awareness.

Website

The PHA website has been a central pillar of the PHA communications response to the COVID-19 pandemic. From late January, the website has been updated daily with the latest guidance for the public and professionals.

A dedicated COVID-19 section has been created to house this information and a regular blog on relevant topics has been published.

The pandemic has dramatically increased the number of visitors to the agency's website. To date in 2020 there have been 2,962,151 visitors to the site, an 11 fold increase on 2019.

The PHA has also worked closely with nidirect to ensure the latest information is readily available for the people of Northern Ireland.

Apart from COVID-19, work has continued on the PHA's other sites such as Minding Your Head and Organ Donation, and the staff intranet Connect has also been redeveloped.

Publications

During 2020, the PHA publications team worked with stakeholders to disseminate the most up-to-date messages about COVID-19 to the public and professionals in order to help prevent the spread of the virus.

Early priorities were to help the public identify the symptoms of COVID-19 and provide clear advice on what they should do. GP surgeries, pharmacies, ports and airports, emergency departments and maternity outpatients all needed different posters to provide guidance to the public.

Advice was also produced in an easy read format for people with a learning disability and, where possible, posters were translated into 11 different languages for the local multicultural communities. Publications had to be kept up to date to reflect changes to public health advice on symptoms, testing, self-isolation, social distancing, car sharing and face coverings and to reflect a consistent brand and messaging across Northern Ireland.

As Northern Ireland went into lockdown, the needs of the public changed to information to help them cope with the unusual situation. This included advice on mental health, alcohol, drugs, physical activity, information for parents of newborn babies and practical advice on planning meals and shopping safely. The shopping poster used infographics and a minimum of text so that it could be easily translated into other languages, converted into video and voiced over.

Dealing with grief and bereavement as well as practical advice on procedures following a death that were different during the pandemic period was an emerging need. Publications were produced in association with the HSC bereavement network, some aimed at the public and others specifically for staff in healthcare settings who were dealing with the deaths of residents or colleagues.

Permission to adapt these materials was given to a local authority in England to support a bereavement service they set up to provide additional capacity during COVID-19.

Demand for information for healthcare staff has been high. Publications were developed on PPE and face coverings, preventing skin damage under respirator masks, instructions on taking swabs, flow charts to identify outbreaks in certain settings and the necessary health protection procedures to follow, testing in care homes, communicating with patients or residents, nutritional advice when caring for patients with COVID-19, and restricting workforce movement to reduce the risk of outbreaks in homes and slow the spread of the virus. It was more important than ever this year to support the

routine vaccination programme, in particular the flu programme. The work of the publications team included the production of around 50 items for both healthcare professionals and the public on flu and other immunisations to ensure the smooth operation of these programmes at this important time.

Encouraging the public to download the StopCOVID NI app, get tested if they have symptoms, self-isolate and share details of close contacts is a new message as developments in technology and contact tracing occur. Our work is ongoing to ensure that PHA publications reflect the very latest information in a way that is as accessible as possible to the public and healthcare professionals in order to help prevent the spread of COVID-19 and save lives.

Looking to 2021, new developments such as the roll out of the COVID-19 vaccination programme will once again require the PHA Communications team to provide bespoke communication solutions in a very timely manner; we remain confident that this is a challenge the PHA will be able to rise to working together with our partners across Northern Ireland.

Author



Stephen Wilson, Assistant Director of Communications and Knowledge Management, PHA

The story of COVID-19 in Northern Ireland: facts and figures

A short document such as this can only touch on a few aspects of the impact on the complex multi-faceted system that is health and social care. Some of the impacts are longer term and will be more evident going forward. Here we are looking at first wave only across a range of services.

As the HSC sought to divert resources to deal with COVID-19, to reduce risk in other services and deal with reduced staffing levels, some patient treatments or hospital appointments were cancelled, access to primary care was substantially changed to channel COVID-19 patients while seeking to maintain access to urgent non COVID-19 patients.

In addition to the managed reconfiguration of services, behaviour changed as some people did not avail of services whether through fear or a desire not to add to pressures. Together these two things will have resulted in delays in diagnosis or treatment with downstream consequences for the individuals affected.

A simple comparison of waiting list changes in April to June 2020 against the previous year will not reflect those who did not present in primary care and get referred to outpatients to then be seen and put on an inpatient or day case waiting list. For this reason, a comparison is also being made of September 2020 against September 2019 in terms of total numbers waiting and those waiting long periods. The rationale for this is to attempt to allow some catch up of referrals from primary care and onwards referral of urgent cases and to reflect the longer waiting times due to the reduced elective activity levels in hospitals.

Table 1: Impact of the COVID-19 pandemic and associated restrictions on Health and Social Care services.

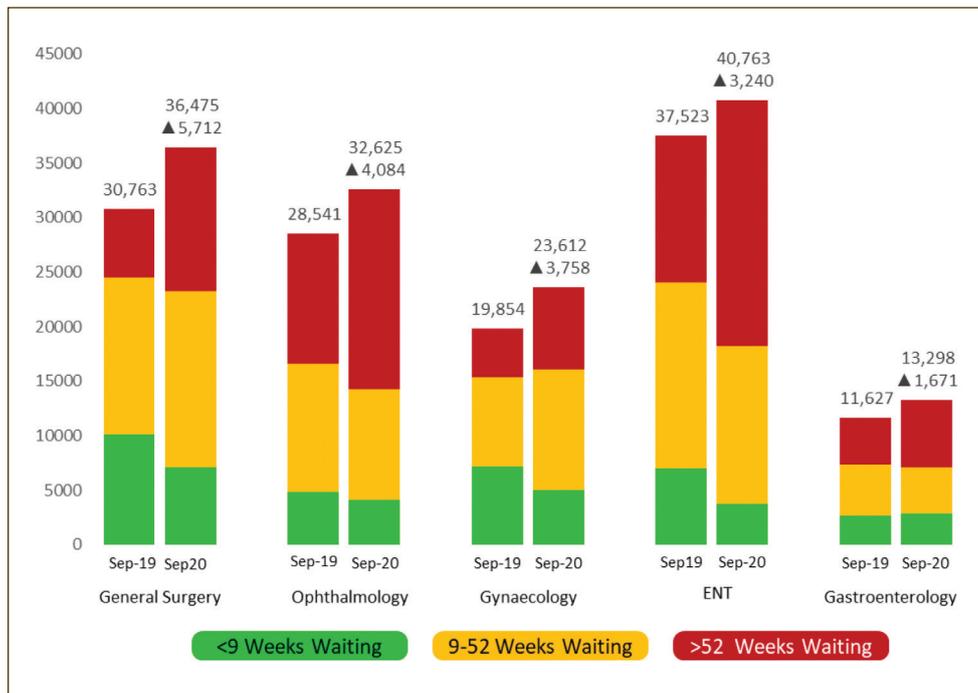
HSC service	2020	2019	Comment
Emergency departments attendances April–June ¹	139,424	215,190	-35% (peaked at -50% in the month of April 2020)
Outpatient waiting lists ²	April 2020 300,143 Sept 2020 324,408	April 2019 288,490 Sept 2019 306,175	Total numbers up 4% April to April and 6% Sept to Sept. However, those waiting > 52 weeks increased by 45,000 (+42%) Sept to Sept and there was a marked reduction in those waiting under nine weeks, reflecting fewer referrals.
Hospital admissions ³ (9 March–17 April)			
Day cases	19,645	35,549	Day cases down 45%
All inpatient admissions	22,900	47,780	Inpatient admissions down 52%

HSC service	2020	2019	Comment
Non elective inpatient admissions	20,461	42,032	Down 51%
Inpatients/Day cases waiting lists ^{4,2}	Sept 2020 103,488	Sept 2019 90,667	+14% overall An increase of 22,143 in those waiting over a year (+87%)
Breast cancer referrals (May–September) ⁴	Total referrals 9,349 Urgent referrals 6,364	Total referrals 11,015 Urgent referrals 6,805	Overall referrals -15% Urgent referrals -6% Reductions most visible in the early months (May was -40%)
Population screening such as bowel, breast, cervical, AAA etc ⁵	Estimated in excess of 100,000 invites were paused with expected delays of four to six months.		Impact on the eight programmes varied (five were temporarily suspended)
Carer assessments offered by Trusts ⁶	April–June 20 2,789	April–June 19 4,160	-33%.
Dentists – paid treatment claims 9 March–17 April ⁷			
Examinations	35,168	142,930	-75%
Fillings	16,294	74,283	-78%
Extractions	4,742	15,766	-70%
Ophthalmologists – number of sight test claims (to July 2020) ⁷			
1 Jan–18 March	105,783	103,950	+1.8%
19 March–18 June	3,142	119,959	-97.4%
GP prescription items – million items ⁸			
March	3.92	3.38	+16%
April–June Qtr	10.02	10.31	-3%
July–Sept Qtr	10.20	10.39	-2%

Note: some of this data is provisional. The sources of each are identified in the references.

Figure 1 illustrates changes in outpatient waiting lists in some of the main specialties. Note the substantial increase in those waiting longest and the reduced numbers of short-term waits reflecting fewer referrals. The figures have risen across a range of specialities.

Figure 1: Number of patients waiting for an outpatient appointment – September 2019 and September 2020.

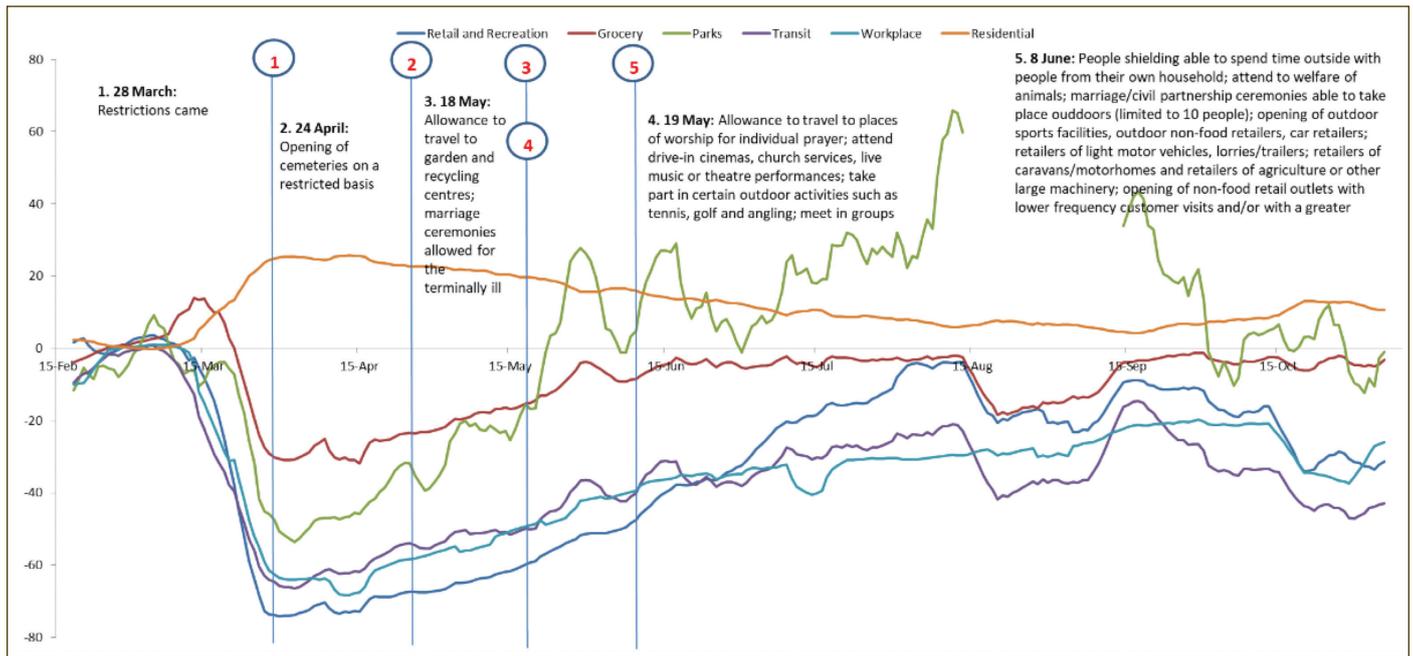


Source: <https://www.health-ni.gov.uk>

Health impacts from factors affecting the wider population

The introduction of lockdown made dramatic changes to individuals' movements, such as working from home, and education closures. Community mobility reports chart movement trends over time and across different categories of places, with the zero axis being the historical level and positive and negative changes reflecting increased and decreased movement.

Figure 2 shows the immediate impact of the introduction of lockdown in Northern Ireland on people's mobility. The chart shows the interplay between decreased travel to work and increased residential travel. It also reveals the gradual increase to parks as lockdown started to lift and over the summer months. It is worth noting that retail and recreation and transit are still not back to their historical levels even after lockdown was lifted.

Figure 2: Effect of restrictions on mobility, March–Oct 2020.

Source: COVID-19 Community Mobility Reports ⁹

NISRA launched a COVID-19 Opinion Survey on 20 April 2020, designed to measure how the COVID-19 pandemic was affecting peoples' lives and behaviour in Northern Ireland.¹⁰ Results for those interviewed on or after 17 June 2020 were as follows. Most people (94%) interviewed said that they had left their home for some reason. The vast majority of these people (96%) washed their hands with soap and water, always or often, after returning home from a public place. Just under half of people (47%) said they had visited a park or public green space. Most of these people (77%) said they met with friends or family members who lived outside their household in these public places. The vast majority of people (93%) reported staying always or often at least two metres away from other people when outside their home. The majority of people (73%) said they had avoided contact with older people or other vulnerable people in the seven days prior to interview because of the coronavirus (COVID-19) outbreak. The results show that this proportion has decreased over time.

Nine out of ten people (90%) interviewed in April 2020 said that they had avoided contact with older or vulnerable people in the seven days prior to interview because of the coronavirus (COVID-19) outbreak. This proportion decreased to 61% in August 2020.

Those people who were interviewed between 17 June and 17 September 2020 were asked about aspects of their life before and after the COVID-19 pandemic. Approximately half of people (52%) thought that some aspect of their lifestyle had changed for the better since the pandemic, whilst just under half (48%) did not. Those people who felt that some aspect of their lifestyle had changed for the better were asked which aspects had improved. Approximately six in ten of these people said they were keeping in touch more with family and friends (62%), spending more quality time with the people they live with (62%) or they had a slower pace of life (59%). About half of these people also said they spent less time travelling (55%), had more time to relax (53%), spent more time on things they enjoyed (53%), spent more time on things that mattered to them (49%) or they did more exercise than before (46%).

In the NISRA surveys over a quarter of people (27%) stated that they were very worried or somewhat worried about the effect the COVID-19 was having on their household finances. These people were asked an additional question about how their household finances had been affected in the seven days prior to interview. The most common ways their household finances had been affected was reduced income (71%), unable to save as usual (50%) or use of savings to cover living costs (33%). Almost three out of ten people (29%) expected the financial position of their household to get worse in the next 12 months.

Mental health and wellbeing

The NISRA surveys found high levels of worry among people regarding the COVID-19 pandemic, however these levels appear to be decreasing over time.¹⁰ In April and May, more than three quarters of people interviewed (76% and 77% respectively) said that they were worried about the effect the COVID-19 was having on their lives. This reduced slightly from the period from June onwards, when this proportion was 68%-69%.

The average wellbeing rating of people interviewed in the period April–September 2020 for ‘life satisfaction’ was lower than that reported by NISRA for the 2018/19 year (7.63 vs 7.89). Anxiety levels in the same period were also higher than that reported by NISRA for 2018/19 (3.20 vs 2.83). However, as we move through the pandemic period, ‘life satisfaction’ ratings appear to be increasing and ‘anxiety’ levels are decreasing. The average ‘life satisfaction’ rating of people interviewed when restrictions had eased in August 2020 was higher than that reported during the lockdown period in May 2020 (7.79 vs 7.42). In contrast, the average ‘anxiety’ rating was higher during the lockdown period in May 2020 than when restrictions had eased in August 2020 (3.51 vs 3.01).

Some 5% of people interviewed in the period April to September 2020 reported feeling lonely ‘often/always’. This is the same as the NISRA published figure for 2018/19 (5%). However, the proportion of people reporting they feel lonely ‘some of the time’ (14%) was higher than the figure reported in the 18/19 annual data (12%). Similarly, a quarter of people (26%) reported feeling lonely ‘never’, lower than 33% in 2018/19. More than one third of people (36%) reported feeling ‘hardly ever’ lonely, higher than 32% in 2018/19. The proportion of people who felt ‘more often, lonely during the lockdown period in May 2020 (42%) was significantly higher than when restrictions had eased in August 2020 (34%).

Community support and safety

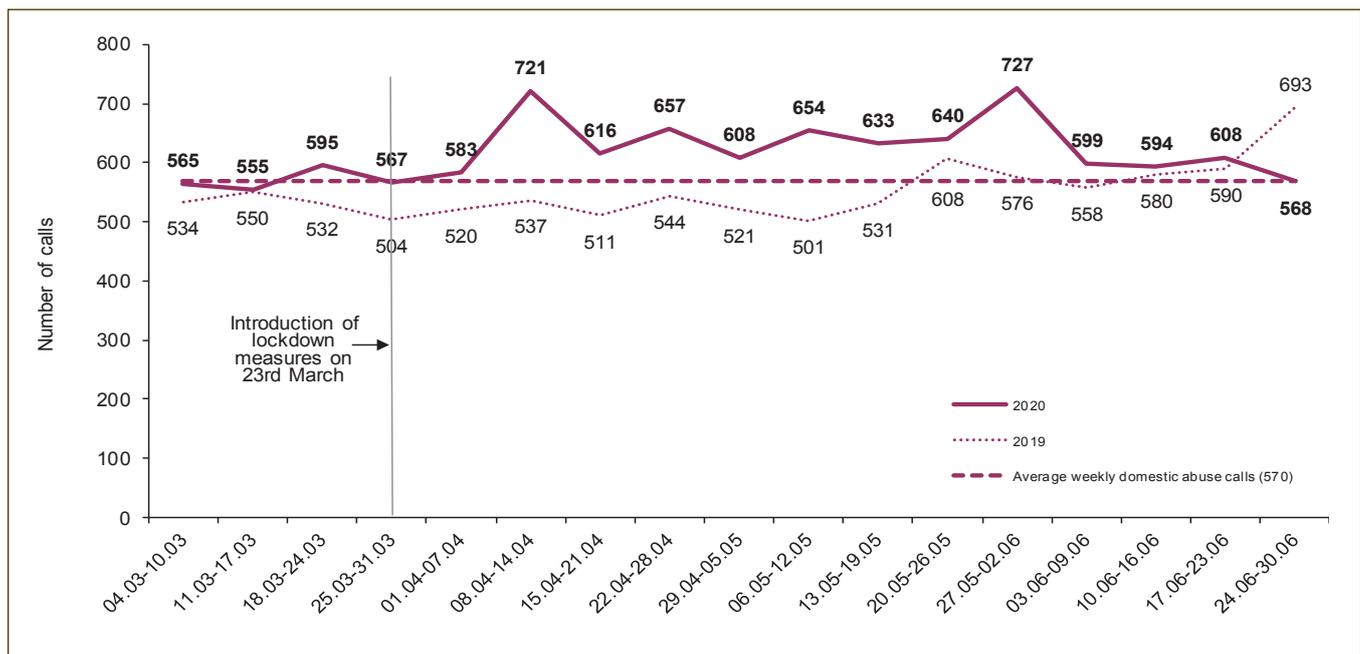
The NISRA surveys showed a general good feeling amongst people that there would be a high degree of community support if they needed it because of the COVID-19 pandemic.¹⁰ Just over eight out of ten people (82%) agreed that if they needed help, other local community members would help them during the pandemic. People interviewed from 17 June on were asked about how safe or unsafe they felt inside and outside of their homes. The vast majority of people (97%) reported feeling safe in their home since the pandemic. Almost half of people (48%) said they felt safe outside their home, but more than one quarter (28%) reported they felt unsafe.

Peoples’ perceptions of anti-social behaviour changed over the course of the pandemic period. In the lockdown months of April and May, almost half of people (48% and 44% respectively) thought that

antisocial behaviour had gone down a little or a lot since the coronavirus pandemic. Conversely, people interviewed in August were twice as likely (19%) to think that anti-social behaviour had gone up a lot or a little compared to people interviewed in April (8%) and May (9%).

There has been a surge in domestic abuse reporting globally since the pandemic. PSNI have produced statistics showing the increase in reporting in Northern Ireland after the introduction of lockdown (see Figure 3).

Figure 3: Domestic abuse calls received by police, 2020 compared to 2019.



Source: <https://www.psni.police.uk/globalassets/inside-the-psni/our-statistics/domestic-abuse-statistics/covid-19/domestic-abuse-calls-to-30.06.20.pdf>

Northern Ireland Children’s Social Services data during COVID-19 show the following:¹¹

- The number of children on the Child Protection Register week ending 9 November was 4.6% higher than the latest official figure prior to COVID-19 (31 December 2019).
- The number of children in care week ending 9 November was 2.6% higher than the latest collected regional figure prior to COVID-19 (30 September 2019).
- The 3 week rolling average of the number of children referred to social services surpassed the pre-COVID-19 average since mid-May 2020.

These figures are provisional and may be subject to change.

Inequalities

At the beginning of the pandemic the phrase “we’re all in it together” was widely used. The expectation was that everyone was at the same risk of becoming infected and experiencing the same illness and outcomes. However, within a few months it had become clear that the disease does not strike all

people equally. Furthermore, the measures put in place to mitigate the spread of the disease also impacted different parts of society in different ways.

An analysis published in the BMJ on mitigating the wider health effects of the COVID-19 pandemic response identified groups which may be particularly vulnerable to the effects of both the pandemic and the social distancing measures:¹²

- Older people—highest direct risk of severe COVID-19, more likely to live alone, less likely to use online communications, at risk of social isolation.
- Young people—affected by disrupted education at critical time; in longer term most at risk of poor employment and associated health outcomes in economic downturn.
- Women—more likely to be carers, likely to lose income if need to provide childcare during school closures, potential for increase in family violence for some.
- People with mental health problems—may be at greater risk from social isolation.
- People who use substances or in recovery—risk of relapse or withdrawal.
- People with a disability—affected by disrupted support services.
- Homeless people—may be unable to self-isolate or affected by disrupted support services.
- People in criminal justice system—difficulty of isolation in prison setting, loss of contact with family.
- Workers on precarious contracts or self-employed—high risk of adverse effects from loss of work and no income.
- People on low income—effects will be particularly severe as they already have poorer health and are more likely to be in insecure work without financial reserves.

Demographic differences

Risk of severe disease and death from COVID-19 is higher in people who are older, male, from deprived areas or from certain non-white ethnicities. Certain underlying health conditions, as well as obesity, increase risk in adults.

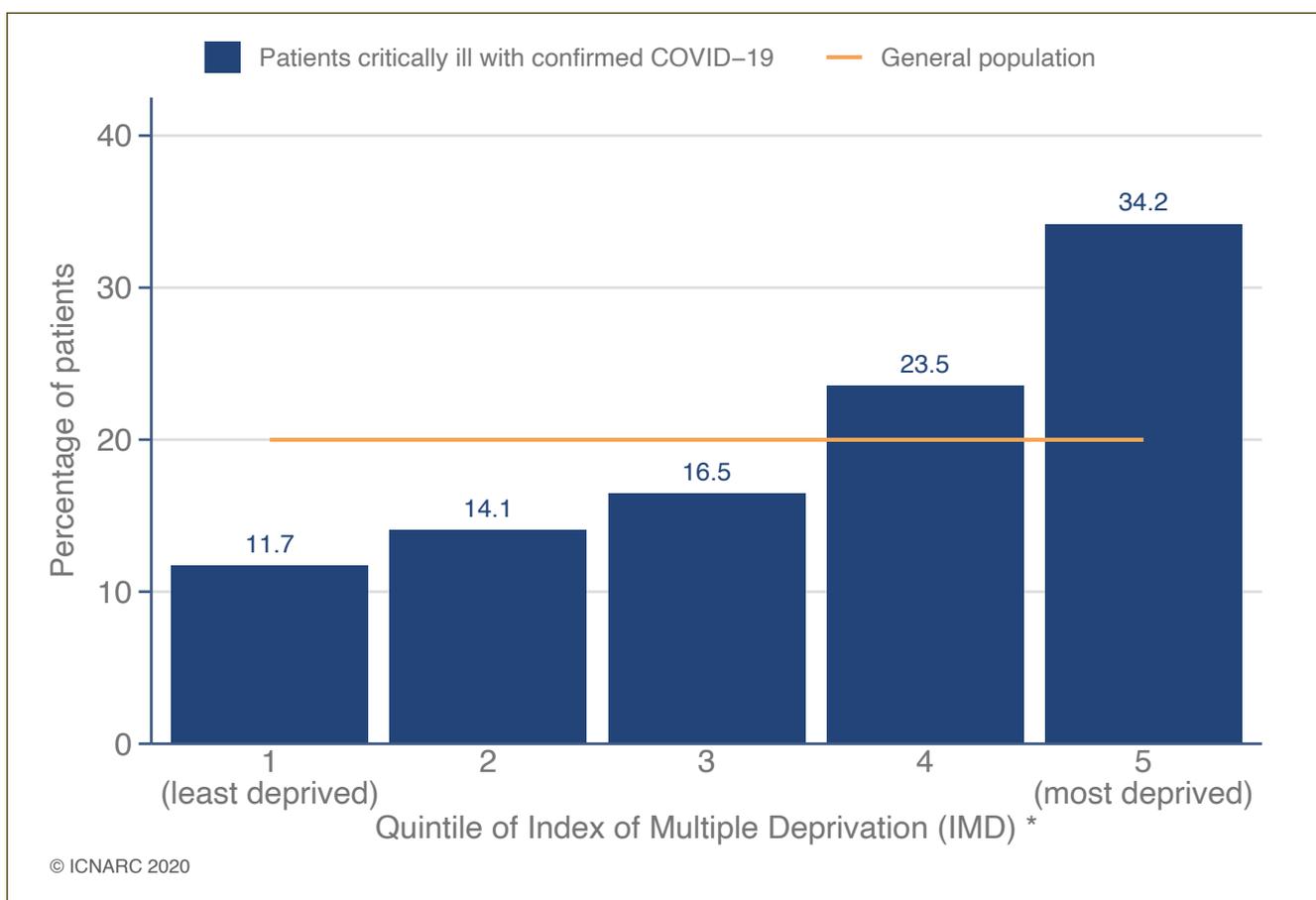
The Northern Ireland Department of Health's report on coronavirus related health inequalities compared how different segments of the Northern Ireland population have been affected.¹³ The report states that:

- The infection rate in the 10% most deprived areas (379 cases per 100,000 population) was a fifth higher than the rate in the 10% least deprived areas (317 cases per 100,000 population).
- Of those testing positive, more than a quarter (27%) were admitted to hospital for treatment, with males (39%) being twice as likely to be admitted as females (19%), and those in the 10% most deprived areas were 37% more likely to be admitted than those in the 10% least deprived areas.

- The admission rate for COVID-19 (confirmed or suspected cases) in the 10% most deprived areas (581 admissions per 100,000 population) was almost double the rate in the 10% least deprived areas.
- While deprivation was found to be an important factor of the likelihood of admission, age was found to have a greater impact. The standardised admission rate for the population aged 75 and over (2,255 admissions per 100,000 population) was 9 times that for the under 75 population (249 admissions per 100,000 population).

An analysis of COVID-19 related death rates in Northern Ireland (up to week ending 6 November 2020) reveals the differences between age groups and genders, as shown in Figure 4.

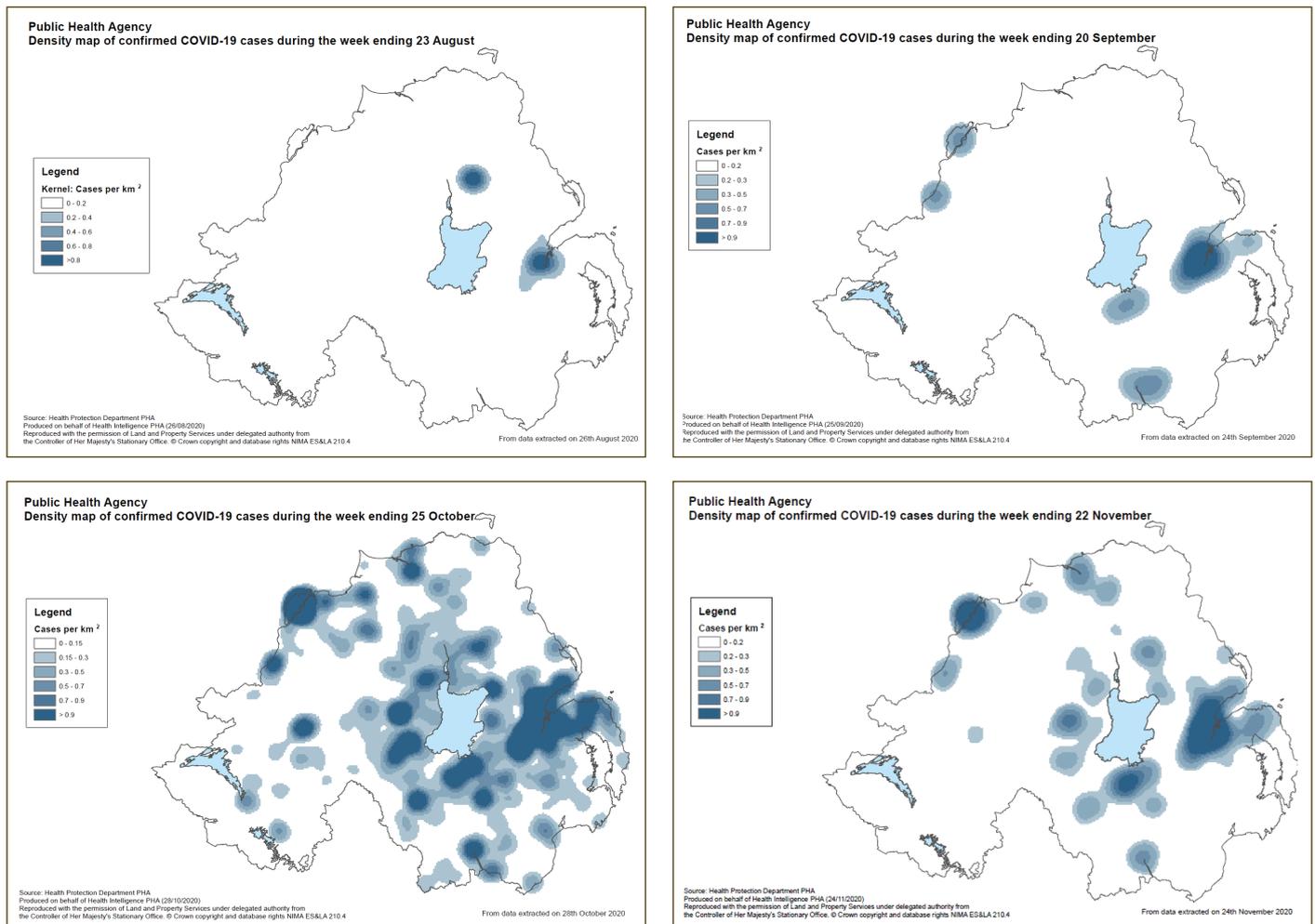
Figure 4: Quintile of Multiple Index of Deprivation for patients in Intensive Care Units in Northern Ireland who had COVID-19.



Source: ICNARC 14

The impact of geography

COVID-19 cases cluster together, both when the incidence is high and when it is low. The following maps from 23 August, 20 September, 25 October and 22 November in Figure 5 illustrate the rise and fall in the number of cases over time, whilst maintaining clear evidence of geographical clustering.

Figure 5: The changing pattern of COVID-19 during the pandemic.

Source: We are grateful to Veterinary Epidemiologists who regularly provided these maps for the PHA

The contour lines on the maps above indicate increasing density of cases, with the darkest shade of blue indicating where there is the greatest density of cases.

Moving forward – opportunities for a greater focus on Intelligence

Responding to COVID has created substantial challenges for data systems and analysts across the HSC and wider. Some of the opportunities for greater focus include:

- The opportunity to gather data from areas (such as nursing homes) that traditionally do not provide routine central reporting.
- The requirement to speed up established or integrate new data flows and publish their outputs rapidly.
- The opportunity to provide data overviews to wider public audiences.
- Implementation of new data coding structures and data definitions and standardisation of their use and the necessary data audit and quality work to improve data.
- The need to publish provisional data ahead of scheduled Official Statistics releases.

- Comparability issues around definitions across countries.
- A potential tension between those wanting to access data and client confidentiality.
- A shortage of analysis expertise and the opportunity to interface with academia to support analysis.
- The opportunity to use new digital presentation methods including mapping.

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COVID-19 surveillance findings up to epidemiological week 47

Introduction

This chapter describes some aspects of surveillance that the health protection surveillance team routinely undertake, and which have underpinned the ongoing evaluation of the COVID-19 pandemic in Northern Ireland. There are other organisations that have also undertaken routine data collection and analysis, and there is a large amount of data being regularly published regarding COVID-19 (for example, the Department of Health Dashboard and the Northern Ireland Statistics and Research Agency).

This report presents data from existing and newly developed PHA Health Protection surveillance systems that monitor COVID-19 activity in Northern Ireland and complements the range of existing data currently available. Full details are published in the PHA weekly bulletins.¹

Unless otherwise stated, data is presented using epidemiological weeks, a standardised method of counting weeks to allow for the comparison of data year after year. The data included in this report is the most up-to-date data available at the time of the report; however, this is subject to change as the data is subject to ongoing quality assurance.

Contact tracing

Contact tracing is the process of identifying, assessing, and managing people who have been exposed to a disease to prevent onward transmission.² Contact tracing can help break the chains of transmission of COVID-19 and is an essential public health tool for controlling the virus.

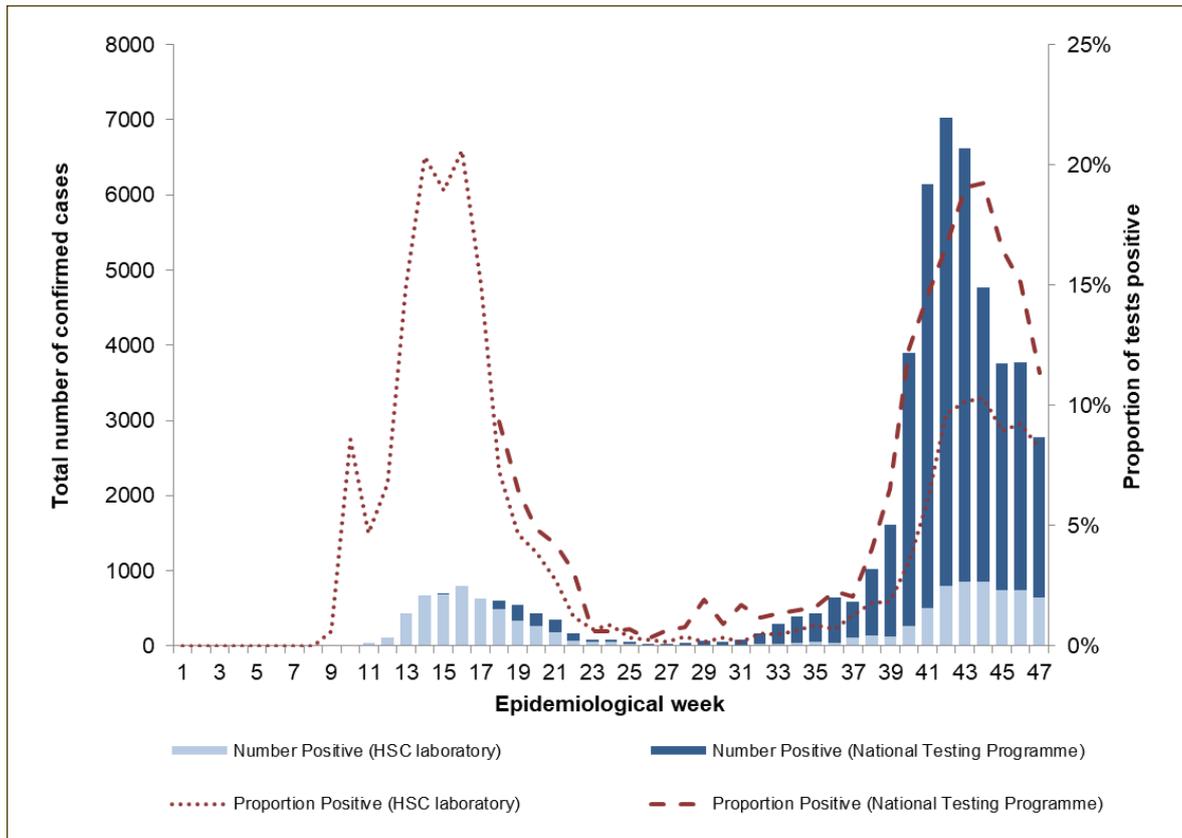
Contact tracing seeks to limit and prevent the spread of infections such as COVID-19. It works by identifying a confirmed case and asking them who they have been in contact with. Individual contacts are considered high risk if they have spent more than 15 minutes in close contact with a confirmed case without personal protection. This means that those who have casually passed by someone on the street will not be considered high risk.

Clusters

In total, up to 23 November 2020, the contact tracing centre has identified a total of 164 clusters with greater than five people and 656 clusters with fewer than five people across Northern Ireland.

Virology testing surveillance

Figure 1: Weekly number of individuals tested for SARS-CoV-2 and proportion positive, by source (HSC Laboratory testing and the National Testing Programme), 2020.



Note: Total individuals tested include those that were reported as indeterminate.

Figure 1 represents the number of new weekly cases reported to the PHA (bars) and the cumulative number of cases (dashed line). From the end of September (week 40 onwards) we have seen a large increase in cases and increasing cumulative confirmed cases, peaking during week 42. This is mainly due to increasing clusters, increasing community transmission and contact tracing within a variety of settings. However, from the end of October (week 43) there has been a decrease in weekly cases. The proportion of positive tests in HSC laboratories, which represents inpatients, and the proportion in the National Testing Programme, representing cases in the community, is also shown. During both waves of the pandemic, the proportion of positive tests rose significantly.

Figure 2: Total confirmed cases, by age, sex and source, 2020.

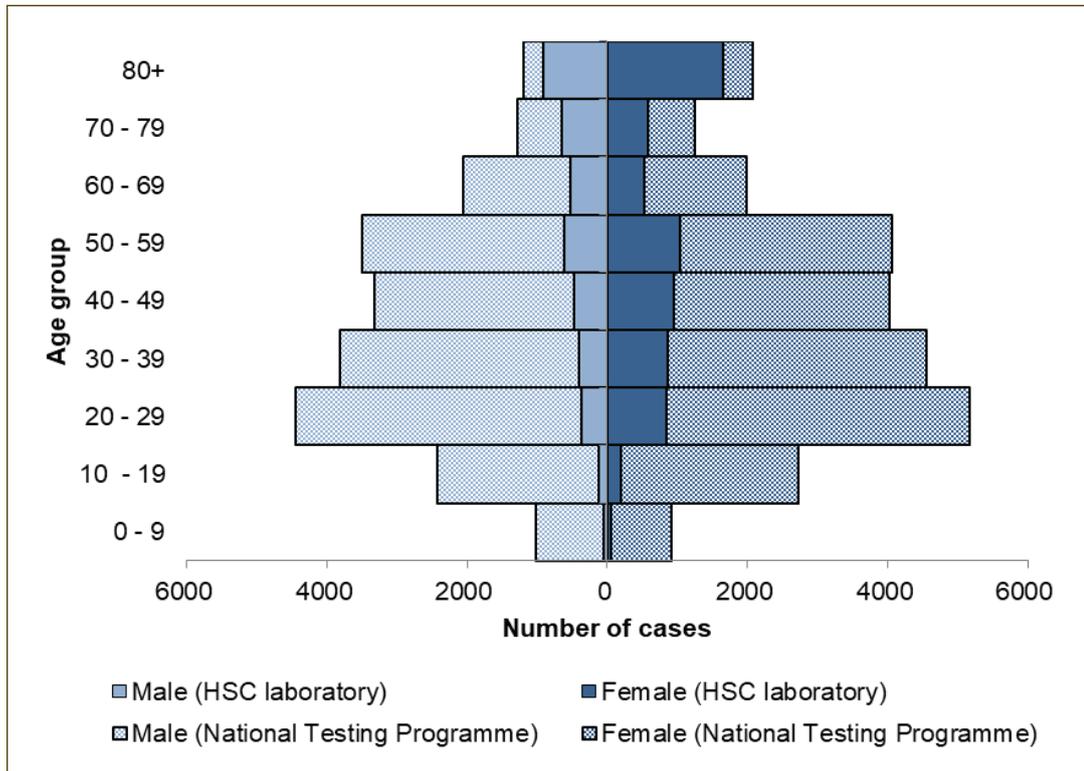
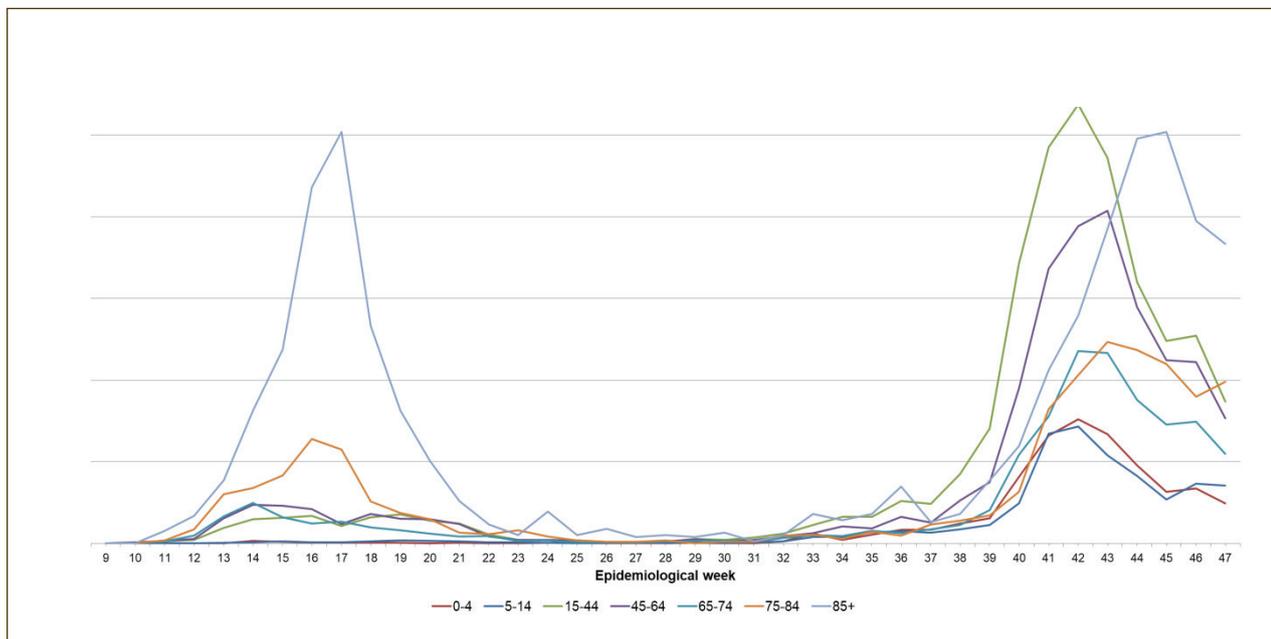


Figure 2 represents the cumulative number of cases reported by HSC laboratories and the National Testing Programme. HSC laboratory cases were mainly detected at the beginning of the pandemic in hospital settings, resulting in higher cases and rates among the older age groups. With the introduction of the National Testing Programme, it has become the main source of case data as a result of enhanced community testing enabling us to detect a greater spectrum of disease. From this data we have seen a higher number of cases among the 20-29 age group.

Figure 3: Weekly laboratory confirmed case rates per 100,000 population, by age group, for all testing data combined, 2020.

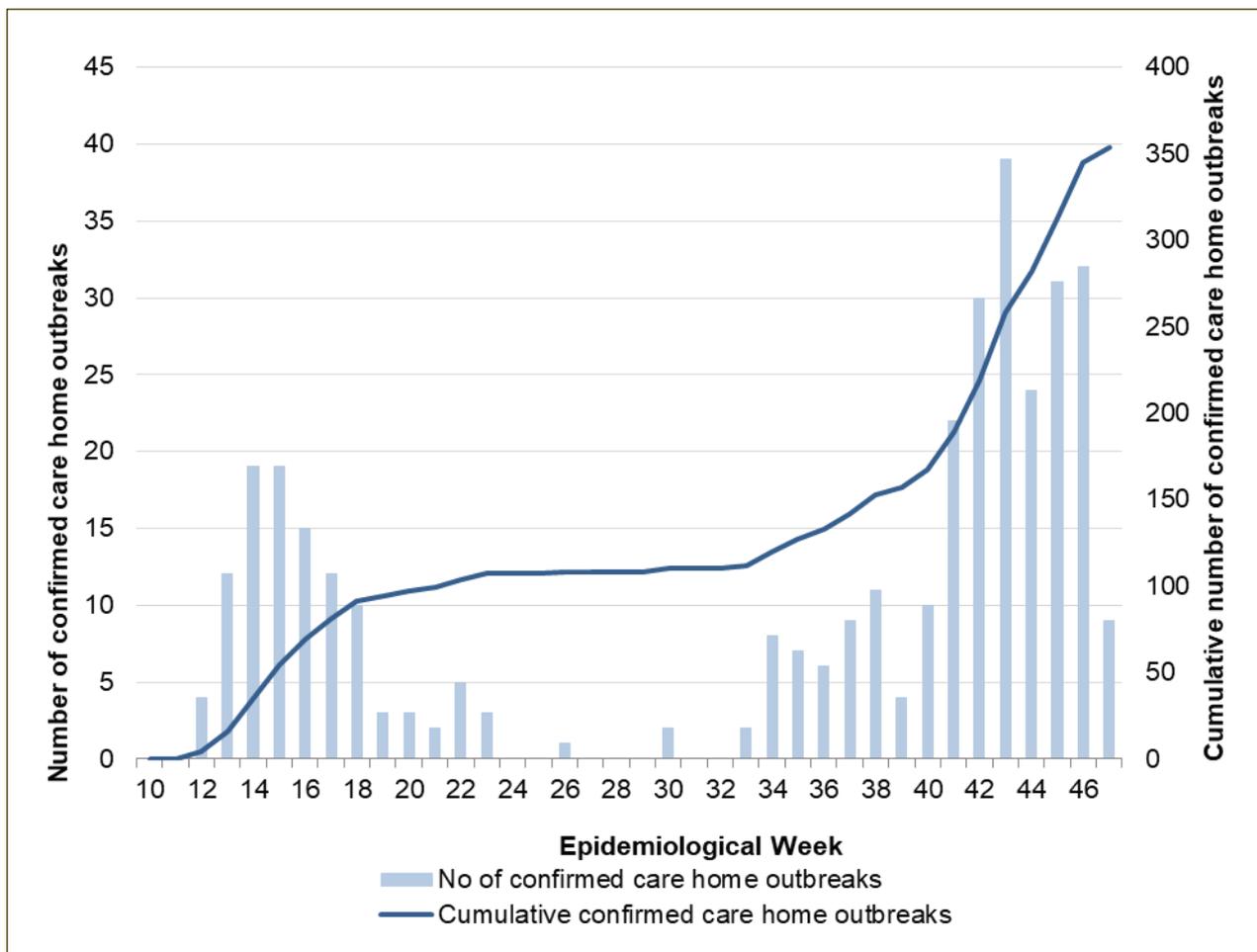


It is important to note that the second wave captures many more cases than the first wave, primarily because there was a vastly different testing resource available during the second wave. The height of the first and second waves is therefore not comparable. As seen in Figure 3, in both waves, cases in the oldest age group (85+) have risen significantly. In the second wave, this was preceded by a rise in those aged 15-44 years, suggesting the possibility of spread from younger to older age groups. Positivity rates in young children have remained low.

Care home outbreaks

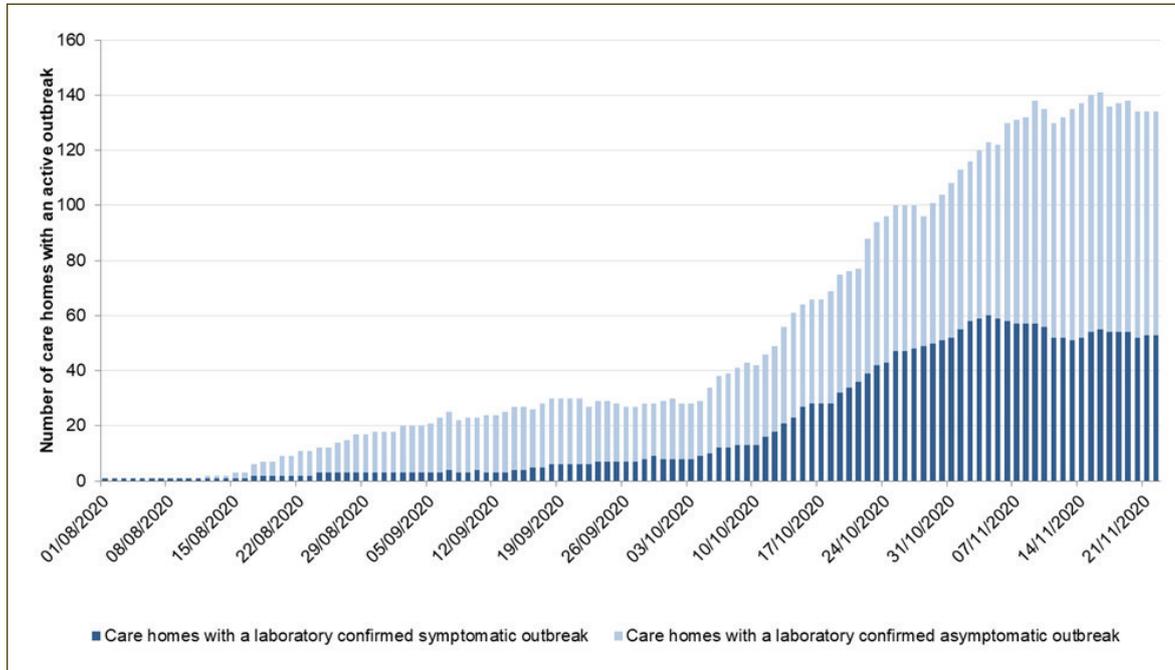
Care homes have been a key setting for COVID-19, which is related to the vulnerability of this population to this particular infection. Figure 4 indicates that there have been two waves of infection in care homes in Northern Ireland. The height of the waves is not comparable, as the second wave has been detected by much more intensive testing in care homes, which results in a lower threshold for detection of cases.

Figure 4: Confirmed and suspected COVID-19 care home outbreaks in Northern Ireland, 2020.



Most of the outbreaks detected in the second wave in care homes have been asymptomatic, with relatively few deaths. This is indicated in Figure 5.

Figure 5: Number of care homes with a confirmed active symptomatic or asymptomatic COVID-19 outbreak in Northern Ireland, 2020.

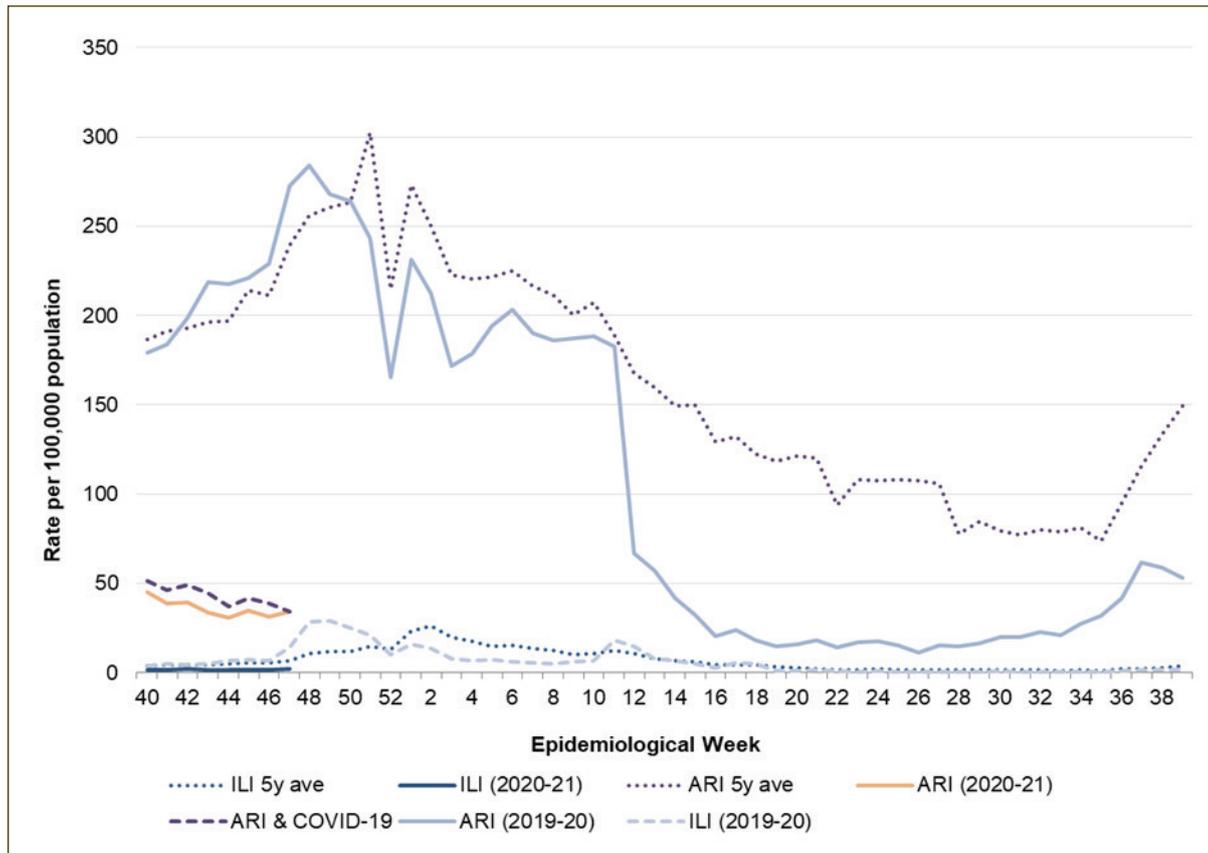


Note: PHA began recording confirmed COVID-19 outbreaks as either symptomatic or asymptomatic on 1 August 2020. This means the numbers represented on the graph may not equal the total active confirmed COVID-19 outbreaks. Confirmed COVID-19 outbreaks reported prior to 1 August 2020 and still ongoing are not included in this graph. Additionally, other respiratory outbreaks are not included.

Primary care syndromic surveillance

The public health surveillance team have monitored respiratory disease in primary care for many years. This has proved particularly helpful in following the pandemic, as a robust baseline is available for comparison purposes. Some of this data is shown in Figure 6.

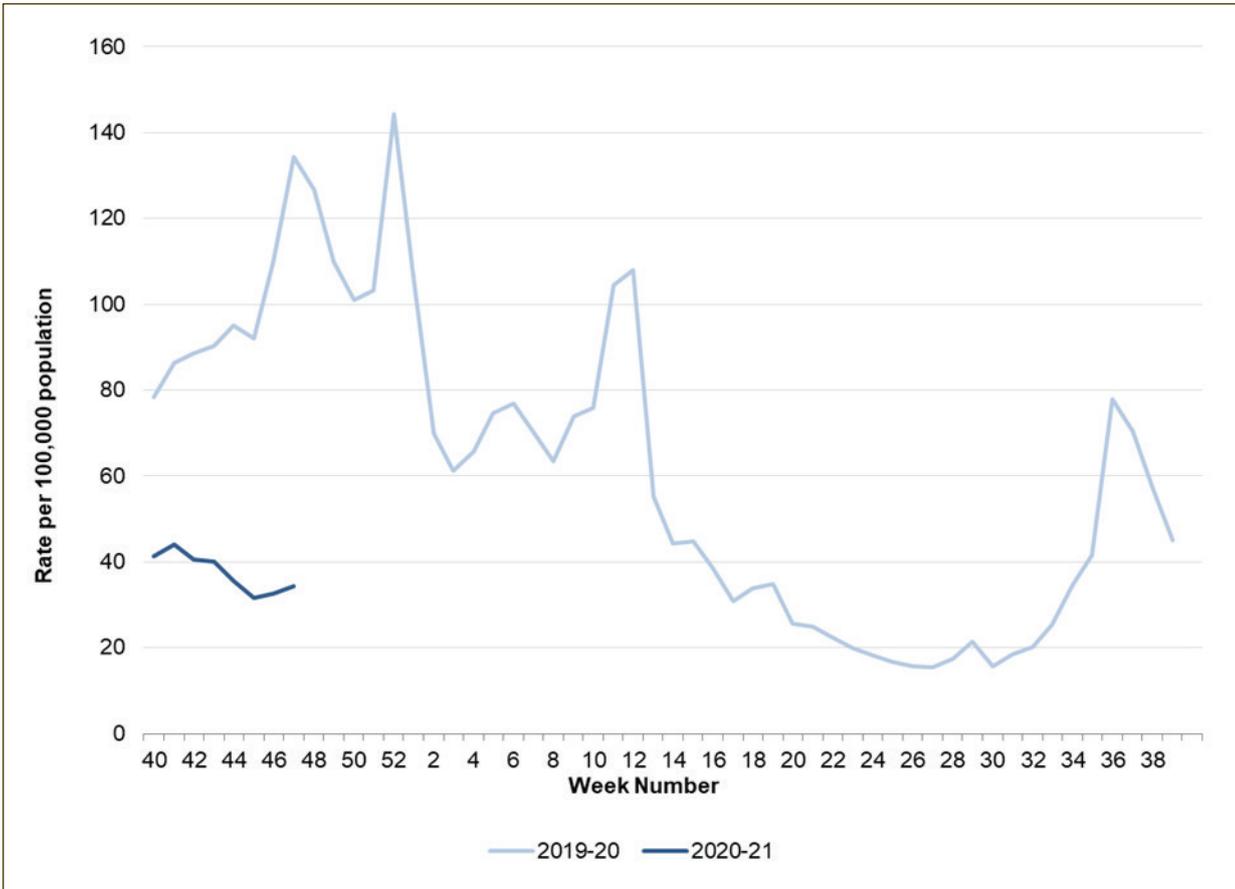
Figure 6: In-hours consultation rates for influenza-like illness (ILI), acute respiratory infections (ARI) and COVID-19, 2019/20–2020/21.



The consultation rate trend for acute respiratory infections (ARI) during 2019/20 decreased from week 40 to a peak in week 48 (284.1 per 100,000 population), before declining. The trend pattern for influenza-like illness (ILI) is similar although rates are much smaller. The peak occurred earlier than the previous five-year average reflecting the earlier 2019/20 influenza season.

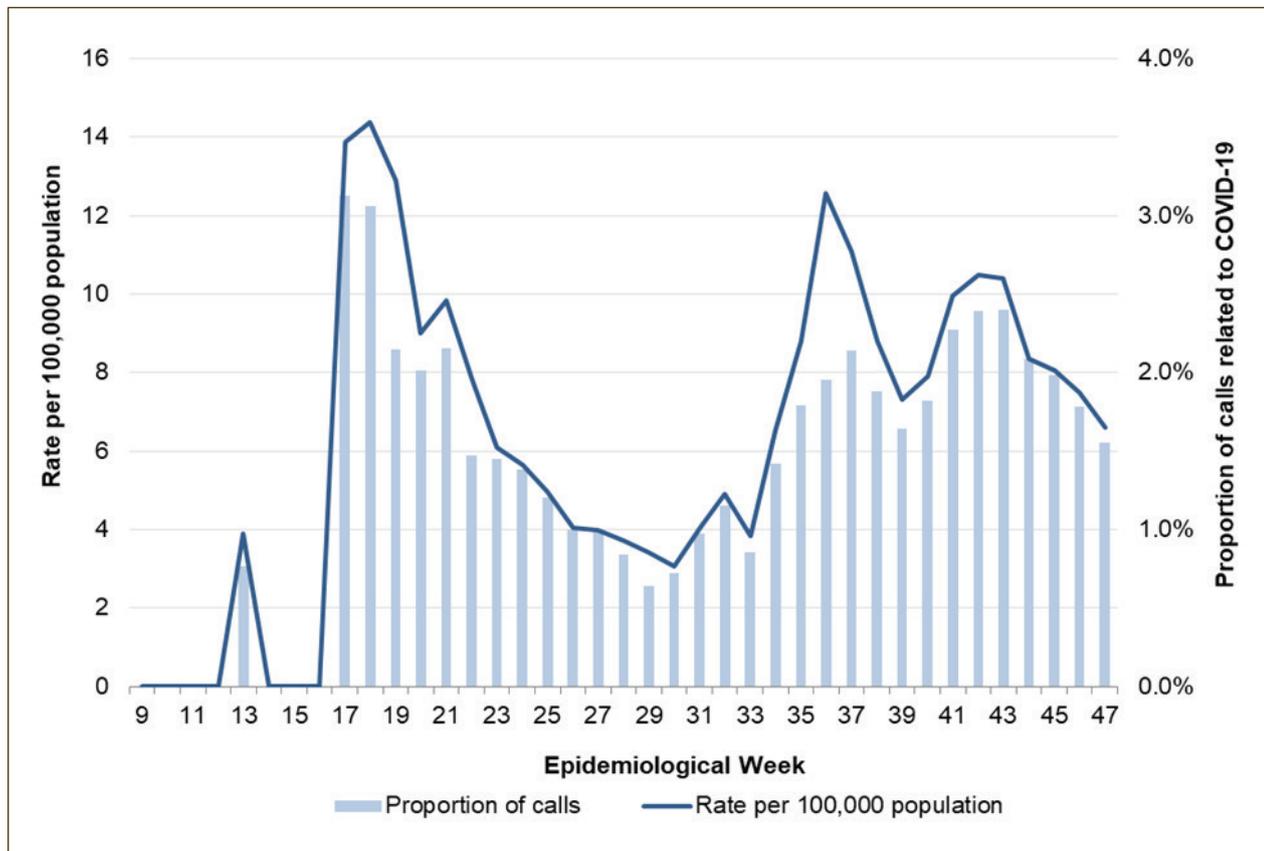
In week 11 ARI consultation rates dramatically fell from 182.8 per 100,000 to 66.6 per 100,000 in week 12, which coincides with the introduction of self-isolation advice, the stay at home directive (“lockdown”) and a change to primary care delivery in managing COVID-19 cases. ARI consultation rates remain well below the average for previous years.

Figure 7: Out-of-hours (OOH) consultation rates for ARI, 2019/20–2020/21.



The ARI consultation rate in primary care out-of-hours (OOH) trend during 2019/20 increased from week 40 to a peak in week 52 (144.2 per 100,000 population), before declining. In week 10 ARI consultation rates in OOH increased from 76.0 to 108.1 per 100,000 by week 12, before dramatically falling again to 55.2 per 100,000 in week 13. This follows a similar trend to in-hours consultations.

In line with international practice, the new respiratory 2020-21 year commenced in week 40. Consultations during week 47 are lower compared to this time last year but have increasing gradually since week 45.

Figure 8: Out-of-hours (OOH) consultation rates for COVID-19, 2020.

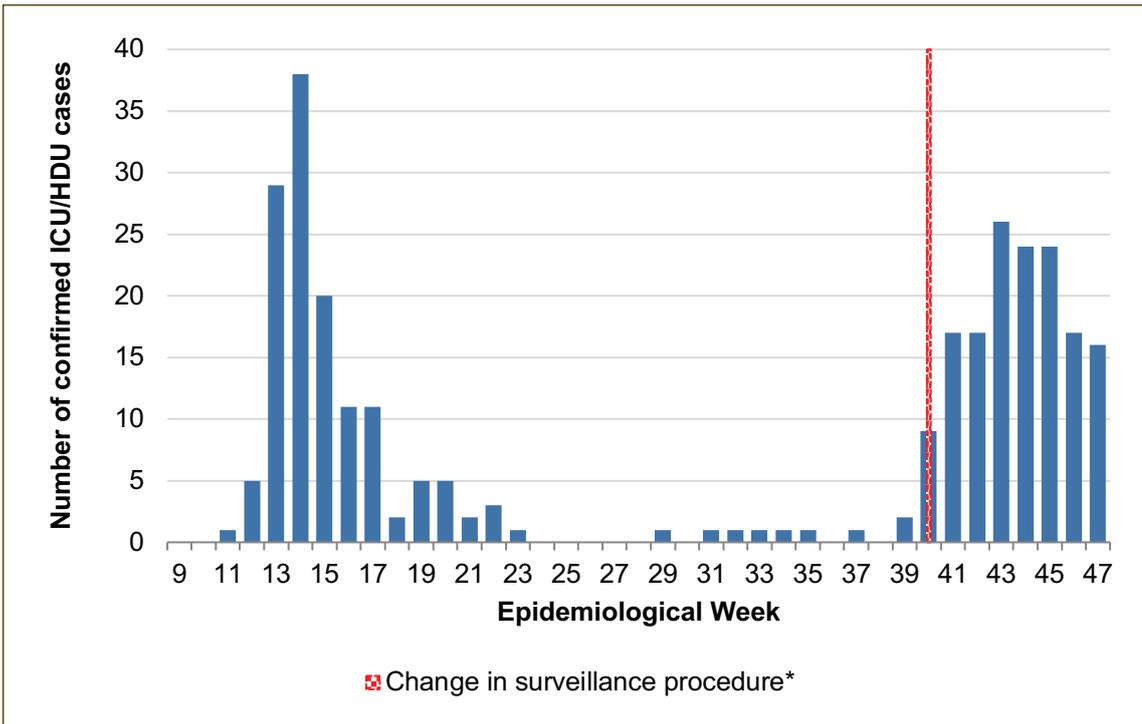
The COVID-19 consultation rate in OOH centres during 2020 started increasing from week 17. It peaked in week 18 at 14.4 per 100,000 before declining. A similar trend was seen in terms of proportion of calls related to COVID-19, though this proportion has so far remained small. This trend coincides with the introduction of GP COVID-19 codes and the change from using established respiratory codes, such as ARI, to COVID-19.

COVID-19 consultation rates have been decreasing gradually in recent weeks. The proportion of calls related to COVID-19 has been decreasing and remains below 2%.

Critical care surveillance

Critical care is an important context for surveillance, particularly for infectious diseases. It is also a barometer of the pressure that the HSC service is experiencing. Figure 9 provides clear evidence of two waves of COVID-19 affecting ICUs in Northern Ireland.

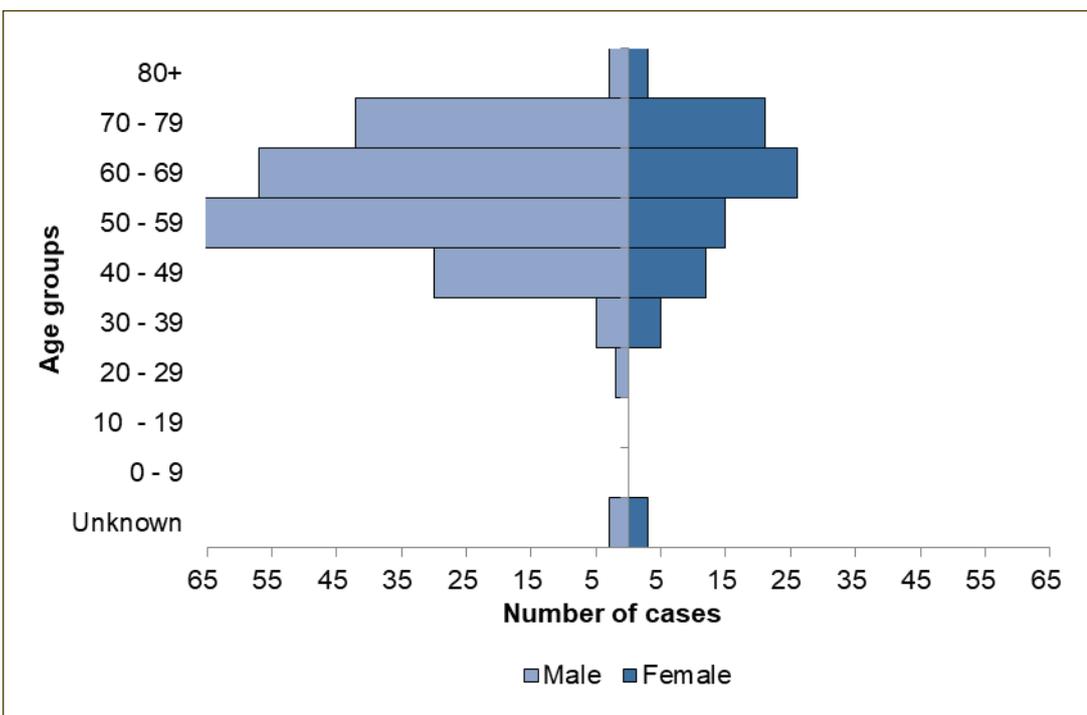
Figure 9: ICU/HDU COVID-19 cases by sample result week, 2020.



Note: Since start of week 40 (28 September 2020), data collection for critical care surveillance has been streamlined to coincide with the well-established surveillance of influenza patients in critical care in conjunction with the Critical Care Network Northern Ireland (CaNNI).

There has been a strong gender difference associated with admission to ICU from COVID-19, with a much higher rate in middle aged men as is shown in Figure 10.

Figure 10: ICU/HDU COVID-19 cases, by age and sex, 2020.



To week 47, there have been 292 individuals admitted to critical care with confirmed SARS-CoV-2 reported to the PHA. Week 14 saw the highest number of ICU reports with a positive result (n=38).

Of the 292 individuals, 71% (n=208) were male. The ages ranged from 26 years to 90 years, with a median age of 61 years.

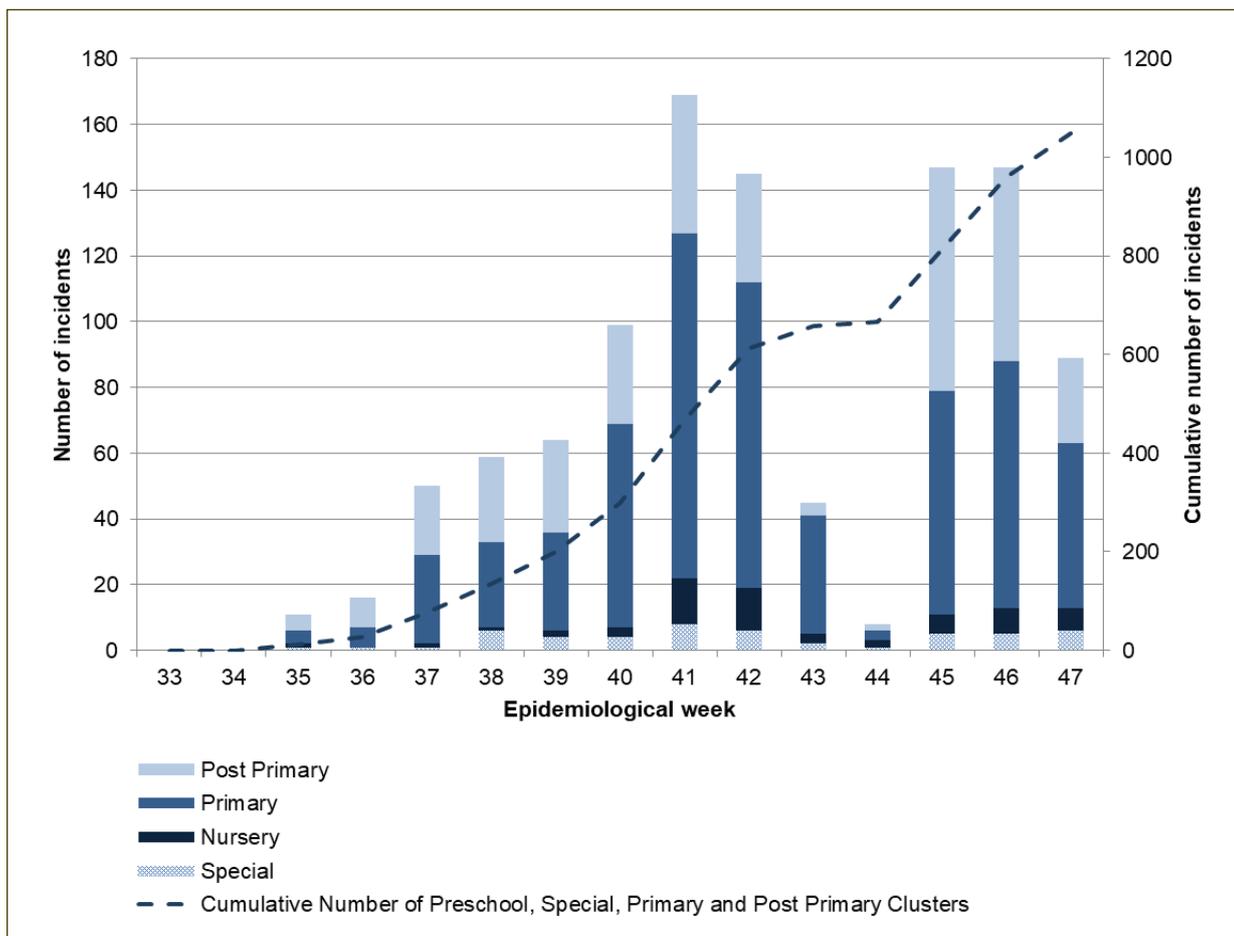
Further details can be found in the Intensive Care National Audit and Research Centre (ICNARC) reports.³

Schools surveillance

Information on school COVID incidents is based on situations reported to PHA COVID School Team.

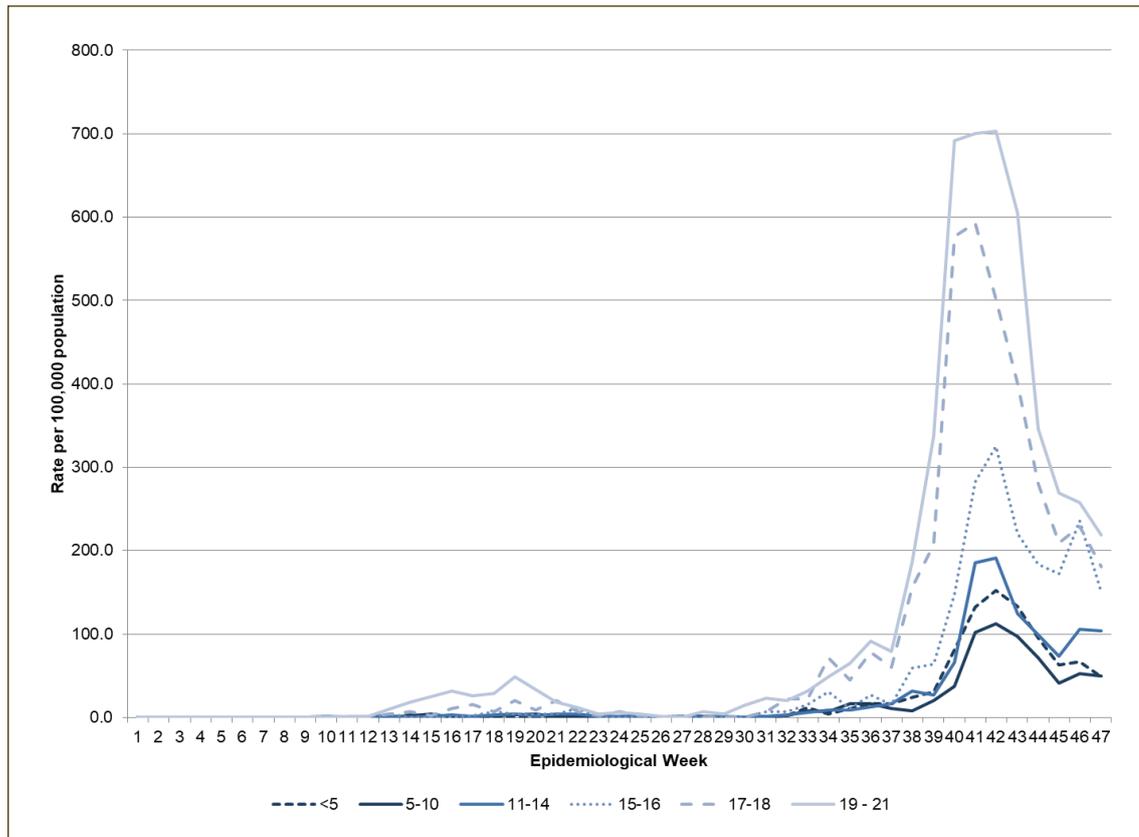
The number of incidents in schools since they first reopened until the end of week 47 is shown in Figure 11. Schools were closed by the Northern Ireland Executive for weeks 43 and 44. The number of incidents was much lower in these two weeks, but did not fall to zero, as some schools continued to provide education for the children of essential workers and some incidents occurred in schools where staff continued to go to school.

Figure 11: Number of COVID-19 incidents in schools, by school type, week 33–47.



The rate of infection with COVID-19 has varied dramatically by age group, with a particularly marked rise in the rate per 100,000 population for those aged 19-21 years particular in the second wave, as is shown in Figure 12.

Figure 12: Weekly COVID-19 laboratory confirmed case rates per 100,000 population, by age group, for all testing data combined, in those aged 21 and under, 2020.



There have been decreases in case rates for all age groups in week 47 compared to week 46. The 19-21 age group had the highest case rates (218.5 per 100,000), followed by the 17-18 age group (180.5 per 100,000).

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Mortality as a measure of the impact of the COVID-19 pandemic

Introduction

Mortality has historically been one of the most important measures of the severity of a pandemic. However, despite it being clear when someone has died, measuring mortality is more complex than one would first assume. There are several different ways of looking at mortality in relation to the impact of COVID-19 and each has their advantages and disadvantages. The varying strengths and availability of these differing approaches are summarised below in Table 1 below. Each of the sources has advantages and disadvantages. Clinically reported deaths are a rapid and timely source of information, but has associated limitations around completeness. Registered death certificates are less timely but a more complete source of information.

Table 1: Comparison of three sources of mortality data.

	Clinically reported deaths associated with COVID-19	Registered Death Certificates	Excess mortality
Frequency	Daily	Weekly	Weekly
Inclusion criteria	All-cause deaths reported to the PHA following a COVID-19 positive test result within the previous 28 days.	Mention of COVID-19 on the death certificate (Part 1 or 2).	All deaths – comparison of total numbers with previous equivalent time periods for that country.
Data Owners	PHA	NISRA/GRO	
Pros	Available quickly.	Reflects the clinician's view about whether COVID-19 was a cause of death and will therefore be more specific to COVID-19. Can show comparative position across countries. Is the definitive source of COVID-19 deaths across other parts of the UK.	Death count tends to be available and no subjective judgement is required and not subject to variation through different testing regimes. Will include the impact of changes in non COVID-19 deaths.

	Clinically reported deaths associated with COVID-19	Registered Death Certificates	Excess mortality
Cons	<p>Reflects all cause-mortality.</p> <p>Tends to be hospital driven. Is 'quick and dirty' data.</p> <p>Affected by testing practice and availability.</p> <p>Potentially missed community deaths where no testing had been done particularly in care homes.</p>	Time lag between death notification and reporting.	Time delays to registration can create responsiveness issues for some countries for comparisons and estimates are used for the most recent period based on known reporting issues.
Data sources	https://www.health-ni.gov.uk/articles/covid-19-daily-dashboard-updates	https://www.nisra.gov.uk/publications/weekly-deaths	https://www.euromomo.eu/

Traditionally death data is reported based on the week of registration not the actual date of death. Where delays to registration occur, for example a death needing to go to the coroner's court, this can mean slight differences in numbers, although these tend to be around specific types of death, such as suicide or undetermined causes of death.

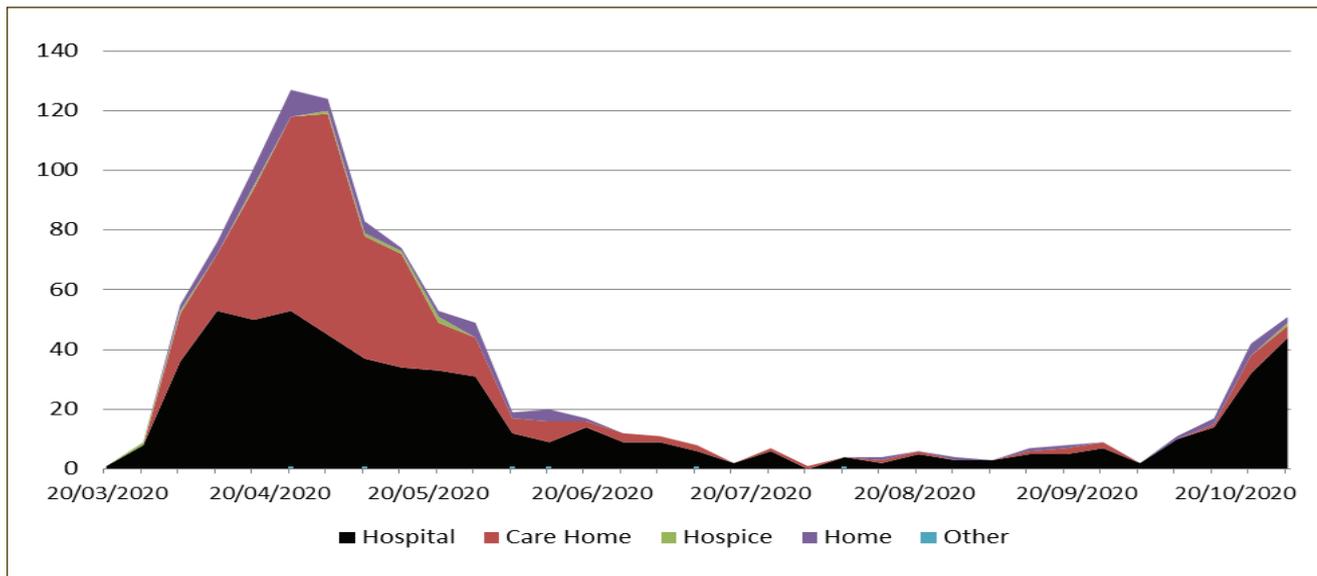
The Northern Ireland Statistics and Research Agency (NISRA) provides the weekly number of registered respiratory and COVID-19 deaths each Friday. Weekly published data are provisional and based on registrations of deaths, not occurrences. The majority of deaths are registered within five days in Northern Ireland.¹

Respiratory deaths include any death where terms directly relating to respiratory causes were mentioned anywhere on the death certificate (this includes COVID-19 deaths). This is not directly comparable to the ONS figures relating to 'deaths where the underlying cause was respiratory disease'. Figures relate to all deaths registered with a mention of COVID-19 on the death certificate. Where COVID-19 is mentioned in part 1 it may not be the underlying cause of death. COVID-19 deaths include any death where coronavirus or COVID-19 (suspected or confirmed) was mentioned anywhere on the death certificate. NISRA quarterly statistics provide detail of underlying cause following coding to International Classification of Diseases (ICD) version 10 rules.

Place of death

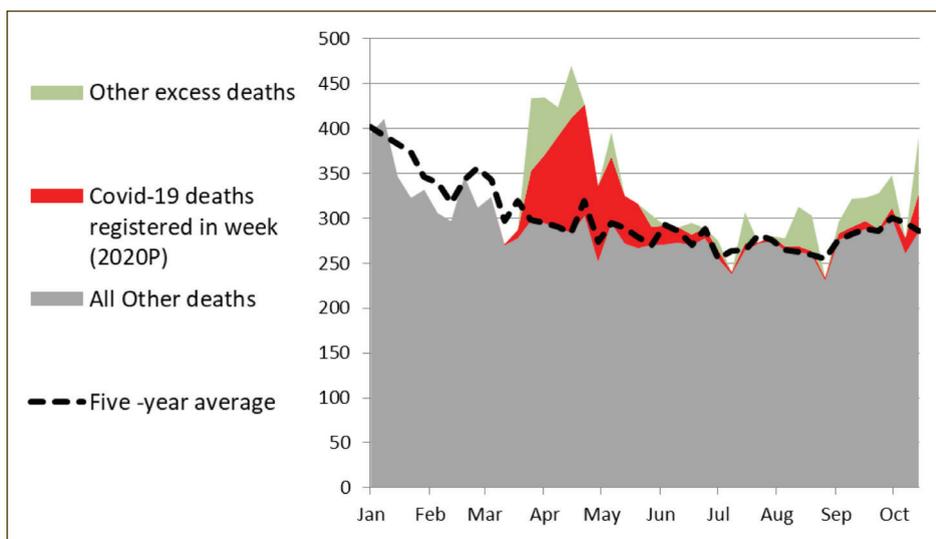
When split by place of death, of the 1,053 deaths involving COVID-19 occurring up to 30 October 2020, 605 (57.5%) occurred in hospital, 375 (35.6) occurred in care homes, nine (0.9%) occurred in hospices and 64 (6.1%) occurred at residential addresses or another location (Figure 1).

Figure 1: Number of deaths by place of death from COVID-19 up to 30 October 2020, based on death registrations (NISRA).



This peak in deaths in late April and early May was well in excess of previous years. Figure 2 below compares total deaths registered per week against the average for the previous five years. The increase in deaths in these weeks is higher than that which would be accounted for by the deaths identified as COVID-19 alone.

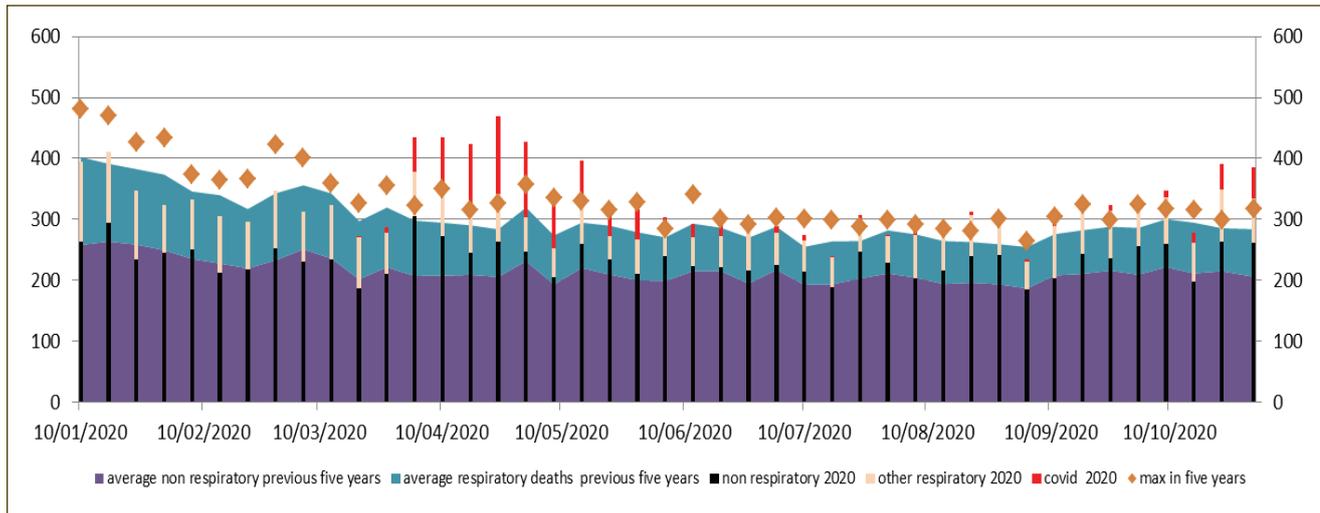
Figure 2: Weekly death registrations, Northern Ireland, comparing 2020 to the average for the preceding five years.



Typically, respiratory deaths account for one quarter to one third of deaths in Northern Ireland with a slightly higher level in flu season. In late April and early May 2020 this was over 40%.

One of the challenges raised in using death certification information for identifying disease is the potential for COVID-19 to be under or over represented depending on the testing capacity, media focus or place of death with more general respiratory causes of death being used instead of COVID-19 or vice versa.

Figure 3: Comparison of respiratory and non-respiratory deaths in the past five years with the 2020 information where COVID-19 has been subdivided out per week in 2020 to end October.

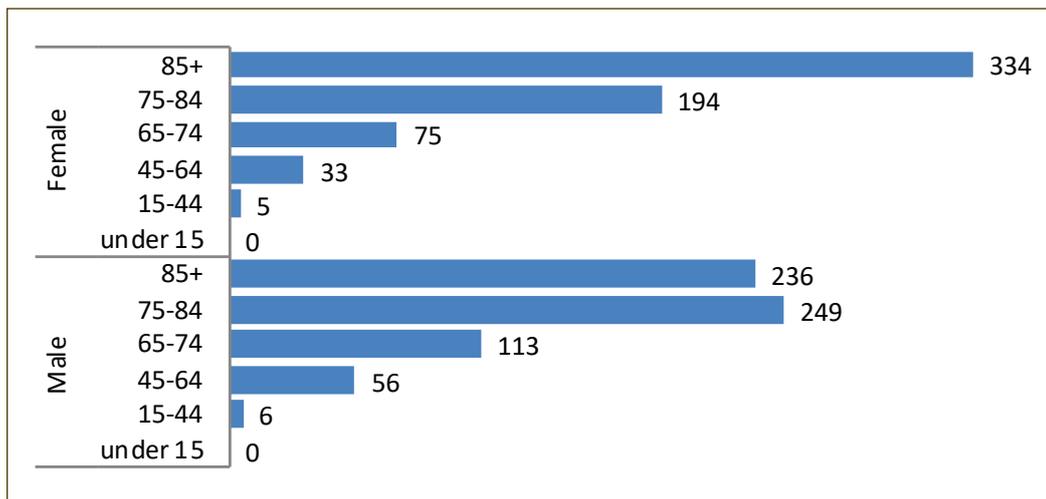


Averages can be misleading and variations occur. The diamond marker shows the maximum number of deaths in the previous five year period per equivalent week. January and February highs in the five years tend to reflect particularly bad flu seasons which 2020 was not at that point. April, May and now October deaths exceed previous highs and the combined respiratory and COVID-19 deaths are in excess of previous respiratory deaths.

Mortality by age group

Deaths in Northern Ireland from COVID-19 have been very much been in older age groups, with only 11 deaths in those under 45 years and only 97 deaths under the age of 65 years in the pandemic up to 13 November 2020. In contrast, there have been 528 deaths in those aged over 85 and older. This is shown in Figure 4 below.

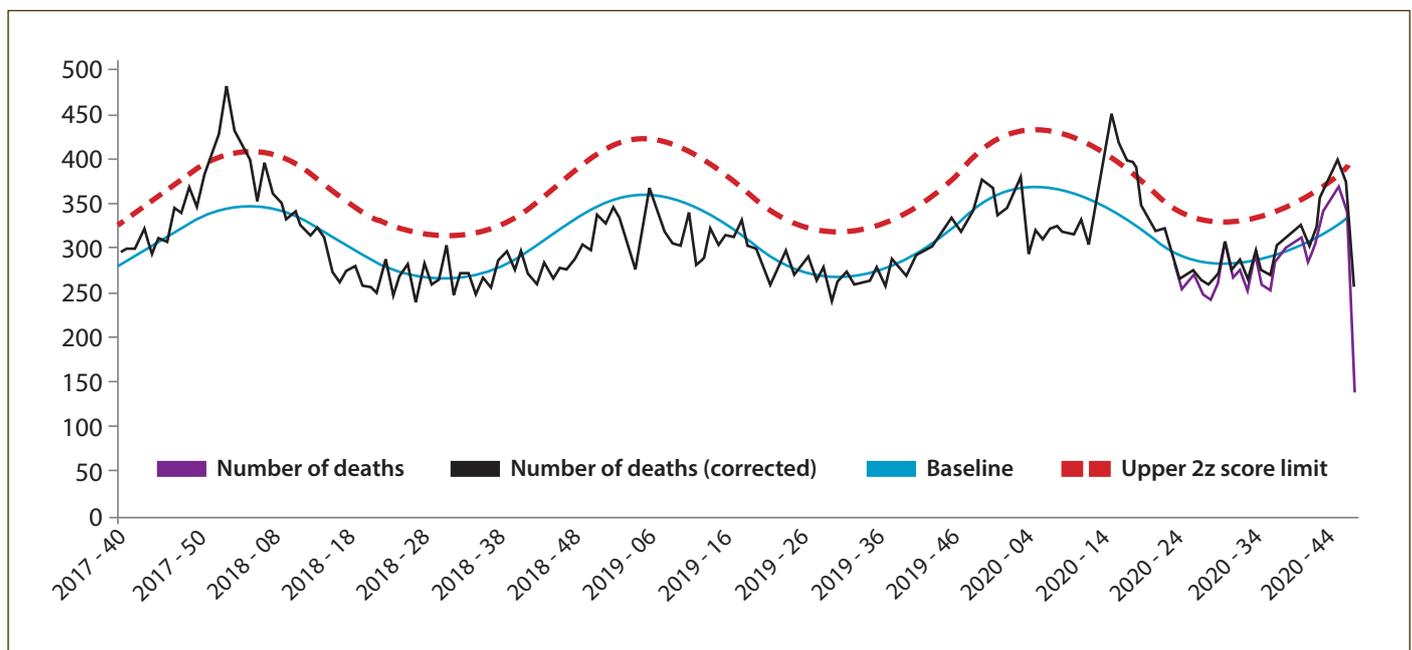
Figure 4: Registered COVID-19 deaths by sex and age group, up to week ending 13 November 2020 (NISRA).



All-cause excess mortality

All-cause excess mortality is probably the single most reliable indicator of the impact of a pandemic of an infectious disease. The dotted line in the graph below indicates two standard deviations from the average for the last five years. One would expect the death rate to exceed this 2.5% of the time, or once every 40 weeks on the basis of random chance alone. However, this threshold has been breached for 11 weeks this year. The seasonal nature of excess mortality is indicated by the wavy nature of the baseline figure.²

Figure 5: Weekly observed and expected number of all-cause deaths in all ages, week 40 2017–week 47 2020.



In 2020, excess all-cause deaths were reported in epidemiological weeks 13 to 20, and week 22. This increase in deaths happened outside the influenza season and at a time when we know flu was not circulating in Northern Ireland. More recently, excess deaths have also been observed in weeks 44 and 45.

While these more recent excess deaths have occurred within the flu season, reports show flu was not widely circulating.³ This suggests the excess mortality may in part be related to COVID-19 deaths and to a fall in presentation to hospital with other conditions (data not shown). Excess deaths were mainly in those over 65 years, which is in line with the age profile of COVID-19 deaths.

Despite delay correction, reported mortality data is still provisional due to the time delay in registration and observations which can vary from week to week; not all registrations for the latest week will have been included the latest model.

There have clearly been excess deaths from COVID-19 during this pandemic. Compared to expected rate of deaths of around 300 per day, COVID-19 deaths amount to around three or four extra days of days of deaths over the timeframe of the pandemic so far.

Conclusion

At the start of the pandemic, historic methods for measuring deaths using death registrations was not timely enough to allow us to assess, in real time, the most severe outcome of COVID-19. The PHA introduced a new method for timely reporting based on all-cause mortality within 28 days of a positive specimen, with the result there are multiple ways to calculate COVID-19 mortality rates. The GRO death registrations data remains the definitive source for COVID-19 related deaths and therefore underpins the analysis in this chapter. From this, clear patterns can be identified, deaths have been clustered in care homes and hospitals, and have primarily affecting the very elderly and those in vulnerable groups. Analysis of the data has shown that in Northern Ireland we have experienced statistically higher number of deaths than would be expected to occur.

Moving forward we need to continue to refine methods and ensure comparability with other parts of the UK and Europe. The PHA team is also working with local universities to develop models that predict mortality and inform how we respond in future.

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Health protection

Core to the work of the PHA is a commitment to protect the health of everyone in Northern Ireland. This includes protecting people from serious threats to health from a wide range of hazards including infectious, chemical or radiation hazards. The most significant health protection in 2020 has been COVID-19, and this section highlights some of the important health protection work that has been carried out during the first phase of the COVID-19 pandemic in Northern Ireland in 2020.

- The role of health protection in the response to COVID-19
- How Health Protection Team responded to the challenges of COVID-19
- Monitoring the spread of COVID-19
- COVID-19 clusters and outbreaks during 2020
- Development of the Northern Ireland Contact Tracing Service during the COVID-19 pandemic
- Pilot study on feasibility of testing close contacts identified by contact tracing
- Care homes surveillance study of asymptomatic and pre-symptomatic SARS-CoV-2 infections in Northern Ireland
- COVID-19 and health protection support for schools
- The genomic aspects of the COVID-19 pandemic
- Vaccination and COVID-19

The role of health protection in the response to COVID-19

The first confirmed case of COVID-19 in Northern Ireland was tested on 26 February 2020.¹ In the first months of 2020 the work of the PHA, and indeed the wider HSC, focused on preparing for, and responding to, the challenges of COVID-19.

The PHA response has focused on surveillance and acute response, and has benefited greatly from the rapid dissemination of knowledge, guidance and research across the world, which has been shared internally to ensure best practice.

Following confirmation of the first case in Northern Ireland, a programme of COVID-19 contact tracing was initiated as part of the disease containment phase. This was led by the Health Protection Team (HPT) and operated by staff redeployed from across the organisation. This initial contact tracing programme was paused when we moved into the 'delay' phase in mid-March. While Northern Ireland was in lockdown, the PHA began the process of establishing a more robust contact tracing programme. Following a one-month pilot scheme, 'Test, Track and Trace' went live on 31 May, and at that point, was the first to do so in the UK.

During this period, the PHA also continued to provide health protection guidance and advice for professionals and the public through the PHA website, public information campaigns and social media. PHA staff also worked closely with HSCB and HSC Trust colleagues to prepare for a possible surge, including ensuring HSC readiness, and making critical care escalation plans.

Working with key partners, including the Department of Health (DoH), Public Health England (PHE), HSC Trusts, NI Pathology Network and universities, the PHA also developed a Northern Ireland approach to COVID-19 testing, and oversaw and coordinated its implementation, focusing on rapidly expanding testing capacity to meet potential demand in the population.

This was achieved in collaboration with local government as well as voluntary and community partners. In order to provide the necessary governance and oversight to this work, the PHA/HSCB/BSO Joint Emergency Plan was invoked, with the establishment of a HSC 'Incident Management' (IM) infrastructure and leadership.

Under this process, the PHA and HSCB jointly chaired daily 'SILVER' Tier meetings receiving reports from HSC Trusts ('BRONZE' Tier) and reporting to the DoH ('GOLD' Tier), ensuring effective communication and decision making.

Cognisant of the potential impact of both the pandemic and the action taken to delay the outbreak on the health and wellbeing of individuals and communities, the PHA also began to plan for the anticipated post-surge and recovery phases.

This included consideration and review of existing resources and contracts to ensure stability and continuity as well as appropriate response to need.

Core health protection functions, including influenza vaccination programme planning and surveillance of Health Care Associated Infections (HCAI) continued throughout the pandemic year, as did work on all other infectious diseases and other hazards.

Note



1. The specimen date was 26 February. Lab confirmation reported to PHA (and case interview) on 27 February.

How Health Protection Team responded to the challenges of COVID-19

Background

On 29 February 2020, COVID-19 was added to the schedule of notifiable diseases in Northern Ireland. Members of the Northern Ireland Health Protection Team (HPT) attended the first national coronavirus Incident Management Team (IMT) hosted by PHE on 9 January 2020. Early health protection activity was related to the development and dissemination of guidance related to infection control and case definitions of COVID-19. The Health Protection Acute Response Team 'duty room' is an established single point of contact for professionals seeking advice on the control of communicable diseases, environmental hazards and vaccination matters. The duty room is operational on weekdays from 9am to 5pm, with out-of-hours and weekend cover provided by an on-call service.

The HPT uses an epidemiological database, HPZone, that records enquiries related to health protection matters, details of cases of communicable disease and information on clusters of communicable disease. Individual cases of COVID-19 that have required Tier 1 management (involvement of acute health protection team) are reported by the contact tracing cell and recorded on HPZone.

COVID-19 presented significant challenges to the acute health protection team in 2020, with increased volume of enquiries from professionals based in healthcare, education, industry, voluntary sector, as well as calls from concerned members of the public. The resilience and versatility of the service was successfully tested during many events. These included responding to major changes to the COVID-19 case definition, and announcements over planned school reopening following lockdown. The core team of health protection nurses, doctors, surveillance and administrative support staff responded positively to the unprecedented demand in a professional manner, whilst maintaining a core non-pandemic health protection service.

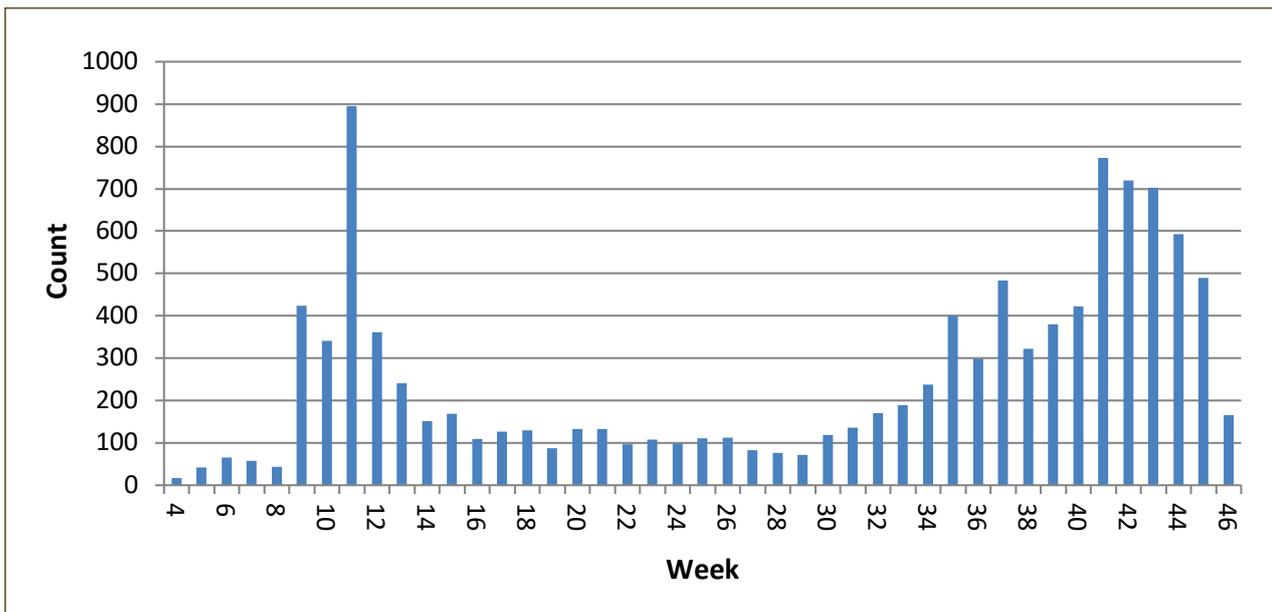
In response to sustained demand for health protection expertise, a dedicated educational cell, providing support to primary and post-primary schools was set up in August, with a health protection guidance support cell formed in October.

Findings

Demand for health protection advice and support related to COVID-19 from January 2020 is presented below.

Enquiries

Enquiries relate to the number of email and telephone contacts received by the health protection team asking for advice related to COVID-19. Recurring themes of enquiries included guidance on case definitions, infection prevention/control queries, interpretation of national/local guidance, media requests and advice to the general public.

Figure 1: Enquiries to the Acute Health Protection Team by week, 2020.

Week 9 activity corresponds to changes made to geographic criteria in the clinical case definition to include areas of Northern Italy. A surge of enquiries in week 11 relates to the change in case definition on 13 March to remove travel from clinical criteria, as well as new changes to hospital criteria. The steady trend in enquiries is reflective of increased disease activity in the community, as well as education cell activity.

Cases

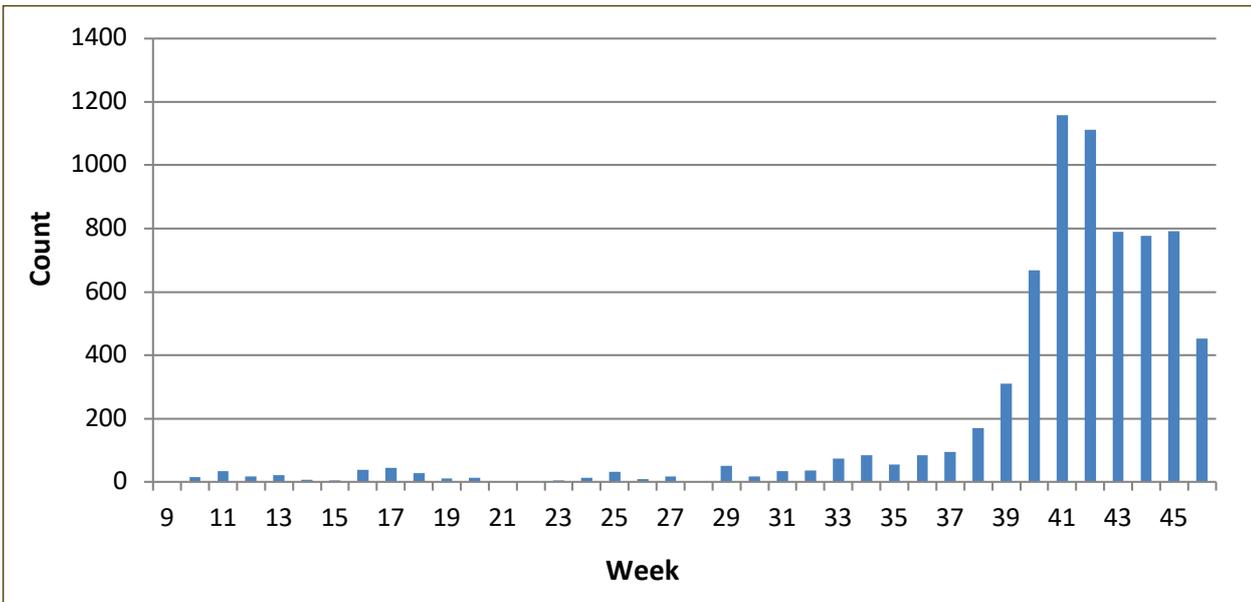
There has been close working between the Contact Tracing Service and the Acute Response Team in Health Protection. Some of the definitions used to inform that interface are provided below.

Cases refer to laboratory confirmed COVID-19 individuals referred for Tier 1 HPT input.

- Clustering of cases with subsequent actions performed, eg letter from education cell to principals or involvement of HSENI or local councils.
- Statutory notification by professionals of COVID-19 as a notifiable disease.

A clear rise in the number of cases managed by tier 1 HPT is indicated in the graph below. This was supported by taking on 25 WTE Senior House Officers as locum staff, and help by staff from elsewhere in the PHA, to support the acute response.

Figure 2: COVID-19 cases managed by Tier 1 HPT – 2020 by week.



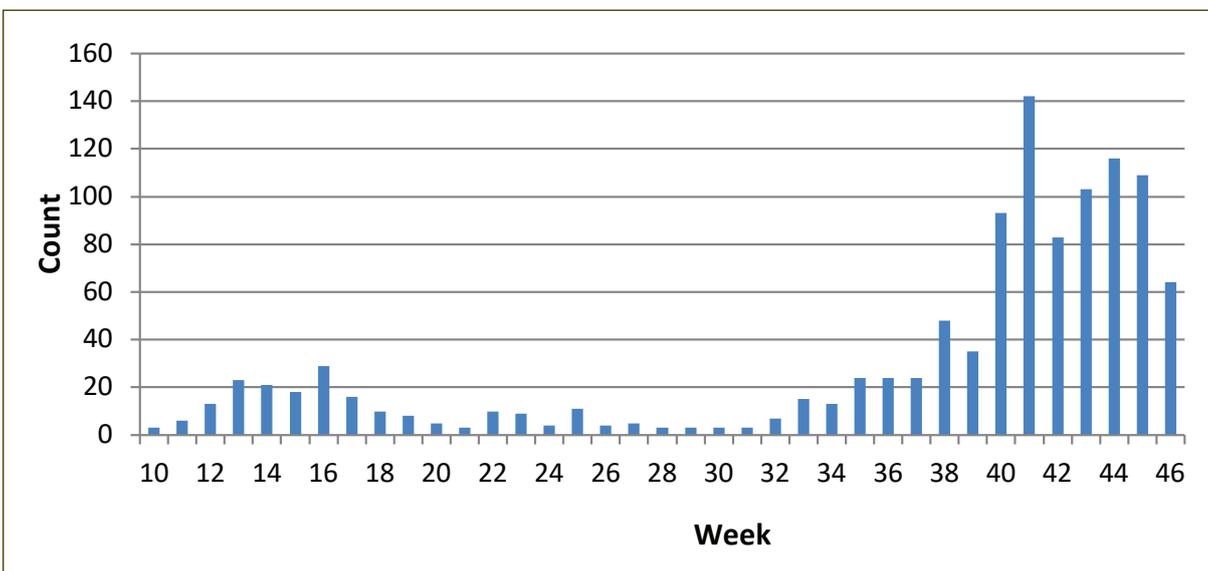
Situations

The next level of response, above an individual case, may be defined as a situation. A situation may be registered in the event of:

- a community cluster or outbreak of COVID-19 (including schools)
- care home cases/clusters/outbreaks of COVID-19
- management issues of individual cases requiring ongoing input
- where there is a local issue related to COVID-19 that requires ongoing monitoring or action.

Situations may overlap because of shared epidemiological factors; therefore, the number of situations handled by the HPT should not be used to understand community disease rates and are more suited as a measure of health protection activity.

Figure 3: COVID-19 situations managed by Tier 1 HPT – 2020 by week.



- The increasing trend in the number of situations after week 38 is reflective of the increased number of circulating community cases, which were linked to both care homes and community clusters.
- Activity after week 38 may also be explained by increased demand for support from schools and subsequent introduction of the education cell.

Discussion

There was an unprecedented demand for health protection support during the COVID-19 pandemic. Increased demand has been observed with high levels of disease activity. Increased demand has also been associated with changes to national and regional guidance on COVID-19. The team have coped remarkably well with these pressures, but have had to work extremely long hours of largely unpaid overtime to do so.

Further information



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Monitoring the spread of COVID-19

Surveillance is a key health protection function. Monitoring and building up information about the spread of COVID-19 in Northern Ireland has been central to the health protection work of the PHA during 2020.

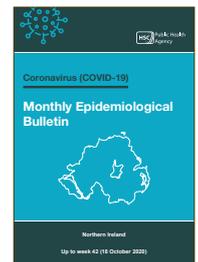
Coronavirus (COVID-19) bulletins

During the year, the PHA Health Protection and Health Intelligence teams developed monthly and then weekly reports on the impact of COVID-19. These epidemiological bulletins present high level data on key areas currently being used to monitor COVID-19 activity. They highlight current issues and public health messages, along with the analysis of the demographic characteristics (for example, age, sex, geographical location, deprivation) of people affected by the virus. The reports also look at some of the wider impact of the virus on the healthcare system, comparing recent trends in activity with historic norms. The reports are highly informative and can be accessed on the PHA website.

There is also a large amount of data being regularly published regarding COVID-19 (for example, the Department of Health Dashboard and Deaths involving coronavirus in Northern Ireland by the Northern Ireland Statistics and Research Agency).^{1,2} The bulletins present data from existing and newly developed PHA health protection surveillance systems that monitor COVID-19 activity in Northern Ireland and complement the range of existing data currently available.

Research was carried out on the first cases of COVID-19 in Northern Ireland and a report completed on those first 100 cases: *Epidemiology of COVID-19 in Northern Ireland 26 February 2020 – 26 April 2020*.³ The report provides the descriptive epidemiology of the first cases of COVID-19 during this period, such as data on age, gender and travel history of the first cases. The data has not been reproduced here, as much of it is available in the monthly and weekly epidemiological bulletins. For more information on the paper, contact Dr Patrick McAleavey.

The PHA publishes a weekly epidemiological bulletin on the impact of COVID-19 in Northern Ireland, available at <https://www.publichealth.hscni.net/publications/coronavirus-bulletin>



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COVID-19 clusters and outbreaks during 2020

Background

One of the core functions for health protection teams is the detection and management of communicable disease clusters and outbreaks. Each potential cluster is risk assessed and a decision made by a public health professional about whether further action is required.

The opportunities for clusters and outbreaks increase with the number of people that are gathered in time and place, for example, a workplace, retail setting, care home or hospital. The impact of a cluster will depend on the vulnerability of the people involved. However, infectious diseases are unique as while healthy individuals may experience mild disease there is always the potential for spread to the more vulnerable which makes every cluster important. We therefore monitor clusters in general settings and have established dedicated programmes for specific settings, like care homes. The aim of this chapter is to describe the epidemiology of clusters and outbreaks with a view to understanding the burden of COVID-19 across different settings.

Approach

A cluster is defined as two or more laboratory confirmed cases of COVID-19 among individuals associated with a specific non-residential setting, who have illness onset dates within a 14 day period. An outbreak expands on this definition by also identifying a clear epidemiological link, such as direct exposure, between two or more cases. Cluster information is available from the regional contact tracing service. For care homes, monitoring of outbreaks is based on notifications of potential outbreaks to the Health Protection Duty Room (Acute Response Team).

Findings

Since reporting began, we have detected 445 clusters of COVID-19 across a range of settings. This excludes household clusters which represent the greatest burden of transmission. Of those with greater than five cases, the highest number occurred in the Belfast City Council area, which could be expected given that it is a hub for businesses and shopping and is more densely populated (Table 1). Overall, the PHA has supported 237 suspected/confirmed COVID-19 care home outbreaks. Since August, the number of outbreaks has started to increase with a higher proportion of asymptomatic detection due to changes in testing in this setting (Table 1).

Table 1: Total number of clusters* that have been recorded by the contact tracing service from 25 May to 27 October.

LGD	5 or fewer**	Greater than 5
Antrim and Newtownabbey Borough Council	Not reported	4
Ards and North Down Borough Council	Not reported	1
Armagh City, Banbridge and Craigavon Borough Council	Not reported	5
Belfast City Council	Not reported	29
Causeway Coast and Glens Borough Council	Not reported	3
Derry City and Strabane District Council	Not reported	11
Fermanagh and Omagh District Council	Not reported	3
Lisburn and Castlereagh City Council	Not reported	4
Mid and East Antrim Borough Council	Not reported	6
Mid Ulster District Council	Not reported	4
Newry, Mourne and Down District Council	Not reported	9
Subtotals	366	79
Cluster total	445	

Notes

* Some clusters may overlap (larger clusters may contain or overlap with several smaller clusters).

**Clusters with fewer than 5 cases are not disclosed as part of data protection regulations.

Discussion

The PHA has significantly expanded its ability to detect and respond to COVID-19 clusters and outbreaks. Changes to testing have increased our ability to detect a wider range of the COVID-19 disease spectrum allowing us to react at any earlier stage to potential disease increases. We will continue to monitor clusters and outbreaks to inform decision making around restrictions and the effectiveness of interventions.

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Development of the Northern Ireland Contact Tracing Service during the COVID-19 pandemic

COVID-19 is a respiratory infectious disease caused by a novel coronavirus, SARS-CoV-2. The disease is mainly transmitted through respiratory droplets and close contact, and is highly contagious. Evidence suggests pre-symptomatic and asymptomatic transmission has facilitated the spread of COVID-19, which moved rapidly across Europe in February, with a global pandemic declared by WHO on 11 March 2020.^{1,2}

During the containment phase, contact tracing was undertaken by the PHA health protection team, which required a high level of resource and support from across the agency. The aim was to detect cases and contacts early in an attempt to contain the virus for as long as possible by limiting transmission within the local population.³ However, despite these efforts, widespread community transmission of COVID-19 was established across the UK. This marked the end of containment and a move towards delaying the effect of the virus by lowering the projected peak of cases and impact on key health services.³ To help achieve these aims, strict social distancing measures were introduced on 23 March 2020.

During this period of 'lockdown', it was recognised that a dedicated contact tracing service was required to allow the relaxation of social distancing measures, and a re-opening of society.

Actions

The Northern Ireland Contact Tracing Service was initially set up as a pilot on 27 April, and has been fully operational since 18 May 2020.⁴ The primary aim of the service is to enable the rapid identification of close contacts and reduce chains of transmission of COVID-19 in the community.^{2,5} A team of contact tracers from a range of professional backgrounds has been recruited, alongside an experienced team of medical doctors to advise on contact tracing activities with support from health protection colleagues. The service was initially located in Belfast; however, it relocated to County Hall, Ballymena, to facilitate social distancing as the service grew.

Impacts

There were relatively small numbers of cases observed during the first three months of the service being operational, with the majority of cases successfully contacted within 24 hours of notification, and close contacts informed within 48 hours of notification, regularly exceeding a target of 80% as recommended by SAGE.⁶ With that, clusters were identified and control measures advised by the health protection team.

A rapid increase in case numbers was observed during September, and by 9 October, Northern Ireland recorded a daily increase of over 1,000 new cases of COVID-19. As a result of increasing case numbers and close contacts, the service needed to adapt. This included the introduction of a SMS notification system to notify close contacts of their status and need to self-isolate, and the use of digital self-tracing to allow cases to complete online entry of close contact information. This has enabled resources to be focused on contacting harder to reach cases, and identifying settings in which COVID-19 transmission may have occurred in a more timely manner.

Next steps

As the situation in Northern Ireland continues to evolve, the Contact Tracing Service will continue to grow and adapt to meet the needs of the local population as we move through a second wave. It is envisaged that this service will be required alongside social distancing measures for the duration of the pandemic.

Further information



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Pilot study on feasibility of testing close contacts identified by contact tracing

Background

Contact tracers based at the Northern Ireland Contact Tracing Service (CTS) make telephone contact with all laboratory confirmed cases of COVID-19 to establish a list of close contacts. Close contacts are subsequently called and advised to self-isolate for a period of 14 days from last exposure to the case. Close contacts that disclose symptoms of COVID-19 to tracers are advised to seek testing. Contact tracing practices in countries outside of the UK vary in their approach. Contact tracing in the Republic of Ireland has included testing of all close contacts of confirmed cases for over six months. Testing of all COVID-19 close contacts (regardless of symptoms) has been recommended by the ECDC, WHO and US CDC.¹⁻³

A two week pilot was set up with the aim to establish prevalence of COVID-19 in close contacts of confirmed cases, and test the feasibility of close contact testing at day 0 and day 7 to inform future contact tracing activity in Northern Ireland.

Approach

The pilot aimed to:

- assess uptake of COVID testing in close contacts at both day 0 and day 7;
- determine the impact of testing – this was based on the proportion of close contacts who test positive at both day 0 and day 7;
- report on the feasibility of testing of close contacts in Northern Ireland over a two week period.

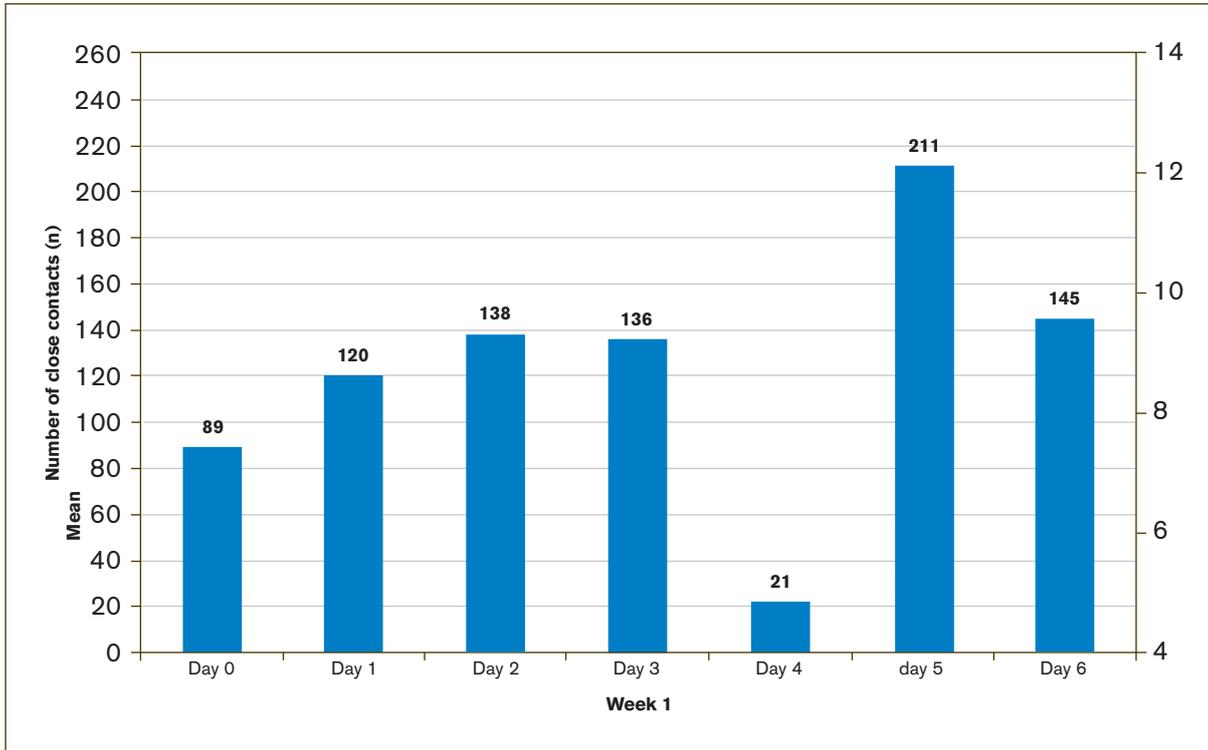
Between 17 August and 30 August 2020, the CTS advised all close contacts of confirmed COVID-19 cases to seek testing at day 0 and day 7 regardless of symptom status. If a close contact informed the CTS at the time of call that they had a recent negative test, they were asked to get tested again in 7 days only. Close contacts were encouraged to access testing at National Testing Initiative sites, through online booking or calling 119.

Findings

Number of close contacts with telephone encounters

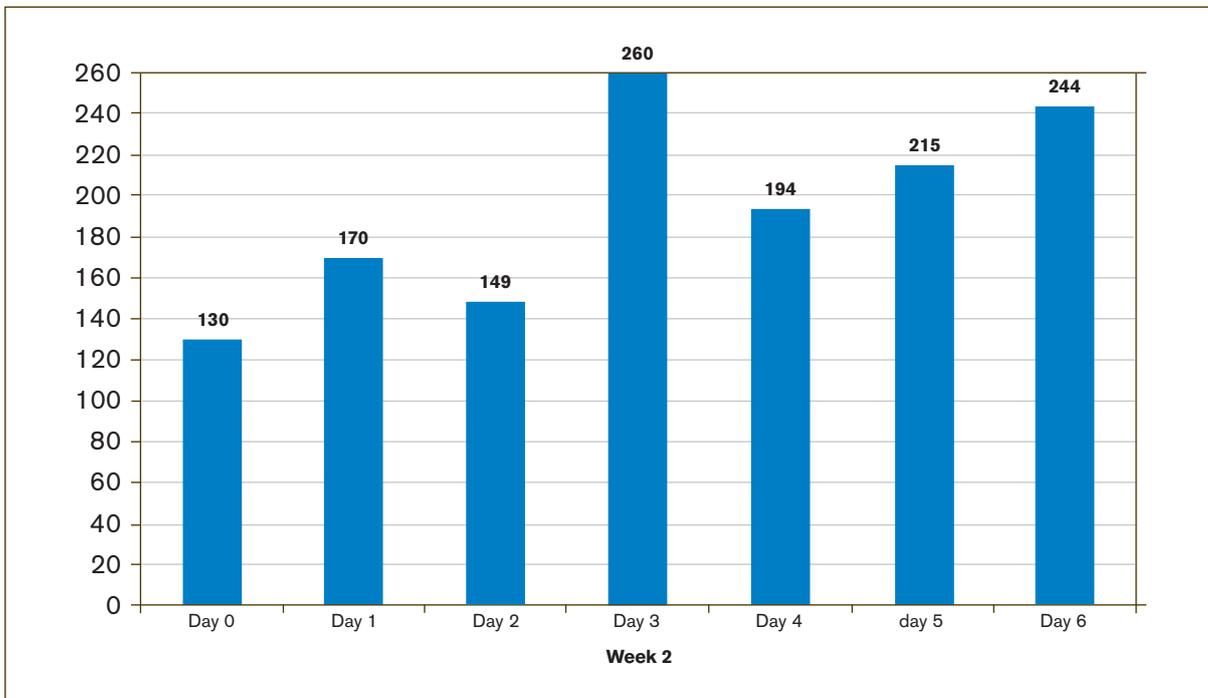
- Overall, 2,495 people were identified as close contacts of confirmed positive cases. Of these, 258 calls were unsuccessful, with a further 15 contacts being duplicates, giving a final sample of 2,222.
- On day 4 of week 1, due to technical problems, the activity of CTS related to gathering close contacts was reduced.

Figure 1: Number of close contacts with successful telephone encounters by day (Week 1).



*On day 4 of week 1, due to technical problems, the activity of CTC related to gathering close contacts was reduced.

Figure 2: Number of close contacts with successful telephone encounters by day (Week 2).



Testing

Day 0 testing uptake

- 75% (n=1,674) of close contacts had a test recorded at day 0. Of these, 61.9% had a test carried out on the same day or shortly after their call from CTS, with the remaining 38.1% having tests in subsequent days.
- 49.6% of close contacts self-reported they had already been tested by the time CTS called them.

Day 0 test results

- 9.4% (n=157) of close contacts tested at day 0 had positive test results, of which 45% were asymptomatic.
- 90.6% of close contacts had either a negative test result (n=1,500), or an inconclusive (n=17) test result.

Day 7 testing uptake

- 1,500 close contacts were advised to get tested at day 7. Individuals who tested positive at day 0 were instructed not to have a day 7 test.
- 734 (48.9%) close contacts completed tests at both day 0 and day 7.

Day 7 test results

- 6.5% (n=48) of close contacts who tested negative at day 0 had positive test results at day 7, of which 52% were asymptomatic.
- Positivity rates in the general population for the three week period the pilot covered was about 1.6%, which means the positivity of close contacts tested on day 0 (9.4%) was almost 6 times (5.9) higher than positivity in the general population at this time.

Discussion

The main findings of the evaluation were that:

- Day 0/day 7 testing of COVID close contacts was feasible at a time where COVID-19 disease rates were increasing.
- A significant proportion of close contacts are asymptomatic and positive at day 0. Early case finding in this manner may positively contribute to bidirectional contact tracing.
- Linking of contacts to lab results was identified as a challenge and requires action, however, this could be addressed through SMS notification of a unique linked code to close contacts.
- Almost half of close contacts reported having already sought out a test, but this is not in a planned or organised manner.
- Positivity rate dropped but then increased sharply when it was no longer in place – the suggestion may be that day 0/day 7 testing may have been able to reduce the rate of increase in the second wave.

Further information



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Care homes surveillance study of asymptomatic and pre-symptomatic SARS-CoV-2 infections in Northern Ireland

Background

Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) poses significant challenges to both care home residents and staff. Recent studies and case reports have highlighted the potential for transmission of SARS-CoV-2 from individuals who are symptomatic, pre-symptomatic, and asymptomatic of infection.¹⁻³ This is of particular concern in settings, such as long-term care facilities.

Differentiating asymptomatic from pre-symptomatic infection and the range of possible symptoms associated with COVID-19 in different populations, remains of interest. The potential for an atypical presentation of COVID-19 in care home residents has been reported.⁴ This study was carried out during April 2020. It was conducted to identify the rate of asymptomatic and pre-symptomatic SARS-CoV-2 infection in care home residents and staff, as well as identify any atypical presentations of infection, within settings where recent cases of COVID-19 had been identified.

Approach

This prospective study with a follow-up review on day seven was carried out in five care homes reporting recent outbreaks of COVID-19, between 6 – 30 April 2020, to the health protection team in the Public Health Agency in Northern Ireland. Care homes included in the study provided residential care, nursing care or both. Testing was arranged through nursing teams in the local trust, who arranged to sample and follow up on results. Samples were submitted for all residents in all five homes included in the study. Members of staff in the homes were also offered testing where this could be facilitated by the trust within the timeframe of the study. Testing was complete for all staff members in two out of the five care homes.

It was recorded if an individual was symptomatic at the time of sampling, or if they had been symptomatic within the 14 days prior to the test. This included typical symptoms according to the current case definition (cough, fever or shortness of breath), as well as any atypical symptoms (that is, sore throat, sneezing, nasal discharge/congestion, wheeze, hoarseness, chest pain, acute deterioration, malaise, nausea, confusion, dizziness, diarrhoea, myalgia, headache, chills or anosmia). Demographic details were requested for each person tested in accordance with standardised data collection forms. These were returned by the facility. Information on comorbidities, according to the categorised risk groups for annual influenza, was also collected. A follow-up review was conducted with the care homes seven days after testing, aiming to determine if anyone who tested positive for SARS-CoV-2 whilst asymptomatic subsequently developed any symptoms. This was to help differentiate between asymptomatic and pre-symptomatic positive cases. The information was analysed for descriptive frequencies using SPSS Version 25. Chi-squared tests were used to compare categorical data.

Findings

A total of 388 individuals were tested as part of the study; including 245 residents and 143 staff (Table 1). The completed enhanced data collection forms were returned for 165 residents and 33 members of staff (Tables 2 and 3).

Figure 1: Confirmed and suspected COVID-19 care home outbreaks in Northern Ireland, 24 February (week 9) to 20 September (week 38) 2020 (dashed red line represents the introduction of care home screening).

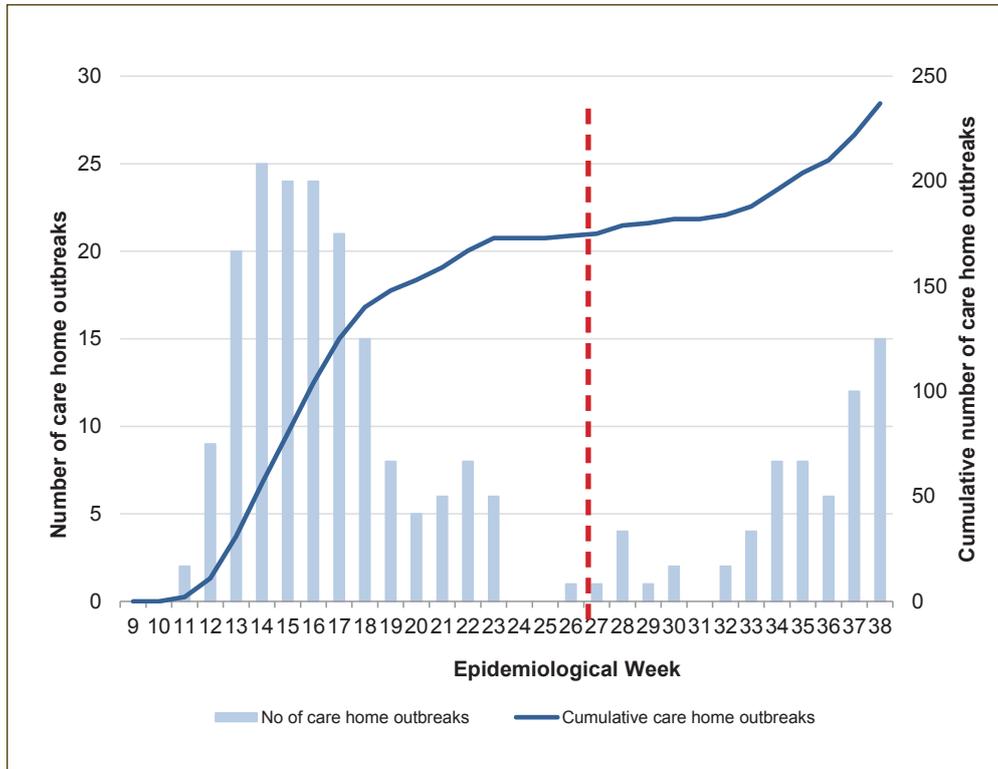


Table 1: Residents and staff tested in care homes, and symptom status reported at the time of testing.

	Total tested	Positive for SARS-COV2 (%)	Negative for SARS-COV2 (%)	Symptomatic at time of testing (%)	Symptomatic at 7-day follow up (%)	Asymptomatic at time of testing (%)	Asymptomatic at 7-day follow up* (%)
Resident	245	87/245 (35.5)	158/245 (64.8)	57/87 (65.5)	75/87 (86.2)	30/87 (34.5)	12/30 (40.0)
Staff	143	10/143 (7.0)	133/143 (93.0)	5/10 (50.0)	8/10 (80%)	5/10 (50.0)	2/5 (40.0)
Total	388	97/388 (25.0)	291/388 (75.0)	62/97 (63.9)	83/97 (85.6)	35/97 (36.1)	14/35 (40.0)

(* Proportion of total asymptomatic positives)

Table 2: Demographics and comorbidities of care home residents tested, where complete information was obtained (n = 165).

Characteristic	Test result for SARS-CoV2 for care home residents			
	Total (%)	Negative (%)	Positive (%)	p-value
Overall	165 (100)	99 (100)	66 (100)	-
Men	44 (27)	26 (26)	18 (27)	0.886
Women	121 (72)	73 (74)	48 (73)	-
Age, mean (SD)	84 (9.95)	83.4 (10.9)	86.4 (8.05)	0.027
Pre-existing conditions				
Chronic lung disease	27 (16)	19 (19)	8 (12)	0.229
Chronic heart disease	73 (44)	39 (39)	34 (47)	0.125
Chronic kidney disease	28 (17)	14 (14)	14 (21)	0.236
Chronic liver disease	6 (4)	5 (5)	1 (2)	0.235
Chronic neurological condition	76 (46)	40 (40)	36 (55)	0.074
Diabetes	20 (12)	9 (9)	11 (17)	0.144
Weakened immune system	2 (1)	1 (1)	1 (2)	0.771

Table 3: Demographics and comorbidities of care home staff-tested, where complete information was obtained (n = 33).

Characteristic	Test result for SARS-CoV2 for care home staff			
	Total (%)	Negative (%)	Positive (%)	p-value
Overall	33 (100)	30 (91)	3 (9)	-
Men	6 (18)	5 (17)	1 (33)	0.567
Women	27 (82)	25 (83)	2 (67)	-
Age, mean (SD)	43.2 (13.8)	43.1 (13.6)	40.3 (18.3)	0.703
Smoker	12 (36)	12 (40)	0 (0)	0.361
Pregnant	0 (0)	0 (0)	0 (0)	-
Pre-existing conditions				
Chronic lung disease	3 (9)	3 (10)	0 (0)	0.573
Chronic heart disease	0 (0)	0 (0)	0 (0)	-
Chronic kidney disease	0 (0)	0 (0)	0 (0)	-
Chronic liver disease	0 (0)	0 (0)	0 (0)	-
Chronic neurological condition	1 (3)	1 (3)	0 (0)	-
Diabetes	3 (9)	3 (10)	0 (0)	0.573
Weakened immune system	0 (0)	0 (0)	0 (0)	-
Other	0 (0)	0 (0)	0 (0)	-

SARS-CoV-2 results and clinical features

Out of the 245 care home residents tested for SARS-CoV-2, 36% (87 out of 245) tested positive (Table 1). Of those who tested positive, 66% (57 out of 87) were symptomatic at the time of testing, or within the 14 days prior to testing. The other 34% (30 out of 87) of residents were asymptomatic at the time of the test, or within the 14 days prior to testing. Of residents who were initially asymptomatic on testing positive for SARS-CoV-2, 40% (12 out of 30) remained asymptomatic 7 days following the test, whereas 60% (18 out of 30) developed symptoms in the week following the test (Table 1). Thus in total, 7 days after testing positive for SARS-CoV-2, 86% (75 out of 87) of residents had experienced symptoms.

Of the 143 members of staff tested for SARS-CoV-2, 7% (10 out of 143) were positive (Table 1). Half of the staff members (5 out of 10) who tested positive were symptomatic at the time of the test, or in the 14 days prior to the test. Half of them (5 out of 10) were thus asymptomatic at the time of testing, or within 14 days prior to the test. At 7 day follow up, 40% (2 out of 5) of individuals who were asymptomatic at the time of testing positive for SARS-CoV-2 remained asymptomatic; whereas 60% (3 out of 5) of staff who had been asymptomatic on testing positive went on to develop symptoms during this time (Table 1).

Overall, the majority of those who tested positive for SARS-CoV-2 reported symptoms between the 14 days prior to the test and the 7 days following (86%). Of these, 69% reported having at least one typical symptom out of cough, fever, or shortness of breath; whilst 13% experienced only atypical symptoms. There were, however, 46% of individuals who experienced at least one atypical symptom. In the resident cohort, the most frequently reported atypical symptom was an acute deterioration with no other cause (37%), with other atypical symptoms including malaise, diarrhoea, confusion, myalgia, and chest pain. In staff, more of a range of atypical symptoms were reported including nasal discharge or congestion, sneezing, sore throat, hoarseness, chest pain, malaise, nausea, chills, diarrhoea, and anosmia. Unfortunately, 27 residents (31%) who tested positive for SARS-CoV2 died during the study period.

Discussion

The findings of this study suggest that individuals infected with SARS-CoV-2 may be asymptomatic at the time of infection or may present with a range of both typical and/or atypical symptoms, outside of those included in the current case definition for COVID-19. This highlights that only testing symptomatic residents and staff in an outbreak scenario, particularly those with symptoms meeting the case definition for COVID-19, may not identify everyone who has the virus in this setting. These findings are consistent with other published studies.^{1,2,3} Additionally, we found in this study that individuals may develop symptoms at least up to one week after they test positive for SARS-CoV-2. During this time individuals may have the potential to transmit the virus unknowingly to others, which may have devastating impacts in settings such as care homes. Once it is known someone has the infection, particularly in a care home setting, strict infection control measures are required to contain the spread of infection.

In conclusion, the findings of this study emphasised that, in an outbreak situation, there is a need to identify all residents and staff in care homes presenting with atypical symptoms and those who are asymptomatic of infection, through comprehensive screening for COVID-19 infection.

Further information



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COVID-19 and health protection support for schools

On 6 August 2020, the Education Minister wrote to school principals advising that all schools were to return to normal patterns of operation and attendance from 31 August. In response to increased health protection activity related to the implementation of Education Restart guidelines produced by the Education Authority (EA), a dedicated Educational Support Cell was formed.

The Educational Support Cell operates seven days a week and performs contact tracing for all staff and pupils attending primary and post-primary educational settings in collaboration with the PHA Test, Track and Trace programme. Clusters are also further investigated by the School Team in liaison with local partners.

The Educational Support Cell works closely with the EA, which provides operational support and guidance for school principals who report cases of COVID-19. The Educational Support Cell has collected data on incidents and clusters reported related to school settings since August 2020. A weekly summary of activity is reported in the PHA COVID-19 weekly epidemiological bulletin.

An incident may be declared following a report of a single confirmed case of COVID-19 in a student or member of staff in the school setting. The incident is closed after 14 days if there have been no further cases.

A cluster is declared on report of two or more confirmed cases of COVID-19 in a student or member of staff in the school setting within a 14 day period. Clusters may be closed after 14 days if there have been no further cases from the last case

School incidents and clusters include all cases in students or member of staff. This includes individuals that acquired the infection outside the school setting.

Results

The data presented provides a snapshot of activity up to week 44 (1 November 2020). A total of 649 school incidents occurred in 561 schools in Northern Ireland. Overall, 50% of schools have had at least one COVID-19 case in a pupil or member of staff.

The figures below are a snapshot of incidents recorded at the time of data extraction. A school may have had more than one incident since opening.

Table 1: Number of COVID-19 incidents in schools from 31 August 2020.

School type	Cumulative total (until 1 November 2020)
Preschool	23
Primary	392
Post primary	200
Special school	34
Total	649

Table 2. Number of school incidents by type of school, by type of incident to 1 November 2020.

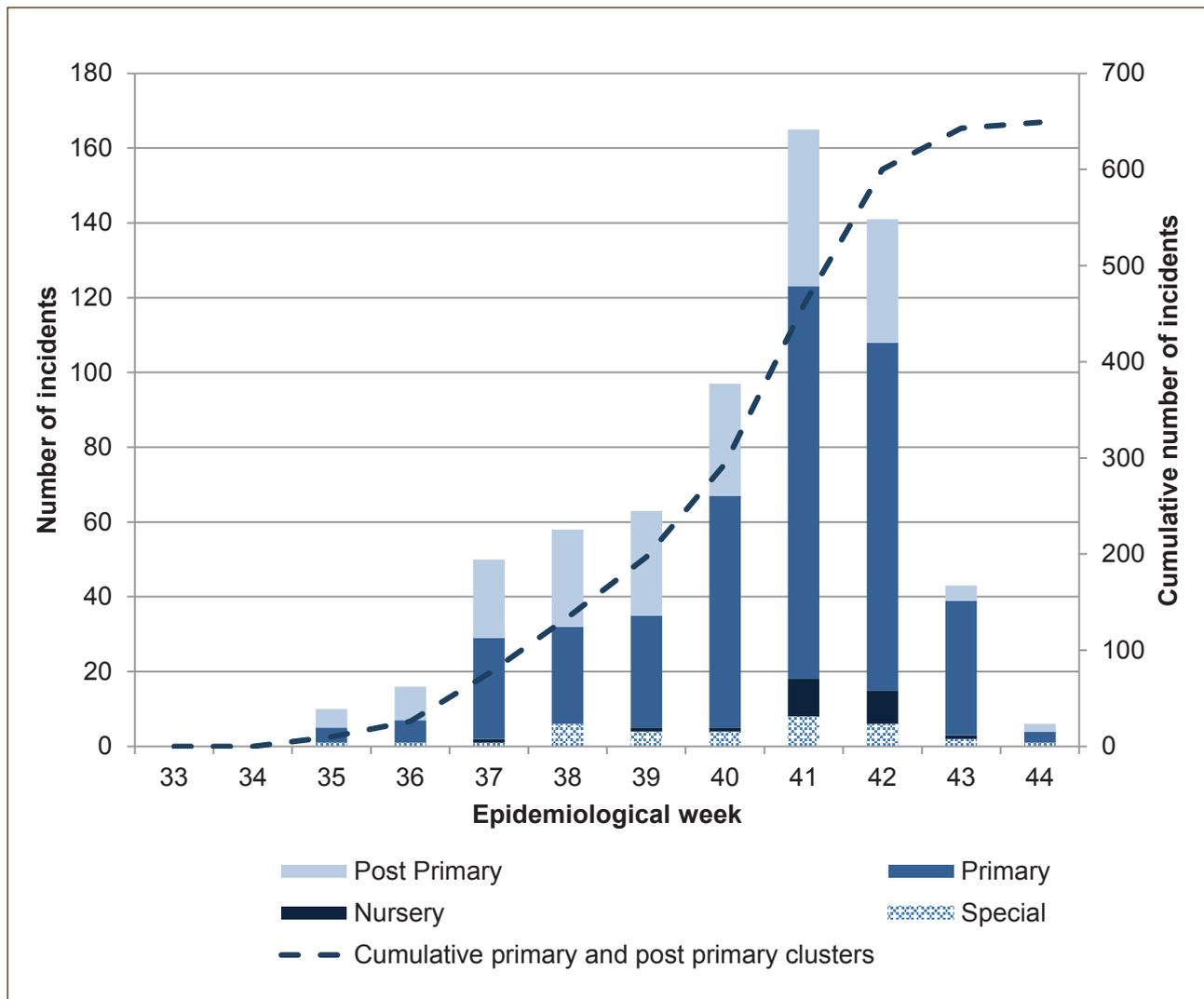
	School type	Total (until 1 November 2020)	Proportion
Single Case	Preschool	13	4.4%
	Primary	219	73.5%
	Post primary	49	16.4%
	Special school	17	5.7%
	Total	298	
Cluster (2-5 cases)	Preschool	10	4.1%
	Primary	147	58.8%
	Post primary	78	31.7%
	Special school	11	4.5%
	Total	246	
Cluster (>5 cases)	Preschool	0	-
	Primary	26	24.8%
	Post primary	73	69.5%
	Special school	6	5%
	Total	105	

Table 3. Number of schools with a COVID-19 incident to 1 November 2020.

School type	No. Schools with at least one case	Total no. schools in Northern Ireland	Proportion of school in Northern Ireland that have had at least one case
Preschool	21	77*	27.3%
Primary	340	805	42.2%
Post-Primary	166	194	85.6%
Special	34	39	87.2%
Total	561	1,115	50.3%

*Nurseries with a DE number

Figure 1: Number of COVID-19 incidents, by school type 10 August – 1 November 2020.



Comments

- The data presented is a snapshot of incidents recorded at the time of data extraction.
- Data is collected on the number of COVID affected school incidents reported to the PHA COVID School Team since schools reopened.
- The definitive source for the number of COVID-19 confirmed cases in school aged children is from the HSC Laboratory testing and the National Testing Programme.
- Direct comparisons of schools' data should not be made with laboratory data as the School Team's figures may be an underestimate compared to laboratory data.

Further information



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The genomic aspects of the COVID-19 pandemic

Virus genomes are not made of DNA like most organisms, but of RNA (ribonucleic acid). RNA is composed of a sequence of bases rather like letters in a word. The genome sequence of the SARS-CoV-2 virus was determined several months after it was first detected in China and is small, at just under 30,000 letters, or bases, with only 15 genes. Humans, by comparison, have around 20,000 genes in a 3 billion base pair genome.

Genomes mutate and letters in the sequence change as the organism multiplies. Virus genomes mutate at a steady rate and this can be used as a molecular clock with genetic differences between two viruses being proportional to the time since they last shared a common ancestor. The individual virus sequences can be placed back in time on a phylogenetic tree, much like a family tree, which determines the relatedness of two or more SARS-CoV-2 viruses. The virus in a particular area such as a hospital, town, or region, may have a particular genomic change that may be different from a virus found in another area. By examining the changes, researchers can trace where it has come from, are able to identify clusters of infections that are linked and help inform infection control procedures by providing evidence to support or refute transmission between potentially linked cases.

The COVID-19 Genomics UK (COG-UK) consortium was created to deliver large-scale and rapid whole genome virus sequencing. It is composed of a partnership of NHS organisations, the four UK Public Health Agencies, the Wellcome Sanger Institute, over fifteen academic partners including Queen's University Belfast and Ulster University, and some commercial organisations that provide sequencing and/or analytic capacity. The consortium is supported by £20 million funding from the UK Department of Health and Social Care (DHSC), UK Research and Innovation (UKRI) and the Wellcome Sanger Institute. Having overcome the complexities of data sharing and the confidentiality aspects, Northern Ireland has recently signed the membership agreement.

Sequencing is done in the Belfast HSC Trust in conjunction with the Sanger Institute and data is fed back to PHA and local Infection Control Teams for the investigation of clusters and outbreaks of infection as well as comparison with strains circulating nationally and internationally. Analysis will also permit: the evaluation of the effectiveness of novel treatments and non-pharmacological interventions, provide information on whether or not outbreaks are due to introductions from outside or ongoing transmission within the community, understand genetic changes that affect how easily the virus is passed on and the severity of the symptoms it causes and target the development of treatments and vaccines to monitor their impact as they are introduced.

The advantages of participation to Northern Ireland are both practical, in terms of local investigations and reputationally, in terms of national participation. Also, for the future, COG-UK intends to extend its sequencing capacity to other organisms of public health significance increasing our ability to more effectively investigate local outbreaks of infection.

Further information



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Vaccination and COVID-19

Vaccination is ranked second only to clean water as the intervention which produces the most protection against infectious disease in the world.¹ It is also an intervention that demonstrates the potential for collaborative engagement involving government, health and social care services and the public in achieving significant public health improvements.

Influenza vaccination

One of the major campaigns undertaken each year is the seasonal influenza vaccination programme, which seeks to provide protection to those most at risk of serious complications from influenza.

This also has the added benefit of reducing pressure on our healthcare system. This year the flu vaccination programme is even more crucial, given the additional threat associated with the COVID-19 pandemic, and the implications of co-infection with both viruses. For this reason we want to ensure the highest possible uptake of the vaccine in eligible populations.

In addition, government, public health, primary care and health and social work staff are working to prepare for the possible release of new COVID-19 vaccines which are being developed. This is a significant workload, not least because it is happening concurrently with the response to the COVID-19 pandemic, continued delivery of existing services and the ongoing delivery of this season's enhanced influenza vaccination programme.

Development of COVID-19 vaccines

As the impact of the COVID-19 pandemic has been felt by us all, there's never been a more important time for health research studies. Development of COVID-19 vaccines is taking place at an unprecedented pace and scale.

Currently, there are over 150 potential vaccines under development worldwide. Over 40 of these are in early phase clinical trials where the safety of the vaccine is monitored (Phase 1 and 2). Ten trials have progressed to the next stage where the ability of the vaccine to protect against coronavirus infection is being investigated (Phase 3 trials).

Recent announcements in the media suggest that vaccines may protect trial volunteers from being infected with COVID-19. The vaccine still has several hurdles to overcome before being rolled-out to the public, for example, the regulatory bodies that license a drug for use in the general population have to review the data from the clinical trial, large quantities of the vaccine needs to be manufactured, and the staff and equipment needed to vaccinate the public needs to be mobilised.

Although this is really encouraging news, it is really important that we continue to assess other vaccines in clinical trials as we need to figure out which vaccines work best, which are best for different groups of people, and to check their long-term safety (see <https://beartofresearch.nihr.ac.uk/Vaccine-studies/Latest-vaccine-news> for the latest information).

In April 2020, the UK Government established a Vaccine Taskforce (VTF) to speed-up the delivery of a COVID-19 vaccine. The VTF provides support on a number of levels including research and development of vaccines within the UK. Two vaccines developed in the UK are currently involved in clinical trials.

The VTF has also strengthened the clinical trial infrastructure where a UK-wide, coordinated approach has been adopted to ensure that the UK is globally competitive to attract clinical trials of the leading vaccines to the region. Northern Ireland is contributing to this UK-wide approach, which is necessary to making this happen.

The Health and Social Care Research & Development Division (HSC R&D) supports the planning and delivery of COVID-19 vaccine trials in Northern Ireland by working closely with a wide range of regional stakeholders: Northern Ireland Clinical Trials Network (NICRN); Health and Social Care Trusts; Queen's University Belfast; Ulster University; HSC Health Protection; Northern Ireland Clinical Trials Unit (NICTU); the Pathology Network and other research facilities. The Northern Ireland team is currently recruiting to Phase 3 trials.

Throughout the UK, more than 22,000 volunteers have been recruited within a relatively short period of time for the vaccine trials. Currently, a number of trials are ongoing, and several more are planning to open over the coming months.

COVID-19 vaccine trials are essential to identify which vaccines are both safe and effective, which are most suitable for specific groups.

Further information

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Service development and screening

The impact of the COVID-19 pandemic on the provision of health services throughout Northern Ireland has been significant.

This section details some of the important areas of work carried out during the first 6-8 months of the pandemic and how the Health and Social Care service responded to the rapidly changing position as information, intelligence and policy decisions became available.

- Impact of COVID-19 on the provision of health services
- The impact of COVID-19 on screening services
- COVID-19: developing testing in Northern Ireland during a pandemic
- Infection prevention and control during the COVID-19 pandemic
- Development of digital interventions
- COVID-19: health and wellbeing engagement in Northern Ireland prisons
- COVID-19: a summary report of the collective approach of the Public Health Agency to support the care home sector, March – June 2020
- The role of Personal and Public Involvement during COVID-19
- Quality Improvement and COVID-19 emergency response planning
- Staff health and wellbeing and COVID-19

Impact of COVID-19 on the provision of health services

The first case of COVID-19 in Northern Ireland was tested on 26 February 2020.¹ In advance of this, Public Health Agency staff were working very closely with HSC Board colleagues to plan for a first and subsequent case. Initially the emphasis was on containment of the virus and the first case was admitted to the regional infectious disease unit in Belfast Trust, with the specific intention of isolating the infected individual and preventing spread.

While containment was the aim initially, it rapidly became evident that Northern Ireland would move to a different phase as the virus spread in the community. From March 2020 onwards, Northern Ireland, in common with the rest of the UK, moved into the 'delay' phase during which the emphasis was on measures to delay the spread of the illness. These measures included a nationwide lockdown of most retail and educational facilities. For the health services the period of lockdown, particularly during the early weeks, was exceptionally busy. Inevitably at the time the lockdown measures commenced many people had already contracted the disease and a proportion of these individuals subsequently required medical care, hospital admission and access to intensive care. During the month of April, pressures on the health services escalated sharply. The maximum number of new admissions to hospital was 52 cases, admitted on 3 April 2020 and ICU occupancy peaked at 57 cases on 7 April 2020.

The measures taken by the PHA in conjunction with the Board, BSO and DoH colleagues to respond to the pandemic are detailed later in this section of the report. In summary they include the following.

Provision of inpatient hospital capacity

People admitted with COVID-19 required to be cared for separately to those with other conditions. Trusts worked tirelessly to cohort and isolate people with COVID. They introduced robust arrangements to separate COVID and non-COVID patients at emergency departments and to test people prior to admission to ensure they were admitted to the appropriate ward. Inevitably this created some delays in the patient pathway as additional steps and tests had to be undertaken in advance of admission.

Critical care

There was a very severe impact on critical care services and a planned increase in the capacity required to respond appropriately to those needing critical care. PHA colleagues worked very closely with Board staff and with the Critical Care Network to provide a robust escalation plan for critical care provision. This planned for the expansion of critical care capacity significantly above the baseline of 88 adult beds. Much of this expansion was planned within the Belfast Trust, at the Belfast City Hospital site, which became the Nightingale Hospital for Northern Ireland.

Planning the increased critical care provision was a collaborative measure involving all Trusts. It did however become evident that the scale of escalation was not as great as anticipated and therefore escalation measures were stepped down, consistent with patient need. The flexibility to increase or decrease capacity in response to the changing demand was viewed as an important component of planning and has been retained across Trusts.

Impact on existing services

The steps outlined above, specifically the need to secure dedicated inpatient capacity and to escalate the critical care capacity, meant that clinical staff across medicine, surgery, nursing, allied health

professions (AHP) and pharmacy had to be deployed from their normal place of work to help support the areas under greatest pressure.

One impact of this was that normal work, such as elective surgical procedures, diagnostic tests, and outpatient clinics were postponed or cancelled. This created much longer waiting times for procedures and a concern that such delays may have far reaching impact in regard to individuals health and wellbeing.

Throughout this period during which planned elective work has been curtailed, the Board and the PHA worked with Trusts to agree what needed to be prioritised according to clinical need. For example, urgent cancer surgery continued as much as possible. Also, live renal transplants continued for many months during the pandemic and for those receiving a transplant this procedure can result in a very significant and long-term improvement in quality of life.

During the early months of the pandemic, particularly during the first lockdown it quickly became evident that the expected volume of activity at emergency departments (EDs) was significantly reduced. While it was understandable that people may have been reluctant to attend hospital, there was considerable concern that some people with serious acute conditions, for example myocardial infarction or stroke, may have not sought appropriate medical attention. It is recognised that this matter is one of the unintended consequences of the pandemic, and PHA colleagues, along with clinicians across Northern Ireland took the opportunity on a number of occasions to issue advice about seeking medical care in urgent/emergency situations.

While there was an inevitable decrease in scheduled clinical consultations, there were, however, many innovative approaches put in place to help respond to need. For example, many outpatient consultations were conducted virtually by telephone or video consultation, hence reducing the risks associated with hospital attendance. This innovation is likely to be maintained in the longer term as it offers both patients and professionals an effective communication channel. Clearly this is an appropriate approach only for those who do not require the face-to-face consultations.

Use of independent sector hospitals

A further step to secure hospital capacity was the measure to utilise the available space, including separate theatres and critical care capacity, in Northern Ireland's three independent sector hospitals. This was an important step and permitted Trusts to arrange for elective surgery and diagnostics in facilities where the risk of contracting COVID-19 could be more rigorously managed. For these people being admitted, a period of self-isolation accompanied by a COVID-19 test prior to admission helped ensure that they were not infectious at the time of admission.

The three independent providers were very helpful in working with Board and PHA staff and contributing to the management of the pandemic through the provision of their capacity. This again is indicative of an innovative approach and how, in the context of an emerging crisis, we can collectively work together to identify solutions.

Impact on HSC staff

Throughout this pandemic HSC staff demonstrated commitment and dedication well beyond normal expectations. Front line staff worked tirelessly to provide care to ill patients and in doing so placed themselves, and potentially their families, at greater risk of contracting COVID-19. Also, many staff embraced new roles at short notice, many of which were demanding either physically or emotionally.

In addition staff in contact with, or at risk of, COVID-19 were required to wear personal protection equipment, some of which is uncomfortable and cumbersome and affects their ability to communicate readily with patients and other members of staff.

Without the dedication of front line staff the HSC could not have responded to the pandemic and the efforts of all staff must be acknowledged now and in the months to come.

Learning from the first surge

During the early months of the pandemic, and particularly during the first surge in March-May 2020, the clinical learning of what treatments worked most effectively has advanced the management of patients. This includes the learning from research on the medicines helpful in controlling the infection and improving outcome, the value of oxygen and non-invasive ventilation and the physical elements of nursing people in critical care, where a prone position is often adopted.

While we know more about the acute management and how best to support and treat people, there is now an emerging trend of people who may suffer debility and long-term consequences for many months (now known as 'long COVID'). This is a concern and a matter on which further research is required. This may also have service implications in regard to the long-term management of people who have been infected with coronavirus.

Monitoring and communication

Throughout the pandemic communication between Trusts, the HSC Board, PHA and the DoH was of prime importance, not least because of the rapidly changing position and the need for information sharing and speedy decision making. To facilitate this, emergency planning arrangements were put in place. This included daily activity reports which were submitted by Trusts and discussed at teleconferences comprising senior staff across the relevant organisations. While at times this was considered to be time intensive, it was a valuable forum for discussion and decision making and has been maintained throughout the autumn of 2020, albeit with meetings held less frequently as the pace of change no longer requires daily discussion.

What next?

Optimism on the horizon in regard to the availability of a vaccine means that in 2021 the emphasis is likely to shift from treating the disease to preventing the infection through a population vaccination programme. Whatever the success of this measure it is clear that for many months ahead our services will need to respond to ongoing infections with COVID-19, the long term effect on people who experience long COVID, and the significant impact of routine procedures that have been deferred during the early stages of the pandemic.

Further information



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Note

1. The specimen date was marked as 26 February 2020, which is when the sample was taken. The date when a positive case was reported to the PHA (and case interview was undertaken) was 27 February 2020.

The impact of COVID-19 on screening services

Introduction

Population screening programmes have a key role to play in early detection of disease. The PHA has responsibility for commissioning, coordinating and quality assuring eight screening programmes. Approximately 400,000 invitations for screening are issued per annum across these programmes.

Pause in screening during the first wave of COVID-19

The following five screening programmes were temporarily paused in the second week of March 2020, at the advice of the Department of Health:

- Routine breast screening
- Bowel cancer screening
- Cervical screening
- Abdominal aortic aneurysm (AAA) screening and surveillance monitoring
- Routine diabetic eye screening (DESP) and surveillance monitoring

This was in response to COVID-19; both to reduce the risk of exposure to the virus for the public and Health and Social Care (HSC) staff, and so that HSC staff and laboratory resources could be re-directed towards the pandemic response.

While some of the above programmes were paused due to COVID-19, screening continued to be offered to people who required:

- Higher risk breast screening - all eligible women continued to be screened at the higher risk screening unit in Antrim Area Hospital
- Diabetic eye screening for pregnant women (sight saving laser treatments and urgent intravitreal injections continued to be provided).
- Infectious diseases in pregnancy screening
- Newborn blood spot screening
- Newborn hearing screening

Restoration and recovery of paused screening programmes

The Strategic Framework for Rebuilding HSC Services, published by the Department of Health in June 2020, called for the phased restoration of these five programmes.

In early June 2020, the PHA established a Screening Restoration Group to coordinate the process of restoring these screening programmes. Individual programme-specific plans were developed and progress made across all areas.

Teamwork and collaborative working is a vital element of the recovery process – the Screening Restoration Group is working in close partnership with all HSC Trusts and charity partnerships, in addition to liaising with colleagues in the UK Four Nations' groups and in the Republic of Ireland.

The on-going impact of COVID-19 in healthcare settings presents challenges to the management and organisation of screening programmes in relation to the need for social distancing and enhanced infection control measures. The four month pause (March – June) has resulted in a backlog of people awaiting screening. In addition, some screening programmes are not able to screen the same number of people as they did before the pandemic due to the enhanced infection control measures which are now required.

There is a similar picture throughout the UK and it has been recognised that unfortunately due to the pandemic there is likely to be an impact on patient outcomes. Emerging research is attempting to determine the impact of the pandemic on cancer-related morbidity and mortality.

A study published in The Lancet in July examined Cancer Registry data in England and estimated a 7.9–9.6% increase in the number of deaths due to breast cancer and an estimated 15.3–16.6% increase in deaths due to colorectal cancer, up to five years after diagnosis.¹

The reasons for these predicted outcomes include a delay in timely access to diagnostic and treatment services, however another important element is the impact the pandemic may have on changes to health-seeking behaviours. The perceived risk of infection from COVID may deter people from attending healthcare services, both screening and non-screening.

“

If you notice any unusual changes to your breasts, see your GP straight away.

With breast cancer, it's not just lumps you need to be aware of. Any unusual changes to your breasts, such as dimpled skin, turned-in nipples or discharge from your nipples, can be a sign of cancer. Nine out of ten women survive breast cancer when it's found and treated early. Listen to your body and get checked. becancerawareni.info

Dr Sara Graham, GP

BE CANCER AWARE **GET CHECKED EARLY** **HSC Public Health Agency**

Produced by the Public Health Agency.

It is important to remember that screening services are provided to a 'healthy population' who have no symptoms. Between screening appointments, or as people wait for a rescheduled screening appointment to take place, anyone who experiences any new signs or symptoms is encouraged to seek medical advice through their GP.

The PHA continues to promote regular public health messaging through a number of channels, advising people to be aware of the symptoms of cancer. The importance of partaking in screening programmes when invited also continues to be promoted and the PHA collaborates closely with all organisations involved in screening programmes to promote informed choice and uptake in screening. Restoration of screening services and the on-going innovative work in screening is therefore vital over the coming years.

Overview of progress in five paused programmes as of November 2020

- **Bowel screening:** routine bowel screening invitations recommenced from week beginning 17 August and the backlog in screening colonoscopy was substantially cleared in all Trusts before invites restarted. The programme is operating with a 5 month delay in invitations.
- **Breast screening:** routine breast screening recommenced in all Trusts during July. Social distancing and infection control requirements have meant that screening clinic throughput has significantly decreased. However, changes to the way that clinic invitations are organised meant that self-referral, for women over the age of 70, which had been previously paused, was re-introduced in October.
- **Cervical screening:** initial invitations for screening were issued to high priority women from the final week of June and routine invitations recommenced from mid-August. The programme is operating with a 5 month delay for routine invitations. Activity at laboratory level is increasing and returning towards pre-COVID levels.
- **Diabetic eye screening:** from August a small number of screening clinics for people at higher risk of sight threatening retinopathy recommenced. The number of people who can be seen at each clinic has been significantly reduced by social distancing and infection control measures. The programme is also working to find alternative screening venues as it has not been possible to routinely use GP practices for screening clinics during the ongoing pandemic.
- **Abdominal aortic aneurysm (AAA) screening:** in July, surveillance clinics for men with medium-large AAA were restarted and clinics for medium AAA commenced in August. Screening has recommenced in 22 of the 24 screening venues across the region.

Screening programmes are adapting to the changes required and a variety of innovative solutions are being proposed to manage the restoration of screening programmes during the pandemic. Ultimately, the PHA continues to work towards improved screening services for the Northern Ireland population, and some examples of this innovation are highlighted below.

Breast Cancer Screening Programme

Before COVID-19, HSC Trusts utilised a system called SMART clinics – this maximises the number of participants that can be invited to attend a screening clinic based on probability of attendance. These were not in use when screening was initially re-started as it could result in more than one participant arriving at the same time, therefore compromising social distancing and infection control measures.

The re-introduction of SMART clinics was piloted at the static unit in Linenhall Street. This was successful and was rolled out to other static units. A pilot has also been conducted in two mobile units where a Portakabin has been successfully used to manage multiple attendances.

SMART clinics have now been rolled out across all units from the beginning of October. As the re-introduction of SMART clinics allowed for better utilisation of appointment slots, self-referral for breast screening for women over the age of 70 could be reinstated at the same time.

Bowel Cancer Screening Programme

During the restoration period, extensive planning work has been continuing for the introduction of quantitative Faecal Immunochemical Testing (qFIT), which is on track for implementation from the end of December 2020.

This new type of test will replace the previous screening kit. As before, the test detects the presence of hidden blood in the stool which may be a sign of colorectal cancer and therefore warrants further investigation. The result from qFIT is more accurate than the current test and is expected to allow the programme to pick up more cancers. The other important difference is that qFIT is an easier-to-use kit for individuals to collect their sample of bowel motion.

Data from Scotland and England have shown that the uptake of bowel screening has increased following the change to qFIT.²

The PHA are working collaboratively with all Trusts to assess and monitor the expected impact of qFIT on screening colonoscopy services.

Conclusion

The COVID-19 pandemic continues to impact on population-based screening services in Northern Ireland. The PHA in collaboration with HSC Trusts and other partners are committed to restoring these services in a safe and effective manner. The PHA will continue to monitor and review the impact of the pausing of screening programmes and to encourage those eligible to participate in screening when invited.

Further information



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COVID-19: developing testing in Northern Ireland during a pandemic

Background

The first case to test positive for COVID-19 in Northern Ireland was tested on 26 February 2020 and diagnostic testing was identified by WHO on 16 March 2020 as a global imperative in terms of controlling and preventing spread of the SARS-CoV-2 virus.¹

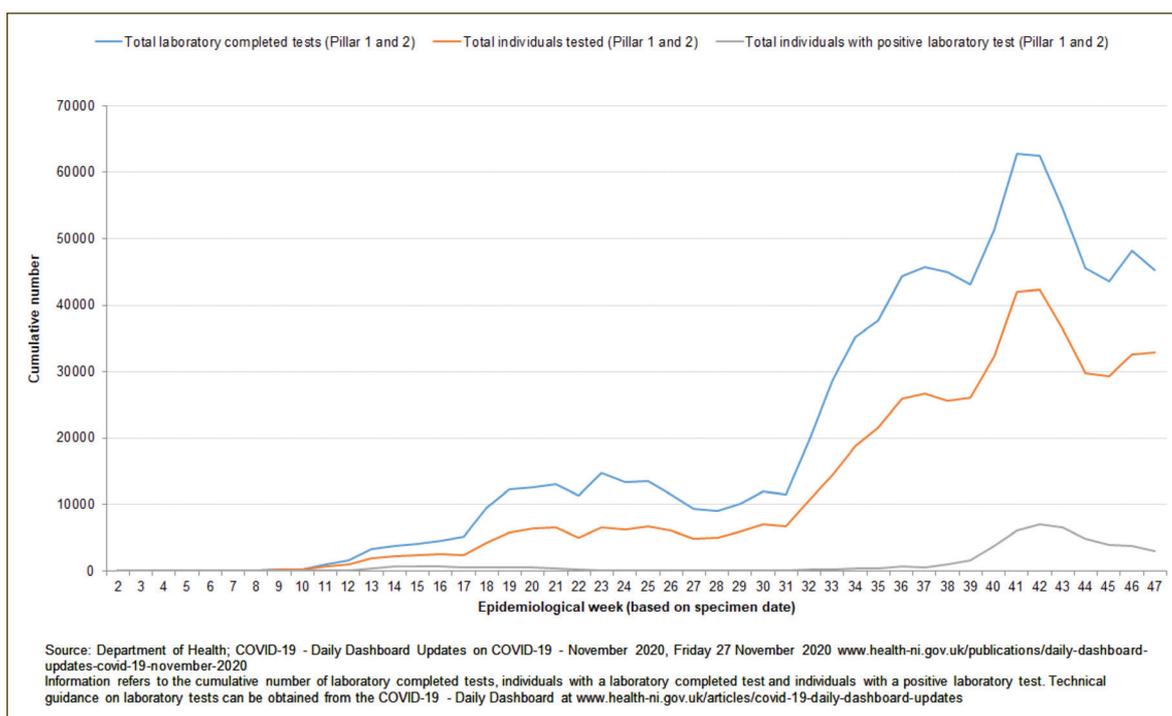
RT-PCR testing, the current gold standard for COVID-19 diagnosis, started in one centre in the UK before testing was rolled out to eight centres across the UK including Belfast Trust.² Testing by HSC laboratories has been called Pillar 1. As case numbers began to increase, further testing was made available in the other four Health and Social Care (HSC) Trusts.

An Expert Advisory Group (EAG) on COVID-19 testing was set up by the Department of Health, bringing together key specialists in areas such as epidemiology, virological and immunological testing, diagnostic validation, academic research, procurement and policy to develop and implement a COVID-19 testing strategy. The EAG was supported by the Northern Ireland COVID-19 Scientific Advisory Consortium, which includes Agri-Food Bioscience Institute, Almac, Queen's University Belfast, and Ulster University.

This work has enabled Northern Ireland to build and grow local diagnostic testing capability and capacity as we moved through the various phases of the pandemic.

A National Testing Initiative which offers testing for symptomatic members of the public throughout Northern Ireland operates via a digital booking system. This has been called Pillar 2. The national initiative has four regional test sites, eight mobile testing units and five walk in sites, soon to be increased to seven. Information on Pillar 2 testing sites is available on the PHA's website.³

Figure 1: Overview of monthly testing by PCR, Northern Ireland, 2020.



These significant testing numbers, achieved through Pillars 1 and 2, help to improve our ability to treat patients, protect the vulnerable and help to protect our healthcare system. Staff from Northern Ireland continue to liaise closely with colleagues working on testing programmes across the UK and the Republic of Ireland, to ensure that resources, new knowledge and, where appropriate, procurement exercises are shared.

Mass testing

Future strategies for COVID-19 involve plans for mass testing expansion across the UK to allow testing to rise from the current hundreds of thousands of tests each day to 10 million a day by early 2021. This is an ambitious plan to develop and deploy more widespread rapid and flexible testing in a wide variety of environments. It is anticipated that the expanded testing will use a range of new technologies that include rapid testing, where results are available faster than PCR tests can currently be processed.

Steps to introduce new diagnostic tests:

- Tests are assessed and validated as approved for use in the NHS and wider community.
- Tests are procured and allocated with Northern Ireland receiving its population share.
- Tests will be appropriately deployed in partnership with the local providers.
- Test data is efficiently and securely recorded, collated and transferred to the test register in the data warehouse so that results are appropriately communicated to patients, health providers and the contact tracing team in the PHA.
- Asymptomatic cases can be tested within specific populations, groups and communities.

Many of the new technologies will continue to require confirmatory PCR testing depending on the circulating levels of the virus.

Further information



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Infection prevention and control during the COVID-19 pandemic

Introduction

One of the main roles of the PHA was a focus on infection prevention and control as COVID-19 began to spread in Northern Ireland. As Director of Nursing, Midwifery and Allied Health Professionals within the PHA, I chair the Northern Ireland Regional Infection Prevention and Control (IPC) cell.

The work of the cell involves overseeing the coordination of infection prevention and control across the HSC systems, Primary Care, including services provided by community, voluntary and independent sectors care providers. This cell is part of the regional infrastructure that has been key in helping to tackle the COVID-19 pandemic. The Regional IPC Cell also has a link in the National IPC Cell. This cell is made up of representatives from across the Four Nations and it provides an opportunity to help shape and influence national guidance.

Approach taken

Personal protection equipment (PPE) helps protect those working in health and social care sectors. PPE covers a number of products which includes masks, visors and eye protectors, aprons and gowns.

The UK government and devolved administrations have published clear guidance on appropriate PPE for health and social care workers. This has been written and reviewed by all four UK public health bodies and informed by NHS infection prevention control experts.

Since the beginning of the COVID-19 pandemic in March 2020, over 261m PPE items have been procured to support HSC, including care homes. A Product Review Protocol has been developed between Infection Prevention and Control Leads (PHA and HSCTs), BSO and MOIC to assess all new PPE items to ensure they are suitable for use in healthcare settings.¹

During 2020, communication has been key and regular meetings have taken place to discuss any IPC issues. These have included weekly Lead IPC Nurse Forum and Regional IPC cell meetings in which a wide range of IPC issues from across the region are discussed and resolved. An Outreach IPC Programme for Care Homes was also established and facilitated through HSCTs including the distribution of PPE.

In an effort to ensure regional consistency regarding the use and decontamination of reusable Respiratory Protection Equipment (RPE), a task and finish group has been established. The group includes representation from DoH, Trusts, PHA and BSO PaLS, including relevant expertise from infection prevention control, decontamination, health and safety and procurement.

The task and finish group is currently working on the development of a regional data specification with BSO. As the PHA's Director of Nursing, Midwifery and Allied Health Professionals I am leading on the development of a Regional IPC Framework to strengthen IPC Teams across HSC. I also have responsibility for overseeing the development of a PPE Modelling Framework. This framework supports the effective procurement of PPE in response to COVID-19 and service rebuilding programme.

An Expert Working Group has also been established to develop an implementation plan for the PHE's *COVID-19: Guidance for the remobilisation of services within health and care settings* which could potentially be linked to surge plans. This work continues and part of Northern Ireland's implementation plan may be informed by work being carried out in other regions. In the interim, Northern Ireland continues to follow the *COVID-19: infection prevention and control guidance Version 3.2* issued on 18 June 2020.²

Wider engagement

The IPC Cell commissioned a 10,000 Voices Survey of staff experience of PPE which closed at the end of September 2020. The report will be used to inform the approach to IPC policy and practice across Northern Ireland. A number of engagement meetings have also been undertaken with Trade Union colleagues to discuss important issues such as the IPC Product Review Group, fit testing, decontamination of PPE and FFP3 masks.

Conclusion

Infection prevention and control has played a key role in helping to control the COVID-19 pandemic and has highlighted the importance of this function in the protection of vulnerable groups in hospital, care homes and other settings. The IPC Cell has received positive feedback about its contribution during 2020, including from Dr Gillian Clarke, GP Adviser, Integrated Care Team, Health and Social Care Board.

Highlighting its work, Dr Clarke said: *"From the beginning of the pandemic Integrated Care have found the advice and support coming from the IPC Cell invaluable. Without it there would be no formal link to any Infection Prevention Control team for Primary Care, Optometry, Dental and Pharmacy colleagues. The advice insured consistency across the region allowing colleagues on the frontline to feel safe and supported in appropriate PPE and ensuring their working environment was COVID secure."*

Further information



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Development of digital interventions

Background

In the 2019 report *Closing the digital gap: Shaping the future of UK healthcare*, Deloitte observed: “Information and digital technologies have long been acknowledged as key enablers in transforming the NHS, however, as yet, healthcare lags behind other industries in the adoption of technologies to improve the performance of staff and the consumer experience. Whereas the hospitality, transport, retail and banking industries are almost unrecognisable from ten years ago, and despite the proliferation of digital health solutions, the transformation of healthcare remains slow and fragmented, with a growing digital divide.”¹ While it is clear that the pandemic has had a dreadful impact upon the public in Northern Ireland (and across the world), physically, emotionally and economically, if it is possible to take any positives from such a terrible situation, digital adoption could be one positive aspect that may well have a lasting benefit within healthcare.

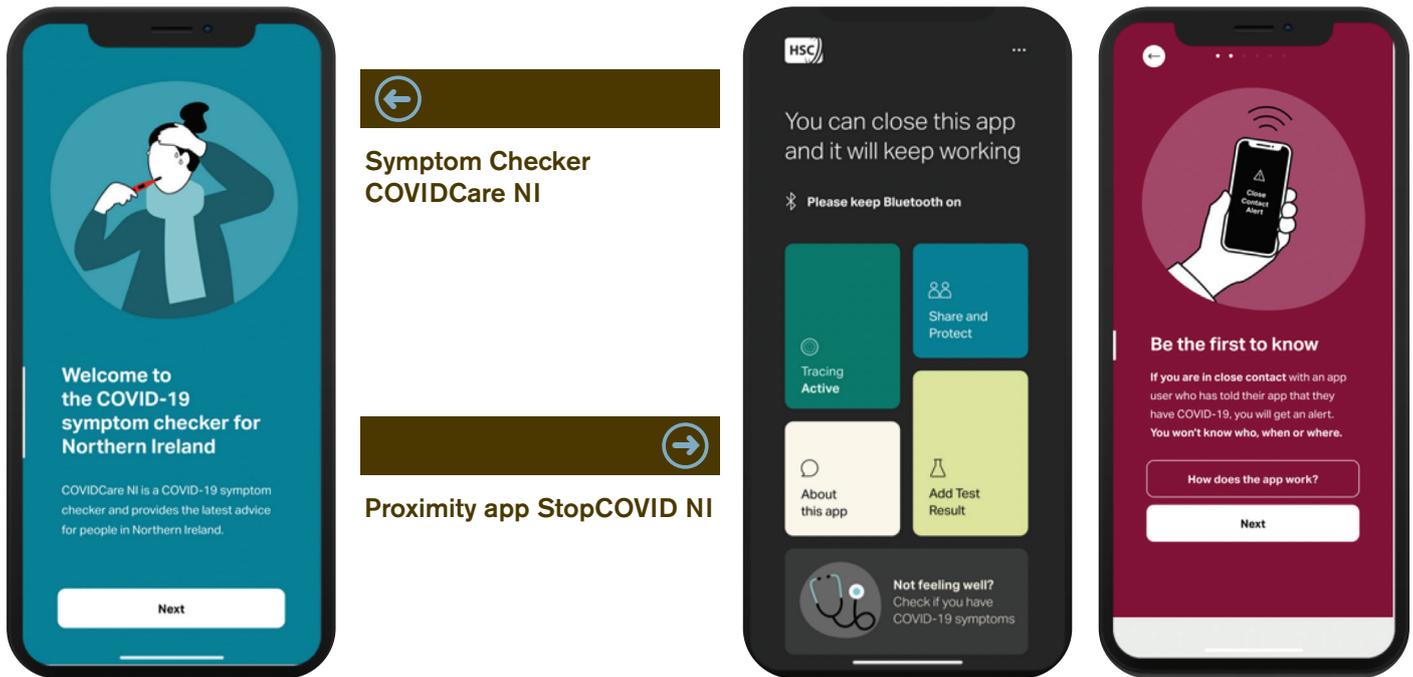
Disruptive events can present an opportunity for review and reflection. There is no doubt that the public health and infection control aspects have forced a revised approach to delivery of healthcare. While there is undoubtedly a downside for members of the public, having to adapt to new ways of accessing healthcare, and cope with the downturn in elective capacity, digital adoption has created some efficiencies, and demonstrated material benefit. Video consultations are making a vital contribution to maintaining access to services, and delivery of new services, such as video interpretation services (for members of the sign language community) are improving accessibility.

Approach

At the start of the pandemic, GP and GP Out-of-Hours (OOH) services were experiencing significant pressure from members of the public with COVID symptoms or seeking COVID advice. The introduction of a 111 helpline for COVID advice, and development of a triage algorithm for COVID symptoms, produced an instant alleviation of urgent care pressures in GP and GP OOH services in March. During March, calls to the helpline hit peak levels of up to 6,000 calls daily, producing a strain on resources. The introduction of a COVIDCare NI app (and online web version) to check symptoms and provide COVID-related information, has delivered a demonstrable impact. Introduction of the app at the end of March resulted in an instant drop in helpline daily calls to about 600, while daily journeys through the app peaked at over 6,000.

The app and website was the first COVID symptom checker introduced in the UK. It is still making an invaluable contribution to alleviating pressure in frontline services. On a typical Sunday in the last month, there would have been approximately 1,400 symptom checks completed. Of these, 87% were triaged without need for further clinical assessment. Over 1,200 individuals on a typical Sunday were able to self-assess without needing to access GP OOH. On a typical Sunday in Northern Ireland 1,600 – 2,000 people would access GP OOH. Adding an additional 60-75% demand to the call volume managed by GP OOH would have a significant adverse impact on the service, reducing access, and increasing call waiting times.

Northern Ireland was the first in the UK to deliver a proximity app StopCOVID NI. This currently has been downloaded over 477,000 times (over 25% of total population and over 45%–55% of total estimated smartphone ownership). Over 17,000 exposure notifications have been delivered since launch, advising people potentially exposed to infection to self-isolate, and breaking chains of transmission. The ratio



of notifications to index cases (of app users notifying a positive COVID-19 PCR test) is 3.4, achieving effectiveness levels superior to the manual process. We linked it to the app in Ireland, allowing our app to work there, and their app to work here. That was a world-first, for the delivery of interoperability between the proximity apps of two countries.

Conclusion

As Product Manager, leading the development and implementation of both apps (and the website), I am confident that digital solutions are making a material contribution in helping the public of Northern Ireland cope with the pandemic.

Further information



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The COVIDCare NI and StopCOVID NI Mobile Apps are available at: <https://covid-19.hscni.net>

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COVID 19: health and wellbeing engagement in Northern Ireland prisons

Introduction

In 2019 the Department of Health (DoH) and Department of Justice (DoJ) jointly published the *Improving health within criminal justice* strategy and associated action plan.^{1,2} In setting priorities, work was undertaken with statutory partners in the areas of accommodation and education, with the third sector and, most importantly service users.

There are three prison sites in the Northern Ireland Prison Estate: Maghaberry, Magilligan and Hydebank Wood College. Maghaberry and Hydebank Wood College are committal prisons. The overall average daily prison population increased by 4.7% during 2019/20 to 1,516 and the number of annual receptions into prison in 2019/20 was 5,322.³ Whilst the overall prison population is relatively small, those detained often exhibit a poor health status on admission to prison.

The Northern Ireland Prison Service (NIPS) is an agency within the Department of Justice with the responsibility for the operation and delivery of services within the Northern Ireland Prison system. South Eastern Health and Social Care Trust (SEHSCT) has responsibility for the delivery of health care in the region's prisons.

On 29 February 2020, COVID-19 was added to the list of notifiable diseases in Northern Ireland. Operational guidance for prisons' response to COVID-19 (PHA 2020) was produced.⁴ The guidance was developed through collaborative working between Northern Ireland Prison Service (NIPS), South Eastern Health and Social Care Trust (SEHSCT), Health and Social Care Board (HSCB), and the Public Health Agency (PHA).

Due to COVID-19, the prison regime, of necessity, changed in April 2020 in keeping with the operational guidance. The public health challenge: to mitigate the spread of COVID-19 whilst still identifying and treating other conditions.

Actions

A summary of the key actions pursued to reduce the spread of COVID-19 included:

- Non-essential personnel/organisations were not permitted to enter or deliver interventions across the prison estate.
- Movement within and between prison sites was both managed and minimised.
- People entering prison were required to isolate for 14 days, to minimise the risk of transmission into the population.
- An area of each committal prison was adapted for cohorting people in quarantine.
- 'Landing bubbles' were established.

Examples of COVID-19 health improvement engagement interventions/activity in prisons

A range of interventions were undertaken to improve engagement of inmates with measures to reduce the risk of the spread of COVID-19. These interventions were designed and delivered in partnership, and involved people in custody in both design and feedback.

Digital platforms: people in care reported to staff that connection and communication with family and friends was a key component to their mental health and emotional wellbeing. During the pandemic, NIPS facilitated 20,000 virtual visits consistent with the intention of the *NIPS Strengthening Families Relations Strategy 2019-2024*.^{5,6}

Non-digital social media platform: 'WhatsUP' and 'FAB' newsletters were created and content was generated by engaging with service users. 'Chat and Chew' and 'Banter for Breakfast' enabled socially distanced purposeful exchanges.

Non-digital resources: in-cell distraction packs are offered to every person after they enter custody. Distraction packs include a mix of puzzles, positive messages, in-cell workouts, competitions relating to art, creative writing, football, music and also the newsletters. Other resources include: colouring packs/books/magazines/Countdown with Courage calendars – support for those in 14 day isolation/Take 5 'Survivor's Guide' – adapted from the Take 5 initiative. Worksheets and self-help sheets on issues such as coping with anxiety, stress and better sleep have also been produced to meet need.

Outdoor socially distanced health and wellbeing events: health messages delivered in an accessible way – for example, Fitness for Food, Men's Health Big Outdoor Quiz and The Big Outdoor Karaoke Picnic, Nurture for Nature .

Quarantine engagement sessions and post quarantine isolation survey: 10,000 Voices is a regional survey which has been devised and coordinated by the PHA.⁷ It uses a narrative based research technology that enables the capture and analysis of large quantities of stories in order to understand complex change. It was adapted by the SEHSCT Healthcare team in 2017 for use in the prison setting, keeping generic questions for national comparison and adding specific questions for the prison experience. It has been further refined to enable men and women to share their experience of quarantine and talk about the impact of COVID-19 isolation in prison on their physical and mental wellbeing.

Peer mentors – 'ASK HIM': a healthcare information mentor project successfully piloted in 2019. Mentors were tasked and trained to make people feel welcome as they arrive into custody and demystify the healthcare systems in prison.

Shared reading: shared reading (SR) is a literature-based intervention which is delivered in groups by trained 'Reader Leaders' who facilitate dynamic discussions of a text. Participants are encouraged to reflect on what is being read and how it might relate to their own lives. Face-to-face groups have been running in all prisons since 2016 and participants have shared their positive experiences of the service and the positive impact on their mental health and wellbeing. The service provider, The Reader, is currently providing an alternative service model through twice weekly curated newsletters; telephone support to NIPS staff re resources/delivery; and, SKYPE evening sessions.⁸ The Reader Programme is also exploring the potential delivery of a bespoke 'DIY Shared Reading' training programme for staff.

Next steps

The following next steps are planned:

1. The Health Promoting Prison (HPP) project (also called the Health in Prisons Project) began in 1995 in the WHO EURO region, in view of the recognition of inequality between public health and prison health. A 'Whole Prisons' approach exists with a focus on key areas as reinforced by *Health in prisons: a WHO guide to the essentials in prison health* – key areas to include mental health promotion and wellbeing, smoking cessation, healthy eating and nutrition, sexual health and relationships, active living; and drug and other substance misuse.⁹
2. The HSCB/PHA Improving Health in Criminal Justice Planning and Commissioning Group has 10 key deliverables: Deliverable 2 relates to health and social wellbeing improvement and Deliverable 6 refers to evidence of service user engagement across all sites. The Group is leading on a complex health needs assessment (HNA). The HNA will be phased and includes the mental health (including emotional wellbeing) and addiction needs of the Northern Ireland prison population. A steering group is being set up to include HSCB, PHA, SEHSCT and NIPS with service user involvement.
3. SEHSCT plans to explore the future role and remit of 'Health and Wellbeing Engagement Team/s' using the learning from COVID-19.
4. SEHSCT plans to explore the future role and remit of the peer mentor model.
5. SEHSCT will publish the findings of the 'Experiences of COVID-19 Isolation in Prison, a Qualitative Study'.

Further information



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COVID-19: a summary report of the collective approach of the Public Health Agency to support the care home sector, March – June 2020

Introduction

The impact of COVID-19 on older people living in care homes in Northern Ireland and the staff who support them has been severe. The majority of care home residents in Northern Ireland are older people, with complex clinical health care needs, presenting at increased risk of death from COVID-19. The mortality rate for COVID-19 in care homes is significantly greater than the general population across all UK countries. The pandemic has placed inordinate strain on the care home workforce, managers and teams who care for the most vulnerable in our society and untold grief for family members losing a loved one. Many people living in long-term care settings due to COVID-19 restrictions have limited access to their families and friends. The PHA has collected over 600 stories of the experience of residents, carers and families of living in a care home during the pandemic via the 10,000 More Voices project, which has been central to informing the guidance and collaborative planning approach from the PHA and the Health and Social Care Board (HSCB).^{1,2}

The long-term impact of policy, guidance, recommendations and approaches to minimise infection in care homes and care for residents and staff is and will be the subject of debate and evaluation for years to come. Emerging research evaluating the comparative performance of UK countries in the first wave relating to care homes is encouraging. The performance of Northern Ireland comparative data is multifactorial, however the collective leadership approach to support care home teams and the long-term care sector was in part led by steps advocated by the PHA to minimise infections and prioritise the care and wellbeing of all residents and staff, in the wake of a global pandemic.

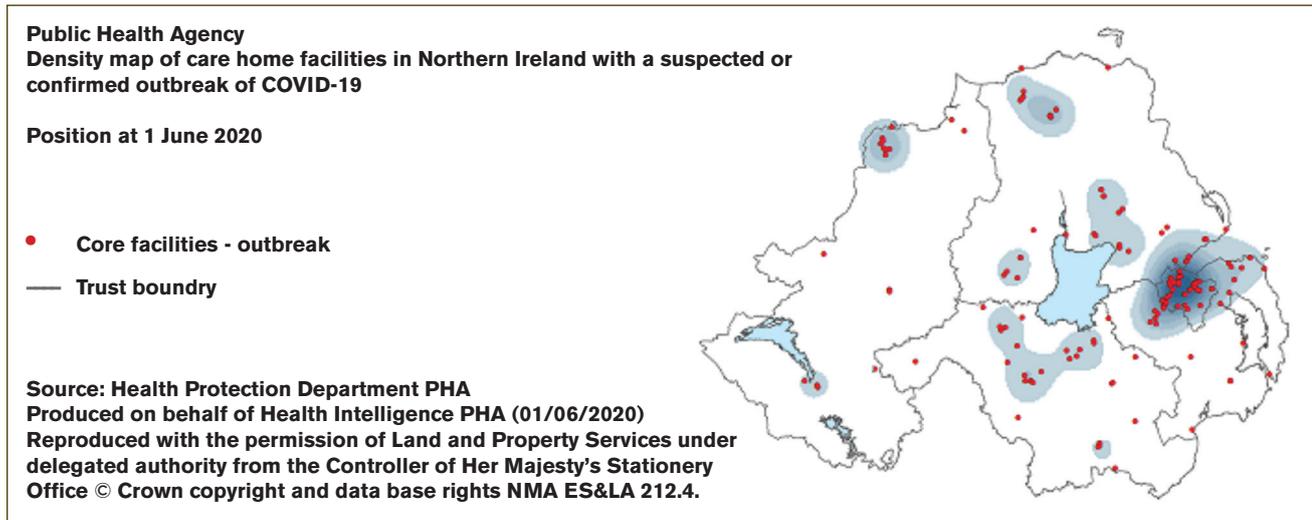
The PHA has demonstrated great strength in its ability to bring together local and regional experts, organisations and sectors at speed to respond quickly, decisively and in a variety of ways to support the care home sector. Partners include the HSCB, Trusts, the Regulation and Quality Improvement Authority (RQIA), Department of Health (DoH), Independent Health & Care Providers (IHCP) and the National Testing Partnership to deliver standardised, expedient and efficient collaborative solutions and support to assist the care home sector navigate this challenging time.

The impact of the first wave of COVID-19 in Northern Ireland's care homes

There are 483 care homes in Northern Ireland, caring for 14,935 residents.³ The first laboratory confirmed case of COVID-19 in Northern Ireland was tested on 26 February 2020 and COVID-19 was classified as a notifiable disease on 28 February 2020.

The profile of the COVID-19 pandemic has very much been a disease of the elderly, with the majority of deaths in those aged over 85 years. Deaths among people living in long-term care settings (residential or nursing) increased substantially during the COVID-19 pandemic across the United Kingdom. A map of the care homes with a suspected or confirmed outbreak of COVID-19 is provided in Figure 1 for illustrative purposes, indicating areas with higher density of outbreak in increasingly dark shades of blue.

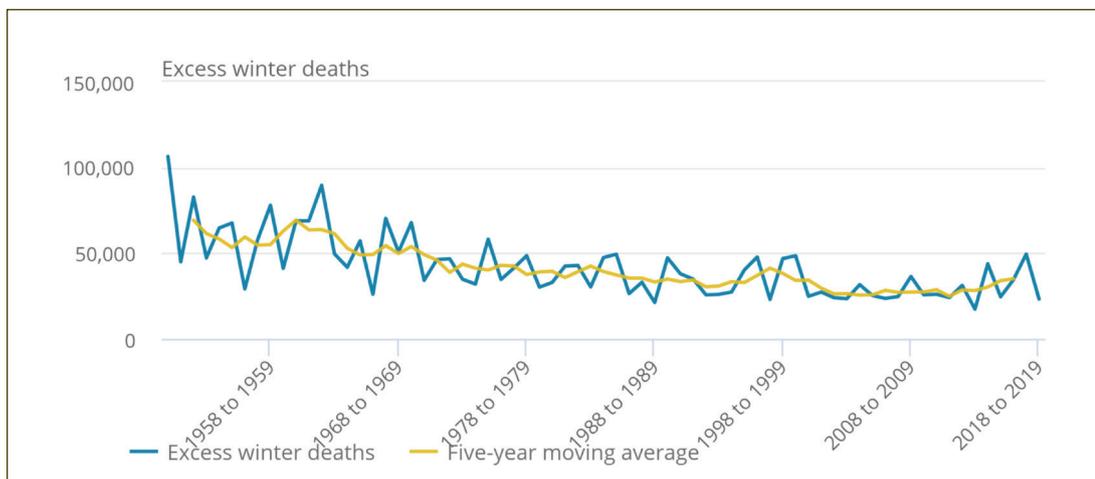
Figure 1: Outbreaks of suspected or confirmed COVID-19 in care homes in Northern Ireland, as of 1 June 2020.



Variation in testing approaches and data reporting across the UK makes comparing the approach of countries in supporting care homes against COVID-19 very challenging. Internationally, the handling of the pandemic is measured by comparative performance in relation to “excess deaths”. Monitoring excess deaths provides understanding of the impact of COVID-19 during the course of the pandemic and beyond. It is defined as the number of deaths above the average for the corresponding weeks in previous years.⁴ Using this internationally recognised comparative performance, Northern Ireland had the lowest share of care homes infected (46% in Northern Ireland, 79% in England, 66% in Wales, 62% in Scotland) and the lowest level of excess deaths in care homes (20% increase in mortality in care homes in Northern Ireland, 38% increase in England, 29% in Scotland, 22% in Wales) compared to other UK countries.⁵

Figure 2 below indicates that excess winter deaths over the course of a number of decades have demonstrated a downward trend in England and Wales. A pandemic disease which particularly affects the very elderly inevitably will see a greater fluctuation in excess deaths. It is likely that very frail elderly people, who would have died of influenza, if COVID-19 did not exist, may have COVID-19 listed as a cause of death this winter instead.

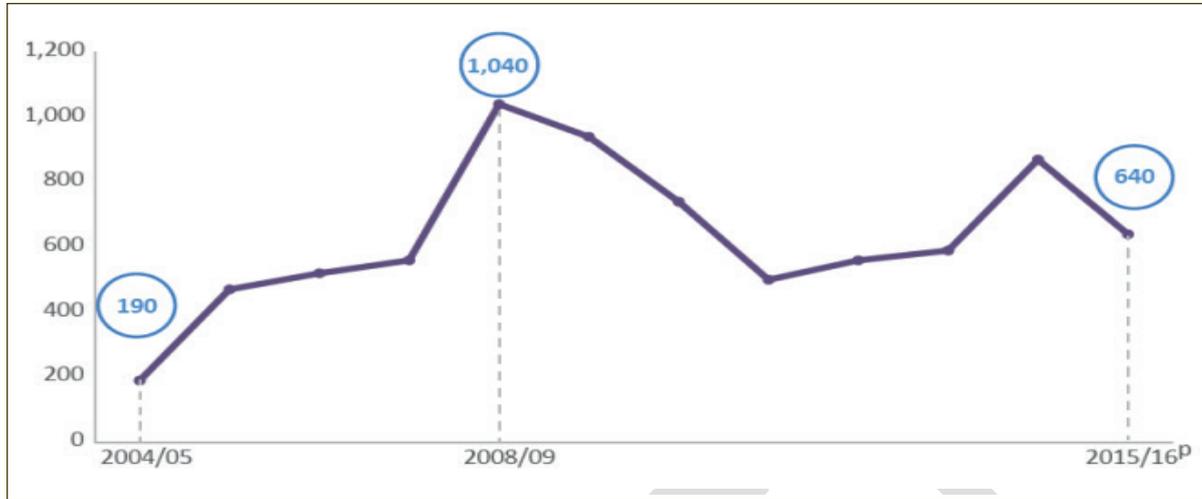
Figure 2: Excess winter deaths, England and Wales from 1950/51 – 2018/19.



Source: National Statistics. Excess winter mortality in England and Wales: 2018 to 2019 (provisional) and 2017 to 2018 (final)

The number of excess winter deaths can vary from year to year. This is illustrated from some historic data from Northern Ireland below.

Figure 3: Excess winter deaths 2004/05 – 2015/16.

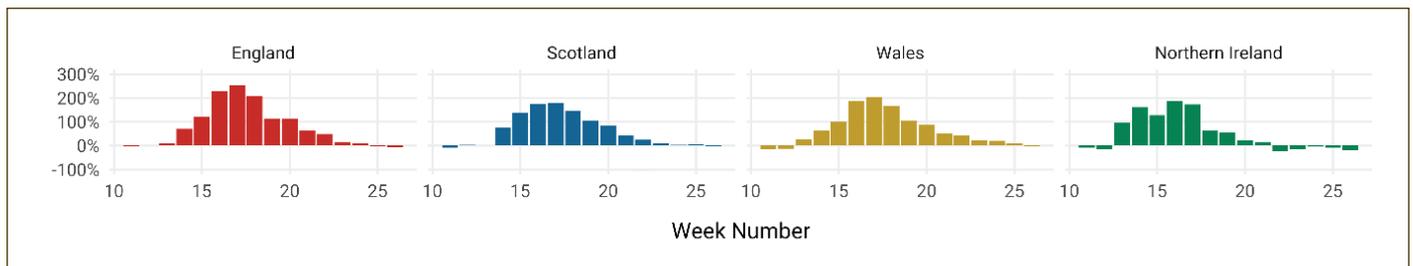


Source: NISRA. Excess winter deaths 2004/05 - 2015/16.

Based on the information provided above, it would not be unexpected if up to 1,000 very frail elderly people, out of the Northern Ireland population of 1.8 million, were to succumb to the combination of a respiratory infection and co-morbidities this winter. A significant percentage of these cases may have COVID-19 as one of a number of conditions factor listed on their death certificate.

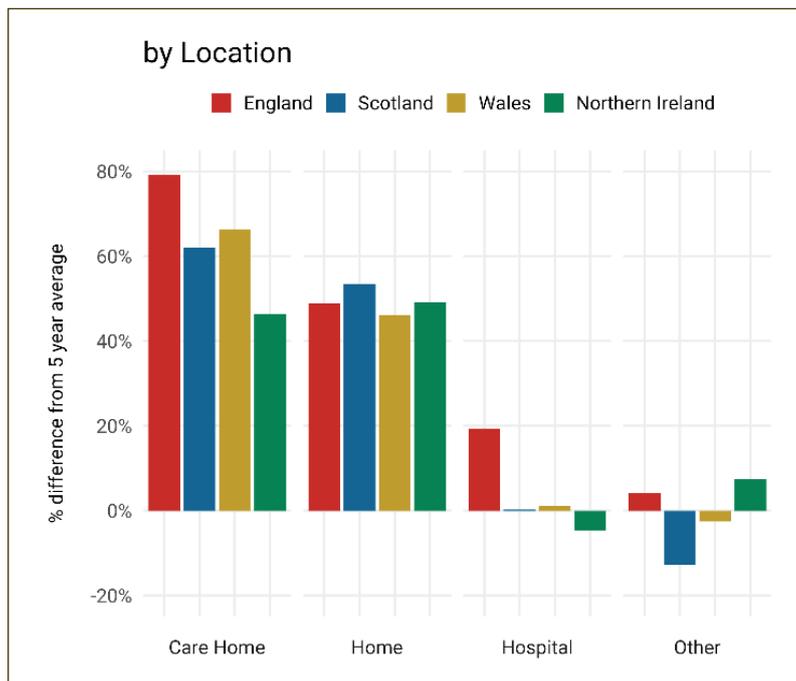
When the rise in care home deaths was first identified, the PHA worked intensively with the care home sector on a wide range of measures to contain the spread of the virus and prepare care homes. This response reduced death rates faster than in other UK countries. PHA and collective leadership intervention had a dramatic effect as illustrated in Figure 4 below. After week 17 there is a much more dramatic fall in death rates in Northern Ireland, which coincided with a strong collective leadership to protect the care home sector from the Director of Public Health in the PHA, the Director of Nursing and Allied Health Professions in the PHA, the Director of Social Care in the HSCB, Trusts, RQIA and other regional representatives and organisations including the independent care home sector.

Figure 4: Death rates for England, Wales, Scotland and Northern Ireland during the first wave of the pandemic.



Source: Bell D et al. COVID-19 mortality and long-term care: a UK comparison.⁵

Figure 5 on the next page indicates that the mortality rate in weeks 11-26 was lower in Northern Ireland than in other parts of the UK.

Figure 5: Excess mortality rate in the UK according to location (Weeks 11-26 breakdown).

Source: Bell D et al. COVID-19 mortality and long-term care: a UK comparison.⁵

PHA/HSCB COVID-19 regional surge planning for the care home sector

In the initial stages of the pandemic, surge plans were developed to respond to an anticipated overwhelming of acute and intensive care capacity. Care homes surge planning was included within the broader scope of social care services and planning focussed on supporting people to receive care and treatment in the community and ensure effective and efficient discharge of hospitalised patients. As the pandemic continued, focus was redirected to the increasing number of infections and outbreaks within the care home sector. The PHA worked in partnership with health protection and HSCB to develop a dedicated PHA/HSCB COVID-19 Regional Surge Plan for the NI Care Home Sector with three overarching objectives:²

1. **Prevention:** to provide support to address areas where action could prevent the spread of infection, including proactive funding for enhanced cleaning, open access IPC training and education for all care homes, risk based approach to visiting, and staff and resident testing in line with the national programme.
2. **Mitigation:** to manage ongoing issues arising from the consequence of an outbreak or a rise in community spread of infection. This includes the provision of virtual and in-reach acute care and clinical support to all care homes as required; virtual and in reach outbreak management support; introduction of the Care Partners model in order to mitigate the risk due to restricted visiting. The plan also includes a review of therapeutic and meaningful activities in order to reduce the risks associated with isolation.
3. **Resilience:** to respond to the financial, workforce and operational issues emerging as the pandemic progressed. This includes workforce planning and support from HSC bodies; plans for post-COVID rehabilitation input from allied health professions; and the funded provision of clinical equipment, oxygen and technological equipment to support care homes.

Additionally, the care home surge plan includes a Decision Support Framework, a risk matrix which measures the care providers' assessment across four domains of Outbreaks, Staff Reliance, Access to Infection Prevention Control (IPC)/Personal Protective Equipment (PPE) and Resident Acuity. Together this matrix is used as a point of reference to guide HSC Trusts in the early identification of risk and enable targeted intervention and inform local and regional surge response/planning. This matrix has been incorporated into RQIA monitoring systems to allow a single point of contact for reporting of pressure areas within the system. Furthermore, the Health Protection team have access to a data warehouse that enables enhanced oversight of COVID-19 outbreaks across Northern Ireland enabling rapid feedback of information to front line providers.

PHA measures to support care homes in Northern Ireland: discharge from hospital to care homes

It is recognised that extended stays in hospital are generally harmful to wellbeing detrimentally impacting service efficiency.⁶ The PHA identified the need to support discharge of people from hospitals to care homes as key factor that would maintain the flow of patients through our healthcare system and ensure sufficient capacity was maintained to treat those who became acutely ill. In order to mitigate against the spread of COVID-19 early in the pandemic, steps were taken to provide advice and guidance on testing, isolation and cohorting of people with COVID including staff.

Early on in the pandemic PHA experts collaborated closely with Trusts, the DoH, RQIA and HSCB to provide streamlined centralised messaging to the care home sector via the *Regional Guidance for the Nursing and Residential Care Homes, Northern Ireland (March 2020)* intended to complement individual testing policy in Health and Social Care Trusts and minimize the risk of infections due to staff providing information for managers, staff, visitors and family members. This guidance has subsequently been updated reflecting the complexity of issues emerging during the first wave and faced by the care home sector. The latest version of *Regional Guidance for Nursing and Residential Care Homes, Northern Ireland September 2020* is available online.⁷ Key information includes Regional Guidance on pre-admission infection prevention and control risk assessment to assist staff to identify and record relevant information regarding past or current infection alongside a detailed discharge process to support transfer from acute hospital, mitigating further spread of infection.

Testing prior to and post discharge

The following steps have been taken to minimise infection in care homes:

- The PHA had a leading role in developing and supporting the regional guidance: *COVID 19 Interim Protocol for Testing*.⁸ Comprehensive information relating to testing prior to and post discharge from hospital to care homes is detailed in the guidance.
- Recommendations specify that “in advance (48 hours) of hospital discharge to a care home the patient must be tested for COVID-19. This new testing requirement is designed to support a timely discharge. The information from the test results, with any supporting care information, must be communicated and transferred to the relevant care home”.
- April 2020: the DoH Rapid Learning Initiative confirmed the potential for transmission of COVID-19 from those who are symptomatic, pre-symptomatic, and asymptomatic of infection with a view to inform testing policy. It emerged that limiting testing to symptomatic residents and staff may not identify all residents and staff with SARS-CoV-2. The PHA facilitated implementation of whole home testing of all residents and staff for both active/open care home outbreaks retrospectively that were notified prior to 24 April as well as ensured implementation of testing policy for all new outbreaks.

- PHA led on the development of the updated guidance for the management of outbreaks within care homes. The PHA Health Protection team provided health protection support and advice within a risk assessed approach to individual care home outbreaks (classified as >2 symptomatic residents) in care homes (nursing and residential). This included the need for all residents and staff to be tested for COVID-19 as part of the initial risk assessment of each outbreak
- The PHA duty room continued to provide advice and support to all care homes which reported positive cases through the transition to planned regular care home testing programme on notification after 24 April to duty room.
- In August approximately 33,000 tests were completed with a further 40,000 tests completed in September. We estimate the continued rolling testing program will involve 10-12,000 tests per week from all care homes.
- Most of the current care home outbreaks have been detected as a result of the regular testing which will hopefully lead to better protection for homes in this further wave of the pandemic.

Management: working in partnership with the National Testing Programme

- May 2020: under the direction of the expert testing group, the PHA sought to utilise the national testing partnership to support whole care home testing of all residents and staff without a COVID-19 outbreak
- June 2020: 197 care homes were tested using this partnership approach. The satellite channel of the National COVID Testing Partnership was trialled with project management support from PHA and testing support from HSCT staff.
- PHA staff coordinated implementation of this early testing by supporting homes with specimen orders, test pickups, mobile testing units on sites for larger homes and all queries in regard to managing testing.
- August 2020: A regular program of COVID-19 testing for all care home residents and staff across Northern Ireland commenced on Monday 3 August 2020.⁹ All asymptomatic residents are tested for COVID-19 every 28 days with all asymptomatic staff testing every 14 days.
- Guidance was developed to ensure that all new admissions to care homes from community settings, including from supported living accommodation, would have their COVID-19 status checked 48 hours before admission to the care home. The same conditions apply to patients admitted to care homes from community settings as apply to patients discharged from hospital to a care home.

Isolation within care homes

PHA has supported and informed the guidance for care homes on isolation measures within care homes.⁷ This guidance assists staff in identifying when it may be appropriate to move someone to a different home or facility as well as referencing Infection Prevention and Control (IPC) measures. Information on where and how to access additional support and advice from their local HSC Trust, RQIA and the PHA is signposted, providing streamlined collaborative messaging to the care home sector.

Care homes may also be signposted to other resources including the *Regional Infection Control Manual* which is regularly updated and is used as a key point of reference by Health Protection duty room staff providing advice to care homes.¹⁰

Access to Personal Protective Equipment (PPE)

In the early stage of the pandemic, it became clear that supplies of PPE were being prioritised for HSC system and private providers were encountering difficulties with procurement of adequate supply.

The PHA, in consultation with the HSCB addressed this challenge by developing the *COVID-19 Regional Surge Plan for the NI Care Home Sector*, in May 2020 which was subsequently updated frequently to reflect the changing needs of the sector.² Specific reference was made to the need for HSC Trusts to coordinate and manage the supply of PPE to care homes within their geographical area, thus promoting security of supply. A regional process was challenging to embed; however it has since demonstrated agility in responding to the needs of the care home sector and demand for PPE. Going forward the regional surge plan will require enhanced monitoring and collaborative engagement with partners such as HSCB and BSO to respond to emerging need.

The PHA undertook a demand modelling study to provide DoH with data on the volume and usage of PPE based on a number of assumptions to make provision for peak surge. This informed the DoH response to sourcing PPE for the entire Health and Social Care system in Northern Ireland, both statutory and Independent sectors. Between 6 March and 2 October 2020, over 232 million items of PPE were delivered across our HSC system, including more than 129 million gloves; 42 million aprons; and 1.5 million FFP3 face masks.

In support of a standardised approach across both statutory and independent sectors, PHA Infection Prevention Control Cell developed and distributed guidance posters that identified the correct PPE to use in particular circumstances, along with posters detailing how to don (put on), doff (remove) and dispose of PPE correctly. Training videos that could be accessed at any time, and interactive Zoom sessions were delivered by PHA and HSC Trusts using regionally agreed procedures. These will be reissued as part of an education refresh as we move through the second surge of the pandemic.

There is a need for more academic research into the optimum use of PPE in care homes. There are some potential adverse effects, in that residents cannot see the face of members of staff and may not recognise them when wearing a face masks. Face masks covering the mouth result in difficulty communicating effectively with people with hearing impairment or who are deaf. Guidance to highlight and support effective communication whilst wearing PPE equipment was developed to highlight the importance of communicating effectively whilst wearing PPE and promoting effective contact with residents, promoting mental health and wellbeing.

Testing in care homes

Symptoms and monitoring

The PHA Health Protection duty room has played an integral role in the symptom monitoring of COVID-19 in care home settings. The PHA Health Protection team has long-established, well-trusted and robust systems in place to monitor infectious diseases and provide direct advice and support to manage outbreaks and limit onward spread. These arrangements were actively implemented early in the initial stages.

Notifications of respiratory illness from care homes to the Health Protection duty room team were thoroughly investigated and support provided to the care home provider in managing the outbreak. A comprehensive risk assessment was completed of the incident, which included an assessment of each individual resident and the environment and an ongoing assessment of the severity, spread and context

of the incident. Advice specific to COVID-19 was given regarding isolation, containment, and infection prevention and control practice, including cleaning, testing information, how to manage symptoms, when to request additional medical advice, and support for PPE. The outbreak was then followed and care home supported till the outbreak conclusion

As we learned more about COVID-19, the revised case definition was expanded to alert clinicians and care homes to the need for a higher index of suspicion regarding possible atypical COVID-19 presentations particular to older people, thus raising staff awareness of the presence and pervasive nature of COVID-19 in care homes.

Subsequently, the PHA amended the COVID-19 guidance for care homes in response to the change in definitions advising care home to treat all residents with atypical symptoms as probable COVID-19 positive in facilities and to manage these situations as potential COVID-19 outbreaks.

Measures to support care home staff with testing management of COVID-19 on a dedicated webpage included:

- A checklist - overview of testing process – simple one page guide
- How to use non-Randox test kits
- Full guidance booklet for Northern Ireland
- FAQ on courier information
- FAQ on testing in care homes

Weekly educational Zoom seminars were held over a four week period in addition to an online training tool that was available to all homes. Staff training on testing in practice was also established through CEC.

A full-time support officer has been appointed to support care home staff queries. Daily support is given to care home staff with managing the ordering system, kit registration, results queries and general communications.

Cleaning

Messaging and advice was directed to the care homes via letter that even if they were not affected by COVID-19, they should implement proactive enhanced cleaning. Guidance on enhanced cleaning is located on the PHA Regional IPC Manual.¹¹

For those care homes affected by COVID-19, the PHA Health Protection Team in the duty room provide advice and guidance on a daily basis and care homes are provided with specific actions as set out within the COVID-19 outbreak pack, provided to each home. Upon clearance of a nursing or residential care home outbreak, the duty room provided support to facilitate a thorough clean of the facility. Subsequently, a final outbreak summary report is produced.

To support care homes during the COVID-19 pandemic, additional funding was made available to care home to enable them to meet the requirements form enhanced cleaning. The PHA supported a bid for funding of up to £6.4 million which was made available to care homes to increase domestic staffing levels and support post outbreak cleaning June – August inclusive.

Other infection control measures

An Infection Prevention and Control Cell was established which brought together IPC nurses, public health doctors and leading experts in IPC to act as an Expert Reference Group, reviewing relevant national and international evidence in order to provide resolved and consistent regional advice for Northern Ireland, under the leadership of the Director of Nursing, Midwifery and Allied Health Professions in the PHA.

In response to an identified need for enhanced Infection Prevention and Control support to care homes, the PHA coordinated a dedicated team of infection and prevention control nurses, who worked with local HSC Trusts to provide specific advice and guidance in relation to individual outbreaks.

Five nurses (one per Trust) were redeployed to assist the Trust Infection Prevention and Control Nursing and Community Teams with a unique strategic role crossing organisations and teams.

This unique role involved:

- Leading in supporting community infection prevention and control activity including input and support to the independent care sector.
- Supporting implementation of the most recent PHE IPC guidance.
- Liaising with relevant HSC stakeholders including RQIA.

Training and guidance

The diverse range of guidance developed by the PHA supporting the wellbeing of residents and staff within care homes is threaded through this paper. The PHA provided a leading strategic role in providing guidance and supporting implementation of guidance by initiating and informing the training of the care home workforce. Initiated by PHA nursing experts, a diverse range of COVID-19 training courses for care homes staff to support symptom management, infection control and supporting the mental health and wellbeing was implemented in regional platforms to reach 2,695 nursing and residential home staff from the period March – June 2020 (CEC) and 251 ECHO sessions to 8,408 residential, nursing and domiciliary care home staff.

Virtual visiting, socially distanced visiting and wellbeing

The DoH developed and issued guidance on visiting on 29 June 2020 and in support of the implementation of this guidance within care homes, PHA developed risk assessment and supporting policy documents to assist care homes with the reintroduction of visitors to care homes.¹² A training session was delivered on 29 July 2020: 'Balancing the rights and risk of visiting during a pandemic'.

The PHA has assisted with the process to scope the need for tablet devices that were subsequently made available to care homes to support virtual visiting.

The PHA led on a 10,000 More Voices project exploring the Lived Experience Project for Residents, Relatives and Staff in Care Homes during COVID-19 Pandemic. Key messages from residents, their carers and families have been central to the *Rapid Learning Initiative in Transmission of COVID-19 in Care Homes* and has informed the surge plan for care homes.^{13,2}

To date over 600 stories have been collected and analysed to inform regional learning and service improvement. A key area of learning is the importance of developing open and transparent conversation between the residents, relatives, providers and decision makers.

The PHA is working towards implementation of an online user feedback system to promote continuous feedback loop in the care home sector. Also in collaboration with the Patient Client Council the PHA are developing a system which reaches out to relatives and residents of care homes to provide feedback on a regular basis on key topics, such as visiting.

Nationally, there are emerging calls to re-evaluate the balance between protecting people from the virus and protecting their wellbeing. Responding to the recommendations of the Rapid Learning Initiative, the *Care Home Action Plan (September 2020)* includes reference to enhancing the opportunities for residents to have access to visitors.^{13,14}

Regulation

Throughout the pandemic the PHA has met regularly and worked closely with RQIA personnel, Trust directors and HSCB to support effective communication between the statutory agencies. PHA worked in partnership with RQIA to develop the regular monitoring survey that informs the risk assessment and surge response identified within the Care Home Surge Plan and incorporated into the revised Care Home Action Plan.^{2,14}

Medical care within care homes

Dedicated care home support teams were established or enhanced from 2018 with Transformation funding. In each of the five HSC Trusts, a team of clinical staff are employed with the aim of enhancing the competence of care home staff to facilitate discharge from hospital and prevent inappropriate hospital admission. A Regional Care Home Transformation programme led by PHA, refocused to respond to COVID-19 challenges across care homes.

Advanced care planning

The PHA has an active role within the Palliative Care in Partnership (PCiP) Programme which provided support to care homes caring for people in the last days of life during the COVID-19 pandemic. The Regional Palliative Medicines Group (RPMG) working with the Northern Ireland Specialist Palliative Care Pharmacy Group and supported by the PCiP programme have developed specific symptom management guidance for people with COVID-19 in the last days of life. This guidance is relevant for use in both secondary and primary care settings (including care homes).¹⁵

Concluding remarks

This report has provided an overview of the collective approach of the PHA to support the care home sector during wave one. Additional deaths of people in the care home sector due to COVID-19 has been a complex and troubling feature of the global pandemic with the long-term impact of restrictions and measures only to be fully understood in the coming years.

Calls for wider re-evaluation to balance the impact of social isolation on care home residents are emerging on the national agenda. Emerging data comparing the performance of UK countries in terms of the international measure of excess deaths in care homes suggests early positive indicators in terms

of the “lowest share of care homes infected” and the “lowest level of excess deaths” in Northern Ireland care homes as compared to England, Scotland and Wales, all of which can be linked to decisive collective actions led by the PHA alongside regional and local organisations. This is only one facet of data and a more complex holistic data set will continue to emerge to challenge our thinking.

Further information



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Professor Hugo van Woerden, Director of Public Health, PHA

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The role of Personal and Public Involvement during COVID-19

Introduction

Personal and Public Involvement (PPI) is the active and meaningful involvement of service users, carers and the public, in health and social care services. People have a right to be involved in and consulted on decisions that affect their health and social care. Under the Health and Social Care (HSC) Reform Act (NI) 2009, PPI is a legislative requirement, but it also brings tangible benefits including improvements in quality, safety and efficiency, reductions in complaints and Serious Adverse Incidents (SAIs), as well as a greater sense of ownership and sense of self responsibility for health and wellbeing.

The Public Health Agency (PHA) was assigned primary responsibility for leading the implementation of PPI across the HSC system and is tasked with providing the Department of Health (DoH) with assurances that HSC bodies, and in particular Trusts, meet their PPI statutory and policy responsibilities.

Reacting to the impact of COVID-19

Much of the work the PHA is involved in is public facing and involves direct interaction, normally in person, with individuals and groups of people; HSC staff, third party organisations, service users, carers and the public. With the introduction of the public health restrictions as COVID-19 spread in Northern Ireland, we have had to rapidly reassess how we carried out our role and how best to advise others in respect of their involvement responsibilities, co-production and partnership working.

In respect to the mainstay of our work, we had to adapt to operating in an environment hugely changed by COVID-19. Technology became much more widely used to enable communication and interaction. This included adapting to social distancing as a key requisite and meetings that would normally have been held face to face, now primarily being facilitated virtually.

Professional advice and guidance

The PHA PPI team provides professional advice and guidance on involvement across all sectors of the HSC. In key areas where we are providing support such as the Inquiry into Hyponatraemia Related Deaths (IHRD) Implementation Programme, the Review of Urgent and Emergency Care and the No More Silos work, we used Zoom for virtual workshops, Survey Monkey to gather feedback and Citizen's Space in order to facilitate input from a wide range of partners including service users, carers and other key stakeholders.

Involvement guides in the COVID-19 environment/era

A range of guides was rapidly developed to help support HSC staff working with service users, carers and the public. This included guides such as Making Virtual Meetings Engaging, Virtual Focus Groups and Online Questionnaires. These guides will be available on the Engage website.¹ In bringing this guidance forward, we also had to be mindful of the need to maintain/develop alternative means of engagement in order to ensure people did not feel excluded, due to the demands of using digital technology.

Involvement and co-production training

The PHA has also been working to create a cohort of people with knowledge, expertise and experience in involvement and co-production across the HSC and among service users and carers, as we seek to build a critical mass of people to change the HSC culture to a truly person centred service.

Webinar series

The PHA, in partnership with the Consultation Institute, co-designed, developed and delivered a ground-breaking series of bespoke webinars to support involvement leadership across the HSC. The autumn 2020 programme was attended by 470 participants, reaching an additional 460 people through recordings of the session.

The series was designed to enable and support HSC staff to continue to meet their statutory obligations to 'Involve and Consult' as they navigated involvement, co-production and consultation requirements, as part of the HSC Rebuild programme. This programme aimed to support the HSC system in the resumption and redesign of HSC services.

These webinars, which were also open to service users, carers, advocates and the public, were highly successful and have received incredibly positive feedback. They were particularly timely in an environment where COVID-19 precluded direct face-to-face teaching/training.

Leading in Partnership

The Leading in Partnership Programme is a high profile initiative aimed at HSC staff, community and voluntary sector colleagues and service users and carers, helping them to inform and shape change in the HSC, with a focus on involvement, co-production and partnership working. It was brought into being by the PHA, working in collaboration with the Leadership Centre and service users and carers.

It faced an urgent need for complete restructuring in the face of the COVID-19 restrictions. The programme made the move to an entirely virtual platform within the space of six weeks. It received a really positive endorsement from the Health Minister, when he joined some of the programme participants during a Zoom session in October. It has now had approximately 100 people take part, with two more cohorts taking place this winter and demand outstripping places by more than 3 to 1.

Further information



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Quality Improvement and COVID-19 emergency response planning

Introduction

Quality Improvement as a concept, and the HSCQI team as facilitators, have played a range of important roles in tackling the COVID-19 pandemic across the whole of the Health and Social Care system. This chapter focuses specifically on one role that was key to supporting the effective coordination of actions across the HSCB and PHA as part of the SILVER emergency response.

Joint PHA/HSCB Senior Management Team 'huddle'

During the COVID-19 emergency response the HSCQI Improvement Hub supported the PHA and HSCB joint response to the pandemic by leading on the implementation of a joint PHA/HSCB Senior Management Team 'huddle'. Using a Quality Improvement (QI) approach, the 'huddle' occurred on a number of mornings per week from 19 March 2020. QI methodologies used included the Model for Improvement, Plan-Do-Study-Act cycles, Appreciative Inquiry and elements of Lean.¹

What is a 'huddle'?

Team 'huddles' are short meetings where each team member shares their key priorities of the day and important updates. These meetings help to keep team members informed of important information, and allow for sharing of collective information.

The approach

This 'huddle' approach was applied to the joint PHA/HSCB Senior Management Team meeting to help improve communication and action planning during the emergency pandemic response to COVID-19. Results have shown good participation from each of the 12-15 cells that were developed to support different aspects of the regional response. The 'huddle' allowed a structured approach to the communication of large volumes of activity contained in the action plans for each cell over a 40-50 minute meeting. Teamwork and communication between cells was demonstrated by the sharing of actions. Initial feedback from appreciative inquiry to date has shown the usefulness of cell structures and the opportunities offered through a 'huddle' to see the "big picture", to work collaboratively within and across teams, directorates and organisations thereby breaking down traditional organisational and professional boundaries.

It has been good to see how a new structure can be implemented using a QI methodology to support changing the format of a meeting which used a traditional meeting format to a 'huddle' format, demonstrating the effectiveness of QI as an approach to lead and implement change. It has been interesting to see how successful this approach has been, given that relatively few participants in the 'huddle' had experience of using a QI approach.

During the timeframe of the first wave of the pandemic (19 March-18 May 2020), staff roles within both organisations continually evolved and the traditional stand up 'huddle' approach had to be modified in order to take into account social distancing and remote working. The use of a QI approach to the implementation of a 'huddle' meeting during the emergency response of the COVID-19 pandemic is an approach which could be used to re-instate similar 'huddle' meetings as required in the future.

Figure 1: How silver supporting cells link with the Gold-Silver-Bronze communication structure.

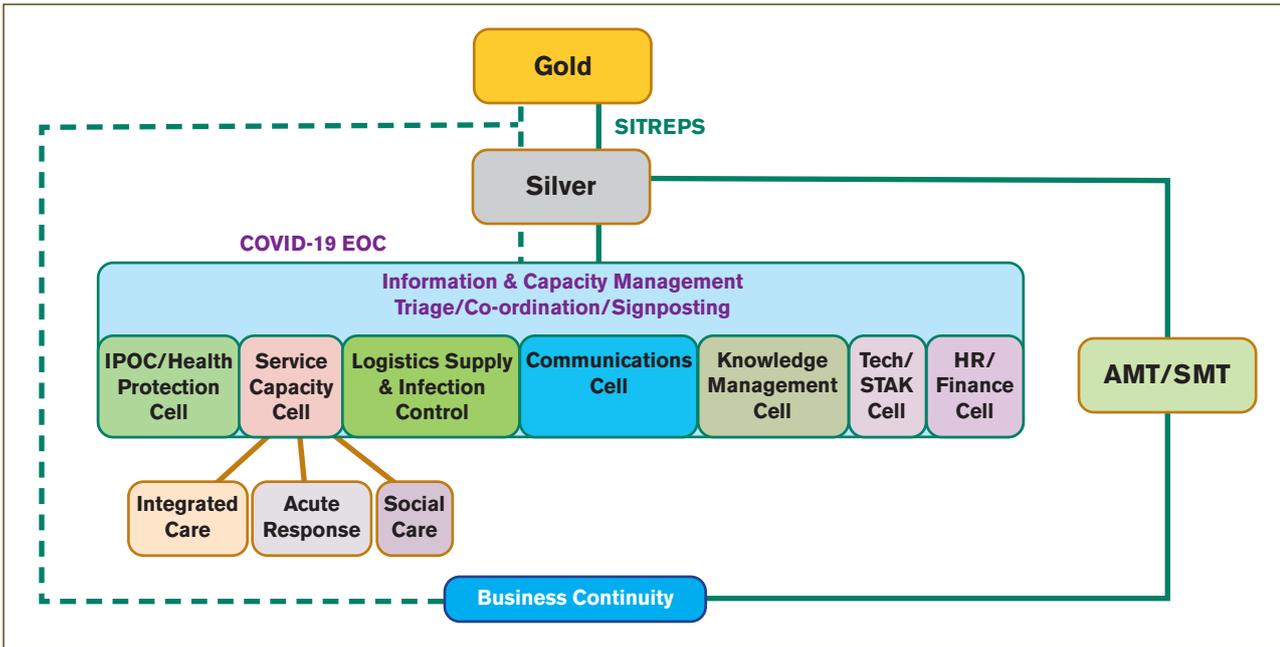


Table 1: Silver Cell Structure

Cell	Sub cells if applicable
Executive Cell	
Emergency Operations Centre	
Logistic & Supply	
Infection Control	
Communications & Media	
Knowledge Management	
Resource	<ul style="list-style-type: none"> • Human Resources • Finance • Staff Health & Wellbeing
Surge - Integrated Care	
Surge - Acute	
Social & Community	
Public Health	<ul style="list-style-type: none"> • Health Protection • Emergency Planning • Scientific & Technical • Service Development • Health Improvement
Business Continuity	
IT & Data cell	

Further information



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Staff health and wellbeing and COVID-19

Policy context

Health and wellbeing 2026: delivering together asks HSC to become exemplars of good practice in supporting staff health and wellbeing.¹ The HSC Workforce Strategy 2026: delivering for our people, also sets out ambitious goals for a workforce that will match the requirements of a transformed health and social care system.² The World Health Organization (WHO) define what is meant by workplace health:

*“A healthy workplace is one in which workers and managers collaborate to use a continual improvement process to protect and promote the health, safety and wellbeing of all workers and the sustainability of the workplace...”*³

PHA support for staff health and wellbeing

The response to COVID-19 brought unprecedented pressures for staff across HSC. In March 2020 it was agreed that PHA should establish a joint PHA, HSCB and BSO COVID-19 Staff Health and Wellbeing Group to support our own staff.

This new group was led by Michelle Tennyson, PHA Assistant Director, supported by myself in my role as PHA Workplace Health Lead. The group has representation from across Health Improvement, Nursing and Allied Health Professionals, Human Resources, Operations and Personal and Public Involvement. This membership brings significant expertise and operates within three defined sub-groups:

- feedback and monitoring;
- resources;
- comfort measures.

Feedback and monitoring

Effective workplace health action begins with employee engagement. Staff were invited to provide feedback through workplace health champions and a confidential email address staffhealth@hscni.net. Concerns raised included home working, caring responsibilities, social distancing in a work environment and action was subsequently taken to address these and other issues raised.



Resources

A SharePoint resource was built by the resources sub-group and used the Take 5 messages as a template. This useful resource hosts a wide range of information and signposts staff to available help: <https://regional.sharepoint.hscni.net/sites/shw/SitePages/Home.aspx>

Comfort measures

Comfort rooms were established by the group in PHA offices – these rooms were a safe space for those staff who were working in the offices to avail of refreshments and to take time away from their desk to reflect and recharge. Staff were also invited to record their reflections and to contribute artwork in work buildings.

Support from Communications and IT Services proved to be essential to help ensure staff were made aware of available support and able to feed into suggestions. Personal stories were added to PHA's internal newsletter *InPHA* and using Take 5 themes, staff were invited to share how they were managing to maintain their wellbeing during COVID-19 lockdown.

Next steps

Support for staff health and wellbeing is of course needed beyond COVID-19 and PHA, HSCB and BSO Staff Health and Wellbeing Group is developing proposals to build on this work. These proposals involve establishing a coordinated and consistent approach to workplace health and wellbeing, with employee engagement underpinning this work. A HSC publication *Supporting the wellbeing needs of our Health and Social Care staff during COVID-19: a framework for leaders and managers* offers an approach which will be integrated into future action plans.⁴

Further information



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Health improvement

The PHA's work is to protect and improve the health and wellbeing of the people of Northern Ireland. The agency is committed to continuing to work with local government and our community planning partners to seek to achieve improved health and wellbeing outcomes for individuals and communities.

COVID-19 presented many challenges during 2020 in relation to health improvement initiatives and services. This section highlights a range of the health improvement work carried out during this time.

- Ensuring governance and continued delivery of services to our population throughout the COVID-19 experience
- Organisational learning from our response to COVID-19
- Working with partners in community planning to reassess action plans and local priorities for recovery and reset
- The PHA response to COVID-19 and family support
- Working together to support our mental health and emotional wellbeing during COVID
- Reducing health inequalities within the pan-disability community through community planning partners
- Working together to improve and protect health and tackle health inequalities for people who are homeless
- Response to COVID-19 outbreaks within BAME communities in Northern Ireland
- Smoking cessation services reset informed by emerging evidence
- Celebrating success in overcoming the challenges of schools closures
- Preventing deconditioning amongst older people who have been advised to stay at home
- 10,000 More Voices: care homes and COVID-19 – the lived experience of care home residents, their relatives and staff during the COVID-19 pandemic
- Obesity prevention actions to support overweight and obese individuals that are clinically vulnerable to COVID-19

Ensuring governance and continued delivery of services to our population throughout the COVID-19 experience

Background

The Public Health Agency (PHA) commissions a significant range of services under the Health Improvement Division. Around 500 services are commissioned from some 132 different providers in a range of thematic areas including drugs and alcohol, suicide prevention and promoting mental health, smoking cessation, and social isolation. Many of these services are delivered face to face often in our most disadvantaged communities who were already facing high levels of inequality pre-COVID. These challenges were compounded by COVID-19 and as Northern Ireland emerged from the peak of the first wave, PHA staff sought to rebuild services as quickly as possible throughout the most vulnerable communities in society to ensure that any downturn in services would not have an impact on long-term health outcomes across the population.

Approach

A Contract Management Group was established to provide assurance to the PHA that services were continuing to deliver to meet communities' needs. Staff across all teams in the Health Improvement Division contacted service providers on at least a monthly basis to: determine progress in contracts returning to scale; complete analysis of demand and capacity at programme and project level; and to facilitate any adjustments necessary to provide a revised service where possible.

Findings

Management reports were completed on a monthly basis and submitted to the Director of Public Health for information and onward to the Chief Medical Officer through accountability reviews. The initial report in April 2020 found that 39% of services were able to deliver as contracted. This increased to 48% in May, 65% in July/Aug and 79% in September. In parallel with this change, the number of services partially delivering services declined from 48% in April to only 16% in September, while those services that had stood down declined from 10% to 3% over this same period. Demand for Health Improvement commissioned services has been shown to continuously increase during the period of review.

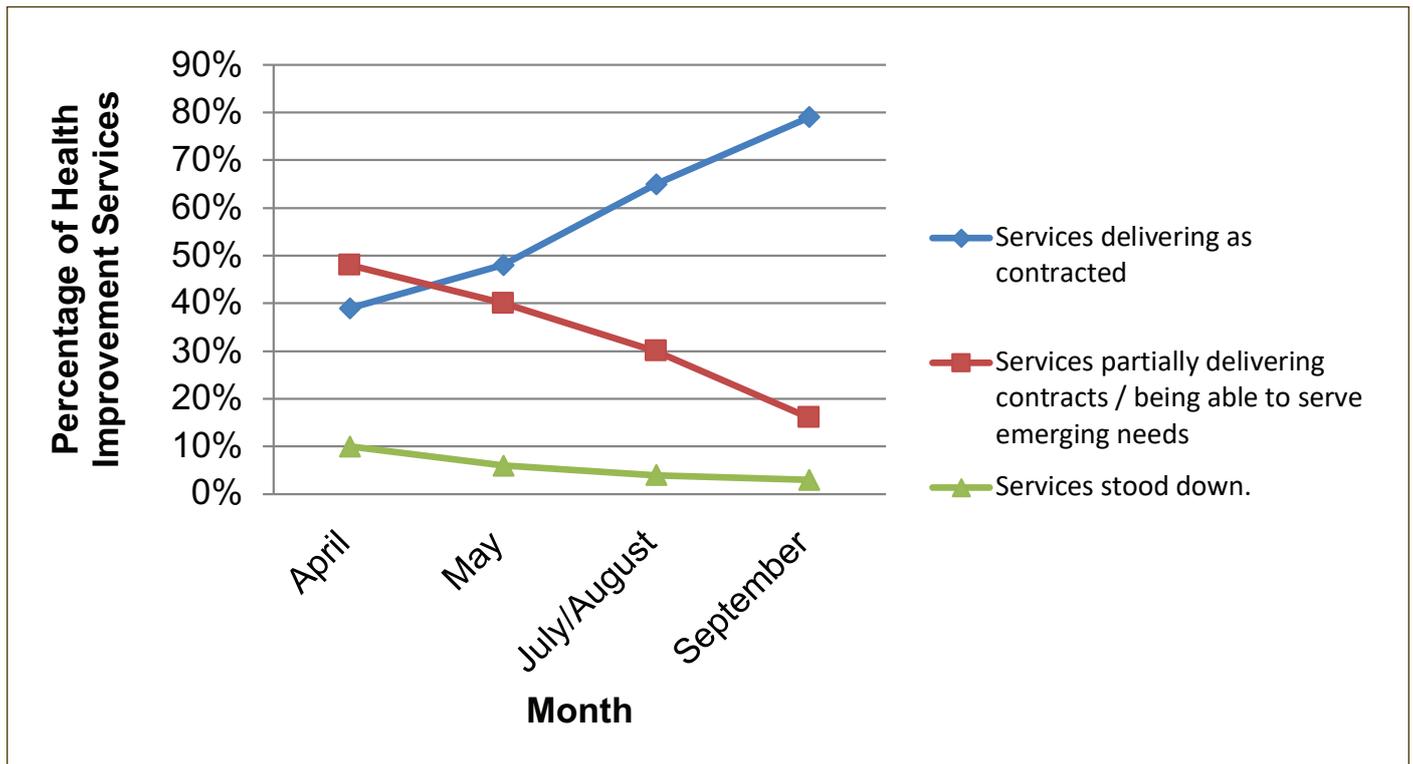
Discussion

The Health Improvement Division found a number of benefits from regular contact with service providers throughout the recovery from first wave of the pandemic and the move into planning for the second wave. Not only did the exercise provide a level of assurance for Directors and the Department of Health (through reporting at accountability meetings), but it also enabled contract managers to negotiate any adjustments necessary to operate effectively within the context of the ongoing pandemic. For example, discussion with service providers confirms that where adjustments were facilitated to provide alternative delivery mechanism to face-to-face psychological therapy sessions, this decreased "did not attend" rates significantly for service delivery and enabled more flexible adjustment of the intervention required with volatile and complex clients.

Conclusion

This team provided a vital role in ensuring that the PHA management team had assurance that services were restored to delivery as contracted and, where necessary, adjustments were made to enable services to be delivered safely and with adequate resource for vulnerable service users across Northern Ireland.

Figure 1: Health Improvement service delivery during COVID-19 pandemic (April-September 2020).



Further information



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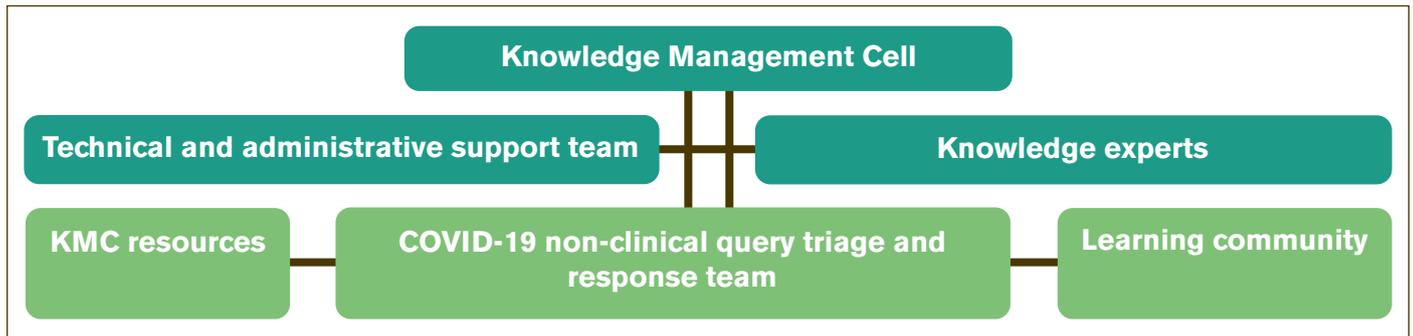
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Organisational learning from our response to COVID-19

Background

The PHA, HSCB and BSO, under the direction of the Knowledge Management Cell, established a 'Learning Community' to facilitate organisational insight within these organisations in relation to learning from the response to COVID-19.

Figure 1: Structure of the Knowledge Management Cell.



Supported by an experienced researcher from the School of Public Health at Queen's University Belfast, the project team developed a questionnaire which was formulated using evidence of good practice from other regions. The survey was distributed to senior staff in the three organisations and we requested that the survey be completed by teams. Fifty four survey forms were returned from teams in 15 of the 22 directorates, which represented approximately 700 staff. The survey generated over 2,500 lines of text which was analysed using qualitative content analysis methodology.

Themes

The analysis generated seven key themes based on salience (categories most frequently used in the response to one or more question) and relevance (issues addressed by at least half of the teams who completed a questionnaire). These seven themes represent over 1,450 (60%) of staff statements and are important to all three organisations. It was clear that the themes are closely linked. The themes are shown in Figure 2.

Figure 2: Key themes identified in the analysis of the survey.



Recommendations

A number of recommendations were developed under three specific themes, based on the results of the analysis.

1. Communication

- Develop an organisational chart that includes core roles and responsibilities and an up-to-date directory of skills relating to staff.
- Develop a robust technical infrastructure which enables better connection across the HSC system and its partners.

2. Working arrangements

- Develop policies regarding new working arrangements including:
 - i. a safe working environment;
 - ii. flexible working arrangements;
 - iii. equitable distribution of workload and arrangements for leave;
 - iv. measures to promote health and wellbeing, and overcome isolation; and
 - v. systems for personal reflection and organisational learning.

3. Organisational

- Provide effective technology, support and equipment for staff in all workplaces.
- Review emergency preparedness structures, including training, to enable a faster and more efficient activation of the emergency response across the organisations.
- Explore how staff from the three organisations can be designated as 'key workers' to enable appropriate support for child care, schooling and caring responsibilities.
- Consider how to maintain new processes and teams where they have ongoing relevance to future business.
- Establish and agree action plans for taking forward the recommendations outlined within this report.

Further information



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Working with partners in community planning to reassess action plans and local priorities for recovery and reset

“Whilst COVID-19 challenges are experienced globally, solutions will be local”.

Background

Community planning localises the wellbeing outcomes sought from Northern Ireland’s Programme for Government. In Armagh, Banbridge & Craigavon (ABC), the community planning team facilitates close collaboration between partners, integrates the use of evidence and has developed a partnership that is keen to seek high levels of quality engagement and involvement of communities, including residents, community groups and businesses. The PHA plays an active role in the partnership.

The published community plan for ABC anticipated 15 years delivering towards “a happy, healthy and connected community, a vibrant and sustainable economy and appealing places for living, working and learning”¹.

Approach

As the COVID-19 crisis hit, the ABC community planning partnership was working actively on delivering its community engagement strategy and a participatory budgeting project.² Officially, this was put on hold to focus on a swift COVID-19 response, with the statutory sector making decisions.

Findings

During this initial response, communities were informed about decisions and their rationale. Recognising the importance of public confidence and buy-in for continued health protection, reset and recovery, the partnership has been keen to engage with affected communities to ensure collaborative reprioritisation of local actions.

The partnership’s Community and Voluntary Sector Panel undertook a food assistance survey to inform the work of the next 12 months.³ Important learning included reasons behind the need for food support, notably shielding, low income or a change to income.

The partnership’s Business Partnership Alliance worked with the council to survey local businesses during lockdown.⁴ Analysis of the 288 responses indicated only 36% of businesses continuing to operate in some way, half of businesses having difficulty or needing help to access government support, and that business challenges included access to finance and cash flow, retaining customer confidence and promoting health and safety.

Discussion

Using evidence like these surveys, the partnership has agreed new priority themes for the short to medium term, with a key overarching aim to ‘maximise community response and partnership working to reduce the impact of the virus’.

Figure 1: The overarching strategic framework for the new action plan.

A detailed 12 month recovery plan has been developed with means by which to track performance. The partnership acknowledges that during reset and recovery, there are difficult decisions to make within the context of the pandemic's social and economic impacts and its ongoing response. Partnership members are conscious that the pandemic has amplified some problems and inequalities, including poverty, domestic abuse, mental ill health and social isolation. Critical to meaningful reprioritisation is the partnership's ongoing endeavour to strengthen relationships with local people, groups, and businesses and continuing to look to them for innovation and local solutions.

Businesses are supporting a safer return to commerce, through improved environments and rebuilding confidence. Links between the swift responses, such as clean and tidy town centres, signage and outdoor seating areas, and the longer-term endeavours of Age Friendly ABC are welcome. The creative and community spirit witnessed during the crisis will be nurtured to reduce isolation among our most vulnerable.

The partnership continues to involve an increasingly wide group of stakeholders in deliberating reset and recovery, and in maximising partnership and community engagement. This healthy partnership approach paves the way for after the crisis towards "a happy, healthy and connected community, a vibrant and sustainable economy and appealing places for living, working and learning".

Further information

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The PHA response to COVID-19 and family support

Public health challenge

Since 2004/05 there has been a general increase in levels of domestic abuse incidents and crimes recorded by the PSNI. In the 12 months from 1 July 2019 to 30 June 2020, there were 32,127 domestic abuse incidents in Northern Ireland, an increase of 570 (1.8%) on the previous 12 months and the highest number recorded in a 12 month period since the start of the data series in 2004/05.¹

Lockdown measures in relation to COVID-19 were introduced on 23 March 2020 and early indication of trends provided in an exceptional management information released by PSNI in July 2020, showed higher levels of calls during April and May than the same months in 2019 by 292 and 252 incidents respectively. While the number of calls received in June was slightly higher than the levels that would have been expected, they were lower than the previous two months (Figures 1 and 2).² Full data analysis for this period is ongoing. However, it is likely that these figures may be revised upwards.

Figure 1: Domestic abuse calls received by police, weekly trends from 1 January 2020 compared with the average weekly number of calls in the 12 months from March 2019 to February 2020.²

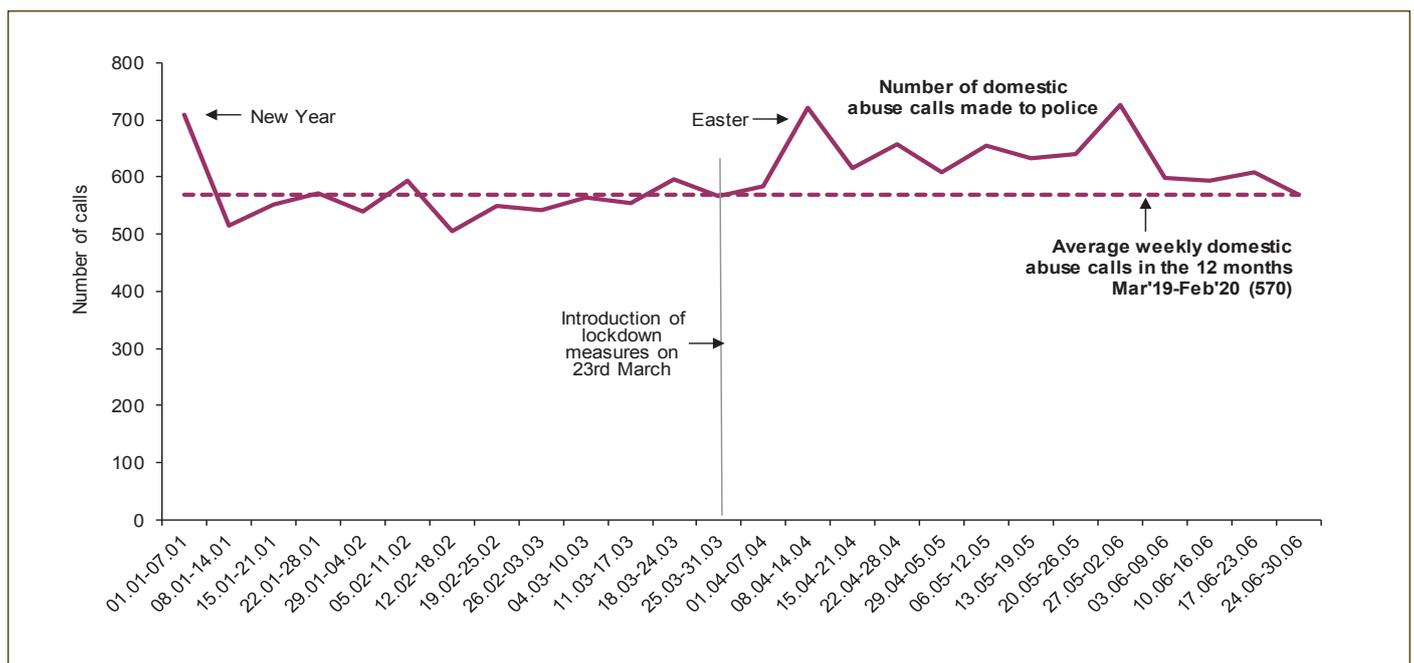
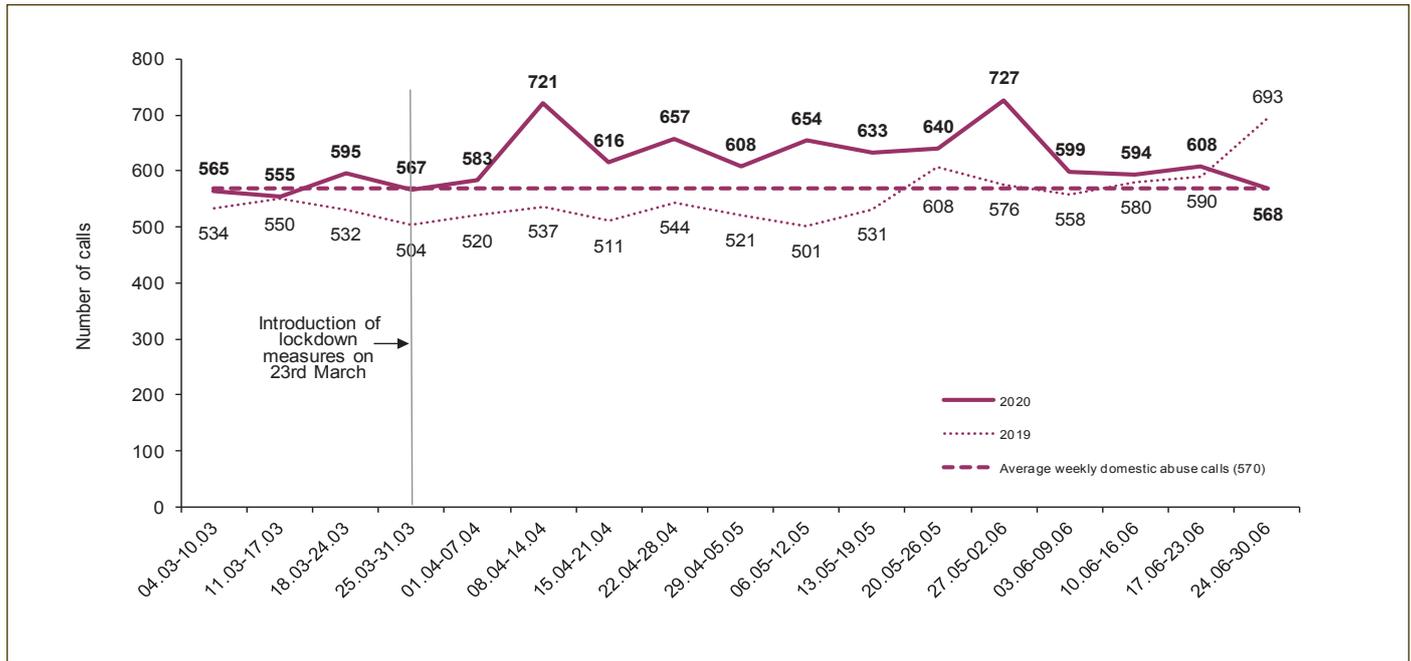


Figure 2: Domestic abuse calls received by police, weekly trends from 4 March 2020 compared with the same time period in 2019.²



Actions

The PHA, consistent with the Social Care Institute of Evidence recommendations, increased family support to ensure increased protective factors were available for families experiencing increased stress, adversity and risk.³ This included the following actions:

- Commissioned five Early Intervention Support Services to an evidence-based standard that ensured early and responsive outreach support through a family support team to families with emerging vulnerabilities.
- Strategic coordination of programme delivery across the region has contributed to the development of the Incredible Years infrastructure and increase in the range of Incredible Years programmes provided regionally, including the Incredible Years Autism Spectrum and Language Delays (ASLD).
- Ensuring provision of Mood Matters, a mental health awareness programme for expectant parents and parents of young babies. There is a strong emphasis on looking after the mental health of both the parent and the child.
- Commissioned the Odyssey Parenting support programme through Parenting NI, which improves communication and relationships between parents and their teenagers. The programme covers a range of topics including teen development, self-esteem, rules and consequences, dealing with conflict and problem solving.

Impacts

- 650 families have been supported through the Early Intervention Support Service with clear measures of benefit identified through the application of Outcomes Star measures.
- An expanded range of Incredible Years programmes is available regionally, including the new ASLD programme. In total, 35 group leaders have been trained to deliver the ASLD programme and an additional 26 group leaders have been trained to deliver the Incredible Years baby programme.

- 80 Mood Matters programmes have been delivered regionally across a range of settings including via Surestarts, the Royal Jubilee Maternity Services and a number of community venues, improving the capacity of new parents to understand and take action on mental health and wellbeing.
- 11 Odyssey programmes have been delivered regionally, supporting around 137 families.

Next steps

The PHA will continue to ensure focused and evidence informed support on families to optimise outcomes for families and children.

Further information



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Working together to support our mental health and emotional wellbeing during COVID

Background

There is significant research and evidence outlining the psychological impact of a pandemic, including the measures of social distancing and social isolation, on both the general population and healthcare staff.

We knew from the experiences of colleagues in other countries during the coronavirus pandemic – and our own experiences here in Northern Ireland in terms of adjustment to societal trauma – that there is value in structured, planned and considered physical and psychological foundations that support good mental health and wellbeing and that such frameworks should operate during the immediate crisis and extend into the longer term aftermath.



Approach

The situation called for a collective response that was caring and humane to help people affected by the pandemic. The Mental Health and Emotional Wellbeing Surge Cell (MHEWB) was formed in April 2020 as part of the wider Executive Cell response to COVID-19. The cell included representatives from Department of Health, Public Health Agency, Health and Social Care Board, Health and Social Care Trusts and community and voluntary partners. The aim of the cell was to ensure that the response to the psychological impact of the pandemic drew on and contributed to national and international clinical expertise and evidence-based practice, and was consistent with guidance emerging from the UK four nations and the Republic of Ireland.

Action

A number of key resources and actions were delivered since April 2020 (see examples of these below) and actions were monitored on a weekly basis with appropriate reporting mechanisms in place. These actions and resources contributed to the Department of Health launching their COVID-19 Mental Health Action Plan on 19 May 2020.¹ The plan focussed on seven strategic themes that had been identified to respond to the impact of the pandemic on the population in Northern Ireland.

The overarching outcome of the plan is to increase the psychological wellbeing and good mental health for the population as a whole. The MHEWB Surge Cell ensured the delivery of an accountable, efficient, and effective network of services to implement the Action Plan. An important function of the cell was to carry out a rapid and rolling review of emerging evidence nationally and internationally and

identify research priorities.² All partners in the Surge Cell worked together to give clear, reassuring and consistent advice and develop resources and information for the population. This approach has been a successful outcome of COVID working, and has helped establish a solid foundation for the development of new ways of working better together to support the mental health and emotional wellbeing of our communities.



Next steps

Working together to promote mental and emotional wellbeing in our communities is a key public health area in moving forward; however, this cannot be achieved by the health sector alone. It requires a multiagency/sector approach with communities coming together to ensure the appropriate information, support and interventions are provided when required.

We all have a duty of care to look after each other.



All the resources and information developed by the MHEWB Cell are available on the **Minding your Head** website at www.mindingyourhead.info

Resources

Resources developed or updated to provide support during the COVID pandemic include:

- Children and Young People's Strategic Partnership (CYPSP) website www.cypsp.hscni.net and Family Support Hubs
- Ongoing promotion of Lifeline's 24 hour crisis support service on 0808 808 8000
- Free stress control classes offered online
- HSC Framework 'Supporting the wellbeing needs of our health and social care staff during COVID-19: A Framework for Leaders and Managers'.
- Helplines NI website updated to include new COVID-19 related helplines
- Revamped www.mindingyourhead.info website incorporating the new COVID wellbeing hub
- Bereavement support resources provided online for the public, care homes and HSC staff
- Revised version of Take 5 steps to wellbeing focusing on looking after your mental health during the coronavirus (COVID-19) pandemic
- Free Psychological First Aid E-learning module and guidance (over 4,000 participants)
- HSCNI Apps Library at apps4healthcare.ni.hscni.net

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References



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Reducing health inequalities within the pan-disability community through community planning partners

Background

Local government is responsible for a wide range of programmes and services that contribute to health and wellbeing of the communities in which they serve, including leisure and recreation, play parks, forest trails, green spaces, arts and cultural activities. These services empower people to utilise opportunities to improve their own health, and throughout this last year we have all looked towards council facilities in our local environments to provide a valuable alternative diversion from all things COVID.

Across Northern Ireland, 21% of the population are recorded as having a disability. This in itself creates health inequalities through economical, physical, communication and social barriers to accessing services and opportunities.

Our public health challenge is to ensure that opportunities and services are offering excellent and innovative practice in access inclusion for the pan-disability community. We could only rise to this challenge through empowering the pan-disability community, developing collaboration and creating the conditions for real change.

Actions

Derry, City and Strabane District Council (DCSDC) and Fermanagh and Omagh District Council (FODC) areas worked with the Public Health Agency (PHA) on the development and piloting of a Local Government Access Inclusion Model. This model includes an Access Inclusion Officer working across council directorates to ensure all health events, activities and programmes are accessible and inclusive to the pan-disability community.

As a further enhancement of this work, the PHA has worked with the Department for Communities (DfC), Department of Agriculture and Environment and Rural Affairs (DAERA) and the 11 councils, to implement a regional capital grants programme which has invested a total of £800,000 in the 2020/2021 financial year (a total of £2.8 million over three years). This programme has assisted in making the physical changes for access inclusion practice within health improvement venues across Northern Ireland.

The PHA has funded a training programme for council officers from all 11 councils to engage and train in excellent practice in access inclusion.

PHA also worked closely with Disability Sport Northern Ireland to create guidelines for local governments relating to excellent practice in the creation of inclusive outdoor spaces.

Impacts

The collaborative approach between the PHA, DfC, DAERA and the councils has created a regional structure which will ensure that innovative practice in access inclusion continues to grow and is embedded across Northern Ireland.

The impact of the physical improvements coupled with the increased knowledge, skills, innovative approaches and support within local councils will create a basis for culture change that provides solid evidence of its effectiveness through an increase in usage of wellbeing facilities by pan-disability communities. This is already the case within DCSDC arts and culture venues, which have recorded an increase of 20% usage from representatives of the pan-disability community.

This work will continue to serve to empower people with disabilities to maximise local opportunities to improve their own health and encourage community-based rehabilitation.

Next steps

- Work is underway to develop a Regional Access Inclusion Support Service to assist the 11 councils in Northern Ireland to continue their work on adapting fully inclusive, innovative, access and inclusion practice for all within the local communities.
- We will monitor and evaluate over time the full impact of the implementation of excellent access inclusion practice within local government health improvement divisions on the lives and wellbeing of the pan-disability community, as well as its contribution to reducing health inequalities and utilising community planning structures.

Further information



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Response to COVID-19 outbreaks within BAME communities in Northern Ireland

Public health challenge

COVID-19 has a disproportionate impact on people from Black, Asian and Minority Ethnic (BAME) backgrounds due to increased risk of infection and excess mortality.¹

Although evidence continues to emerge, what is already clear is the influence of cultural, societal, and behavioural factors, all of which appear to account for some of the differences in risk.¹ Socioeconomic disadvantage in BAME populations, high prevalence of chronic conditions and the impact of long standing racial inequalities are suggested explanations for the increased risk of death from COVID-19.²

A challenge for public health has been ensuring effective communication of the key protective measures around COVID-19 to BAME communities. The development and dissemination of public health messages, in a format which can be understood by people for whom English is not their first language, has been crucial.¹

Barriers to communication include the range of different languages, limited access to digital communication, poor health literacy and some BAME groups being unable to read and write in their own language.

Actions

To address these the Public Health Agency (PHA);

- utilised existing partnerships including the PHA Minority Ethnic and Migrants advisory group with members from statutory, community and voluntary sectors to identify key links with BAME communities;
- supported the role of bi-lingual workers in the community and voluntary sector in their development of key messages in appropriate formats, such as voiceovers in different languages;
- identified the need for ensuring Northern Ireland specific public health messages were shared, as some newcomers have come from other parts of the UK or from the Republic of Ireland where messages varied;
- worked with partners including the South Tyrone Empowerment Programme (STEP), Inter-Ethnic forum and the Honorary Romanian Consul to Northern Ireland to ensure widespread dissemination of information using the range of social media platforms. Evidence suggests health messages are more likely to be received from trusted sources within the BAME communities.¹

Impacts

An outbreak at a local factory with a significant number of BAME workers highlighted the value of having these existing partnerships in place.³ Local response was rapid with key partners coming together to determine what resource and response measures were required. The bi-lingual workers were essential in coordinating workers' attendance at test mobile units and in ensuring any follow up

guidance was understood. Support was also given by other local partners such as councils to support those self-isolating with food packages to ensure adherence to the public health messages.

Next steps

The value of existing cross sector partnerships is evident and these should continue to be built upon to mitigate risk of exposure to COVID-19 but also to address long term actions to reduce health inequalities. In addition there is a need to extend resource dedicated to BAME health and wellbeing across the region and to develop a clear plan of action going forward.

The lack of data available on the Northern Ireland BAME population has once again been highlighted. Gaps in data collection and analysis must be filled so that there is adequate understanding of local BAME needs and the extent to which they are being met by policy.⁴ It is important to support the collection of Census 2021 data by encouraging BAME individuals to take part and continue to advocate for ethnic monitoring.

Community participatory engagement with BAME groups would support improved uptake and understanding of public health messages.⁵ Consultation with our BAME communities is necessary to improve our understanding of their needs, the level of risk and their motivation.

Further information



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Working together to improve and protect health and tackle health inequalities for people who are homeless

Homelessness can be a consequence as well as a cause of deteriorating health. People who are homeless often have multiple needs in relation to their physical and mental health and this can be impacted further for those with substance reliance or addiction issues, and for those from other vulnerable groups. People who experience homelessness face some of the worst health inequalities – the average age of death is 44 years for men and 42 years for women.¹ Moreover, while people who are homeless have a fundamental right to be treated with dignity, compassion and respect, as a group they are often marginalised and discriminated against.

The statutory responsibility for homelessness sits with the Northern Ireland Housing Executive (NIHE) and the Department for Communities leads on the Interdepartmental Homelessness Action Plan. The health and social care needs of people who are homeless are well documented and for many health can be neglected, as they are unable to access appropriate care in a timely manner.

“Money problems, family breakdowns, mental and physical health issues, civil unrest, violent or sexual abuse can all contribute to individuals, families or any group of people that normally live together, becoming homeless. The impact of homelessness on a household can be devastating and long lasting as well as extremely costly to the public purse. There are many opportunities for a range of agencies through the provision of advice, assistance and support to intervene at early stages and stop a household reaching the point of crisis.” (NIHE Homeless Strategy for NI 2017-2022 – Ending Homelessness Together)²

The PHA and HSCB are currently represented on a number of regional groups including the Homelessness Strategic Steering Group (DfC), the Central Homelessness Forum (NIHE) and the Supporting People Homelessness Regional Thematic Group (NIHE). Our health protection and health improvement divisions within the Public Health Directorate currently lead on a range of work to improve health outcomes and tackle health inequalities for people who are homeless.

Within health improvement, a range of thematic issues including work relating to drugs and alcohol; mental health, BAME and poverty complement the PHA’s homelessness work. Additionally, the health improvement team commissions a number of homelessness interventions including: the Home Starter Pack Scheme jointly funded together with the Northern Ireland Housing Executive; and Resources for Rough Sleepers co-ordinated through the Council for the Homeless NI.

Within health protection, colleagues have commissioned and led on a range of homelessness work supported by the Transformation Implementation Group, including: the development of the Belfast Inclusion Health Service; within the Western HSCT a Band 7 nurse and podiatrist providing COVID-19 support to those living in hostels; within Northern HSCT the development of a GP rota for patients experiencing homelessness and during 2018/2019 the establishment of an emergency department-based homelessness nurse.

Increasing health inequalities and poor health outcomes, coupled with high healthcare costs, and all compounded further this year by COVID-19 has resulted in the recent development of a multi-disciplinary approach across a range of HSC organisations to more effectively respond to and meet the health needs of people who are homeless.

During the first surge, the response to the impacts of COVID-19 for people who were homeless and the wider sector was led by colleagues from nursing and the HSCB. Their leadership and response paved the way for more collaborative working across HSC organisations and beyond, by fully demonstrating what could be achieved when a range of key HSC organisations, divisions and stakeholders come together.

More recently this work has contributed to the development of a joint PHA/HSCB led strategic planning process for homelessness. Working together key HSC stakeholders will build upon existing good practice, developed by colleagues in health improvement, health protection, HSCB and others - ultimately ensuring a more cohesive and collaborative HSC approach, to identify and respond to health issues for people who are homeless.

NIHE have reported a significant decrease in homelessness in 2019/20 with 16,802 presentations (compared to 2015/16 to 2018/19 ranging from 18,628 to 18,202), of these presentations there were 11,323 acceptances in 2019/2020. Over the course of the pandemic response the Housing Executive, in conjunction with homeless charities and organisations identified 62 individuals who were rough sleeping across Northern Ireland. These individuals were engaged with and assisted to avail of temporary accommodation and for the provision of support, as appropriate.³

Further information

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Smoking cessation services reset informed by emerging evidence

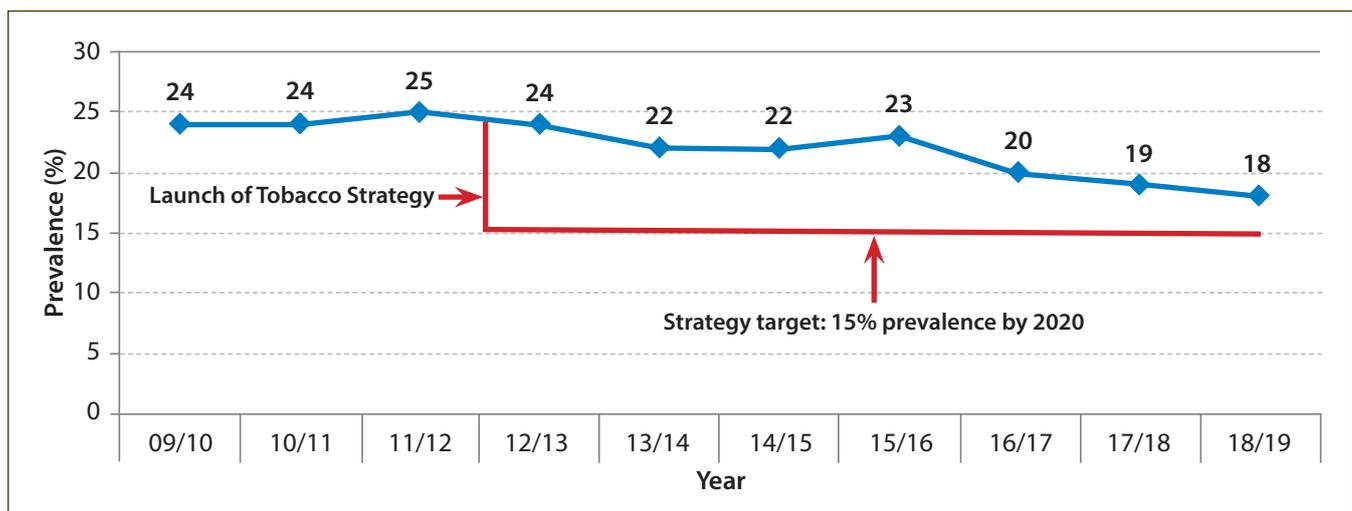
Public health challenge

Smoking and the impact it has on the health and wellbeing of our population is a key concern for public health and tobacco control.¹ Smoking is the main cause of preventable illness and death in Northern Ireland, killing around 2,400 people each year.² It is not only the primary factor in 80% of lung cancer deaths, but is also estimated to be responsible for 80% of deaths from emphysema and bronchitis and 14% of deaths from heart disease.³ While the impact of smoking itself is grave, concern has grown given the emerging evidence surrounding the impact of smoking in the context of COVID-19.

The World Health Organization conducted a review of 35 peer reviewed studies on smoking and COVID-19. This review found evidence that smokers are more likely than non-smokers to develop severe disease from COVID-19 and that smoking is associated with increased severity of disease and death in hospitalised COVID-19 patients.⁴ An estimated 18% of the adult population (age 16 and over) within Northern Ireland currently smoke. This equates to almost 268,000 people.⁵

While the smoking prevalence rates in Northern Ireland have decreased from 24% in 2012, it is clear there is still work to do.⁶ This work will be paramount not only to reach the prevalence target of 15% as laid out in the Department of Health Ten year Tobacco Control Strategy for Northern Ireland, but also to ensure the continued delivery of smoking cessation services in the challenging context of COVID-19.⁶

Figure 1: Smoking prevalence rates in Northern Ireland in relation to the Tobacco Control Strategy target.



Actions

A comprehensive capacity review of commissioned smoking cessation services across GP, pharmacy, Health and Social Care Trusts as well as the community and voluntary sector was completed. Services were supported to remodel their delivery and incorporate important changes in line with government COVID-19 guidelines. These included remote contact with service users (telephone/video calls)

and cessation of carbon monoxide monitoring for example. Effective communication with all partners continues to be key, with smoking cessation messaging also having been shared via the PHA blog and related social media posts and press releases.⁷

Impacts

Actions taken have ensured services remained operational and available to the public to support them with smoking cessation. Increased cognisance was given to the potential benefits of alternative methods of service delivery going forward.

Next steps

While support to all service providers will continue, it is acknowledged this must happen alongside development of services to incorporate the learning from COVID-19 to date. One such way will be to strengthen the web based solutions currently available to aid smoking cessation in Northern Ireland. Regional, co-produced, web based services which keep the service user at the centre, will be fundamental in ensuring both continuity and agility of smoking cessation services going forward.

Further information



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Celebrating success in overcoming the challenges of schools closures

Education plays a vital role in helping people enjoy self-esteem, self-confidence, success and good health and wellbeing. Individuals who perform well at school and achieve qualifications are more likely to adopt healthy lifestyle behaviours and to find employment. They are also less likely to engage in risk taking behaviours. Education is also a way of breaking the cycle of poverty and leads to opportunities for social mobility.

Leading Northern Ireland academic, Dr Noel Purdy, Director of the Centre for Research in Educational Underachievement at Stranmillis University College, warned that:

“The current lockdown and the differentiated experiences of home-schooling have the potential to further disempower and disenfranchise, thus exacerbating the social injustice of an already deeply divided education system.”

But despite the challenges to learning presented by school closures many pupils, families and communities have participated in innovative approaches to continue to access the curriculum and to support the wellbeing of our children and young people.



Young people engaged in the Box Clever summer camp, at Monkstown Boxing Club, to address learning lost during school closures.

THRiVE is a collaboration of parents, schools and organisations working together to help children and young people in the Rathcoole and Monkstown areas of Newtownabbey to do really well, even in a time of unprecedented change and uncertainty.

The partnership includes parents, schools, community and voluntary organisations, local community members, Public Health Agency, Barnardos, six local primary schools, one post

primary school, Monkstown Boxing Club, Abbey Surestart, Antrim and Newtownabbey Borough Council, Controlled Schools' Support Council, Department for Education, Education Authority, Stranmillis University, and the Northern Health and Social Care Trust.



There are many aspects to the THRiVE programme and the following can only give a summary of some the creative and innovative approaches used by partners and participants to quickly adapt to working in new ways to provide much needed support during the COVID pandemic.

- **“We Can”** – this campaign aimed to create an energy and buzz in the area, promoting the idea that together, children, young people and parents can achieve, learn, be healthy and be connected with each other.
www.instagram.com/wecannewtownabbey
www.facebook.com/ThriveGroupNewtownabbey
- **Parent Champions** used the campaign to promote the “We Can” culture and messages of hope and positivity as well as tips for surviving lockdown.
- **Aspiration and parent engagement** work provided weekly telephone support and the provision of wellbeing and learning resource packs. Parents also received weekly newsletters based on Take 5 with ideas for activities to promote health, learning and positive relationship at home during lockdown.
- The **BOOST** programme for primary school children who require extra support to reach their full potential in numeracy and literacy continued via weekly calls during lockdown, with graduation events being held via Zoom.
- The **ASPIRE programme** continued to provide a combination of physical activity and education to post primary school pupils in danger of dropping out of school. Although the delivery model had to change, the support continued with pupils using Google Classroom to enable them to continue preparation for English, Maths and other key subjects. Recent GCSE results for the ASPIRE pupils were exceptional, with 100% achieving seven GCSEs at grade A-C, 77% achieving seven grades A-C including English and Maths, and 44% achieving nine A-C including English and Maths.

- The **Box Clever** Summer Camp delivered a four week programme to 50 young people to address summer learning loss through structured wellbeing and academic activities to strengthen social skills, and build a foundation for children to ensure all students reach their full potential in school, career, and life.

Further information



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Preventing deconditioning amongst older people who have been advised to stay at home

Public health challenge

During the initial COVID-19 lockdown, there were significant concerns for the physical and mental wellbeing of older people who were unable to go outside due to shielding or self-isolation guidelines, specifically:

- any reduction in their normal physical activity levels could result in a loss of muscle tone and strength, leading to an increased risk of falls;
- reduced social contact could increase their risk of isolation and chronic loneliness;
- reduced access to fresh food, and a limited choice of food availability, could increase their risk of malnutrition.

Therefore, getting timely guidance to help them stay well at home, while observing COVID-19 restrictions, was critical. However, getting information to this target group was in itself challenging due to the disruption of traditional communication channels. The alternative digital and virtual communication channels were not appropriate due to low levels of digital literacy amongst this target population.

Actions

A small task and finish group comprising the Public Health Agency (PHA), AGE Northern Ireland (NI), and the NI Age Friendly Network was established. Key public health messages were approved. It was agreed that printing and distributing the key public health messages in a single resource was the most appropriate way of reaching a wide target audience.

The group reviewed similar messages that were published for older people in other parts of the UK. In the interest of expediency permission was requested to use and adapt the *Keeping Well at Home* (Manchester) booklet developed by the Healthy Ageing Research Group at the Manchester Institute for Collaborative Research on Ageing. Amendments were



made to the Manchester booklet to ensure the information was relevant to a Northern Ireland audience, based on Northern Ireland restrictions and local support services. The booklet contained practical information on home exercise, mental wellbeing, staying connected, nutrition and hydration, as well as information on local contacts.

In addition, a video campaign *Move with Mary* was developed in partnership with the Northern Ireland Frailty Network to bring to life the home exercises recommended in the booklet. A subsequent Northern Ireland wide media campaign was launched to raise awareness of the new resources and the key public health messages.

Impacts

In total, 30,000 copies of the *Keeping Well at Home* (NI) booklet have been distributed to older people to date. The media campaign was picked up UK wide. It received major coverage across all local media channels with over 300,000 audience figures. The *Move with Mary* videos have had over 11,000 views on YouTube, and 1,200 DVDs have been circulated to support those who cannot access YouTube.

Verbal feedback suggests the booklet has been well received and is having a positive impact on health behaviours, with older people reporting adherence to the home exercise recommendations.

The effectiveness and value of the booklet is currently being evaluated by the Healthy Ageing Research Group at Manchester, and Northern Ireland has participated in their research.

Next steps

As we head into winter and face another period of COVID-19 restrictions we will continue distributing the booklet and raising awareness of the public health messages within it across a wide range of media channels. We have reconvened our task and finish group to develop another series of videos to bring to life our *Take 5 Steps to Wellbeing* messages that are outlined in the booklet.

Further information



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10,000 More Voices: care homes and COVID-19 – the lived experience of care home residents, their relatives and staff during the COVID-19 pandemic

Background

“We are a hidden treasure ... and unfortunately no one is looking for us”

Words of a care home resident

In May 2020 the 10,000 More Voices team commenced a study to capture the experiences of residents, relatives and staff in care homes during the COVID-19 pandemic. The findings of this project were central to the Rapid Learning Initiative into the Transmission of COVID-19 in Care Homes as part of the second surge planning through the Department of Health.¹ The 10,000 More Voices initiative is part of Patient Client Experience (PCE) work, led within the Public Health Agency (PHA) and seeks to provide a person centred approach to improving and influencing health and social care system through the voices of experience.

Approach

The study sought to collect experiences through three bespoke surveys exploring the following core concepts of the experience in care homes

- communication
- safety
- care delivery
- changes
- good practice
- challenges

Respondents were requested to share their story through an open question and to share deeper reflections by responding to self-indexing statements known as triads (three related elements of a concept) and dyads (extreme aspects of a concept). Surveys were available through an online link, printed copy or telephone/video conferencing consultation. Easy read versions were also developed to widely engage with the defined groups. Each core concept was analysed through Sensemaker® Analyst Software. This software captures the experiences from real people and supports the visualisation of patterns through triads and dyads, determining key messages from residents, relatives and staff.

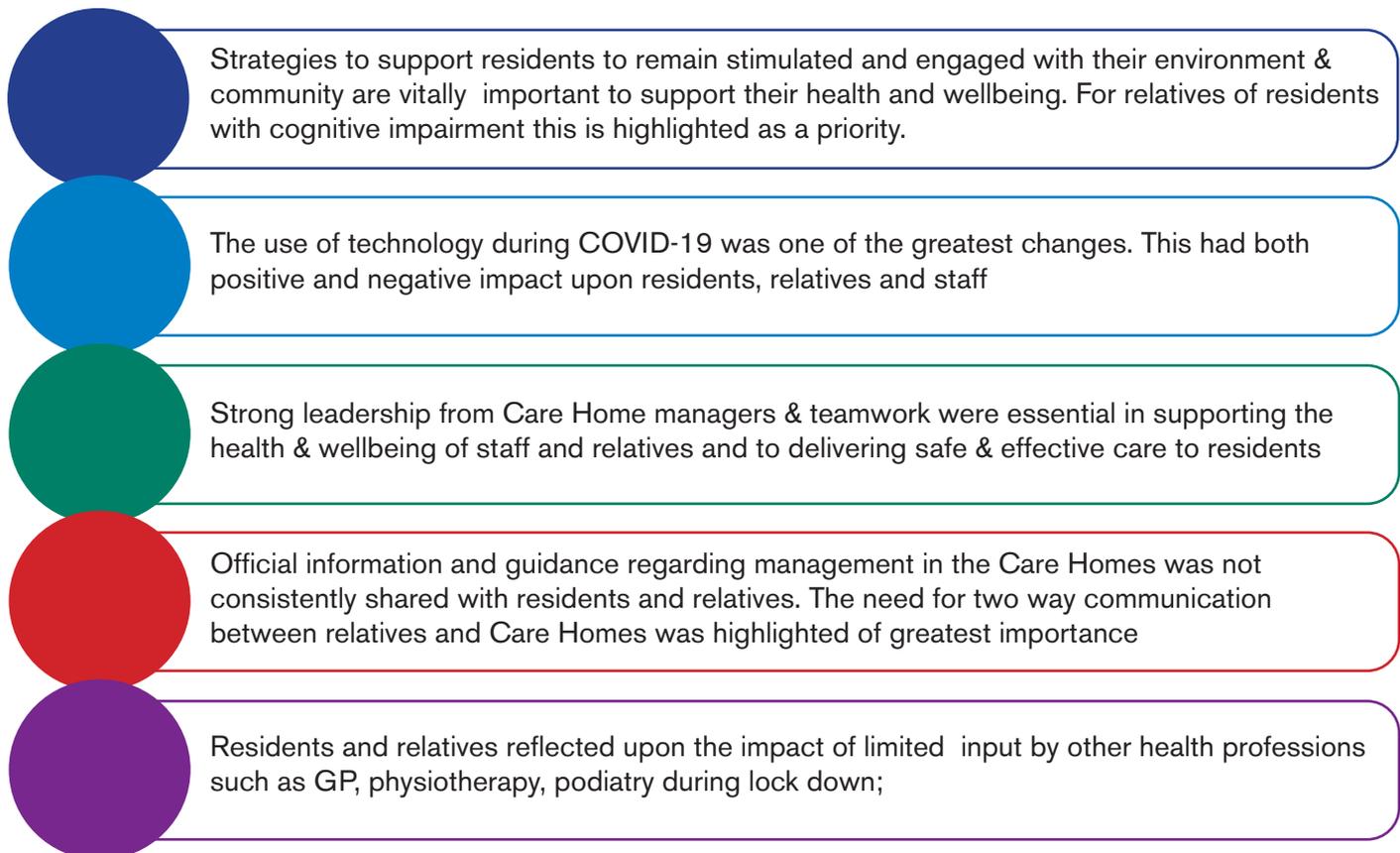
Findings

Table 1 outlines the number of returns according to each respondent group received between 24 June 2020 and 31 August 2020.

Table 1: Number of surveys returned per respondent group.

Respondent Group	Number of returns
Residents	519
Relatives	109
Staff	116

The following diagram outlines the key messages of the collective analysis of all returns.



Conclusion

"Hear the patient voice at every level- even when that voice is a whisper"

Don Berwick²

The purpose of a 10,000 More Voices study is to ensure the voice of the respondents, in this case residents, relatives and staff, will make a difference at both a local and strategic level. The key findings outlined and the direct words of the respondents have informed actions to support residents, relatives and staff during a second surge of COVID-19. This study has also reinforced the need for a culture shift in engaging openly with the residents and relatives of care homes, affirming that at all levels of the health and social care system their voice are heard.

Further information



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The full report is available through www.10000morevoices.hscni.net

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Obesity prevention actions to support overweight and obese individuals that are clinically vulnerable to COVID-19

Public health challenge

The UK government's 'Guidance for social distancing for everyone in the UK' published on 23 March 2020, and subsequent guidance on 'Staying Safe and Alert (Social Distancing)' published on 11 May 2020 both identified those who are seriously overweight (having a BMI $\geq 40\text{kg/m}^2$), as being a clinically vulnerable group at an increased risk of severe illness from COVID-19.^{1,2} In contrast the Centers for Disease Control and Prevention (CDC) in the United States expanded the list of those at increased risk of severe illness from COVID-19, lowering the cut-off for categorising a person at increased risk, from a BMI of $\geq 40\text{kg/m}^2$ down to $\geq 30\text{kg/m}^2$.^{2,3}

Current evidence does not suggest that being overweight or obese increases an individual's chances of contracting COVID-19.⁴ However as the evidence demonstrates overweight and obese individuals are significantly more likely to become seriously ill if they contract COVID-19 in comparison to those of a healthy weight.

It should also be noted that obesity is related to a number of NCDs including diabetes, hypertension and cardiovascular disease. In studies to date these conditions have been among the most frequently reported co-morbidities in COVID-19 patients, and with each disease being an identified risk factor for severe COVID-19.⁵⁻⁸

Physical activity benefits physical health as well as mental health.⁹ Evidence from China has shown COVID-19 has triggered a variety of psychological problems including panic disorder, anxiety and depression.¹⁰ The World Health Organization has also noted elevating levels of stress and anxiety associated with self-isolation and social distancing.¹¹

In Northern Ireland more than three in five adults aged 16 and over are estimated to exceed a healthy weight (62%). Overall 37% of adults are estimated to be overweight, with a further 25% estimated to be obese. In the case of children more than one in four are estimated to exceed a healthy weight (27%), with 19% estimated to be overweight, and 8% estimated to be obese.¹²

The implications of COVID-19, such as restrictions around face-to-face delivery, group programmes, and indoor programme delivery, created challenges for the provision of advice and programmes to aid behavioural change for both physical and mental health, for those individuals that need it most.

Actions

To address these issues the Public Health Agency (PHA):

- collaborated collectively with a range of partners across all 11 councils in Northern Ireland, culminating 58 leisure centres working to develop a reset plan for Physical Activity Referral Programmes (PARS) in line with COVID-19 guidelines;
- adapted, from face-to-face to virtual, a new Early Years Obesity Prevention Programme for children aged 0-5 at risk of obesity, and their families to be delivered across Northern Ireland;
- supported those shielding by providing evidence-based nutrition advice associated with the food parcels distributed throughout the pandemic.

Impacts

- All 11 councils across Northern Ireland are delivering PARS programmes for clients referred against criteria where elevated BMI and a co-morbidity exists.
- All five HSCTs and various Surestart staff have been trained, virtually, to deliver an Early Years Obesity Prevention Programme to families with children aged 0-5 at risk of obesity. Family programmes have been rolled out virtually across Northern Ireland.
- Those shielding have received evidence-based nutrition advice in conjunction with the food parcels delivered throughout the pandemic.

These three pieces of work have helped in the short term, and will also provide long-term benefits to public health, physically and mentally, including in relation to possible future elevated risk associated with obesity regarding future pandemics.

Next steps

The value of collaborating with partners is evident and these relationships should continue to be strengthened, not only to mitigate risk of exposure to COVID-19 but also to address long-term actions to reduce health inequalities. Robust structures to address obesity across Northern Ireland are required, in line with a whole systems approach, to work with all government departments for collaborative gain and cross fertilisation of actions, from research to service provision, from communication to education and from legislation to protection and enforcement.

Further information



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If you would like more information on the impact of COVID-19 on obesity or a copy of the evidence review used for this article, please contact Elaine Wilmot, Health Intelligence Manager, PHA.

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Research and development

Research is essential to help the health and social care community provide a response to the threat posed by COVID-19. This section contains a range of research carried out into the impact of COVID-19 during 2020. The content was provided by the HSC R&D Division within the PHA as well as by other members of the research community.

- The COVID-19 pandemic: the R&D contribution
- Monitoring COVID-19 infections in the UK population: the ONS COVID Infection Survey
- Seroprevalence of SARS-CoV-2 antibodies in children: A prospective multicentre cohort study
- Seroprevalence of SARS-CoV-2 antibodies in a Northern Ireland population sample
- Mapping of COVID-19 data using Geographic Information Systems (GIS)
- Community-based COVID-19 spatial analysis in Northern Ireland using smartphone, self-reported symptom data
- Assessing the impact of the COVID-19 pandemic on those with serious mental illness in Northern Ireland
- The impact of COVID-19 on the physical activity and sedentary behaviour levels of pregnant women with gestational diabetes
- A scoping study into excess mortality, and its relevance in Northern Ireland
- COVID-19 UK Health and Social Care Workforce Wellbeing and Coping Study: Phase 1 May-July 2020
- An analysis of caller behaviour to a crisis helpline during the COVID-19 pandemic
- Humans and machines collective intelligence for COVID-19 evidence: Northern Ireland COVIDCare use case
- Exploring the facilitators and barriers to following COVID-19 guidelines on social distancing among young people in Northern Ireland and Republic of Ireland
- Remote consultation for the mental health care of older people in care homes
- The IMPaCCT of the 2020 COVID-19 pandemic on those with a rare disease
- Consequences of the COVID-19 lockdown on health and the economy in Northern Ireland
- Exploring the experiences and perspectives of clinically extremely vulnerable people during COVID-19 shielding

The COVID-19 pandemic: the R&D contribution

HSC R&D Division is a regional function placed within the Public Health Agency (PHA). The ethos of the HSC R&D Division is based on the principle that the best health and social care must be underpinned by knowledge, based on well conducted research, which can then be applied in the delivery of care. Evidence is growing to show that healthcare organisations engaging in research provide better outcomes for patients.¹⁻⁴ The global community of health and social care has looked to research more so than ever to provide a response to the threat posed by the new SARS CoV-2 virus.

HSC R&D Division invests significant funding in infrastructure consisting of skilled research professionals to support the delivery of health and social care research in Northern Ireland. As research is a global endeavour, with many research studies taking place at sites across a number of countries, these Northern Ireland structures mirror those in other UK nations.

In response to the pandemic, research adopted a UK-wide approach to the prioritisation and delivery of clinical trials. A UK-wide urgent public health funding/decision-making committee was set up involving all of the major stakeholders from the research funding community, and a series of UK-wide trials were prioritised, with written recommendation to all Trusts across the UK from the Chief Medical Officers (CMOs) to participate. Northern Ireland researchers have been able to participate and lead some of these urgent public health studies, delivered across the Northern Ireland Clinical Research Network and other infrastructure such as the Clinical Research Facility and Northern Ireland Clinical Trials Unit. In addition, a series of COVID-19 vaccine trials is being co-ordinated in a similar way across the four nations. Northern Ireland has been chosen as a site for recruitment of up to 300 participants for the Novavax study (which may increase to 450), and hopes to be chosen as a site for up to three further vaccine trials.

As of 2 December 2020, 925 people in Northern Ireland have been recruited to COVID-19 research studies including vaccine trials. Of these, 443 have been recruited to the three priority studies highlighted by the UK CMOs (RECOVERY, REMAP-CAP and PRINCIPLE). Patients on the REMAP-CAP study were among the first to receive the steroid therapies which have proven effective in the management of severe COVID-19 symptoms. The remaining 482 people were recruited to the Novavax vaccine trial, which completed recruitment on 29 November in Belfast. Further vaccine studies are anticipated in early 2021 taking place in C-TRIC at Altnagelvin.

As outlined above, the impact of COVID-19 on the research community and the research networks in particular has been profound, with many trials and studies being paused for recruitment during the first wave (where participants were already on a trial their treatment/data collection continued), and there have been issues in achieving a full re-start in some clinical areas.

COVID-19 has also had a significant impact on the R&D Division team itself. The PHA entered business continuity mode during the first wave of the pandemic, and despite being a regional function, the R&D team was requested to undertake a number of significant COVID-19 related projects in addition to the normal work of the office, most of which are still ongoing. The main functions of financial and research governance were maintained, but other less vital work was de-prioritised and therefore

some normal business did not proceed as usual. Other priority areas of research have also emerged because of COVID-19, which were also in excess of usual business.

The main additional projects were as follows:

- Set up a Scientific and Technical Advisory Cell for the PHA, to respond to high-level queries during the emergency phase of the pandemic, on the basis of available evidence, using input from the senior team and academic colleagues.
- Participate in the UK-wide urgent public health prioritisation panels and ensure that Northern Ireland was well placed to participate in these studies, while at the same time managing the pausing of non-COVID research across the system.
- Lead a laboratory-based community surveillance group, undertaking a study of antibody seroprevalence across the Northern Ireland population – this is to be repeated during November 2020 and possibly in early 2021. This group also maintains a knowledge of other seroprevalence studies ongoing in Northern Ireland.
- Work with colleagues in the Office of National Statistics (ONS), the Northern Ireland Statistics and Research Agency (NISRA) and Department of Health (DoH), to roll out a UK-wide COVID infection survey which includes a questionnaire, ongoing swab testing and antibody testing of a random sample of households UK-wide. This study went live in Northern Ireland on 29 July 2020 and will continue for two years.
- Set up and chair a group looking at behavioural science aspects of COVID-19, with input from colleagues from academia, PHA, DoH and the Strategic Investment Board Innovation lab. This group has produced a series of informative work on evidence-based approaches to identifying challenges of and managing behaviours towards preventing transmission of the SARS-CoV-2 virus during the pandemic, reporting through to PHA, DoH and other key stakeholders.
- Work with UK-wide colleagues to set up a public registry where people can provide their permission to be contacted for participation in the UK-wide vaccine trials. This register is long term and will eventually be used as a pool for recruiting participants to other COVID and non-COVID research in the future.
- Take a leading role in the set-up and rollout of vaccine studies in Northern Ireland – like many other parts of the UK, Northern Ireland has had limited experience in delivering vaccine trials, but participation in the COVID-19 studies was considered a priority. R&D Division senior team members have been a vital part of the vaccine trials delivery group that has built the infrastructure to get the vaccine trials underway in Northern Ireland.
- Team members joined a number of UK-wide groups such as the Scientific Pandemic Influenza Group on Behaviours (SPI-B), Public Health England Research & Science Cell and the UK Collaborative on Development Research Epidemics Group and shared the outputs back with colleagues across the system.

The entire research infrastructure should be commended for how it has responded to the COVID-19 crisis. It has been instrumental in highlighting the way forward with both testing and treatment. This rapid mobilisation and the benefits of research should be evidence of the vital role it plays in the delivery of effective health and social care at all times.

Further information

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Monitoring COVID-19 infections in the UK population: the ONS COVID Infection Survey

The first cases of infection with a novel coronavirus, subsequently designated SARS-CoV-2, emerged in Wuhan, China on 31 December 2019.¹ Despite intensive containment efforts, there was rapid international spread. By 20 October 2020, SARS-CoV-2 had caused over 40.4 million confirmed infections and 1.1 million reported deaths globally.² A global pandemic was declared by the World Health Organization (WHO) on 12 March 2020.³

Containment efforts initially relied heavily on population quarantine measures to restrict population movement and reduce individual contacts.^{4,5} Exit from these measures, and implementation of alternative control strategies, has been informed by numerous sources of clinical and scientific information regarding community transmission levels, laboratory confirmed cases, hospital/ICU admission rates and population behavioural data. There remains an on-going need for scale-up and maintenance of such information-generating activities, including diagnostic testing, collection of robust data that describe recent and past SARS-CoV-2 exposure at an individual and population level, and changing population behaviours.

Laboratory diagnosis of infection is mainly based on real-time reverse transcriptase polymerase chain reaction (RT-PCR). Diagnostic RT-PCR targets the viral ribonucleic acid-dependent RNA polymerase or nucleocapsid genes using swabs collected from the upper respiratory tract (URT; nose and throat).^{6,7} However, the requirement for specialist equipment, skilled laboratory staff, and PCR reagents has created bottlenecks. Clinical care and public health containment efforts are thus impeded by diagnostic delays even for clinically unwell patients, and further limited by a lack of wider testing including mass screening, and testing of specific high-risk groups. Furthermore, asymptomatic infection rates are not fully understood. Improving population-level data improves dynamic models that inform planning of restriction measures (as exemplified by experiences in other countries).⁸ Even when available, RT-PCR from URT swabs may be falsely negative, due to quality or timing of collection; viral titres in URT secretions peak in the first week of symptoms, but may have declined below the limit of detection in patients who present with symptoms beyond this.^{9,10} In individuals who have been infected and recovered, RT-PCR provides no information about prior exposure or immunity.

For these reasons, attention turned to the potential for antibody testing to provide data to support individual or population-level release from lock-down and inform mathematical models to predict the future trajectory of the pandemic, as well as supporting diagnosis of individuals with a clinical COVID syndrome. Assays that reliably detect antibody responses specific to SARS-CoV-2 could contribute to diagnosis of both acute infection (via rises in IgM and IgG levels) and identify those who have been exposed and recovered with or without symptoms (via persisting IgG).¹¹ Receptor-mediated viral entry to the host cell occurs as a result of the interaction between the unique and highly conserved SARS-CoV-2 spike (S) glycoprotein and the ACE2 cell receptor.¹² This S protein is the primary target of specific neutralising antibodies, and serology assays for SARS-CoV-2 therefore typically seek to identify these antibodies.¹³

For these reasons, the Department of Health and Social Care has funded the COVID Infection Study (CIS), which is led by the Office for National Statistics, sponsored by the University of Oxford and involves partners from across the UK nations, including DoH, NISRA and PHA. CIS is a population-based longitudinal survey of incidence of infection and changing antibody status of the UK population, delivered under Pillar 4 of the UK Government's Testing Strategy. The study aims to provide accurate information regarding the extent of transmission and ongoing rates of infection in the UK. It utilises a repeated cross-sectional survey design which, over 12 months, aims to recruit approximately 380,000 individuals from approximately 180,000 households in England, plus approximately 20,000 households and 42,000 individuals from each of Wales and Scotland, and up to 20,000 households and 42,000 individuals from Northern Ireland.

The proportion of the population that is currently infected with SARS-CoV-2, symptomatically and asymptotically, is estimated, based on diagnostic RT-PCR of a nose and throat swab collected by the participant (self-swabbing) or by a parent/carer from participants aged 2-11 years, as well as self-reported symptoms. In approximately 10-20% of households, a trained healthcare professional will also collect blood to estimate seroprevalence using antibody assays, to quantify the percentage of the adult population in the UK that has previously been infected. An antibody assay for IgG is utilised in all participants with blood draws; neutralising antibodies will be directly assayed in a subset of participants with blood draws. This will substantially increase certainty of models that have been used to predict the effect of interventions aimed at reducing virus spread.

Critically important questions remain about onward transmission and waning immunity in individuals who are positive, whether such individuals can be re-infected symptomatically or asymptotically, and about incidence of new infection in individuals without prior exposure. The nested serial sampling approach can efficiently provide estimates of these outcomes in different subgroups over time. Participants have the option to consent for one visit, repeat visits each week for one month, and monthly for a further 12 months. Anyone with a positive test for virus is also invited to provide a blood sample as quickly as possible after their positive test and at monthly visits to contribute additional information on how immunity after infection changes over time.

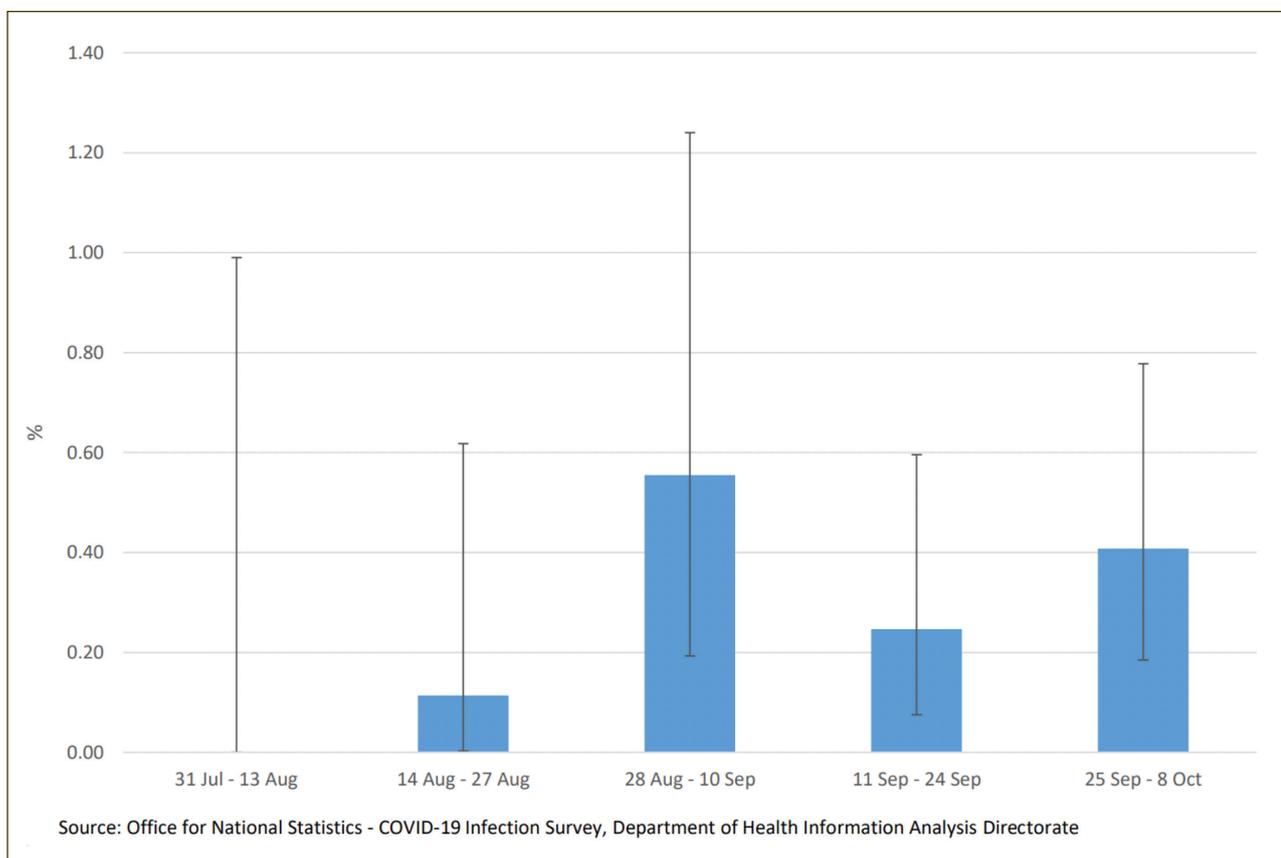
In addition, for planning the continuing response to the pandemic, it is essential to understand the relationship between symptomatic/asymptomatic infection, immune status and use of health resource, and with mortality. Consent is therefore sought to link study results to health data for one year after the last study visit for each participant to estimate the impact on the NHS/HSC, to available data from national test databases, to ensure that information on other tests for SARS-CoV-2 is available, and to ONS and relevant national mortality data to estimate the impact on mortality. The goal is to obtain results which can be generalised across all the countries in the UK and help manage the pandemic moving forward.

During the most recent two weeks of the study (25 September to 8 October) it is estimated that 0.41% of the population in Northern Ireland had COVID-19 (95% confidence interval: 0.19% – 0.78%). This equates to around 1 in 200 people (95% confidence interval: 1 in 500 to 1 in 100).

- Estimates of the total national proportion of the population testing positive for COVID-19 are weighted to be representative of the population of Northern Ireland that live in private-residential households in terms of age (grouped), sex, region, and household size.

- In the last six weeks, of the 6,525 participants included in this analysis, 21 tested positive from 16 households.
- In the last two weeks, of the 2,641 participants included in this analysis, 10 tested positive from 8 households.
- In Figure 1, the weighted positivity rates for Northern Ireland are set out for non-overlapping fortnights up to 8 October. It should be noted that no Northern Ireland respondents to the survey tested positive for the two week period ending 13 August. It is too early to comment on any trend in the results from the survey on the proportion of the population testing positive for COVID-19 in Northern Ireland.

Figure 1: Estimated % of the population in Northern Ireland testing positive for coronavirus (COVID-19) by non-overlapping 14 day periods up to 8 October 2020.



Note

All results are provisional and subject to revision. Due to the relatively small number of tests and positive swab results within the sample, confidence intervals are wide and therefore results should be interpreted with caution.

These statistics refer to infections reported in the community, by which we mean private households. These figures exclude infections reported in hospitals, care homes and/or other institutional settings. Results for Northern Ireland are published weekly on the Department of Health website, and latest results can be found here: <https://www.health-ni.gov.uk/publications/covid-19-infection-survey-0>

Results will be published at a UK level in the near future, and will be available here: <https://www.ons.gov.uk/peoplepopulationandcommunity/healthandsocialcare/conditionsanddiseases/bulletins/coronaviruscovid19infectionsurveys/pilot/16october2020>

Further information

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Seroprevalence of SARS-CoV-2 antibodies in children: a prospective multicentre cohort study

Background

Studies based on molecular testing of oral/nasal swabs underestimate SARS-CoV-2 infection due to issues with test sensitivity and timing of testing. The objective of this study was to report the presence of SARS-CoV-2 antibodies, consistent with previous infection, and to report the symptomatology of infection in children.

Approach

This multicentre observational cohort study, conducted between 16 April–3 July 2020 at five UK sites, aimed to recruit 1,000 children of healthcare workers aged 2 to 15 years of age. Participants provided blood samples for SARS-CoV-2 antibody testing and data were gathered regarding contacts with unwell individuals and symptoms.

Findings

Recruitment summaries can be visualised in Table 1. The median age of participants was 10.1 years (range 2.03 to 15.99 years), with 484 (49%) aged under 10 years; 509 (51%) were male. In total 68 out of 992 participants tested positive for SARS-CoV-2 antibodies, giving a seroprevalence of 6.9% (95% CI 5.4 to 8.6, n=992). Seroprevalence by site can be seen in Table 1. Of those with positive SARS-CoV-2 antibody tests, 34 out of 68 (50%) reported no symptoms. The most commonly reported symptoms of SARS-CoV-2 infection were fever in 21 out of 68 participants (31%) and gastrointestinal symptoms (diarrhoea, vomiting and abdominal cramps) in 13 out of 68 participants (19%). The univariate analysis of individual variables associated with SARS-CoV-2 infection is shown in Table 2.

In addition to clinical features, variables such as age, gender, the work role of the parent (patient facing or not), and known household contacts were included. Age and gender were not associated with SARS-CoV-2 infection. Parental role showed significant association in the univariate analysis, but this was no longer significant once corrected for site and other variables in the multivariate analysis. Contact with a household member with confirmed SARS-CoV-2 infection was significantly associated with SARS-CoV-2 infection in the participant in both the univariate and multivariate analyses. The multivariate analysis identified four variables independently associated with the presence of SARS-CoV-2 antibodies:

- (i) known household contact with confirmed SARS-CoV-2 ($p < 0.0001$)
- (ii) fatigue ($p = 0.001$)
- (iii) gastrointestinal symptoms ($p = 0.0001$)
- (iv) changes in sense of smell or taste ($p < 0.0012$)

Conclusion

Following the first pandemic wave in the UK, 68 out of 992 (6.9%) children of healthcare workers had evidence of prior infection with SARS-CoV-2. As expected there was marked geographical variation, with London reporting the highest infection rates (11.6%) and Belfast the lowest (0.9%, $p < 0.0001$). Of the 68 participants with positive antibody tests, 34 out of 68 (50%) reported no symptoms. The most commonly reported symptoms associated with SARS-CoV-2 infection were fever in 21 out of 68 participants (30%) and gastrointestinal symptoms in 13 out of 68 participants (19%). These symptoms were independently associated with previous SARS-CoV-2 infection based on the weighted binary multivariate regression modelling. Current UK testing strategies directing testing only for those with fever, cough or changes in smell/taste, would have identified 26 out of 34 (76%) of symptomatic participants in this study (assuming 100% sensitivity and specificity of RT-qPCR swab testing). Adding gastrointestinal symptoms would have identified nearly all symptomatic cases (33 out of 34 or 97%).

Next steps

All sites have now completed the two month repeat sampling and the final round of testing has commenced (planned for October–December). Collaborations with groups in Bristol and Oxford have been formed to allow for further analysis and outputs. This includes developing a new saliva based antibody test (collaboration with the University of Bristol) and exploration of antibody titres over time (collaboration with Oxford University).

Table 1: Recruitment summary and seroprevalence by site (n and (%)) unless otherwise stated)

Site	Screened (n)	Included Participants (n)	Antibody Positive (n)	%*
Belfast	217	215	2	0.9(0.2 to 3.3)
Cardiff	192	178	10	5.6(3.1 to 10.0)
Glasgow	229	224	20	8.9(5.9 to 13.4)
London	215	199	23	11.6(7.8 to 16.8)
Manchester	189	176	13	7.4(4.4 to 12.2)
Total	1,042	992	68	6.9(5.4 to 8.6)

Table 2: Univariate analysis of variables (Fisher's Exact for categorical variables, Mann-Whitney U for continuous variables). Number and (%) with feature shown for categorical variables and median for continuous variables unless otherwise stated.

Variable	Complete Data n (%)	Without SARS-CoV-2 Antibodies n (%)	With SARS-CoV-2 Antibodies n (%)	Odds Ratio (95% CI)	P Value
Median age (years)	992(100)	10.1(5.8)	10.2(6.9)	-	0.481
Aged 10 years and over	992(100)	472(51)	36(53)	1.1(0.6 to 1.8)	0.802
Male gender	991(99.9)	468(51)	41(60)	1.5(0.9 to 2.5)	0.133
Parents (patient contact)	992(100)	789(85)	52(76)	0.6(0.3 to 1.1)	0.055
Confirmed household contact	960(97)	63(7)	30(44)	10.9 (6.1 to 19.6)	<0.0001
Fever	962(97)	102(11)	21(31)	3.5(1.9 to 6.2)	<0.0001
Gastrointestinal Symptoms	962(97)	31(3)	13(19)	6.6(3.0 to 13.8)	<0.0001
Headache	962(97)	34(4)	12(18)	5.4(2.4 to 11.4)	<0.0001
Lethargy/fatigue	962(97)	8(1)	9(13)	16.8(5.5 to 51.9)	<0.0001
Cough	962(97)	90(10)	7(10)	1.03(0.38 to 2.3)	1.000
Change in sense of smell/taste	962(97)	7(1)	5(7)	10.0(2.4 to 37.8)	<0.0008
Myalgia/arthralgia	962(97)	21(2)	5(7)	3.3(0.94 to 9.4)	0.031
Sore throat	962(97)	41(5)	5(7)	1.7(0.5 to 4.4)	0.367
Shortness of breath	962(97)	13(1)	3(4)	3.1(0.6 to 11.8)	0.098
Coryza	962(97)	27(3)	1(1)	0.5(0.0 to 3.0)	0.715
Rash	962(97)	10(1)	1(1)	1.3(0.0 to 9.5)	0.556
Conjunctivitis	962(97)	1(0)	0(0)	0.0(0.0 to 508.7)	1.000

*IQR=Interquartile range

Further information



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Seroprevalence of SARS-CoV-2 antibodies in a Northern Ireland population sample

Background

Serological assays are of critical importance to determine seroprevalence in a given population, define previous exposure and potentially identify highly reactive human donors for the generation of convalescent serum as a therapeutic treatment option.

Public Health England (PHE) has established a surveillance programme for population blood antibody testing in England, but as the progress of the pandemic would not necessarily follow the same pattern across all regions, and the optimum logistical solutions for a survey might vary in each region, there is a need to examine this in a local context. Furthermore, it is estimated that antibody tests of sufficient accuracy to be used in more formal diagnostic testing to inform policy or clinical decision-making will not be identified for some considerable time. The assay being used in the current PHE study is sufficiently accurate for population testing, but not for diagnostic purposes.

Current Northern Ireland context

No prior analysis of the true prevalence of COVID-19 in the general Northern Ireland population had been undertaken. Obtaining accurate data is challenging due to the asymptomatic presentation of many infections that remain undetected by current healthcare and surveillance systems. These challenges may be overcome using serological assays to detect blood levels of SARS-CoV-2-reactive antibodies, which provide an indication of prior exposure to the virus.

Approach

To this end, the Community Surveillance Sub-group was tasked by the Departmental Expert Advisory Group on Testing with coordinating a scoping study, which was undertaken in May–June 2020.

The rationale for this study was to derive preliminary estimates of the proportion of the Northern Ireland population that has had previous exposure to viral infection, and who have reactive antibodies (IgG) present in their bloodstream. This knowledge could inform planning in a number of contexts, working towards the more formal process of population testing during later phases of the pandemic.

This study employed an ELISA-based assay to screen a representative cohort of blood samples from across the various HSC Trusts, deriving a preliminary estimate of the proportion of the Northern Ireland population that have contracted COVID-19. Such data is of critical importance in many contexts, for example to provide insight into virus transmission, inform planning and control measures, and identify potential donors for convalescent serum therapy. Planning and delivery of the study was coordinated by the Community Surveillance Sub-group of the Departmental Expert Advisory Group on Testing, and involved contributions from the HSC Trusts, PHA, Queen's University Belfast (QUB), Ulster University (UU), the Northern Ireland Biobank and the Agri-Food and Biosciences Institute (AFBI).

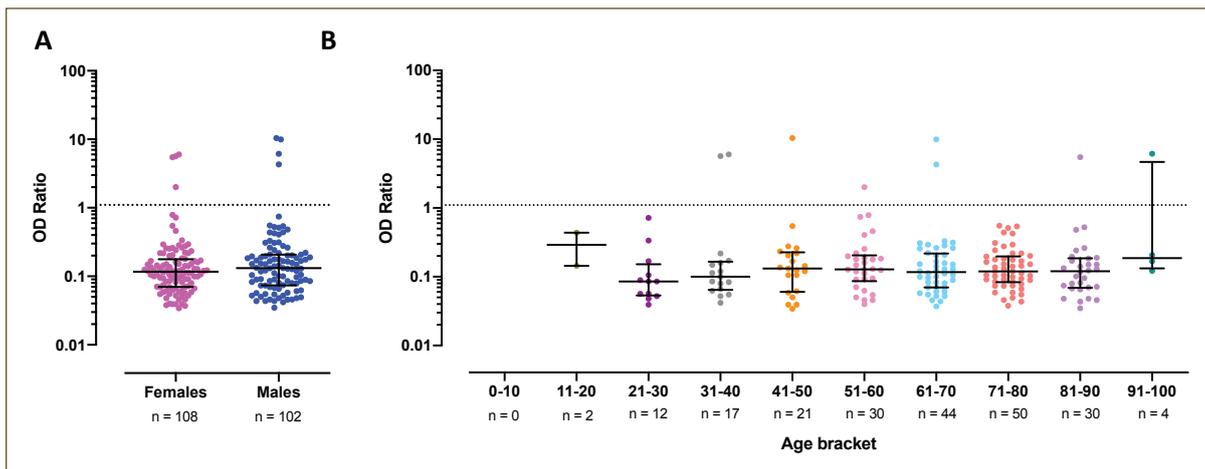
Residual blood plasma/serum samples that were originally collected and processed for other clinical purposes were sourced from within the Clinical Biochemistry laboratories across all five HSC Trusts. A sample pool representative of age and sex of the population was identified. Samples were de-identified by NHS staff and given a study specific ID, before being transferred securely to QUB and UU for testing, facilitated by the Northern Ireland Biobank governance processes. Data were combined and statistically analysed by QUB, UU and AFBI.

Findings

1. Western Health and Social Care Trust

- 210 randomly selected blood plasma or serum samples were collected between 20–22 May
- Samples were analysed at UU
- Overall, out of the 210 individuals, 8 positives were identified
- This represents a COVID-19 seroprevalence of 3.8%

Figure 1. Graphical presentation of the individual antibody titre results for WHSCT based on (A) gender and (B) age.

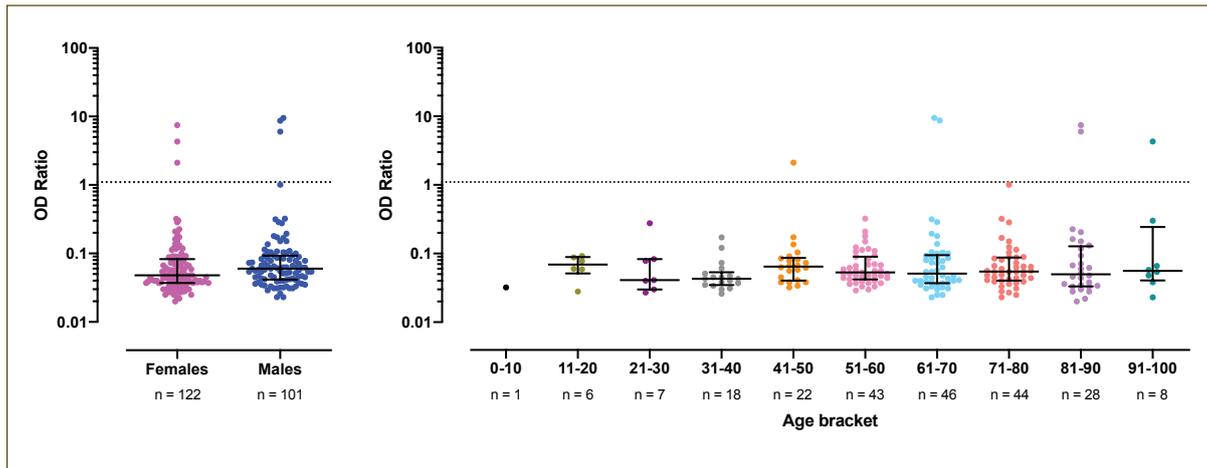


Note: Dashed line represents threshold for anti-SARS-CoV-2 IgG positivity, as defined by an optical density (OD) ratio of ≥ 1.1 . Median and interquartile range shown for each grouping.

2. Belfast Health and Social Care Trust

- 223 randomly selected blood plasma or serum samples were collected between 27–29 May
- Samples were analysed at QUB
- Overall, out of the 223 individuals, 6 positives were identified
- This represents a COVID-19 seroprevalence of 2.7%

Figure 2. Graphical presentation of the individual antibody titre results for BHSCT based on (A) gender and (B) age.

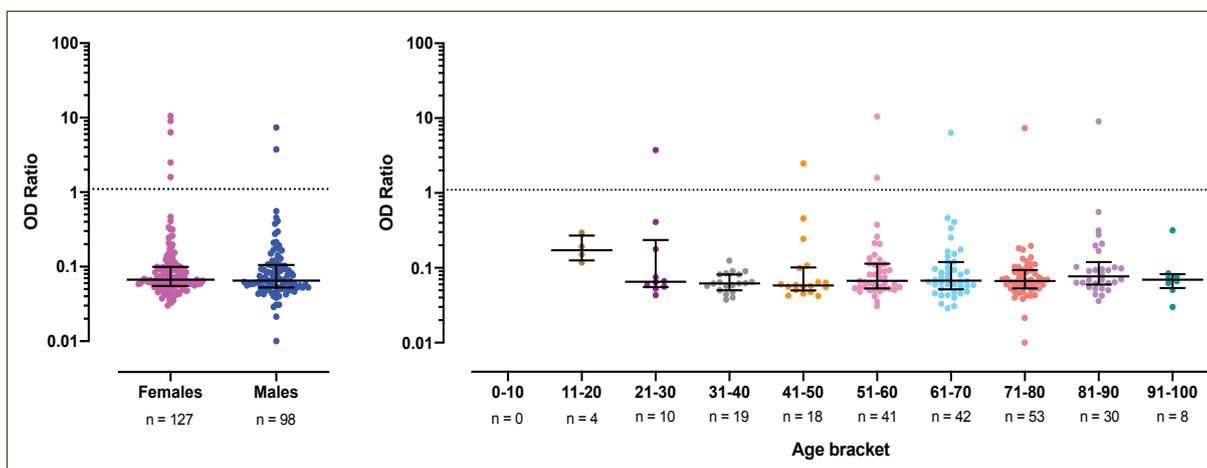


Note: Dashed line represents threshold for anti-SARS-CoV-2 IgG positivity, as defined by an optical density (OD) ratio of ≥ 1.1 . Median and interquartile range shown for each grouping.

3. Northern Health and Social Care Trust

- 225 randomly selected blood plasma or serum samples were collected between 9–10 June
- Samples were analysed at UU
- Overall, out of the 225 individuals, 7 positives were identified
- This represents a COVID-19 seroprevalence of 3.1%

Figure 3. Graphical presentation of the individual antibody titre results for NHSCT based on (A) gender and (B) age.

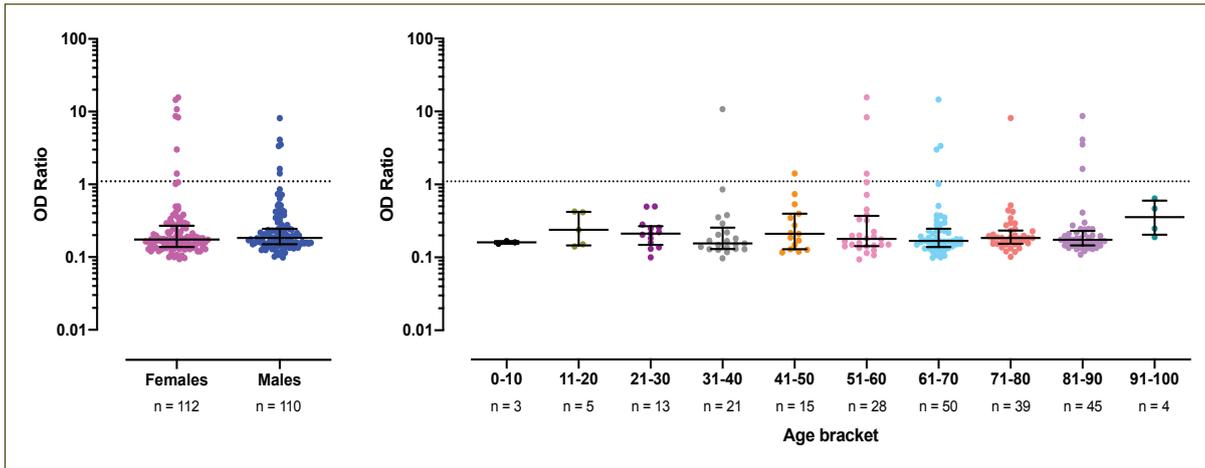


Note: Dashed line represents threshold for anti-SARS-CoV-2 IgG positivity, as defined by an optical density (OD) ratio of ≥ 1.1 . Median and interquartile range shown for each grouping.

4. Southern Health and Social Care Trust

- 225 randomly selected blood plasma or serum samples were collected between 10–16 June
- Samples were analysed at QUB
- Overall, out of the 225 individuals, 14 positives were identified
- This represents a COVID-19 seroprevalence of 6.2%

Figure 4. Graphical presentation of the individual antibody titre results for SHSCT based on (A) gender and (B) age.

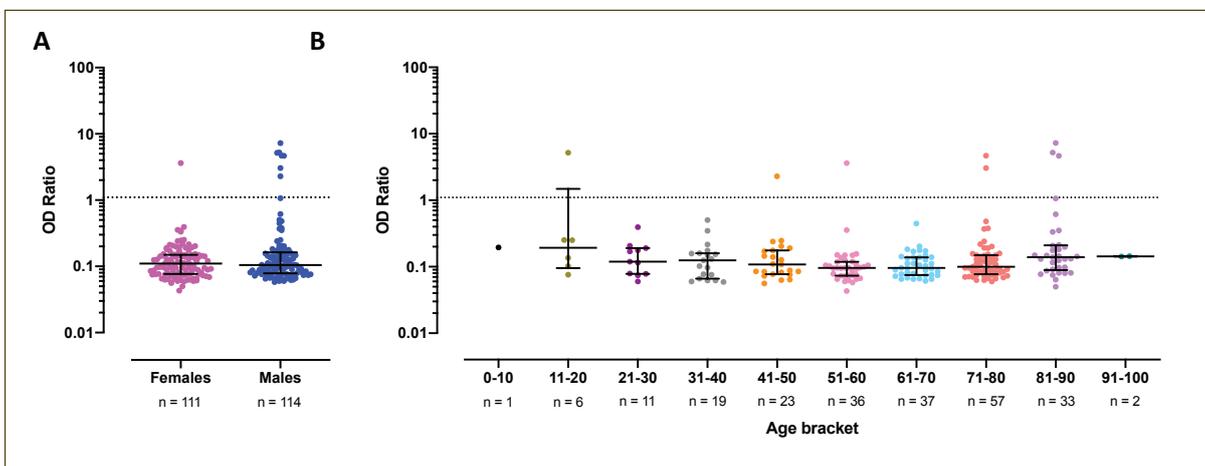


Note: Dashed line represents threshold for anti-SARS-CoV-2 IgG positivity, as defined by an optical density (OD) ratio of ≥ 1.1 . Median and interquartile range shown for each grouping.

5. South Eastern Health and Social Care Trust

- 225 randomly selected blood plasma or serum samples were collected between 22–25 June
- Samples were analysed at QUB
- Overall, out of the 225 individuals, 8 positives were identified
- This represents a COVID-19 seroprevalence of 3.6%

Figure 5. Graphical presentation of the individual antibody titre results for SEHSCT based on (A) gender and (B) age.

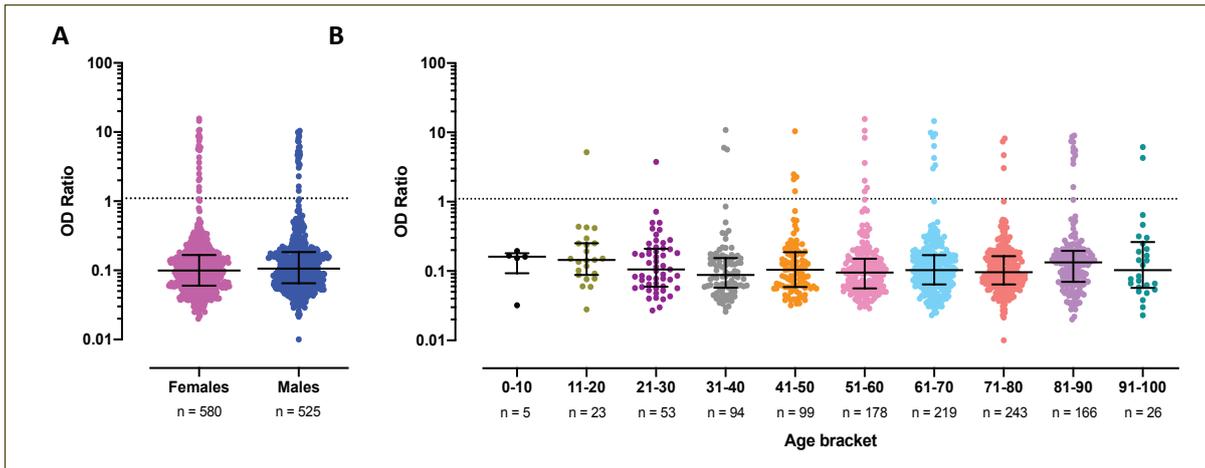


Note: Dashed line represents threshold for anti-SARS-CoV-2 IgG positivity, as defined by an optical density (OD) ratio of ≥ 1.1 . Median and interquartile range shown for each

6. Amalgamated results for all five Trusts

- 1,108 randomly selected blood plasma or serum samples were collected between May–June
- Samples were analysed at QUB and UU
- Overall, out of the 1,108 individuals, 43 positives were identified
- This represents a COVID-19 seroprevalence of 3.9%

Figure 6. Graphical presentation of the individual antibody titre results for all five Trusts based on (A) gender and (B) age.



Note: Dashed line represents threshold for anti-SARS-CoV-2 IgG positivity, as defined by an optical density (OD) ratio of ≥ 1.1 . Median and interquartile range shown for each

Figure 7. Percentage positive cases per postcode district

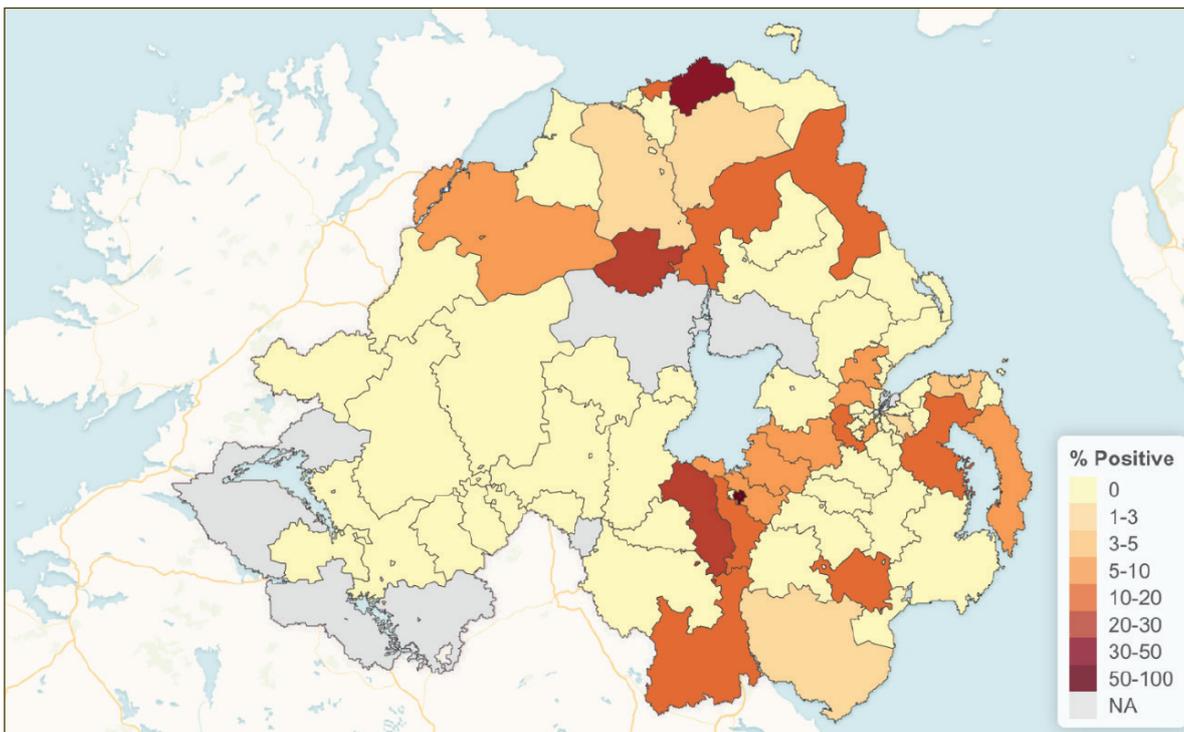


Table 1: Age analysis

Age	n	SARS-CoV-2 positive (n)	% of total n	% of total SARS-CoV-2 positive (n)
0-10	5	0	0.5	0
11-20	23	1	2.1	2.4
21-30	53	1	4.8	2.4
31-40	94	3	8.5	7.1
41-50	99	5	9.0	11.9
51-60	178	7	16.1	16.7
61-70	219	8	19.8	19.0
71-80	243	4	22.0	9.5
81-90	166	11	15.0	26.2
91-100	26	2	2.4	4.8
TOTAL	1,106	42	100	100

NB. Age not recorded for two samples (hence total n = 1,106 rather than 1,108 as in report), one of which was positive for SARS-CoV-2 (hence SARS-CoV-2 n = 42 rather than 43 as in report)

Table 2: Gender analysis

Gender	n	SARS-CoV-2 positive (n)	% of total n	% of total SARS-CoV-2 positive (n)
Females	580	20	52.5	47.6
Males	525	22	47.5	52.4
TOTAL	1,105	42	100	100

NB. Gender not recorded for three samples (hence total n = 1,105 rather than 1,108 as in report), one of which was positive for SARS-CoV-2 (hence SARS-CoV-2 positive n = 42 rather than 43 as in report)

Next steps

The findings of this study provide valuable evidence of the prior exposure of a representative sample of the Northern Ireland population to the SARS-CoV-2 virus. Ongoing surveillance of seroprevalence during the course of the pandemic would identify changes in serological status of the population, and could be linked with data for hospital and ICU admissions for COVID, as well as detected incidence of COVID infection. Findings can be used as part of the planning and response to the pandemic, adding additional data to the surveillance and modelling activities, thus helping to guide decision making and actions.

Further information



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Mapping of COVID-19 data using Geographic Information Systems (GIS)

The capacity for GIS to provide data driven maps has enabled visualisation of the rapidly changing spatio-temporal dynamics of the COVID-19 epidemic.

Postcode data derived from COVID-19 surveillance submissions have provided a spatial reference point. These points can be plotted on a map as a specific point or be aggregated to defined areas, such as local government districts (LGD) or postcode areas, using GIS software such as ArcMap (ESRI systems, USA). Such software can also be used to generate kernel density maps of cases highlighting disease 'hotspots' (Figure 1). While these are useful, kernel density maps have their limitations as they take no account of variation in the underlying population. For defined areas such as LGDs, incidence or prevalence maps can be produced, but these use artificial disease boundaries. An ongoing challenge has been to provide 'hotspot' incidence maps that are independent of spatial boundaries and, which also take account of the overdispersed distribution observed with COVID-19 infection levels.

Alongside kernel density and point location maps, another practical GIS application was developed to assist in identification of areas with increasing cases based on BT four digit postcode areas (Figure 2). These maps indicate the change in the number of confirmed COVID-19 cases over the last two weeks. A red/amber/green coding provides a visual indicator of whether cases are increasing or decreasing within each of the 80 BT areas in Northern Ireland over the fortnight. Maps such as these are produced on a weekly basis and provide a visual time series or 'data movie' of changes over time and highlight the rapidly changing dynamics of this epidemic.

At the other end of the spatial scale (in conjunction with Ulster University), GIS has provided a very useful aid to enable management of local outbreaks. Maps with street-level detail have permitted visual assessment of outbreak cases in a locality over time, which can assist in identifying secondary and tertiary points of spread.

Modern desktop computer capabilities and the ready availability of GIS software has enabled electronic spatial mapping to be utilised as a very practical real-time tool for assisting in tackling infectious disease epidemics. No more markers pinned onto paper maps!

Figure 1: Kernel density map of confirmed COVID-19 cases during the week ending 4 October 2020.

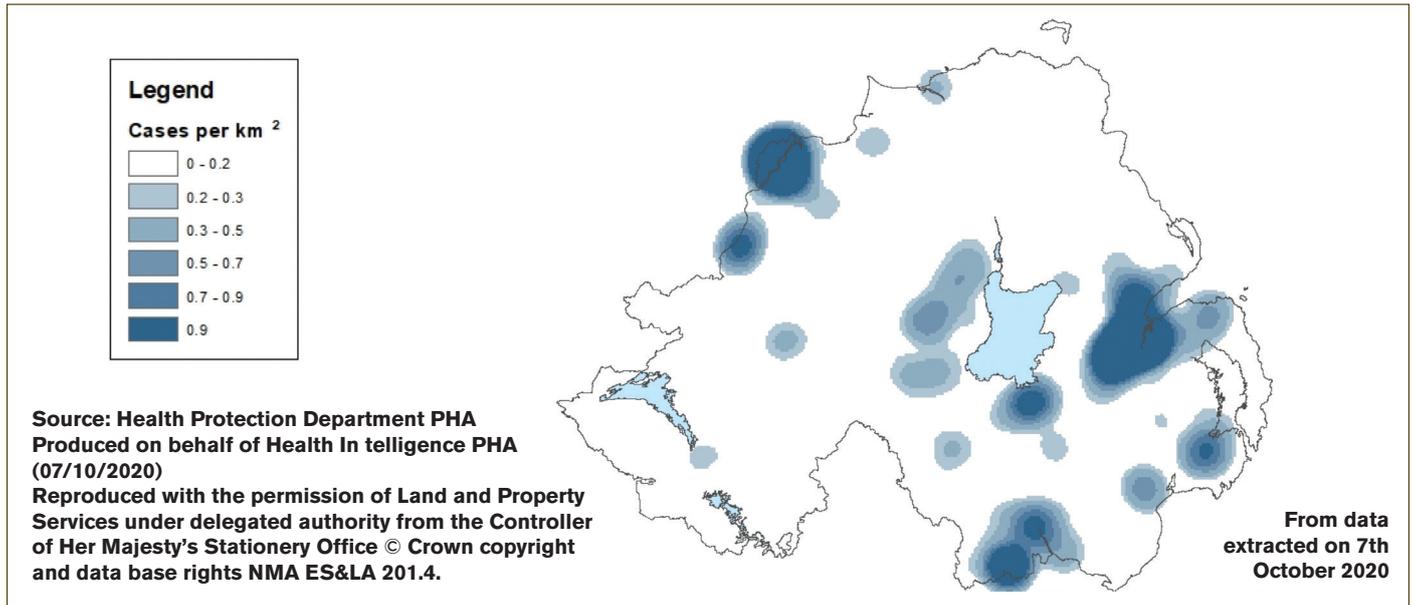
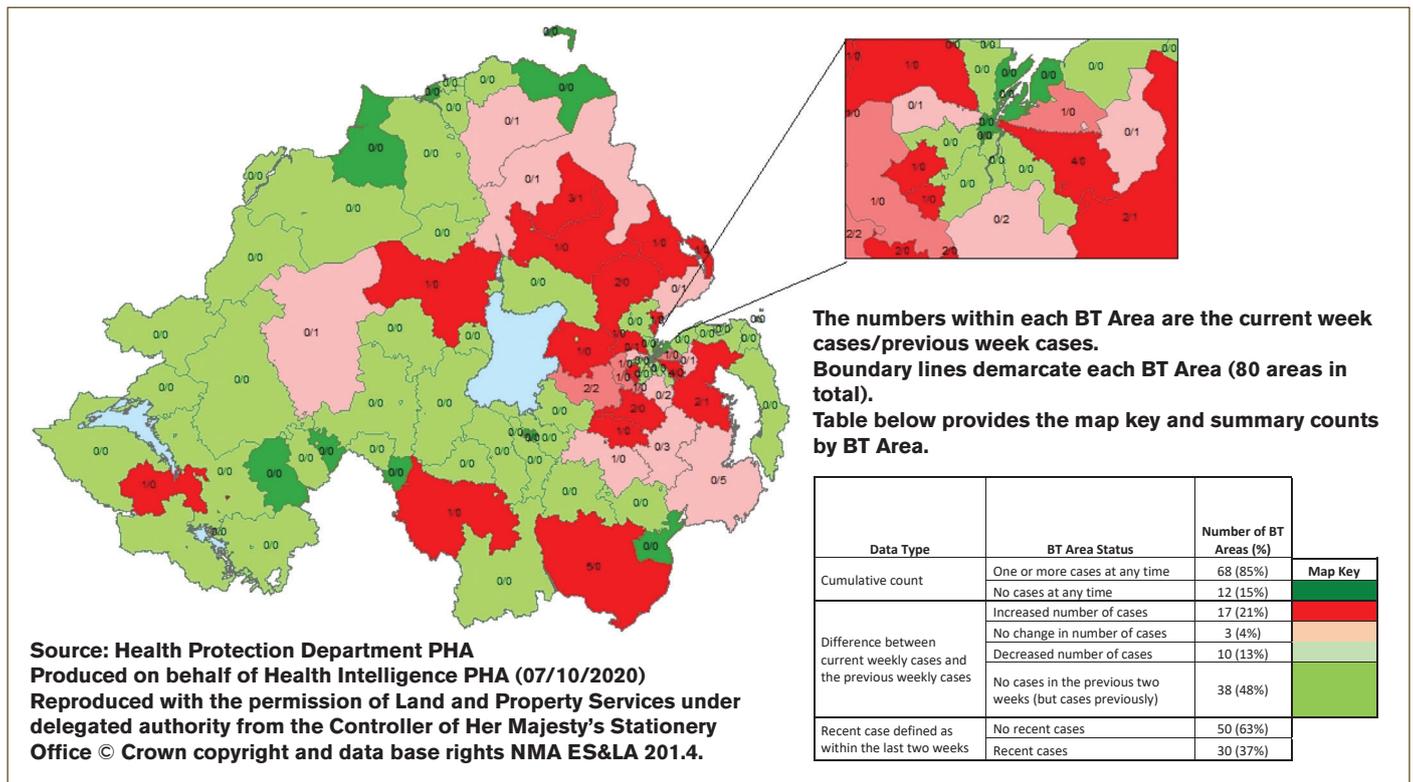


Figure 2: Confirmed COVID-19 case by BT area example (since 25 May 2020 and excluding care home residents).



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Community-based COVID-19 spatial analysis in Northern Ireland using smartphone, self-reported symptom data

Background

Different countries adopted a range of strategies, including mobile platforms, to monitor the spread of COVID-19. While assessing the effectiveness of different measures to prevent the spread of COVID-19 in the community remains a challenge, it is essential nevertheless to assess the prevalence of the disease during all stages of the pandemic.^{1,2} National statistics agencies record data on the number of COVID-19 related hospital admissions and deaths but contagion of the virus in the community depends on individual and social behaviour, and such data remain more difficult to record. This interdisciplinary project investigated the spatial and temporal variation in the prevalence of COVID-19 symptomatology in the community and the relationship between the observed self-reported symptom prevalence and social deprivation in Northern Ireland.

Two COVID-19 mobile data platforms are available in Northern Ireland, the KCL ZOE symptom tracker app launched on 24 March 2020 (developed by a collaboration between King's College London (KCL) and the health science company ZOE; <https://covid.joinzoe.com/>) and COVIDCare NI (formerly known as 'COVID-19 NI') released on 6 April 2020 by the Department of Health in Northern Ireland (DoH). The COVIDCare NI symptom checker app was developed primarily as part of a triage system to provide advice for users on whether they should self-isolate and – in cases where the symptoms are severe or the users are within at-risk categories – to seek medical assistance. Both smartphone apps record data from both asymptomatic and symptomatic individuals and provide a way to track how the virus has progressed through Northern Ireland using self-reported health information.

Approach

A comparison of data from the two smartphone symptom apps was used to track the propagation of COVID-19 in Northern Ireland by capturing self-reported health information. Data from both smartphone symptom tracking apps were generated on a series of 7 and 14 day periods, known as sliding windows. Each period contained 1) the total number of individual active users who have used the COVID symptom checking/recording features and 2) the total number of individual users recording an assessment, with symptoms meeting the classic (new continuous cough or high temperature) or refined (new continuous cough or high temperature or anosmia) Public Health England (PHE) case definitions.³ Data containing invalid postcodes or postcodes outside of Northern Ireland were removed during post-processing. For both mobile platforms, data were analysed at Super Output Area (SOA) level for Northern Ireland. The KCL ZOE tracker app generates data geocoded to SOAs, while in the case of COVIDCare NI, data were converted from postcode to SOAs. There are 890 SOA administrative wards across Northern Ireland. When the numbers of users or those reporting symptoms (from either app) were too small in any SOA ($n \leq 5$) the data providers suppressed these small cell counts to avoid any disclosure risk. By "reporting symptoms" we mean that, on any given date, symptoms would have satisfied the PHE COVID definition.

Two approaches were used.

1. Predictive mapping using geostatistical Bayesian modelling

“Predictive mapping” was used to investigate changes in the geographic variation in the numbers reporting COVID-19 symptoms. The key idea behind a geostatistical Bayesian modelling approach is that maps of disease prevalence are made more informative when you can enhance the resolution of the map in areas where the data are sparse by using data from contiguous areas to help “update” the data poor neighbourhoods. This was accomplished using R package PrevMap, a programme based on a Bayesian inference, on spatially referenced prevalence data.⁴ Regular grids of 1km, 5 km and 10km were tested. A 10km grid was found to be optimal. It should be noted that there are uncertainties associated with any automated predictive mapping procedure and the results provide reasonably granular estimates of disease prevalence across the region. However, the benefits of using the predictive mapping approach are that:

- The predictive models allow us to estimate prevalence of COVID-19 where we have little or no data reported, based on data reported by active symptomatic app users within geographic areas that are contiguous.
- The models account for the population of each Census area and therefore the observed variation across the prevalence map is not so dependent on population density.
- The models’ uncertainty can be at least quantified, based on a number of computer simulations (11,000 in this case).

2. Spatial regression analysis

Generalised linear regression and spatial regression analysis (using *glm* and *spatialreg* R packages) were used to investigate the relationship between the numbers of symptomatic app users (of either mobile platform) and the degree of social deprivation in the person’s area of residence (using Multiple Deprivation Measures (MDMs) provided by the Northern Ireland Statistics and Research Agency).⁵ Further analysis included Census data to investigate the relationship with population household density, derived as the number of residents divided by number of households for each SOA. A “spatially lagged regression model” incorporates spatial dependence explicitly into the regression equation and as such acknowledges that prevalence in neighbouring areas (SOAs in this research) may be an important predictor for the estimation of prevalence rates in the area of interest.⁶

For both COVID-19 self-reporting symptom mobile platforms, the data were analysed in the following forms:

- Rates calculated as the number of active users reporting PHE symptoms (classic and revised) as a proportion of the number of active users for each SOA that occurred in the defined periods of time (Table 1), standardised according to the population of each SOA. This allowed comparison of the self-reported prevalence of COVID-19 in terms of active app users reporting PHE symptoms.
- Age and sex standardised rates based on the 2011 Census population of Northern Ireland.⁷ The age brackets used based on 2011 Census population data comprised <18, 18–24, 25–34, 35–49, 50–65, >65.

Table 1: COVID-19 symptom mobile data provided by two sources: A) KCL ZOE symptom tracker app and B) COVIDCare NI for seven time periods used in the analysis.

Date of end of reporting period	KCLZOE Reported symptoms (Refined PHE)	KCLZOE (No. of SOAs with reported symptoms)	COVIDCare NI Reported symptoms	COVIDCare NI (No. of SOAs with reported symptoms)
21 April 2020	1,849	592	2,173	758
27 April 2020	1,584	515	1,912	729
4 May 2020	1,503	493	1,577	677
11 May 2020	1,476	484	1,282	614
18 May 2020	1,325	439	928	540
23 May 2020	1,228	407	804	496
1 June 2020	968	322	430	399

Note: The table shows the number of SOAs with reported symptoms for each of the time periods. The dates correspond to the end date of 14 day symptom reporting sliding window (resulting in a one week overlap of data).

Findings

The trends in self-reported symptoms are comparable for the two COVID-19 symptom mobile data platforms (Figure 1). An increase in the number of active users of the KCL ZOE tracker app was observed between 30 March and 6 April 2020 followed by a sharp decrease after 6 April 2020. The COVIDCare NI app shows a similar trend in an observed decline in active users reporting COVID-19 symptoms from the start of reporting period 21 April 2020.

Geostatistical Bayesian predictive modelling enabled insight into spatiotemporal changes in the number of people reporting active symptoms. Analysis concentrated on four key time periods using a 14 day period reporting period (Figures 2 and 3). The probability maps show the areas predicted to exceed the regional average of users reporting symptoms for the analysis periods. The findings for the initial analysis period (21 March 2020) indicate that the greater Belfast area shows the highest likelihood of users reporting symptoms, exceeding the regional average for Northern Ireland. The predictive modelling also shows that this above average trend extends to Lisburn and Derry SOAs for the later reporting period (11 May 2020).

Regression analysis of population standardised self-reported prevalence rates of COVID-19 shows that there tends to be more active users of these apps in less deprived areas over all reporting periods. However, the most deprived areas show the highest rates of self-reported COVID-19 symptoms. Full analysis of these results is provided in McKinley et al.⁸

We also found that there tended to be more users reporting COVID-19 symptoms in areas of social deprivation that had low levels of employment. In addition, age standardised data from COVIDCare NI showed that there was a higher self-reported prevalence of COVID-19 symptoms within the age

groups <18, 18–24 and 25–34 years within the most deprived SOAs. The relationship between self-reported prevalence rates and housing density varies across different age groups but most significantly a positive relationship was observed for age groups <18, 18–24, 35–49 and 50–64, indicating higher prevalence rates for higher density housing areas for these age groups.

Conclusions

This research underscores the importance of place and health, and demonstrates the value of a robust spatial statistical approach to examine the impact of COVID-19 in the community. The findings underline the potential for COVID-19 to exacerbate socioeconomic inequalities with higher prevalence of self-reported COVID-19 symptoms associated with social deprivation, housing density and age.

The research indicates a heightening of health inequalities during the restrictions of lockdown, with a higher burden of COVID-19 associated with the most socially deprived areas, and in particular those areas with most unemployment. These results should inform the search for and design of effective public health interventions to reduce health disparities and improve overall health outcomes in the population.

Acknowledgements

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This work also uses data provided by participants of the COVID-19 Symptoms Study, developed by ZOE Global Limited with scientific and clinical input from King's College London. This study makes use of anonymised data held in the Secure Anonymised Information Linkage (SAIL) Databank. We would like to acknowledge all the data providers who make anonymised data available for research. We acknowledge the responsibility for the interpretation of the information supplied by SAIL is the authors' alone. We acknowledge the collaborative partnership that enabled acquisition and access to the de-identified data, which led to this output. The collaboration was led by BREATHE – The Health Data Research Hub for Respiratory Health, in partnership with SAIL Databank at Swansea University, the Health Data Research UK Swansea University site team and the Usher Institute at the University of Edinburgh. We acknowledge the input of ZOE Global Limited and King's College London in their development and sharing of the data, and their input into the understanding and contextualisation of data for COVID-19 research. All research conducted was completed under the permission and approval of SAIL independent Information Governance Review Panel (IGRP) project number 1078.

Figure 1: Comparison of COVID-19 symptom mobile data platforms provided by two sources: KCL ZOE symptom tracker app data for Northern Ireland (reporting period 24 March–22 June 2020); COVIDCare NI symptom checker feature, (reporting period 6 April–29 June 2020). The dates correspond to the end date of 14 day symptom reporting sliding window.

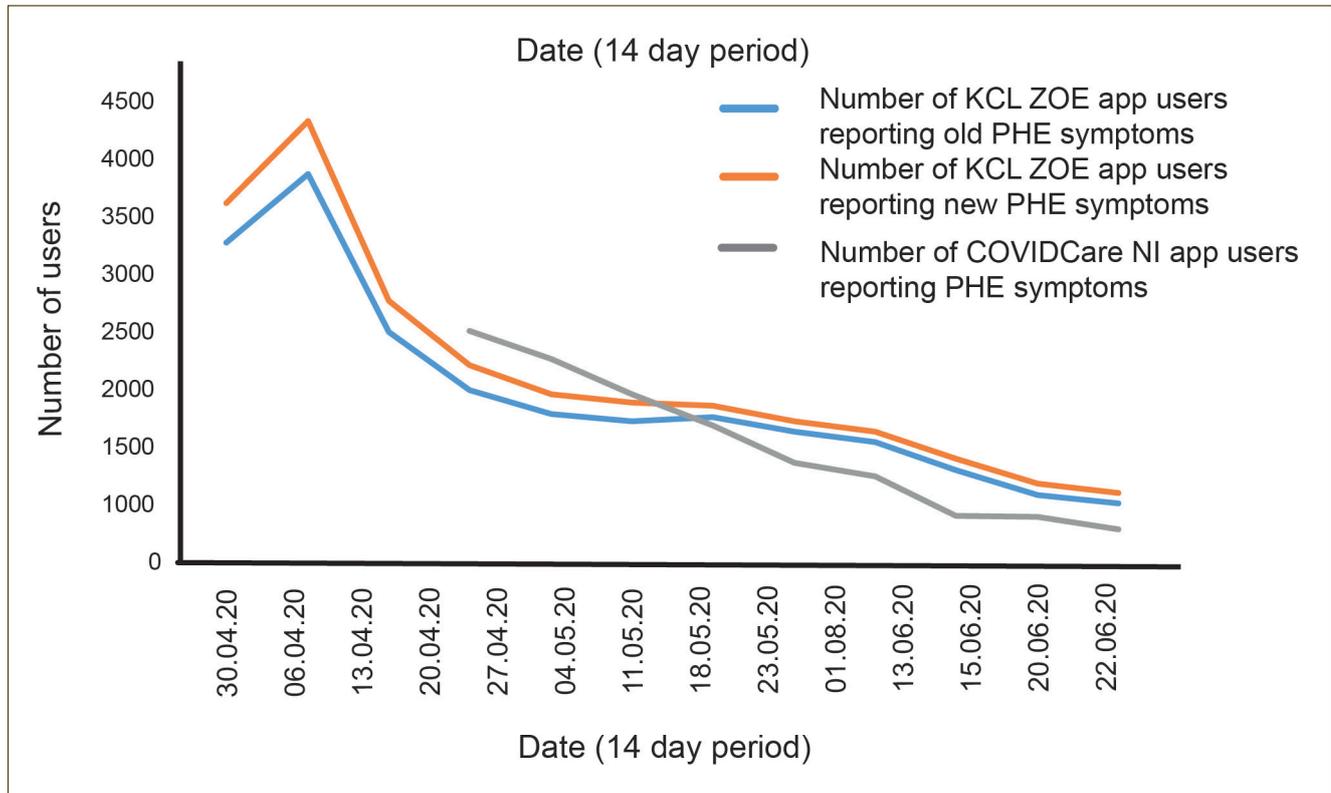


Figure 2: Geostatistical Bayesian modelling using data provided by COVIDCare NI. The Figures (A- D) show the probability, based on significance levels, of areas exceeding the regional average for the different 14 day time periods.

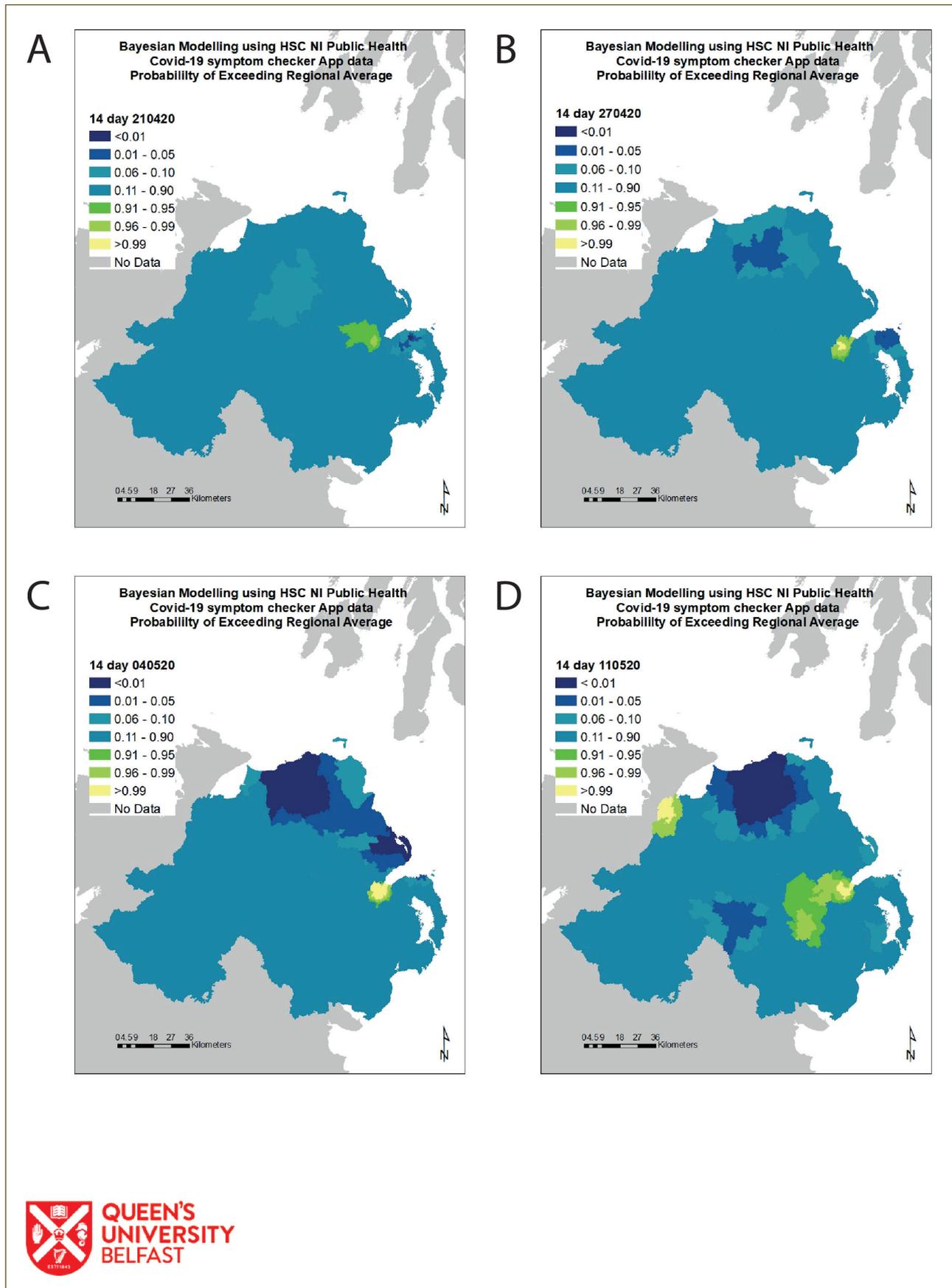
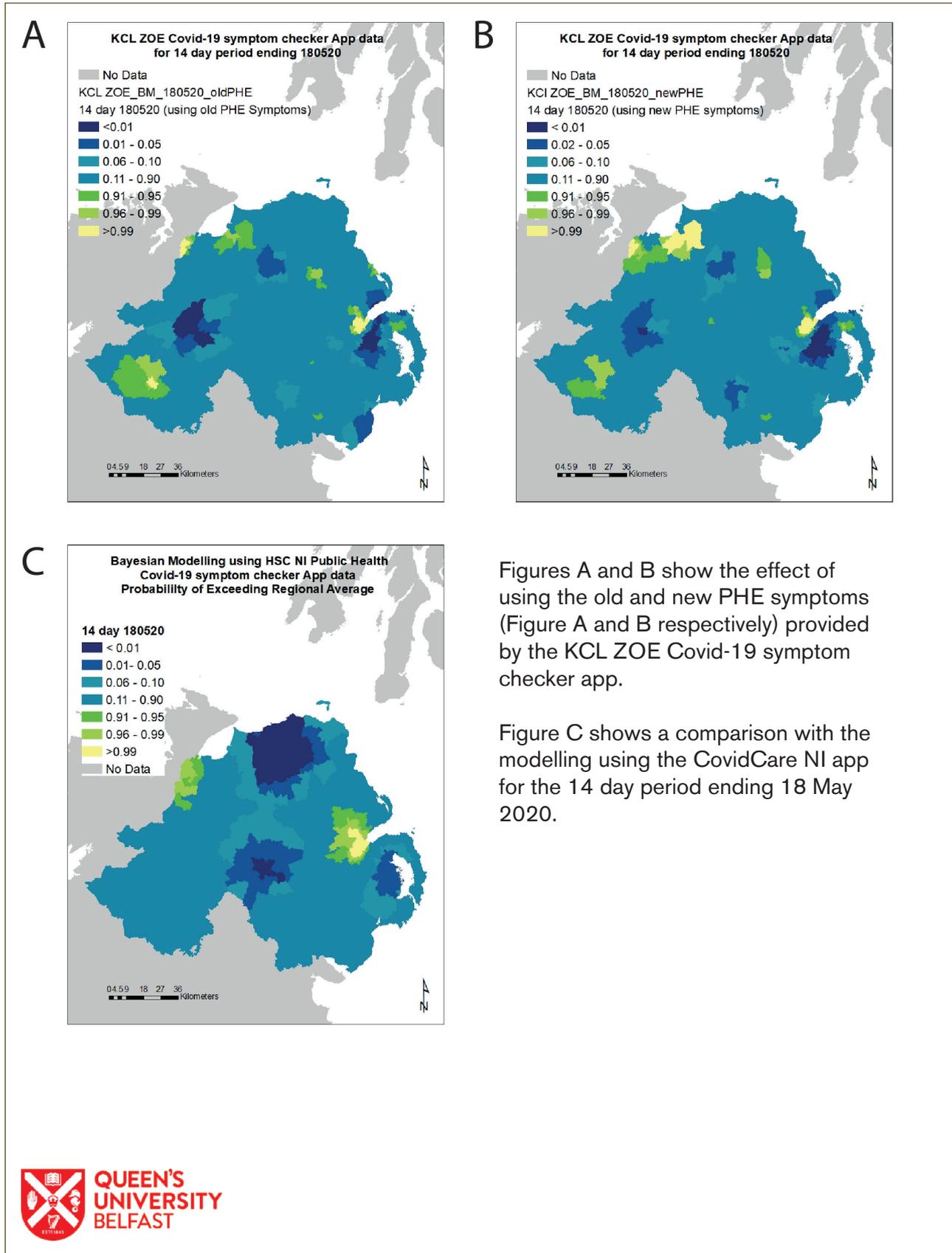


Figure 3: Geostatistical Bayesian modelling using data provided by KCL ZOE COVID-19 symptom checker app and COVIDCare NI. The Figures (A-C) show the probability, based on significance levels, of areas exceeding the regional average for the 14 day time period ending 18 May 2020.



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Assessing the impact of the COVID-19 pandemic on those with serious mental illness in Northern Ireland

Introduction

Northern Ireland entered the COVID-19 pandemic with higher rates of severe mental illnesses such as, anxiety, depression, and psychotic illnesses like schizophrenia, than Great Britain and the Republic of Ireland.^{1,2} Severe mental illness describes a range of disorders that, due to their debilitating nature, often limit an individual's ability to engage in functional and occupational activities.

When the condition of a person with mental illness deteriorates to the point where they require intensive treatment, or when their safety is severely compromised, acute inpatient care may be necessary.

Community mental health services, in providing psychosocial support for those with mental illnesses, perform an important role in preventing relapse and subsequent hospitalisation.³ These services suffered significant disruption following the COVID-19 outbreak; with redeployment of staff, cancellation of outpatient appointments and the adoption of telephone contact as the primary means of support.^{4,5} This disruption, together with the wider societal distress brought about by COVID-19, may have resulted in more patients requiring inpatient psychiatric care. It was acknowledged that inpatient care in Northern Ireland had already been under considerable strain prior to the pandemic.⁶

We aimed to determine the proportion of all mental health inpatients in Northern Ireland for whom COVID-19 was felt to have contributed to their admission. A retrospective cross-sectional survey of all patients in acute psychiatric care in four out of Northern Ireland's five Health and Social Care Trusts on 22 July 2020 was completed. COVID-19 was identified as contributing when the clinical team had documented it as such in electronic or written notes. Patient data was anonymised and collated within a Microsoft Excel (2016) document in line with each Healthcare Trust's GDPR recommendations. Statistical analysis was completed using IBM's SPSS statistical package, version 26.

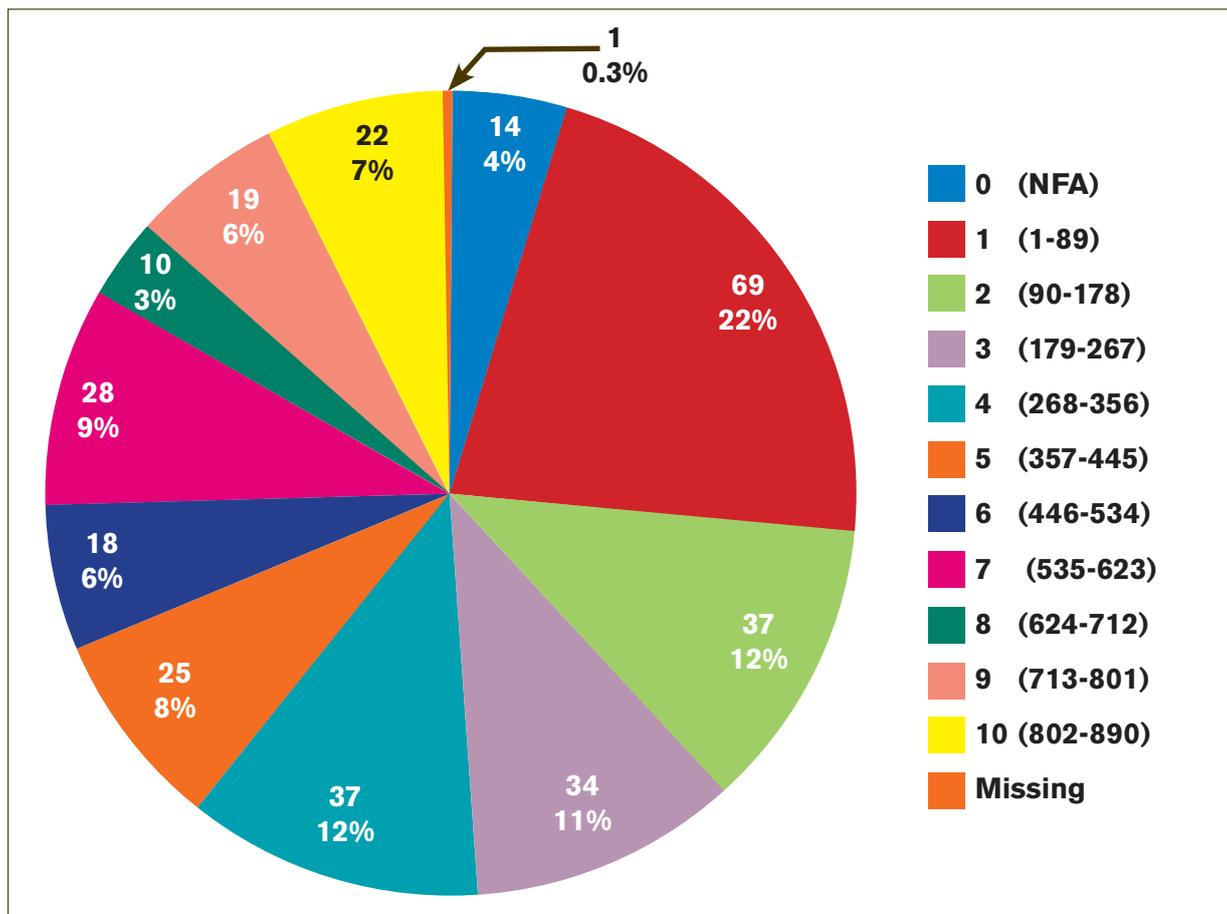
Findings

At the time of writing, data collection has been completed for the Southern (SHSCT), Western (WHSCT), South Eastern (SEHSCT) and Belfast Health and Social Care Trusts (BHSCT), with data collection in the Northern Health and Social Care Trust outstanding. The total number of inpatients was 314: 167 (53.2%) inpatients were male, and 153 (48.7%) were under the age of 45. Overall, 186 (59.2%) of patients were single and the majority (68.8%) lived in the 50% most socially deprived areas of Northern Ireland or had no fixed abode. The average length of stay was 53.64 days when those with a stay longer than 1 year were excluded. The most common diagnoses based on ICD10 criteria were Schizophrenia and related disorders, with 159 (50.6%) of cases, affective disorders with 74 (23.6%) of cases, and personality disorders with 31 (9.9%) of cases.

Table 1: Summary of main findings of cohort description of psychiatric inpatients in BHSCT, SEHSCT, SHSCT, WHSCT, n= 314.

Variable	Summary Statistic
Male	n = 167 (53.2%)
Age - Under the age of 45	n = 153 (48.7%)
Marital Status - Single	n = 186 (59.2%)
Length of stay (days) with those >1 year inpatient removed (n=29)	Mean 53.64 days (SD 69.97)
Diagnostic Category (most common)	
Schizophrenia F20-29	n = 159 (50.6%)
Affective Disorders F30-39	n = 74 (23.6%)
Personality Disorders F60-69	n = 31 (9.9%)

Figure 1: Social deprivation category indicated by NISRA multiple deprivation category or being of no fixed abode (NFA), n = 314.



COVID-19 was felt to have contributed to the reason for admission in 83 (26.4%) cases and delayed discharge in 24 (7.6%) cases. The impact, however, ranged depending on the Trust, with the greatest impact on admission having been recorded for the Belfast Trust. The exact cause for these differences is unclear; however, potential reasons may include varying rates of COVID-19 transmission at the time or the variable impact of the pandemic on services across Northern Ireland.

Of the reasons given for COVID-19 impacting on the need for admission, 63.3% were for indirect effects such as loss of support from family, friends and services due to lockdown and financial pressures.

Figure 2: Reasons given for COVID-19 impacting on admission (n = 150 reasons).

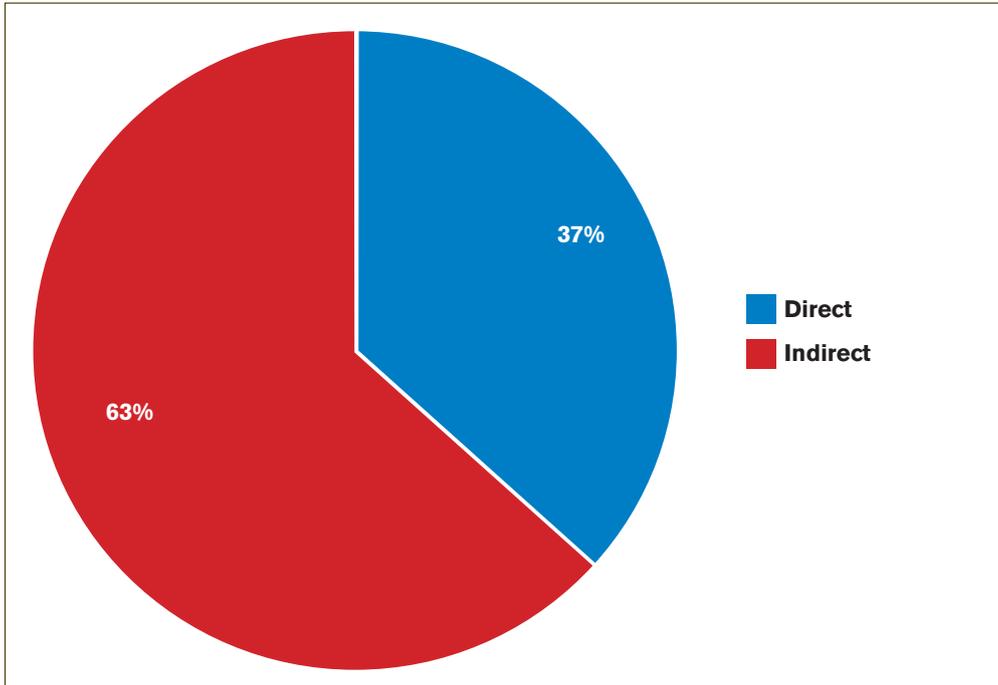
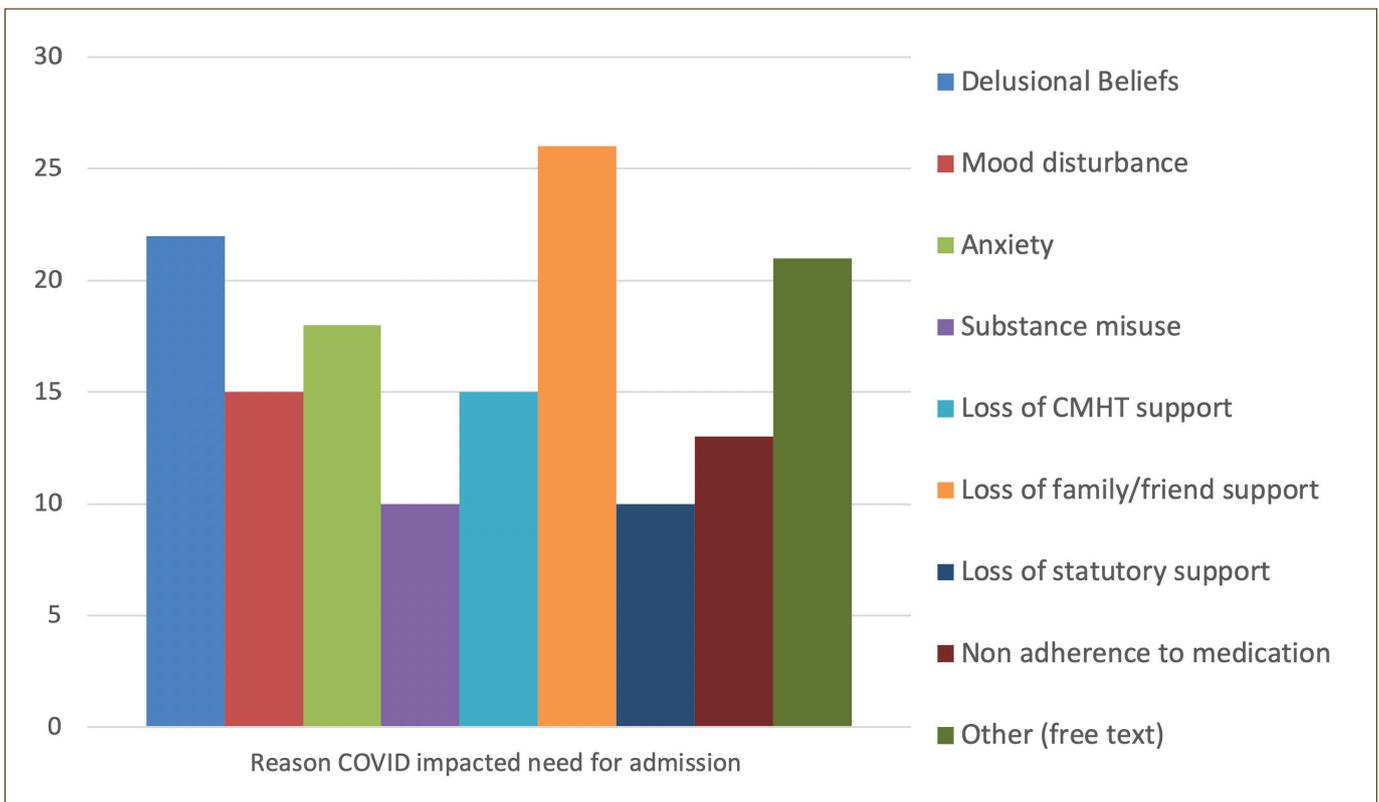


Figure 3: Reasons given for COVID-19 impacting on admission by category (n = 150 reasons).



Patients were 50% less likely to have required admission as a result of the impact of COVID-19 if they were under the care of community mental health teams, and where COVID-19 did impact upon the need for admission, it was 50% more likely that this was the patients' first admission.

Discussion

The COVID-19 pandemic was felt to have contributed to over a quarter of psychiatric inpatient admissions, with a diverse range of direct and indirect mechanisms implicated. Over a quarter of patients admitted either live in areas comprising the 10% most socioeconomically deprived areas in Northern Ireland or had no fixed abode.

Factors indirectly related to COVID-19, such as loss of support from family, friends and services due to lockdown and financial pressures, contributed to a higher proportion of cases than the direct effects of the virus on mental state. Where COVID-19 was felt to have contributed towards admission, it was 50% more likely to be an individual's first admission to a mental health facility.

Although our results relate to a comparatively small proportion of the population in Northern Ireland, the varied and enduring factors contributing to psychiatric inpatients may be generalisable to the wider population. Social isolation and loneliness, alcohol misuse, domestic violence, and unemployment have all been observed during COVID-19 restrictions and serially implicated in the contribution to the development of mental health disorders.⁷⁻¹⁰ This is supported by our finding that COVID-19 was more likely to be associated with those admitted for the first time, than those who had previously been inpatients.

Associations between socioeconomic status and the COVID-19 respiratory illness, mortality and medical admission, have been well documented.¹¹ Our results highlight that social deprivation may also confer a vulnerability towards mental illness and psychiatric inpatient admission. Again, this may be generalised to the wider population, particularly as further economic and social disruption looks set to continue.¹⁰ A focus on prevention and early intervention, with the aim of reducing the likelihood of psychological distress amongst the general population and the development of mental illness should therefore be strongly considered. Targeting socioeconomically deprived groups may confer the greatest benefit.

Perhaps of greater and more immediate concern to health authorities is the effect of COVID-19 on individuals with severe and chronic mental illness.⁵ As well as being more vulnerable to the multiple aforementioned factors affecting the entire population, people with illnesses like schizophrenia and severe depression were often forced to contend with the disruption in long term input from services, including assertive monitoring of their mental health.^{5,10}

Evidence based treatment for schizophrenia, for example, includes assertive community treatment to encourage behavioural activation and intensive case management to monitor for any signs of relapse.⁵ Opportunities may have been lost to intervene early in the course of relapse, perhaps leading not only to increased rates of inpatient admission, but more severe disease at the point of admission.^{9,12}

It may be decades before the full extent of this disruption is understood; repeated relapse is associated with lifelong poorer outcomes in many mental illnesses, and the social and economic burden of treatment of chronic mental illness is significant.^{13,14} Protection and reinforcement of evidence-based early intervention strategies should represent a priority in maintaining the ongoing wellbeing of these vulnerable groups.

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The impact of COVID-19 on the physical activity and sedentary behaviour levels of pregnant women with gestational diabetes

Background

The public health guidance for physical activity (PA) recommends at least 150 minutes of moderate intensity PA weekly for the general population and during pregnancy.¹ In Northern Ireland, it has been estimated that approximately 51% of non-pregnant females meet these guidelines.² Despite the established benefits for mother and baby, levels of PA have been found to fall during pregnancy.^{3,4}

The COVID-19 pandemic has had far-reaching consequences for all areas of society and has significant impacts for pregnant women. A recent review indicates that pregnant women with pre-existing comorbidities, high maternal age, and high body mass index who contract COVID-19 may be more likely to be admitted to an intensive care unit and preterm birth rates are higher in pregnant women with COVID-19 than in pregnant women without the virus.⁵ Pregnant women have also experienced changes in their maternity care, with a reduction in face-to-face appointments and restrictions on who can attend appointments with them.

Women diagnosed with Gestational Diabetes Mellitus (GDM) are likely to have been further impacted with changing care pathways and testing procedures. GDM is a glucose intolerance with onset or first diagnosis during pregnancy.⁶ There is evidence to suggest the need for medication for women with GDM may be reduced through PA and PA can improve blood glucose control.^{7,8} Current National Institute for Health and Care Excellence (NICE) guidelines recommend women diagnosed with GDM are told that possible treatment includes changes in diet, exercise and medication.⁹ Therefore, PA is particularly important for this group of women.

PA levels of the general population are known to have been impacted by COVID-19: for some lockdown has been positive with an increase in time for PA, for others working from home may have increased sedentary behaviour and reduced incidental PA associated with personal transport and general movement throughout the working day.¹⁰ The PA levels of pregnant women are also likely to have been affected, with frequently reported activities in pregnancy such as swimming, pregnancy yoga and Pilates not being possible during lockdown.¹¹

This research aimed to investigate the impact the COVID-19 pandemic had on the PA and sedentary behaviour levels of women with GDM in the UK.

Approach

A UK wide, online survey investigating the PA and sedentary behaviour levels of pregnant women diagnosed with GDM during COVID-19 was circulated through social media channels. Women who had been pregnant during the COVID-19 pandemic and had been diagnosed with GDM; were resident in the UK; were 18 years old or over and could understand written English were invited to participate. The questionnaire included: demographics, individual circumstances (eg living arrangements, access to

space for PA), health and pregnancy, activity levels, sedentary behaviour, worry scores using the Brief Measure of Worry Severity Scale and level of agreement with COM-B statements relating to Capability (I had the ability to be physically active), Opportunity (I had the opportunity to be physically active) and Motivation (It was important to be physically active, I found exercise enjoyable and satisfying, I felt guilty when I don't exercise) both before COVID-19 and during COVID-19.¹²⁻¹⁵

Ethical approval was granted by the Ulster University Nursing and Health Research Ethics Filter Committee on 3 July 2020.

Findings

- 553 responses to the survey.
- Mean age of women was 32 years (SD 4.7), 93% were white, 59% had an undergraduate degree or higher and 62% were multiparous.
- 13% of women were in their first trimester, 57% in their second trimester and 30% in their third trimester.
- 47% of women were meeting the PA guidelines pre-COVID-19.
- 23% met the PA guidelines during COVID-19.
- Women in their first and third trimesters were less likely to meet the PA guidelines during COVID-19 than women in their second trimester (T1 13.1%, T2 28.2%, T3 18.2%, $P=.008$).
- 60% of women reported decreased activity levels during COVID-19, 21% reported no change and 19% reported increased levels.
- The most frequently cited reason for a decline in PA was fear of leaving the house due to COVID-19 (69%).
- Level of education, having fitness equipment at home and knowledge of how to exercise safely in pregnancy were all positively associated with PA levels during COVID-19.
- Women who reported they knew how to exercise safely in pregnancy were 1.8 times (OR 1.80, 95% CI 1.07, 3.02) more likely than those who did not know how to exercise safely in pregnancy to meet the PA guidelines during COVID-19 when controlling for level of education, fitness equipment ownership, space to exercise, key worker status, other children, maternity leave, employment status and working from home.
- 76% of respondents agreed/strongly agreed they would take part in an online exercise class if it was available.
- 92% of the women agreed/strongly agreed it would be useful to receive information on the PA guidelines in pregnancy.
- 79% of the women had increased sedentary time during COVID-19.
- The percentage of women agreeing/strongly agreeing they had the ability to be physically active dropped from 87% before COVID-19 to 59% during COVID-19.
- Reported opportunities to be physically active decreased from 88% before COVID-19 to 51% during COVID-19.
- The mean worry score for the women was 12.15 (SD 6.65, range 0-24), 45% of the women had worry scores classified on the scale as 'dysfunctional' (A score of 12 or above).
- Women with higher worry scores (over 12) were significantly less likely to meet the PA guidelines during COVID-19 than those with lower worry scores (OR 0.58, 95% CI 0.37, 0.92). However, there was no statistically significant association between worry scores and fear of leaving the house.

Figure 1: Percentage of women meeting the PA guidelines before COVID-19 and during COVID-19 by country.

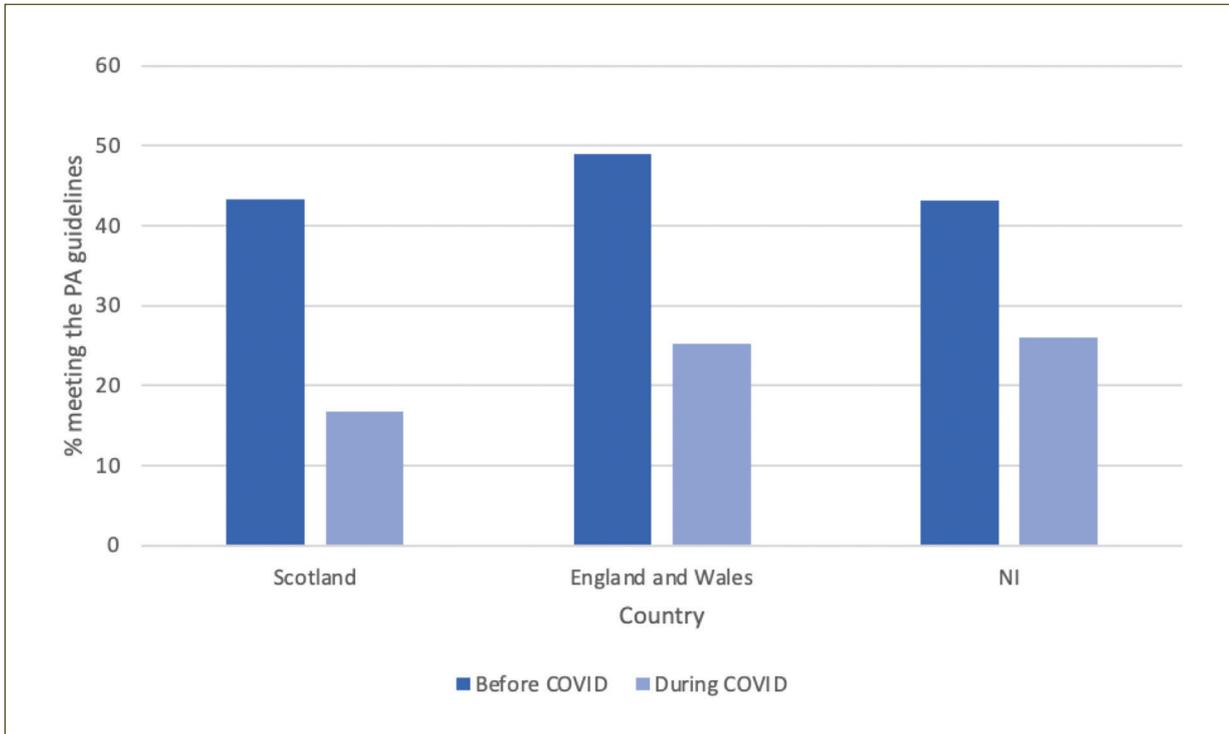
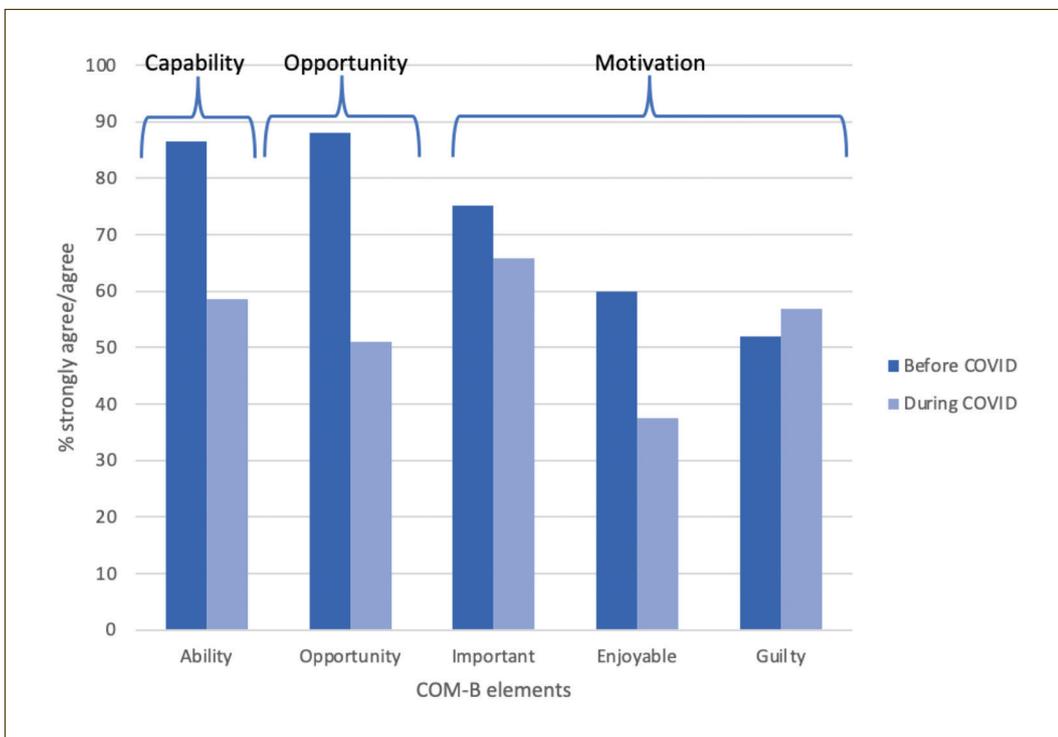


Figure 2: Agreement with COM-B statements before COVID-19 and during COVID-19.



Implications for practice and policy

The findings highlight the need for focused interventions to address the decreased levels of PA and increased sedentary time for women with GDM as a result of the COVID-19 pandemic. The percentage of women meeting the PA guidelines during the COVID-19 pandemic dropped by 50%, with 69% of women who reported decreased PA levels during COVID-19 attributing the decline to fear of leaving the house due to COVID-19. Alternative PA options such as online exercise classes which can be completed in the women's own home need to be made available for this group of women, thus removing the barrier of fear of leaving the house.

Women who reported knowledge of how to exercise safely in pregnancy were 1.8 times more likely than those who did not have this knowledge to meet the PA guidelines during COVID-19. This highlights the importance of women receiving appropriate information on not only the PA guidelines for pregnancy but also examples of suitable and safe exercise they can carry out during pregnancy. While women in Northern Ireland are given 'The Pregnancy book' at their initial appointment which contains information on the PA guidelines, exercise tips, exercise to stop in pregnancy and stretching exercises, more information is required on types of appropriate exercise.¹⁶ For example, a bodyweight exercise circuit which could be carried out at home with little or no equipment would be helpful.

The results of this study show the decline in both women's perceived abilities and opportunities for PA during COVID-19. As the COVID-19 pandemic is likely to remain for some time and face-to-face group exercise classes have been suspended twice to date in Northern Ireland, considerable thought needs to be given to increasing the PA opportunities for this group of women within the current restrictions.

The high level of worry experienced by this group of women is also cause for concern. Antenatal anxiety scores are associated with a greater risk of postnatal depression and women diagnosed with GDM are already at greater risk from postnatal depression.^{17,18} Evidence suggests physical activity in pregnancy can reduce the risk of both antenatal depression and postnatal depressive symptoms.^{19,20}

Conclusion

Action needs to be taken to reduce the decline in PA seen by the women in this study. PA in pregnancy with GDM has been found to have a number of positive benefits. A systematic literature review found that women who exercised were 47% less likely to need insulin compared to those in the control groups (OR 0.53, 95% CI 0.29, 0.97, P=0.04).⁷ It has also been found that women who use insulin during pregnancy are at higher risk for large for gestational age (LGA) infants (28.5% vs 13.1%, p<0.001) and caesarean sections (44.1% Vs 27.0%, p=0.001).²¹ PA has also been associated with lower birth weights and there is a lower risk of macrosomia in newborns of mothers who exercised during pregnancy.^{22,23}

Women need to be fully informed that PA in pregnancy is not only safe but also beneficial. They need to be shown ways to be active from their own home and encouraged to remain active. Providing women with suitable examples of exercise routines and access to online exercise classes delivered by an instructor qualified in prenatal exercise are possible solutions to reduce the decline in PA during the COVID-19 pandemic and associated lockdown periods.

Recommendations are provided for policy makers, midwives and health service providers to assist them in understanding how best to support pregnant women with GDM through a second wave of COVID-19 or future lockdowns.

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A scoping study into excess mortality, and its relevance in Northern Ireland

Background

As COVID-19 has spread globally, reported increases in mortality have exceeded those attributed to COVID-19. The range and variety of statistics and reporting data used make it increasingly challenging to compare countries or regions, and to gauge the true impact of the pandemic. As of 10 November 2020, the number of deaths from coronavirus globally was reported by Johns Hopkins University (JHU) as 1,267,780.¹ This number of deaths includes only those reported as COVID-19, whereas many more deaths may be occurring as a result of the pandemic; this is known as excess mortality, referring to any death above the level normally expected, based on the non-crisis mortality rate.² Excess mortality can therefore be applied to the COVID-19 pandemic to establish its wider impact. It is usually calculated using the average mortality statistics from that country in the preceding five years and the equation:

$$\text{Excess Deaths} = \text{Observed Deaths} - \text{Average number of deaths under normal conditions}^2$$

This is a particularly complex situation in which data is being generated. Statistics are dependent on the way that COVID-19 cases are defined and on testing strategies employed. Docherty and colleagues established that whilst there has been an overall increase in morbidity and mortality, this is not fully accounted for by mortality recognised as COVID-19.³ The remainder of this excess mortality, they suggest, may be attributed to unrecognised COVID-19, an increase in deaths from other causes, or a combination of these two factors.³ Consideration of each of these factors in turn is therefore necessary to give a clearer idea of the pandemic's overall impact.

Approach

This scoping study used the six step scoping study framework developed by Arksey and O'Malley.⁴ Thorough searches were conducted to identify the combination of published and grey literature which was utilised in this study. The source cut-off was 8 July 2020, encompassing the 'first wave' of the pandemic.

Findings

When examining the extent of excess mortality internationally, sources vary in their presentation of this data; whilst it may be a more comparable figure, this is only of use if presented as a percentage mortality change, as opposed to raw numbers of excess deaths, which will ultimately be skewed by population size. Considering Northern Ireland, 885 excess deaths were reported from March to June, 17.4% greater than expected, with most (556) of these occurring at home, including only 44 COVID-19 deaths at home, and fewer than expected deaths occurring in hospitals.⁵ Comparing the four nations of the UK, England had the highest peak in excess deaths, quantified in terms of age-standardised mortality rate, at 107.6% in week 16; Scotland's peak was 71.7% during Week 15, followed by Wales' peak of 68.7% in Week 16; the Northern Ireland peak was 48.2% in Week 17.⁶ Evidently the excess mortality varies according to the area of the UK and time period in question.

Testing strategies vary greatly by both time and place. In the UK, changes have been made dictating the available testing capacity, eligibility and availability.^{7,8} With so many changes to the testing strategy,

any temporal comparison of case numbers and subsequent COVID-recognised deaths could be highly inaccurate. Globally, variations in testing strategies, intentional under-reporting of cases and test specificity and sensitivity represent statistical issues. These variations contribute to inaccuracies and a lack of comparability across statistics including reported cases, COVID-19 deaths and case fatality rate.

The COVID-19 pandemic has affected all aspects of life, through both healthcare access and pandemic mitigation measures. A significant multifactorial impact has been felt on supply and demand of cancer services, which may increase 12-month mortality of newly diagnosed cancers by 20% in England.⁹ More broadly, unemployment has previously been linked to all-cause cancer mortality, and much cancer research has been put on hold.^{10,11} Acute coronary syndromes (ACS) have been directly impacted, with decreased demand and ACS hospital admissions reduced by up to 75% in areas of the UK most impacted by COVID-19.¹² Lockdown policies and other mitigation measures meanwhile may increase suicide rates, elderly frailty and domestic violence.¹³⁻¹⁵ Evidently each of these aspects contribute to the pandemic's overall impact but are not encompassed by statistics such as the case fatality rate (CFR) or reported COVID-19 deaths, highlighting the usefulness of excess mortality as a statistic.

Discussion

Whilst it is evident that excess mortality overcomes variation and discrepancies in testing strategies, it is important to note that it is not impacted by differing variations of COVID-19 deaths which are used globally. The WHO definition is:

*"A death resulting from a clinically compatible illness in a probable or confirmed COVID-19 case, unless there is a clear alternative cause of death that cannot be related to COVID disease (eg trauma). There should be no period of complete recovery between the illness and death."*¹⁶

This definition is the international standard but is not adopted consistently, and even within the UK there are definitive differences.¹⁷ The use of excess mortality therefore overcomes such an issue.

However, excess mortality should not be considered infallible. In calculating excess mortality in England and Wales, using 2019 alone as a baseline rather than a 5 year 2015-19 average results in an 8% increase in what is considered to be 'excess' mortality, reflecting the influence differing baseline calculations may have on the resulting statistics.¹⁸ Excess mortality also requires a defined time period for mortality; whilst we can look exclusively at the 'first wave' for instance, this does not encompass the deaths which may continue to be caused in the coming months, such as due to delayed cancer diagnoses as discussed.

Evidently, excess mortality is an important tool in determining the impact of the COVID-19 pandemic. However, its ability to gauge the broad impacts limits its usefulness in determining the causes of specific mortality. Some reports suggest that excess mortality is proportionately greater in the older population, and so age-standardised data may be important to determine if this is the case, and to aid comparability between regions and countries.¹⁹ In order to prevent further excess mortality, its causes must be established, and so even if it is determined to be important, it must be used alongside other statistics, such as reported COVID-19 deaths, rather than as a standalone figure. Excess mortality's application to non-COVID deaths may also be applicable in the determination of appropriate mitigation measures, to limit the detrimental effects of these.

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COVID-19 UK Health and Social Care Workforce Wellbeing and Coping Study: Phase 1 May-July 2020

Background

In December 2019, a novel coronavirus emerged (COVID-19) which was quickly designated a pandemic with all countries urged to take 'urgent and aggressive action'.¹ Worldwide social and economic disruption for governments and their citizens followed with a rising death toll and efforts to prepare, protect and treat citizens impacting across all sectors in society. While it was clear that trying to fight this pandemic is everybody's business, the task of caring for affected individuals and their families in the UK has fallen to an already greatly pressured, understaffed and underfunded health and social care sector, and those who work within it.¹

Approach

The aim of this research was to explore the impact of providing health and social care during a pandemic on the UK health and social care workforce. A survey questionnaire measured wellbeing, quality of working life, and ways of coping whilst working during the pandemic. Work and home life segmentation was also explored. Additional open-ended questions sought further detail from respondents on how the pandemic had affected their work and work setting, what employers had done to support their staff, lessons that could be learned for future pandemics and 'normal' health and social care provision. The perceptions of health and social care workers about the 'Clap for Carers' initiative were also garnered.

In April 2020, funding was secured from Northern Ireland Social Care Council (NI SCC) and the Southern Health and Social Care Trust to support the dissemination of the first of three online surveys to nurses, midwives, allied health professionals (AHPs), social care workers and social workers in the UK. The remainder of the research has been funded by the Health and Social Care Board (Northern Ireland) with contributions from England's National Institute for Health Research (NIHR) Policy Research Unit in Health and Social Care Workforce.

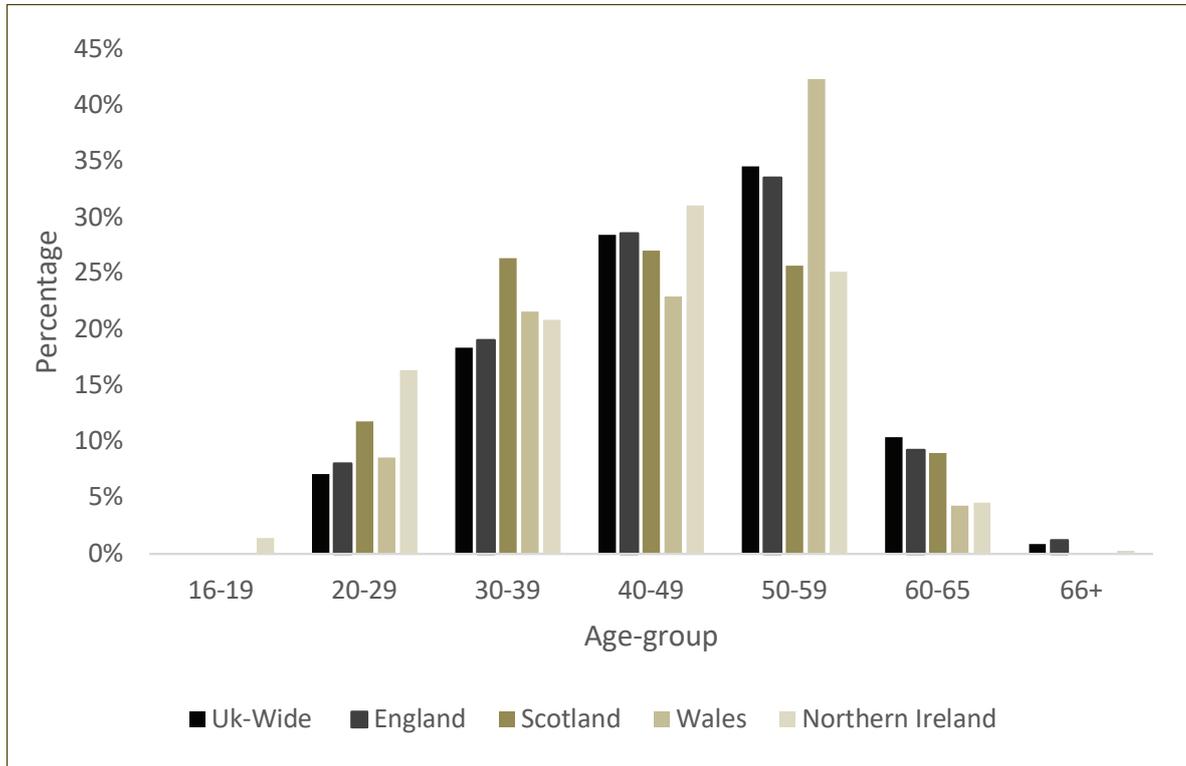
Key findings

Respondents' profiles

The survey received 3,290 responses; of the responses 1,897 were from Northern Ireland, 1,062 were from England, 146 were from Scotland and 185 were from Wales. Most of the sample were social workers (1,282) and social care workers (1,245), followed by AHPs (388), nurses (199) and midwives (190). The difference between the country responses rates and professional occupational rates are explained by some respondents not indicating which country they were from.

In line with OECD 2020 figure on the over-representation of women in the health and social care workforce, most of the respondents were female across all professions, and all midwives were female.² Respondents were mainly in the 30-59 age bracket. The fewest number of respondents were aged 16-19 or over 60 years.

Figure 1: Age of respondents by country.



Almost one quarter (24.1%) of the respondents worked with older people. These were mainly based in Scotland, however nearly a third of respondents from Northern Ireland worked with older people. Very few (0.5%) respondents reported that they had come out of retirement to support the workforce during the COVID-19 pandemic. Most respondents were employed on a permanent basis although Northern Ireland had the largest proportion of agency (temporary or locum) staff at 6.2%, while Wales had the lowest level of agency workers at 0.5%. Scotland had the highest number of part-time workers, making up just under one third (31.2%). Midwives were most likely to be employed part-time compared to other professionals. Most respondents worked full-time, typically 37.5 hours per week. Respondents in Northern Ireland worked the highest number of hours' overtime. Nurses and social care workers worked the most overtime.

Wellbeing

Wellbeing was measured using the Short Warwick-Edinburgh Mental Wellbeing Scale (SWEMWBS).^{3,4} Seven statements are presented, each referring to a positive state of mind (eg "I have been feeling relaxed") and respondents are asked to check a box along a five-point scale to indicate how often in the past two weeks this statement reflects their experience (eg 'Rarely', or 'All of the Time'). These five-point responses can then be summed. Scores of 7-17 signify likely cases of either depression or anxiety, while 18-20 indicates possible cases of depression or.⁴ A small number (9%) of survey respondents registered in the likely range, while a further 33% fell in the possible range. The overall average score in our population was almost two points below published population averages. This, along with the cumulative 42% of respondents at sub-20 scores (compared to around 17% in the general population), suggests that our sample had considerably lower wellbeing than the general population. For example, a population mean for wellbeing using the Short Warwick-Edinburgh Mental Wellbeing Scale was found to be 23.61.⁵

The overall mean wellbeing scores were slightly higher for the Northern Ireland sample than UK wide. There was a significant difference in mean total wellbeing scores across countries but no significant difference in mean total wellbeing scores across occupations.

Table 1: Total wellbeing score by occupation.

Occupation	Mean Wellbeing Score
Nursing	21.15
Midwifery	20.91
Allied Health Professional	21.51
Social Care Worker	21.14
Social Worker	21.14

Table 2: Wellbeing scores by country.

Wellbeing Item	UK-Wide	England	Scotland	Wales	NI
I've been feeling optimistic about the future	3.11	3.18	2.95	3.22	3.27
I've been feeling useful	3.43	3.50	3.38	3.40	3.56
I've been feeling relaxed	2.77	2.81	2.64	2.87	2.76
I've been dealing with problems well	3.38	3.40	3.42	3.50	3.47
I've been thinking clearly	3.46	3.48	3.54	3.51	3.57
I've been feeling close to other people	3.08	3.12	3.12	3.16	3.24
I've been able to make up my mind about things	3.53	3.55	3.55	3.53	3.69
Overall mean Wellbeing Score	20.95	21.15	20.74	21.25	21.61

Multiple regression modelling was used to examine the coping factors that predict mental wellbeing (SWEMWBS) scores whilst controlling for various demographic variables (age, gender, ethnicity, disability), as well as country of work, occupational group and number of sick day absences in the previous 12 months.^{7,8}

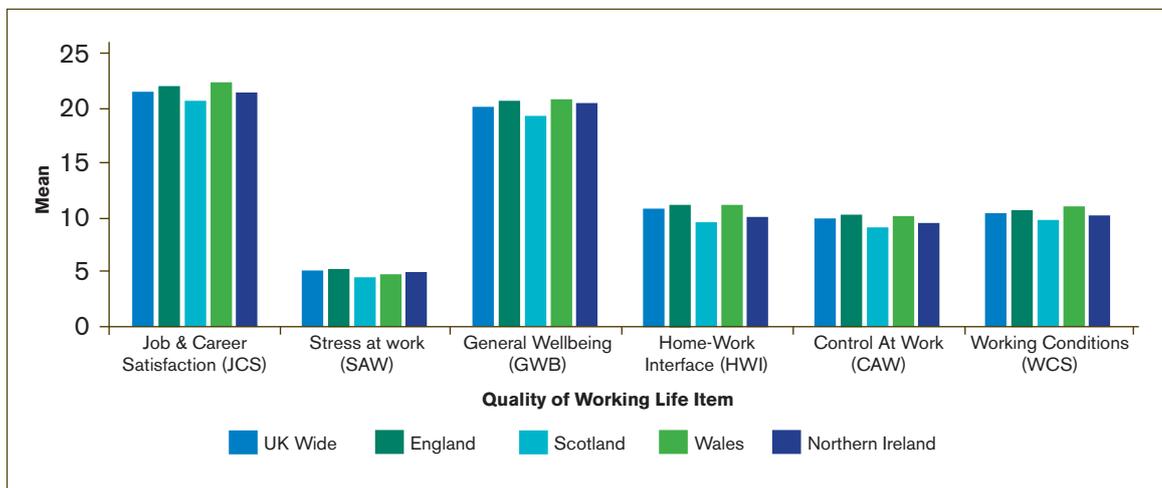
The results indicated that the model accounted for approximately 34% of the variance in mental wellbeing scores. The following coping variables each uniquely predicted higher wellbeing scores, namely, use of Active Coping, Emotional Support, Work Family Segmentation, Relaxation and Exercise. Lower wellbeing scores were associated with more negative coping strategies. No group differences emerged in terms of age, disability or ethnicity but males reported higher scores than females. Preparedness for re-deployment was added to the model but was not significantly associated with changes in mental wellbeing scores.

Work Related Quality of Working Life

The day to day quality of working life was captured in qualitative responses and by the Work-Related Quality of Life (WRQoL) scale results.⁶ The questions give an in-depth picture of working life, examining the following key aspects. Control at Work assesses whether respondents feel they are involved in key decisions (eg “I feel able to voice opinions and influence changes in my area of work”); Job Career Satisfaction (JCS) looks at whether organisations provide a roadmap and direction of travel for employees, as opposed to firefighting each problem as it arises (eg “I have a clear set of goals and aims to enable me to do my job”); Stress at Work (SAW) asks for responses to statements such as “I often feel under pressure at work”; Working Conditions (WCS) asks about the safety and appropriateness of the work environment; and Home-Work Interface concerns the organization’s active efforts to understand and adjust for pressures outside of work (eg “My employer provides adequate facilities and flexibility for me to fit work in around my family life”). All statements are responded to on a 5-point scale from Strongly Agree to Strongly Disagree, and can be aggregated to six discrete measures or one composite measure.

There were significant differences in all the quality of working life areas across countries. Respondents in England scored highest in Stress at Work, whilst those in Wales scored highest in Job and Career Satisfaction, General Wellbeing, and Working Conditions. Respondents from Scotland scored lowest for all quality of working life items. The highest total score for quality of working life was in Wales (83.94). The Stress at Work responses were reverse scored for consistency with the other WRQoL scales so that a high score on this domain implies lower stress.

Figure 2: Quality of working life scores by country.



We explored levels of quality of working life by country, lower, average and high scores across percentages of respondents who scored across these levels. UK wide levels of quality of working life were in the higher category and England had the highest level of respondents reporting higher quality of work life, followed by Wales and then Northern Ireland. More respondents from Northern Ireland and Scotland reported a lower level of quality of working life than those from England. There were significant gender differences across all the quality of working life domains with males reporting a significantly higher total quality of working life score than females.

Multiple regression modelling was used to examine how coping factors predict Work Related Quality of Life (WRQoL) scores whilst controlling for various demographic variables (age, gender, ethnicity, disability), as well as country of work, occupational group and number of sick day absences in the previous 12 months.^{7,8}

The results indicated that the model accounted for approximately 25% of the variance in WRQoL scores. The following variables each uniquely predicted higher WRQoL scores, namely, use of Active Coping, Emotional Support, Work Family Segmentation, Family Work Segmentation and Relaxation. Lower WRQoL scores were associated with more negative coping strategies and higher Family Work Segmentation. No differences were evident in relation to age, occupational group or gender but those with a disability recorded lower WRQoL scores on average. The number of days absent due to sickness in the previous 12 months was associated with lower WRQoL scores. Adding the experience of re-deployment to the model showed that those who felt prepared for re-deployment tended to report higher WRQoL scores than those who felt unprepared or unsure.

Limitations and strengths

This cross-sectional survey was based on a convenience sample of health and social care workers and therefore the results cannot be interpreted as a representative sample. Furthermore, there is not an even distribution of responses across the four UK countries nor across work settings and types, so the results cannot be considered representative across countries or occupational groups. The strength of this study is that it covered different parts of the UK enabling comparison and that frontline workers (other than medical practitioners and psychologists) responded; similarly, we were able to hear from respondents working in the NHS and in different providers of social care. Lastly, we have a range of free-text statements from respondents and these provide some valuable personal accounts of experiences.

Discussion

The findings reflect comparison opportunities between disciplines and countries and an opportunity for good practice guidelines to be co-produced with frontline workers and managers. These could help inform employers of ways to enhance working conditions that promote staff wellbeing and to identify areas of working life that require immediate attention. The findings also provide insights into the coping mechanisms and positive and negative strategies the workforce have used to manage workplace and outside life demands. In particular, the regression analysis indicates that improving quality of working life and wellbeing is dependent on the workforce drawing on more positive coping strategies. This reinforces the importance of employers providing health and social care workers with the knowledge, support and guidance about effective coping strategies. The regression analysis also shows that lower quality of working life is associated with higher family work segmentation, indicating that employers could help improve family-work segmentation by recognising, accepting and helping the workforce address family-related issues. The qualitative comments from respondents indicate that during the pandemic, family related issues became a more prevalent concern.

Furthermore, in thinking about Northern Ireland specifically, our findings are two-fold. First, despite the considerable differences in health and social care services between Northern Ireland and other countries there were many commonalities of experience. Work is needed across the UK to assist the small numbers (9%) of our respondents registered in the likely range of experiencing anxiety and/or

depression, while a further third fell in the possible range. This presents current but also longer-term challenges for employers (and society). Our data suggest that our sample had considerably lower wellbeing than the general population. Efforts are needed to address this stark finding.

However, there were some differences between countries; we found that overall mean wellbeing scores were slightly higher for the Northern Ireland sample than UK wide. The reasons for this need to be explored and responses need to be developed and evaluated. Public health colleagues could assist here through the exercise of their skills and use of their data and networks. Free-text responses to seven questions were analysed and identified three overarching themes: 'Changing Conditions', 'Connections' and 'Communication'. These themes and the overall findings have informed a number of recommendations for good practice which can be found in the full report.

Conclusion

We have reported some of the findings of this large study and directed some of our discussion and recommendations to public health communities. We plan further surveys and would be pleased to hear from anyone with ideas to assist in publicising, content development and taking forward our recommendations. We thank our survey respondents whole-heartedly and our funders.

The full report can be found at: https://ulster-my.sharepoint.com/:b:/g/personal/j_ross_ulster_ac_uk1/EXkLPuiM-VFMoGQwtXFlzjwBTfBJYNguHky0BdXq-XsY9A?e=gTcbut or by emailing the corresponding authors.

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An analysis of caller behaviour to a crisis helpline during the COVID-19 pandemic

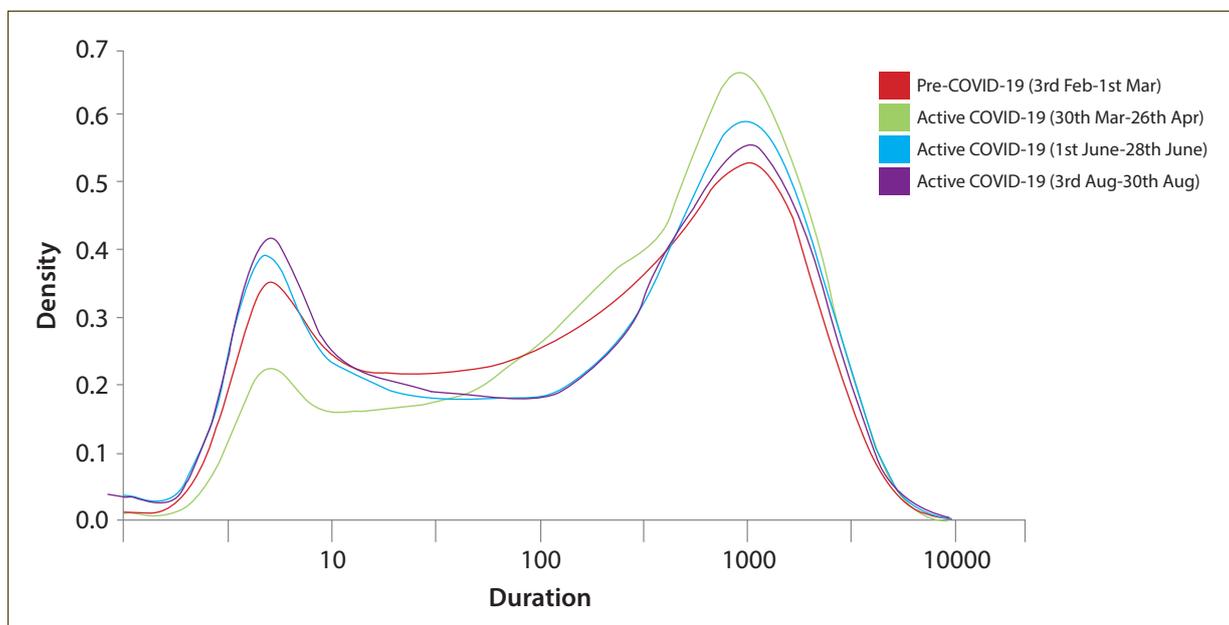
Background

There is growing concern about the impact that the COVID-19 pandemic may have on population mental health. Data indicates that levels of distress have increased due to the pandemic. People living with mental illness may be impacted most as face-to-face support groups have been disrupted due to the lockdown restrictions, leading to a reliance on remote services such as crisis helplines. The objective was to determine whether telephony data could reveal the impact of the COVID-19 pandemic on callers to Samaritans Ireland.

Methods

This study presents an analysis of anonymous call log data from Samaritans Ireland over four periods lasting four weeks each; one period before the first confirmed case in Ireland (Pre-COVID-19; 3 February–1 March 2020) and three other periods after the introduction of the lockdown restrictions; a first Active COVID-19 period (30 March–26 April 2020), a second Active COVID-19 period (1 June–28 June 2020) and a third Active COVID-19 period (3 August–30 August 2020). Statistical analysis was conducted to explore any differences in duration of calls across all four periods. Clustering was performed to determine the caller archetypes that contact the helpline based on their usage patterns and whether this changed across the four periods.

Figure 1: Pre vs Active COVID-19 call duration (answered calls only; log10 scale).



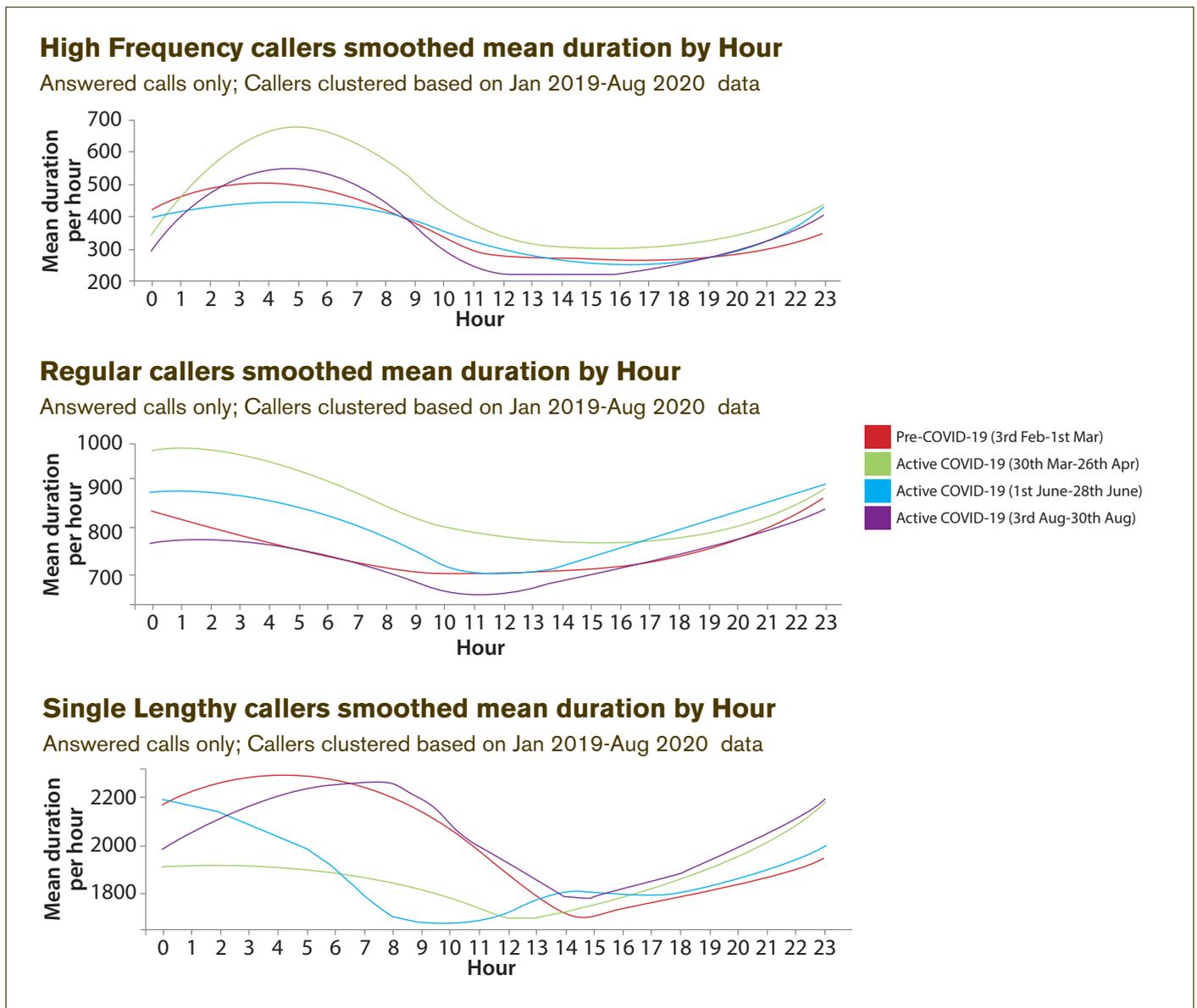
Results

The incidence of longer emotional support calls (30 minutes or more) increased dramatically in the first Active COVID-19 period from the Pre-COVID-19 period, reflecting higher levels of support being sought. This trend towards longer calls decreased across the later Active COVID-19 periods towards the Pre-COVID-19 period norm.

Five caller types were discovered (high frequency, regular, single lengthy, typical and unpredictable) and each showed differences in the time of day in which they made calls and their distribution of call duration across all periods. Apart from the 'unpredictable' callers, each other caller archetype tended to make longer calls to the service from Pre to Active COVID-19 periods. This change is more profound in the earlier hours of the morning, particularly between 1am-6am.

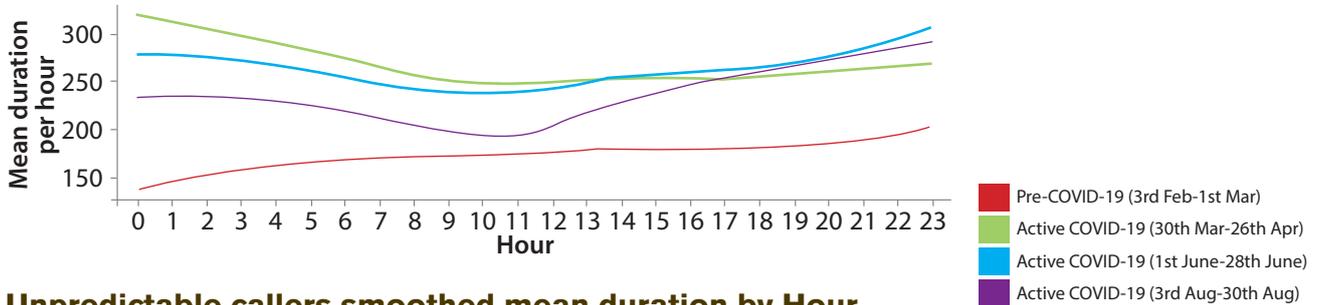
Overall, significant differences were noticed between the Pre-COVID-19 period and the first Active COVID-19 period. The behaviours observed in the later Active COVID-19 periods trended towards that of a Pre-COVID-19 norm.

Figure 2: Smoothed mean duration by hour for five types of caller



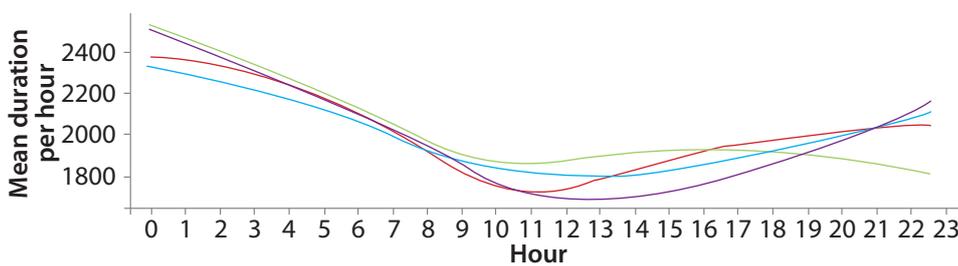
Typical callers smoothed mean duration by Hour

Answered calls only; Callers clustered based on Jan 2019-Aug 2020 data



Unpredictable callers smoothed mean duration by Hour

Answered calls only; Callers clustered based on Jan 2019-Aug 2020 data



Conclusions

Compared to the Pre-COVID-19 period, fewer calls of up to 5 minutes and more calls of 30+ minutes were made proportionally during the Active COVID-19 periods. The changes were most pronounced during the hours of 1am to 6am. The changes between the Pre and Active periods suggest the impact of removing existing mental health supports and reported increasing distress amongst most ‘at risk’ groups, but indicate that the impact was not the same on all caller archetypes. The trend back to the Pre-COVID-19 norm in call behaviour either suggests a relationship between ‘loosening’ of lockdown restrictions and levels of distress, or indicates hedonic adaptation amongst callers to the service.

Discussion

The findings highlight that telephony data can be used to measure the effect of an external event on society in real-time; in this case, the impact of COVID-19 on a national crisis helpline service. The results indicate that the introduction of the lockdown restrictions created a societal impact on the population. The findings indicate the possibility of using this approach as a real-time technique to help inform government policy.

Note

*This work is published in JMIR Mental Health. For more information on caller archetypes discovered in this work, see: “Behavior of Callers to a Crisis Helpline Before and During the COVID-19 Pandemic: Quantitative Data Analysis” <https://mental.jmir.org/2020/11/e22984>

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Humans and machines collective intelligence for COVID-19 evidence: COVIDCare NI use case

Background

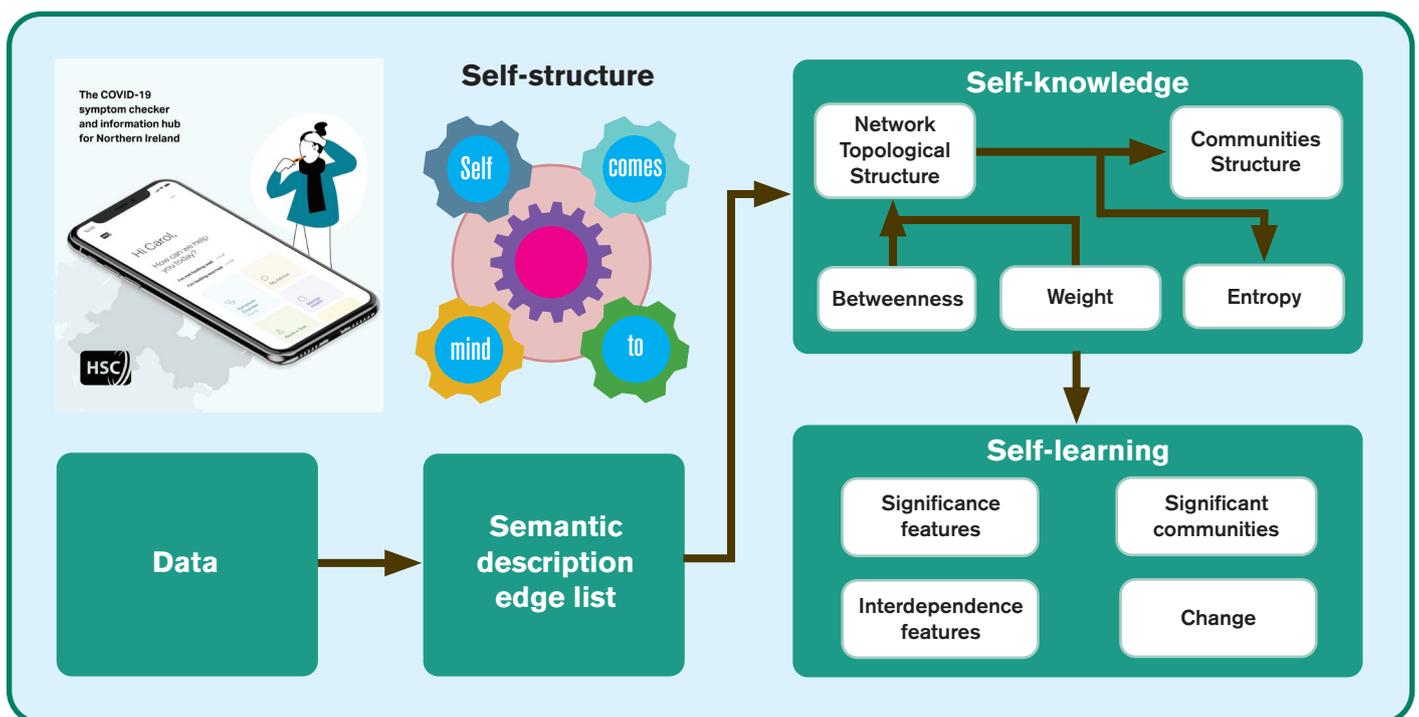
No-one expected that responding to a pandemic crisis would be easy but having the right data in the right moment is crucial, and in particular, evidence on its severity and progression is paramount. Generating and accessing data on self-reported symptoms on an app across Northern Ireland, alongside the symptoms' severity and COVID test results, has offered an opportunity to develop an artificial intelligence (AI) self-learning approach, bringing to bear a form of human-machine collective intelligence.

We found that the severity of symptoms reported by app users is high and significantly related to the progression in the numbers of confirmed cases. This could be used to develop a real-time alert system to provide evidence on the disease progression and therefore assist crisis management and contact tracing interventions, especially in areas where access to testing is difficult. Such a system could make policy-making more agile in early stages of local epidemic growth and allow the use of testing and contact tracing in a more personalised way.

Approach

In this research we have adopted an AI self-learning approach for developing networks of significant and interdependent knowledge from where to infer decision making (Figure 1).^{1,2}

Figure 1: AI self-learning architecture.



The result is a network of nodes (bigger nodes represent higher significance) with colours representing communities and lines (thicker lines represent a more relevant interaction between nodes) that can be interpreted by nonexperts in mathematics or statistics (as happens in more complex representations) and support a near real-time visualisation and attention structure for COVID-19 analysis.³⁻⁷

Findings

Self-organising communities emerged from the AI self-learning (with a deviation from 2 to 4) in each of the days with DBREATHING_Yes as the more significant symptom in the period of analysis. The type of structural knowledge extracted is described in Figure 2 with results for 31 May 2020. Sometimes this variable would integrate the broader range of symptoms as described in Figure 2 and other times would be mostly associated with the fever.

Figure 2: The knowledge structure extracted from the self-reported data on the COVIDCare NI app on 31 May 2020 using self-supervised machine learning. Community 3 is the more relevant and integrates COVID-19 related symptoms.

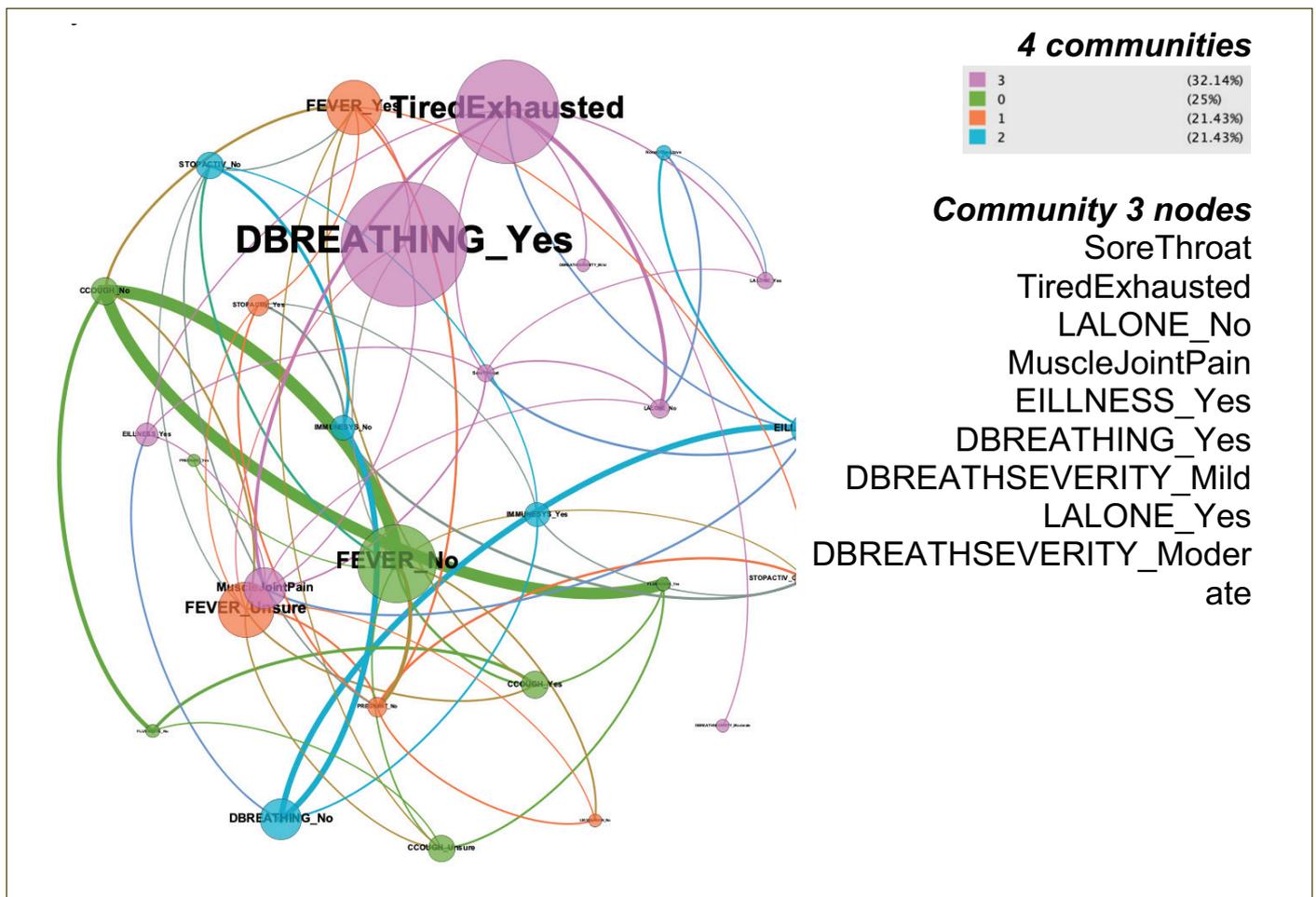
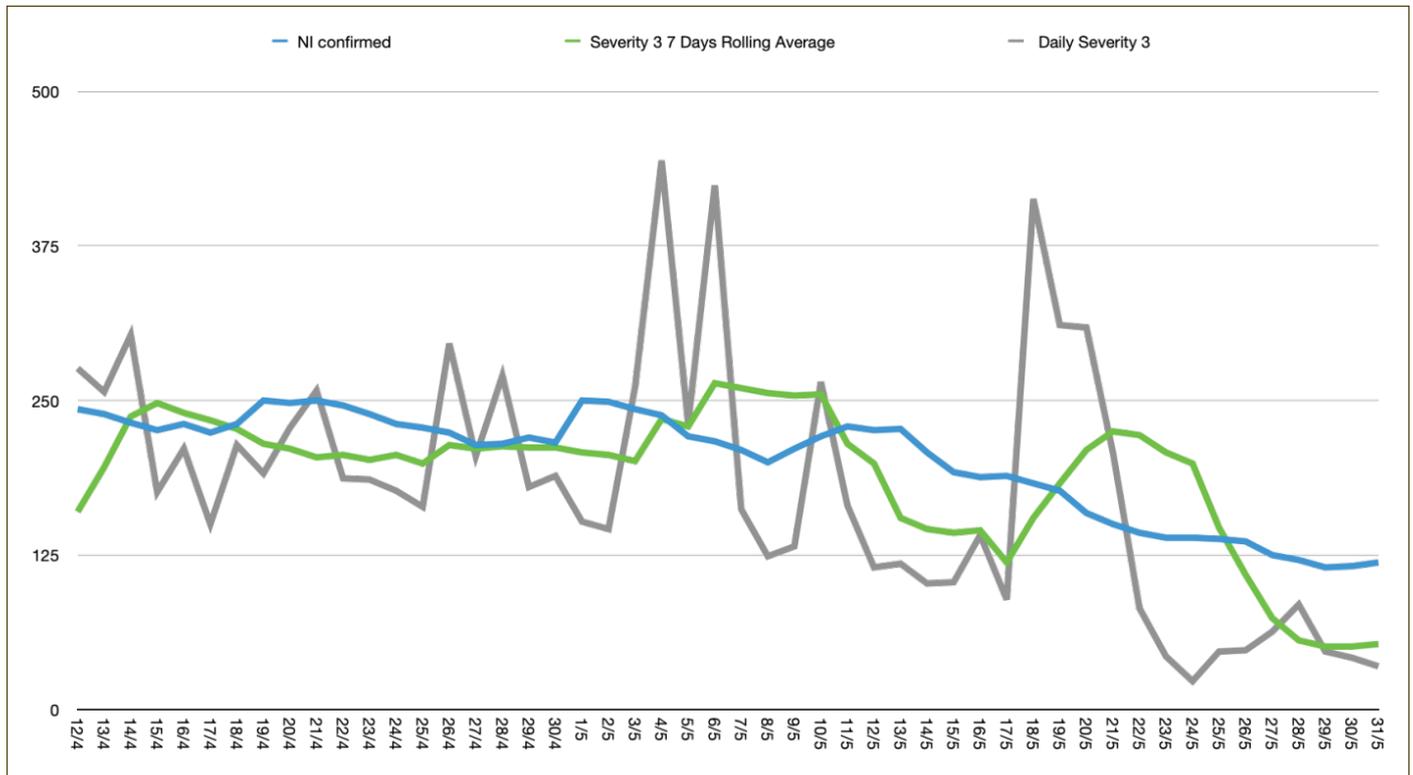


Figure 2 shows that CCOUGH_No and FEVER_NO are significantly interdependent with a quantified weight of 66 and FLUVACCINE_YES and CCOUGH_No also significantly interdependent with a quantified weight of 62. It was also observed that one of the communities regularly integrates more severe symptoms (in this case community 3) which is consistent with other studies.^{8,9}

Figure 3 shows that the rolling average of that community closely relates with the daily reported positive cases.

Figure 3: Evolution of NI positive reported cases and its relation with daily severity and a 7 day rolling average obtained from the multiplication of the community with the symptoms related with severity 3 and the number of app updates.



Discussion

Now that policy makers' central concern is how to balance the reopening of the economy with the management of the epidemic, the ability to extract the maximum knowledge and evidence on COVID's course in the community from self-reported symptoms could be a fundamental companion to the formal laboratory testing.

The methods and models described here can be particularly valuable in situations where little laboratory infrastructure exists, when access to or resources in the health economy are limited for the population, and when more specific local intervention is needed.

Conclusion

We have shown that with AI self-learning we can leverage the collective intelligence of the population who report symptoms, and this can contribute to decision making and an efficiency increase on the pandemic response at a personalised scale.⁸

Acknowledgements

This work uses non-identifiable data provided through use of the COVIDCare NI app (formerly known as COVID-19 NI). The app was produced on behalf of the Department of Health by Digital Health and Care Northern Ireland, working in partnership with commercial partners Civica and BigMotive. We wish to acknowledge the access granted to the non-identifiable data, which led to this output.

Further information



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Exploring the facilitators and barriers to following COVID-19 guidelines on social distancing among young people in Northern Ireland and Republic of Ireland

COVID-19 has rapidly changed people's lifestyles worldwide, and one of the most dramatic effects has been the need to social distance from others. Young people may experience social distancing guidelines as particularly challenging because of their developmental stage and lifestyles, which are typically centred on peers and relationship building. Young people have been socialising more as public health restrictions have eased, so there is a need to understand how young people can be supported in socialising in a safe way. An online survey by the PHA Behaviour Change Group explored the facilitators (enabling/motivating factors) and barriers (personal and environmental/social obstacles) to young people practising social distancing.¹ Young people aged 16-25 years from Northern Ireland and the Republic of Ireland were recruited between July and August 2020. The survey closed on 24 August 2020 prior to school/university restarts. Survey items were guided by the COM-B model and Theoretical Domains framework.^{2,3}

Key findings

Four hundred and seventy-seven valid responses were collected. Most respondents were aged 19-22, were students, and were living at home at the time of data collection. The majority of respondents reported minimal exposure to COVID-19. In general, young people demonstrated that they have a good understanding of what social distancing means and how it should be practised. The findings suggest that many young people play an active role in reducing transmission through social distancing; with approximately half practising this when spending time with family and friends outside their household. However, a significant proportion engage in social distancing half the time or less often.

Most young people believe that the actions they take can help control COVID-19 transmission and the majority are willing to wear a facemask when social distancing is less manageable. However, young people find it difficult to social distance for several reasons. Many young people felt that being restricted in places to go and things to do made social distancing more difficult. While the majority of young people reported that they would distance even when friends did not distance, a large proportion were influenced by their peers. Many young people (<60%) also find it hard to remember to distance while with friends or family outside their household.

Nine in ten young people reported feeling worried about a loved one contracting COVID-19 and the majority of young people were aware of the risks to them and others where social distancing is not practised. Young people commonly reported feeling lonely, restricted, weird, and worried because of social distancing measures; however, a substantial proportion of young people still feel that it is a behaviour that they ought to be engaging in; which may relate to perception of personal risk and worries about family/close others' contracting COVID-19.

Implications

The findings of the report bear relevance for prospective strategies to encourage transmission preventative behaviour in young people. With a better understanding of the factors that hinder or support social distancing, public health agencies are in a better place to develop targeted interventions and health messages. Qualitative analysis is underway which will elucidate some of the barriers/support to social distancing among this important demographic group.

The full report on the survey findings is available at: <https://research.hscni.net/report>

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Remote consultation for the mental health care of older people in care homes

Background

COVID-19 has produced significant disruption to the provision of mental health care services globally.¹ The effects of this may have been most pronounced among nursing home residents, who in addition to being vulnerable to the respiratory effects of COVID-19, have also faced the social isolation brought about by restrictions on visitors.²

Nursing homes have adopted strategies, such as restricting the use of communal areas, as a means of preventing cross-contamination. However, these measures have compromised the non-pharmacological mainstays of management of two of the most common presentations to both general practice and Psychiatry of Old Age services; delirium, and the behavioural and psychological symptoms of dementia (BPSD). Medical input, at a time when their visits are restricted, has therefore seen an increase in both demand and importance.²

COVID-19 has reawakened discussion surrounding the use of telemedicine in many areas of routine clinical practice and the remote care of people with dementia has been the subject of numerous studies.^{3,4} These have reported telemedicine to be both valid and acceptable to patients and care home staff when used for the dementia diagnosis and the management of BPSD.⁴ However, remote consultation has not thus far been adopted in routine NHS practice.⁵

Approach

We therefore aimed to determine nursing homes' capacity and enthusiasm for telepsychiatry assessments. Over a two-week period in June 2020, we contacted senior staff at the 70 nursing and "Elderly Mentally Infirm" (EMI) homes falling within the Belfast Health and Social Care catchment area and administered a short survey via telephone. Two questions; "how would you rate your facilities' current capacity to participate in mental health assessments via video link?" and "how interested would you be in establishing the capacity to participate in mental health assessments via video link?", were answered using a 5-point Likert scale.

Results

Participating nursing homes (56 out of 70; 80%) reported that reliable WiFi connections and appropriate equipment (such as a tablet device, or desktop or laptop computer with webcam) were available in 41 out of 56 (73%) and 40 out of 56 (72%) facilities. Staff at 21 out of 56 (38%) reported that they already felt they had the capacity to facilitate such consultations (answering "5" on the Likert scale); 16 out of 56 felt they had little (5 out of 56; 9%) or no capacity (11 out of 56: 20%) to currently do so. Respondents were "very interested" in establishing capacity to use remote consultations in 44 out of 56 (79%) of surveys.

Discussion

Our survey demonstrates that the majority of Belfast nursing homes currently possess the appropriate equipment to facilitate telemedicine, and the majority of their staff (84%) demonstrate an enthusiasm for its adoption. A failure to have adopted telepsychiatry into routine practice may therefore be more closely related to factors within mental health services, such as our access to appropriate equipment, than those within nursing homes. A survey of American psychiatrists working in nursing homes reported widespread support for telemedicine, but only 13% felt they had access to appropriate equipment.⁶

However, it is likely that obstacles to telemedicine go beyond hardware; in spite of most respondents' access to equipment, we observed variation in their current capacity to engage with remote consultations, perhaps suggesting a lack of comfort or familiarity with the medium. This may suggest that additional training to both care home staff, and mental health professionals, may be necessary before telepsychiatry becomes a component of routine clinical care.

Even when effectively facilitated, however, telepsychiatry in the care home setting is not without disadvantages. As acceptable as patients and clinicians find remote assessment, both groups report a preference for face-to-face consultation.⁴ Sensory impairment and environmental factors can interfere with comprehensive cognitive assessment, and effective engagement of patients with attentional difficulties can be challenging.⁷ Safeguarding confidentiality may also represent a significant obstacle in routine adoption, particularly when unfamiliarity with technology often necessitates the assistance of a third party.

Conclusion

Nursing home residents, particularly those with dementia, will remain vulnerable to mental health conditions as well as COVID-19-related respiratory illness, and both the acquisition of necessary equipment, and the training to use this equipment, should form an important part of healthcare provision to this population.

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The IMPaCCT of the 2020 COVID-19 pandemic on those with a rare disease

Background

Rare diseases affect 1 in 17 people in the UK (around 3.8 million people), which makes them an important consideration within public health. In the UK, a rare disease is classified as 'rare' where less than 1 in 2,000 people have the individual diagnosis.¹ Access to information and support for those living and working with rare disease is currently perceived as inadequate.^{2,3} The impact of the COVID-19 pandemic and related lockdown on people living with a rare disease has not been widely researched. We evaluated the experiences of individuals with a rare disease to identify strategies and measures that may improve their quality of life in these challenging and unprecedented times.

Approach

An online survey was conducted with individuals living with a rare disease to assess the health, healthcare, and psychosocial impact of the COVID-19 pandemic, particularly during the first stage of lockdown (beginning March 2020, and through to the continued time of shielding for those who were recommended to do so). The survey was designed by public health researchers in Queen's University Belfast (QUB) and the University of Aberdeen. It was distributed via charities, patient advocacy groups, social media platforms and media outlets across the UK, though was open to respondents worldwide. Qualitative analysis of open-ended questions was conducted using thematic analysis.

A second phase of the survey is underway to evaluate how circumstances have changed for those living with a rare disease.

Findings

There were 424 respondents to the survey with 293 residing in the UK, of those 57 were from Northern Ireland. Varied experiences of lockdown were reported by those living with a rare disease(s). While both positive and negative views were reported, patients predominantly reflected on negative and challenging experiences. The diverse range of answers provides important insights into these challenges. Six themes emerged from the data:

1. information, communication, and long term uncertainty;
2. mental impact of lockdown;
3. practical support and carer responsibility;
4. social interaction;
5. health service, healthcare experience, impact on health and wellbeing; and
6. healthcare professionals.

Theme 1 - Information, communication, and long-term uncertainty

People with a rare disease want personalised, specialist and hospital-based information regarding how to reduce their risk of contracting COVID-19 and how COVID-19 may affect their primary condition.

They seek clarity around shielding, and clearer guidelines from the government. They want to know what their work will look like in the future. Thoughts from respondents were around whether they will be able to be, or should be, off work long-term. They also wanted information to support decisions made around working, such as when they should return, and whether they will continue to be supported until they do. Further information about shielding research is available from the QUB Rare Disease website (www.qub.ac.uk/sites/RareDisease/COVID-19/Shielding/).

Theme 2 - Mental health impact of lockdown

Some respondents are already accustomed to isolation in their day to day life due to their rare disease. Others accepted that isolation was necessary, but many expressed feelings of fear, anxiety, worry and stress, and there was a lack of hope over the future. Feelings of restriction and powerlessness were associated with shielding. The immense pressure of work changes often confounded isolation issues and increased stress.

Theme 3 - Practical support and carer responsibility

The impact of COVID-19, and the associated lockdown, greatly increased the burden of care. The reduction of statutory provision, day centres, and community delivered care, together with increased roles at home, such as home schooling, increased the pressure on carers. This was all amidst the challenge of having their own rare disease. Respondents were struggling with a lack of respite, a loss of family members offering assistance, and decreased support from formal carers. Many challenges were also reported in relation to the practicalities of grocery shopping.

Theme 4 - Social interaction

People mentioned frequently how they missed family, friends, and physical contact. Others are spending more time with family than they would ordinarily. The loss of creative and social groups was felt intensely by people who would have attended these as a part of their weekly routine.

Theme 5 - Health service, healthcare experience, impact on health and wellbeing

Cancelled or postponed appointments, treatments, surgeries and routine check-ups were causing many people concern and frustration. Respondents described managing their own condition without professional support, and not having access to some medications. Patients expressed concern over longer-term impacts of the COVID-19 pandemic on the health service, and were also worried about the deterioration of their health due to reduced medical care.

Theme 6 - Healthcare professionals

Limited contact with healthcare professionals was a source of frustration. Some respondents reported great difficulty making contact with General Practitioners (GPs). Conflicting information from specialist consultants, GPs, and the government, was a source of stress. The struggles experienced by those with a rare disease when communicating with healthcare professionals under normal circumstances have been confounded by the current pandemic.^{1,2} There is fear that the life of someone who has a rare disease would not be fought for by health professionals in a COVID-19 treatment scenario.

Recommendations by respondents for ways in which they could be better supported/informed:

- A phone call from their specialist healthcare provider could provide support, information and necessary reassurance, as respondents reported feeling ignored, neglected, and fearful of what could happen if they contracted COVID-19.
- Clearer information from healthcare providers and the government about who is in a vulnerable group is desired. Questions were raised over why a nationwide registry of those with rare diseases does not exist – could more resources be allocated to developing a registry of those with a rare disease?
- Respondents reported they would like the opportunity to share experiences, during this pandemic, with others living with the same or a similar condition – either via an online forum or group call with a professional such as a consultant.
- Those with a rare disease would also like information on accommodation options when they are shielding and dealing with the challenges of household members who are not shielding. Also, information would be welcomed regarding access to accommodation when travelling to hospital appointments that are not nearby (a common occurrence for some who have a rare disease).
- Guidance on respite for those in caring roles would be valued, especially where less support was received from networks.

Discussion

Those with a rare disease, or those caring for someone with a rare disease, are in the unique position of often being experts in their own condition, having more day-to-day knowledge of it than many healthcare professionals.^{2,4} The COVID-19 pandemic has been particularly challenging for patients with rare diseases where there has been a lack of information available on how COVID-19 will affect them individually. Many describe having crucial healthcare appointments postponed, no longer having their condition as regularly monitored, and in some cases adjusting medications and making decisions without the support of a healthcare provider. Respondents reported a decrease in support and increase in practical challenges during lockdown. This is a severe consequence given that it is widely reported that support for those with a rare disease is limited under normal circumstances.⁵⁻⁸ Their physical and mental health has in many cases deteriorated due to the impact of COVID-19 pandemic on many aspects of their lives. Improvements to how those with a rare disease are informed, supported, and provided healthcare, specifically for their rare disease, are needed during this pandemic.

A complementary project by our team evaluated the impact of COVID-19 on groups supporting rare disease patients via a targeted online survey. Many groups experienced a significantly increased number of calls to their helplines as well more followers to their websites and social media feeds; recurrent concerns included shielding and disruption to medical care. As many groups are no longer meeting in person, online meetings, webinars, and zoom chats have become a regular part of their service. Fundraising was highlighted as an area of concern, with several groups no longer able to provide research support. Rare disease groups requested support to sustain their much-valued services through these trialling times, in particular funding support, improved quality and frequency of COVID-19 related government/medical communications, more COVID-19 'safe spaces', and public engagement emphasising the need for social distancing for highly clinically vulnerable groups.

Conclusion

The findings from this study suggest that the COVID-19 pandemic may have a negative impact on the mental and physical wellbeing of patients living with a rare disease. Health and Social Care services should work with third sector organisations to improve services for those living with a rare disease by implementing measures to improve their quality of life, while also keeping the general population as safe as possible from COVID-19.

Further information



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Consequences of the COVID-19 lockdown on health and the economy in Northern Ireland

Background

Coronavirus disease 2019 (COVID-19) is a novel infectious disease spread through transmission of severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).¹ Now pandemic, it has a range of clinical presentations from asymptomatic infection to severe disease and death.²

In March 2020, the Northern Ireland Executive imposed strict non-pharmaceutical interventions to reduce transmission and the subsequent burden on health services. Commonly referred to as 'lockdown', these restrictions involved suspension of all but essential services as well as stringent social distancing rules raising concerns that it would negatively impact local health and economy.

Approach

The aim of this article is to explore the relationships between lockdown, health, and the economy, and how this has affected Northern Ireland between March and October 2020. This was achieved through a rapid literature review of the consequences of lockdown and relevant time series graphs.

Findings

Lockdown reduces the spread of SARS-CoV-2

As seen in Figure 1, the Northern Ireland R_0 value decreased during the most stringent lockdown restrictions and rose again following the subsequent easings from the Roadmap to Recovery.

Figure 1: Time series of R_0 estimations for Northern Ireland from 29 February to 16 October 2020 using hospital admission data and web application, EpiEstim App.^{3,4} Key events from the Road to Recovery are depicted.



Lockdown negatively impacts non-COVID-19 health

Treatment delay

By June 2020, the number of patients waiting for an inpatient or day procedure was 100,915 and was 13% higher than the same period in 2019. In addition to this, the number of patients waiting for urgent appointments had increased by 7,914 and was 68.3% of the total increase. The largest increases were seen across general surgery, gynaecology, and ophthalmology.⁵

Cancer targets had also continued to be missed with a decrease of 34% in the number of patients starting treatment following an urgent GP referral within the specified 62 days. A decrease of 10% in the number of patients seen within 14 days by a breast cancer specialist following an urgent referral was also reported when compared to the same period last year. Furthermore, there were 13% fewer new breast cancer referrals in June 2020 than in June 2019.⁵

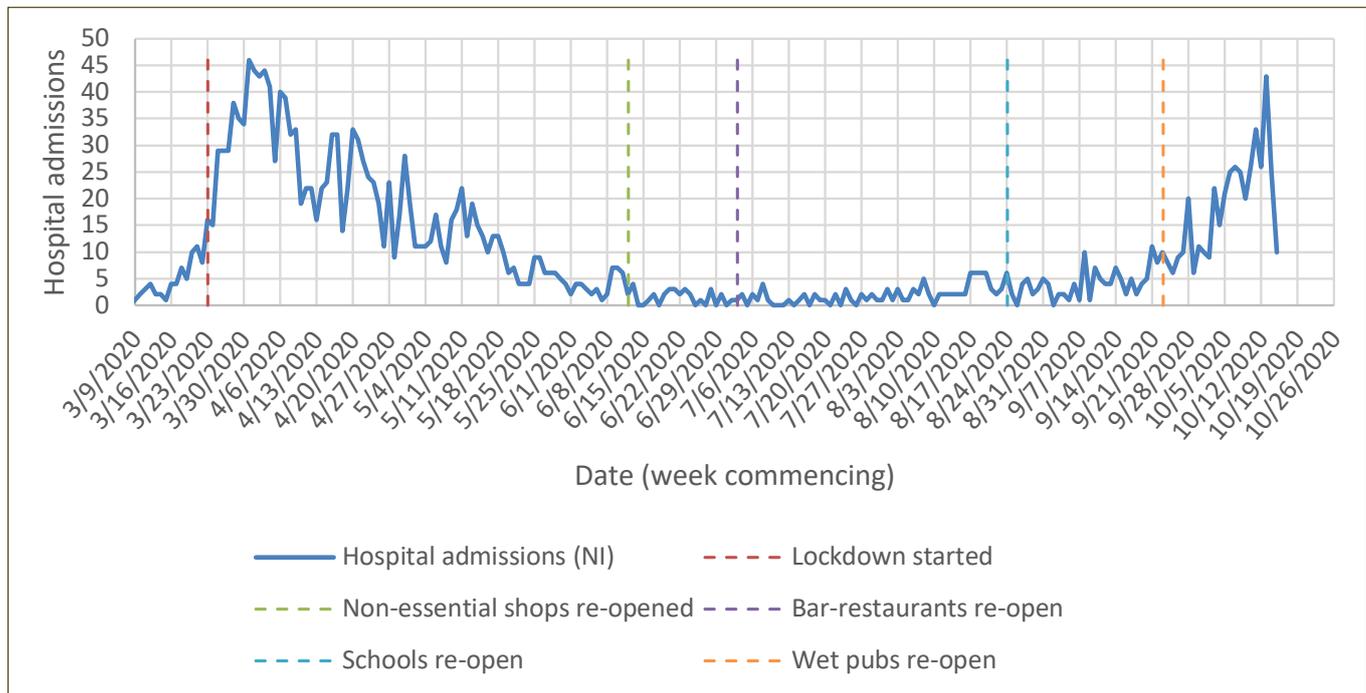
Significantly fewer sight tests and dental examinations have been carried out when compared to last year. Between mid-March and mid-June, 2020, there was a 97.4% reduction in sight tests and, from March to mid-April 2020, there were 75% fewer dental examinations, 78% fewer dental fillings, and 70% fewer dental extractions than there were in the same period in 2019.⁶

Hospital attendance, emergency waiting times, and hospital admission

There was a 32% decrease in hospital attendances during May 2020. There was, however, an increase of attendances triaged as seriously ill (very urgent or life-threatening). Perhaps because of the fewer attendances, the four-hour performance rate improved by 4% from 67% to 71%.⁷ There was a respective 52% and 48% reduction in emergency and elective hospital admissions and fewer people died at hospital between March and April 2020 than the same period the year before.⁸

As seen in Figure 2, hospital admissions declined following the introduction of lockdown and remained low and stable until a small rise before schools re-opened and a substantial rise following the opening of pubs that do not offer food ('wet' pubs).

Figure 2. Time series of hospital admissions for Northern Ireland from 29 February to 16 October 2020. Key events from the Road to Recovery are depicted.



Lockdown negatively impacts the economy

Experimental statistics from the Northern Ireland Composite Economic Index indicated that local economic activity decreased by 17.8% over the year to Quarter 2 2020. While this does not reflect the full impact of the lockdown imposed, it is the largest decrease seen since records began.⁹

Information on the unemployment rates until the end of May 2020 suggests that Northern Ireland’s unemployment rate of 2.4% is significantly below the rates of late 2018 as well as the current UK rate of 3.9%.¹⁰ However, the average weekly hours of work fell by 5.3 hours from December/February 2020 to March/May 2020 and by 6.5 hours from March/May 2019.¹¹ In addition to this, 8,860 redundancies were proposed in Northern Ireland between 1 October 2019 and 30 September 2020.¹²

The local unemployment rate may be softened by the 240,200 furloughed on the government’s Coronavirus Job Retention Scheme as Northern Ireland has one of the highest uptake rates in the UK at 30.4%. Within Northern Ireland, the Mid-Ulster area has the highest uptake rate of furloughed employments at 35% while Belfast has a rate of 28%, representing 16,000 and 41,500 employees furloughed respectively.¹³

Discussion

Universal lockdown demonstrably reduced the spread of COVID-19, but it has also had a negative impact on non-COVID-19 health. Specific to Northern Ireland, cancer screening programmes were halted, and red flag referrals were reduced; urgent operations were postponed; opticians and dental practices were closed; and GP services were limited.

Additionally, between March and June, the cumulative number of excess deaths had exceeded the cumulative number of COVID-19 related deaths (where COVID-19 is mentioned on the death certificate). The four-month period produced 885 excess deaths but only 837 of these deaths were COVID-19 related.¹⁴ It is possible that the difference of 5.4% excess deaths is attributable to changes in access to health services or indirect effects of lockdown and isolation.

It is possible that the lockdown effect on health was two-fold; ill people could not access healthcare through lack of provision and ill people did not want to access healthcare in case they caught the virus or were burden on their health service.

The lockdown measures have also severely impacted the economy in Northern Ireland. Even though lockdown was introduced at the end of the first financial quarter, the local economic activity experienced the largest quarterly decrease since the Great Recession. According to the Department for the Economy, lockdown has had a “devastating” influence on economic activity in Northern Ireland. It was estimated to have been running up to 30% below normal before lockdown restrictions were eased.¹⁵

While the effects of a markedly dropped GDP on economic activity can be readily felt, the lasting effects of this latest recession on local health, healthcare and education are yet to be seen.

Lockdown, while applied uniformly, has not been experienced equally. Those with lower average earnings and younger people were more likely to be financially affected by the lockdown impact on employment and earnings. It is estimated that over half of those in employment in the lowest-income households have had their work affected compared to 30% of those in the highest-income households.¹⁶ Healthwise, those who work in typically underpaid essential services are unable to work from home and have a greater possibility of exposure to the virus. In addition to this, young and disabled people saw the biggest increase in depressive symptoms between March and July.¹⁷

It is acknowledged that those on the lower end of a socioeconomic scale are at a disadvantage within the current health and economic system. Subsequently, it is likely that these health and economic gaps are set to widen due to lockdown and its consequences.

Conclusion

Lockdown played a vital role in the reduction of SARS-CoV-2 transmission. However, its negative consequences relating to non-COVID-19 health and healthcare provision as well as the economy will be substantial and long-lasting. While not intentional, this happened by design; the immediate threat of COVID-19 was deemed more harmful to population health than current or future health threats.

A systems-thinking approach is necessary when it comes to policy and decision making. For instance, lockdown was initially based on the overall transmission rate, regardless of where these transmissions occurred. Accordingly, the cycle is a balancing one: uniform restrictive measures lead to fewer transmissions; with the reduction in transmission, restrictions can be eased. However, transmissions rise with eased restrictions necessitating an increase in restrictive measures. In short, uniform lockdown is not a sustainable solution to a long-term problem.

The implementation of UK lockdown occurred because containment through contact tracing was not considered a viable option at the time. However, with increased testing capacity and a much lower population than the rest of the UK, Northern Ireland has conducted a successful test and trace service since the middle of April. This may have also ameliorated the possible effects from the easing of lockdown restrictions. Not only is contact tracing sustainable in Northern Ireland, transferrable protocols have been established for future novel infectious diseases.

Continuation of contact tracing coupled with targeted measures (including any vaccination programmes) is therefore a worthwhile consideration as an alternative to 'full' lockdown. However, any targeted restrictions would need to be judiciously applied to ensure that they do not disproportionately affect already disadvantaged populations and robust social and economic support should be provided.

Further information



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Exploring the experiences and perspectives of clinically extremely vulnerable people during COVID-19 shielding

Background

In March 2020, people in the UK who were deemed to be 'clinically extremely vulnerable' were advised to 'shield' as they were at higher risk of becoming seriously ill with COVID-19. Initially, the government-issued advice for those shielding was to avoid leaving their homes and to minimise face-to-face contact with other people. This advice was relaxed in June 2020 to allow those shielding to leave home with other members of their household or with one person from another household. On 31 July 2020, the advice was 'paused', allowing those who had been shielding the same freedoms as the rest of the population. However, a strong emphasis remained on the need for extremely vulnerable people to adhere strictly to population-level guidance around social distancing, hand hygiene, etc.

Shielding advice was issued to an estimated 80,000 people in Northern Ireland, significantly changing their lives and those living with them. In May 2020, the Patient and Client Council (PCC) sought to engage with these groups, in partnership with the Department of Health (DoH). The rationale was to ensure that the voices of those impacted by shielding informed decision making and messaging around changes to the restrictions introduced in March 2020.

Approach

It was decided that an online survey was the best method of engagement, based on the assumptions that:

- living under shielding restrictions may increase people's availability and willingness to respond to an online survey; and
- a large volume of intelligence could be generated relatively quickly, which was important given the urgency of the project.

Development of the survey questionnaire was led by the PCC, with input from the DOH and other stakeholders. The main priorities were to gather insights around:

- how people had been affected by shielding;
- what the most important things were for those shielding;
- what support people had accessed to help them deal with the impact of shielding;
- what actions or changes people would require if they were advised to continue to shield in some way; and
- what information people would need to support them to safely ease shielding restrictions.

Survey items were a mixture of demographic information and categorical/open-ended questions. People had the options to respond to the survey online or over the telephone, or a 'paper' version could be requested or downloaded, completed and sent back to the PCC via post or email. The postal, email and phone survey responses were inputted to the survey platform by PCC staff. The survey was

available to complete online between 2 June and 15 July. Input of postal responses was completed by early August 2020.

The survey was complete by 3,517 people. Survey data were downloaded in MS Excel for analysis by PCC Research staff. Descriptive statistics were produced based on respondent demographics and categorical responses. A coding frame was set up for analysis of qualitative response data, allowing each response to be assigned one or more codes or ‘themes’.

Findings

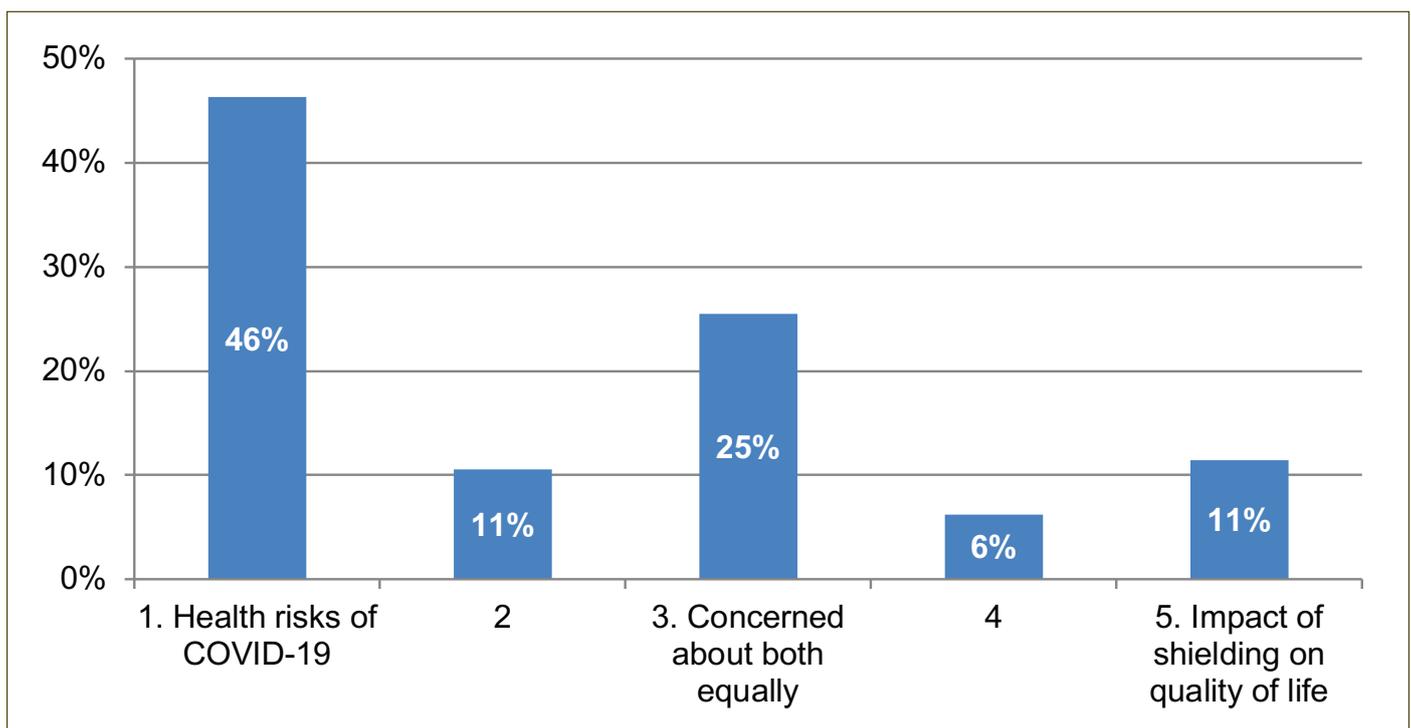
Impact of shielding

Isolation was the most commonly reported impact of shielding. Feelings of loneliness were often attributed to the inability to see family or friends, or to living alone, and persisted throughout the shielding period.

Negative impacts on people’s **mental health** or emotional wellbeing were another very common – and related – theme. Many people stated that shielding had either brought on or exacerbated anxiety and/or depression.

A smaller but still significant number of respondents mentioned feeling frightened, of others bringing COVID-19 into their home or of going out in public (due to perceived poor public adherence to social distancing). This was in keeping with categorical response data, which suggested that respondents were much more concerned about the health risks of COVID-19 than about the impact of shielding (Figure 1).

Figure 1: What concerns you more: the health risks of COVID-19 or the impact of shielding on your quality of life? Please select a point on the scale below. (n=3,377)



Loss of independence and increased reliance on others was another recurring theme, as was the inability to attend **work or education** – and the associated impact on some people's financial circumstances and job security.

Interestingly, around one in every eight respondents talked about the positive impact of shielding, stating that it made them **feel safe** and that it was manageable after a period of adjustment. Relatively very few mentioned **disruption to their healthcare or social care** as a major impact of shielding.

Additional support preferences

Respondents requested several types of additional support to cope with shielding. A significant proportion stated that they wanted **more information or guidance** on how to shield; on what support was available for those shielding and how to access it; and on when and how the government was planning to change shielding arrangements.

A similar number requested **increased or improved support with food deliveries**, and reported problems with registering for and booking priority supermarket slots.

It was also common for respondents to suggest that more efforts from GPs or from hospital staff to **'check in' with shielding patients** about how they were coping would have been helpful. A much smaller group expressed a desire for **emotional or psychological support**, and this became less common in later responses.

Suggested changes if shielding restrictions continue

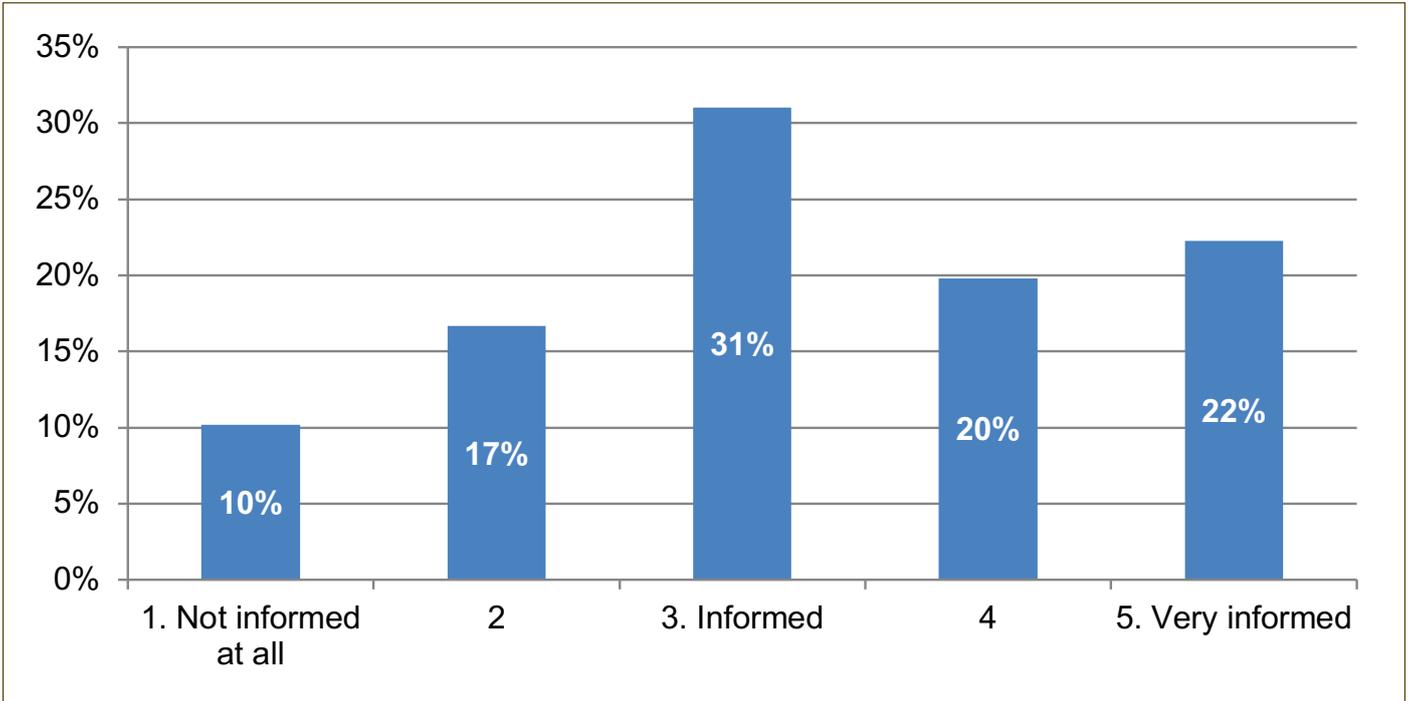
Respondents were asked what public services and the government could do differently to make their lives easier or more enjoyable while still allowing them to feel safe if they were required to continue shielding.

Around one in every ten respondents stated that they were **happy with the response** to date, with many people specifically very positive about the approach taken by health and social care professionals.

Other respondents touched on a range of themes in their proposals, but the provision of **more and better information** was the most frequently mentioned idea, cutting across both:

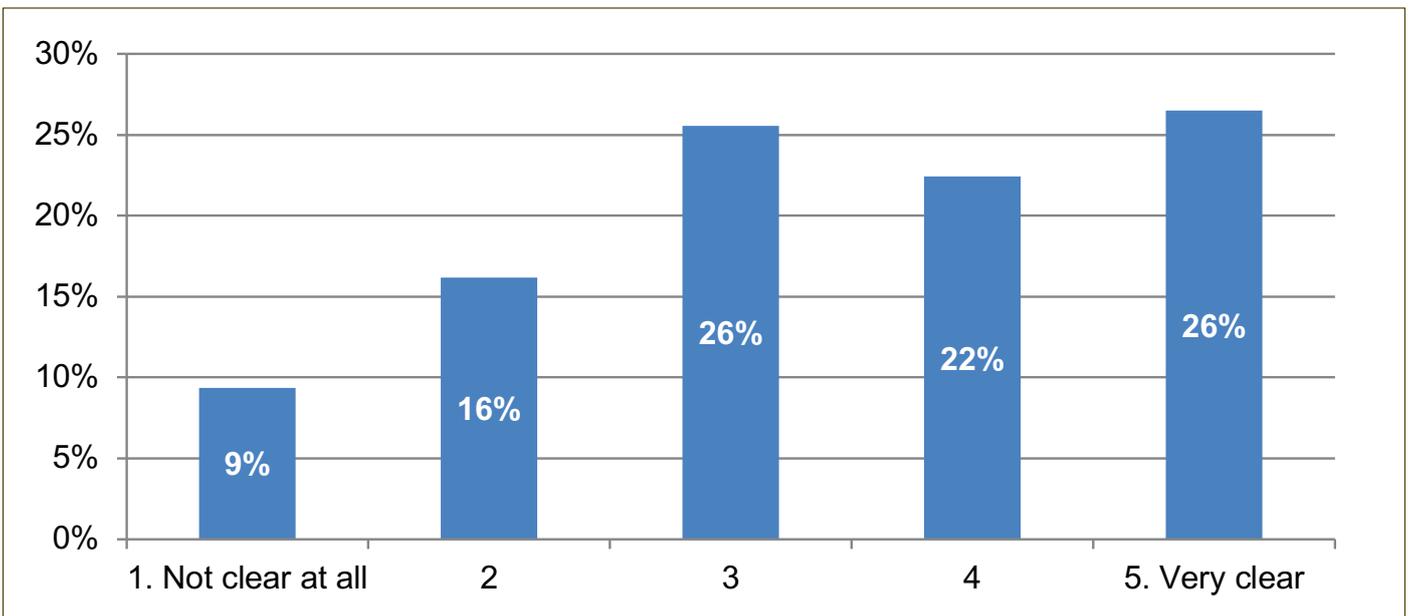
- Shielding-specific information, with many people mentioning a lack of information, unclear guidance, poor communication of the rationale/scientific basis for guidance, and difficulties in finding out when and how the guidance was likely to be updated. Addressing this was a clear priority for many respondents and there was a feeling that the reduced uncertainty from having regular, clear, consistent updates would help address many of the other issues and challenges people were experiencing;
- General COVID-19 information, with people wanting clear, regular and localised updates on the current COVID-19 situation (infection rates, deaths, R number, etc) so that they were equipped to make informed decisions about emerging from shielding.

Figure 2: Do you feel you have the INFORMATION you need to help you make decisions about shielding? Please indicate on the scale below how informed you feel. (n=3,383)



This was in keeping with categorical response data: fewer than half of respondents tended to the positive end of the scale when asked how informed they felt to make decisions about shielding (Figure 1) and how clear the information and advice around shielding had been (Figure 2). Categorical and qualitative data showed that information provision had become less of an issue over time but it remained a major area for improvement from the perspective of people shielding as the pause in shielding restrictions approached.

Figure 3: How clear has the information and advice you have received about shielding been? (n=3,370)



Other – albeit much less common – suggestions relating to HSC included **more efforts to ‘check in’ with people** and a **safe return to accessing necessary or routine healthcare**. Specific suggestions around the latter included making access to GPs, dentists and Emergency Departments easier and safer, opening day centres, increasing domiciliary care provision and taking steps to start treating people on waiting lists.

Outside the direct remit of HSC bodies/professionals, there were several common themes. As they emerged from shielding, many respondents sought clarity or assurances about **returning to work and education**. They voiced uncertainty and anxiety about their rights and status, specifically around whether they (or those in their household) could be ‘forced’ to return to the workplace or school, and what measures would be put in place to ensure their safety when commuting and working. Related to this, many requested **continued or improved financial support**, including automatic eligibility for the furlough scheme or alternative support as the economy began to open up and more people were asked or required to return to work. Others proposed people shielding should have **designated times to go to public places**, use shops, attend the GP, etc. without other members of the public present.

Smaller numbers asked for **greater stratification** in shielding guidance. This group felt that restrictions should be tiered based on an individual or group’s risk level, keeping the most vulnerable as safe as possible, without imposing unnecessary restrictions on those at lower risk.

Discussion

Shielding had clear detrimental social and psychological effects on a significant number of respondents. It is encouraging that relatively very few mentioned a need for professional support or counselling – this may indicate that the emotional impact of shielding was temporary for most people. However, this cannot be assumed, particularly given the uncertainty about how long shielding (or some form of it) will need to continue and the apparent reluctance of many of those shielding to return to a normal, less isolated life as shielding restrictions eased.

This fear of COVID-19 and the risk it represents to clinically extremely vulnerable people was a central concern. It was often accompanied by a perception that the rest of the world had gone back to ‘normal life’ and that going out in public therefore posed too much of a risk until such times as a COVID-19 vaccine becomes available. Concerns about contracting COVID-19 may help explain why the proportion of respondents voicing frustrations or hopes around accessing routine or necessary healthcare was relatively low, although this still equated to a large number of people.

Many people shielding in Northern Ireland due to COVID-19 appeared to prioritise being kept informed above other areas of unmet need. There was a strong desire to be given clear guidance on what they should and should not do; there were also clear messages that people wanted to see and understand any available information on COVID-19 infection rates (ideally at as localised a level as possible) and on the actual risk posed to them as individuals. Respondents expected that having access to this information would empower and support them to make their own informed decisions about whether

and how to emerge from shielding. In reviewing the categorical and free text response data, it was apparent that more could be done in this area – one in five respondents still seemed to feel uninformed even as the ‘pause’ in shielding advice approached in July.

Many respondents asked for improved access to food deliveries, either because they were unaware of or had not tried to access priority supermarket delivery slots or, in many cases, because they had experienced major issues or delays in the process of registering for these. However, references to these problems were less common in later responses.

The practicalities and challenges of returning to work or education after (or during) shielding cut across several questions. This was a major source of uncertainty for people and one of the areas in which respondents were most likely to demand clarity from the government as shielding restrictions eased. Common questions included whether those unable to attend work would be expected to go on Statutory Sick Pay and whether people shielding (and their family members) could or should be furloughed or exempted from attending school. These queries were again strongly linked to respondents’ fear of COVID-19 and the tension this was creating as they were expected to return to normal activities.

Another recurring theme was around increased contact with HSC services and professionals. It was common for respondents to request more proactive ‘checking in’ from their GPs or consultants, for reassurance but also, in many cases, for opportunities for social interaction

Conclusion

Based on survey findings, the PCC identified several key areas for action in the event of further restrictions for clinically extremely vulnerable people, with a number of specific recommendations under each. These are presented below.

Table 1: Survey themes and recommendations for improving experiences of clinically extremely vulnerable people

Theme	Recommendation
1. Information (including volume, quality, stratification)	Provide more and/or better shielding-specific guidance
	Provide more and/or better general COVID-19 information (eg localised rates of infection or death)
	Increase clarity and assurances about returning to work and education for clinically extremely vulnerable people and those in their households
	Introduce stratified tiers for different groups as shielding restrictions are eased or reintroduced, based on risk
2. Increased awareness of/adherence to public health guidance and restrictions	Increase effort to educate the public about clinically extremely vulnerable people and the risks they face
	Increase effort to deter the public from breaching restrictions
3. HSC support	Increase effort from Health and Social Care to 'check in' with clinically extremely vulnerable people
4. Access to services	Provide easier access to food deliveries or to guaranteed priority supermarket slots
	Designate space/time for clinically extremely vulnerable people to go outside, visit shops, leisure centres, GPs, etc without the perceived risk of coming into contact with the general public
5. Financial support	Continue or improve financial support for clinically extremely vulnerable people and those in their households
6. Access to routine health care	Make arrangements for safe return to accessing necessary or routine healthcare
7. Psychological support	Make emotional or psychological support available to those who need it

Further information



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Concluding remarks

Concluding remarks

I wish to pay tribute to all healthcare staff for the exceptional manner in which they have responded to the COVID-19 pandemic. The COVID-19 pandemic has been a complex challenge to the whole of society. This report has highlighted some aspects of the response to the pandemic in Northern Ireland.

Overall, I believe the HSC system has coped well with the surges in hospital admissions that have occurred due to the virus. During 2020, a strong health protection and contact tracing response was mounted and adverse outcomes have been less severe than was perhaps predicted at the onset of the pandemic, with the initial suggestion of 510,000 deaths in the UK.¹

COVID-19 is an unusual disease in that, as David Spiegelhalter, an expert in risk communication indicates, “the risks of catching and dying from the virus vary 10,000-fold depending on age”.² It is difficult to think of any other disease where this level of variation exists across the age spectrum. Health policy over the last few decades has rightly sought to reduce inequalities associated with age. There has been a complex interaction between these two factors at play in the Western societal response to COVID-19: a desire for equity and a virus that is very inequitable in its age-related effects.

A positive factor in this pandemic is that the pace of learning and research has outstripped that undertaken in any previous pandemic, with global collaboration supporting the response, but there is still much that remains unclear.³ In 2020, some areas, such as the north of Italy, had overwhelming numbers of infections in a short period of time, whilst other areas, such as much of the African continent apart from South Africa, seem to have had a mild pandemic.⁴ Deaths in Northern Ireland have thankfully been lower than might have been anticipated.

Communication is key in a pandemic, but it is made harder by the variable quality of information, particularly on social media.⁵ This is a difficult issue to tackle. In a bid to increase trust, some social media companies have removed material they consider misleading, but it could be argued this may have increased rather than decreased concerns regarding censorship in some sections of the public.⁶ Similarly, in the academic world, several authors have expressed concern that heterodox views, which may contain an important kernel of truth, have been excessively targeted by a ‘cancel’ culture.⁷

There has thankfully been heavy investment in finding solutions to the pandemic. However, a collaboration for Behavioural, Environmental, Social and Systems Interventions for pandemic preparedness (Bessi) has calculated that globally (as of 20 November 2020) there were 1,725 drug trials registered for treatments of COVID-19, but only 11 trials of Behavioural, Environmental, Social and Systems Interventions for reducing transmission of SARS-CoV-2.⁸ There is an argument that funding of non-pharmaceutical trials needs to be addressed at a global level.

Figure 1: Comparison of pharmaceutical versus non-pharmaceutical trials to reduce COVID-19.



Source: <https://www.bessi-collab.net/>

Health economics is a key tool in advising which interventions are the most cost effective.^{9,10} There is evidence that early lockdown in the UK may have had an incremental cost effectiveness ratio (ICER) per Quality Adjusted Life Year (QALY) that is significantly higher than normal thresholds.^{11,12,13} This reflects the extraordinary challenge that COVID-19 has been to the global health system.¹⁴ The COVID-19 pandemic is a complex one that touches lives in different ways and has evoked a wide range of reactions that stray beyond the bounds of medicine but have a bearing on the public's health in the widest sense.¹⁵

Public health is about protecting people from serious threats to health. But public health is also about tackling inequalities, and the PHA's continued focus has been to influence and implement a wide range of evidence based programmes and actions to address the major causes of poor health and barriers to wellbeing and improved life expectancy.

The impact of COVID-19 has spread far beyond that of an infectious disease. It has impacted on many sectors including the economy. A number of experts have expressed concern that this may lead to increases in inequalities in relation to deprivation and poverty among our most vulnerable in society over the next decade.

The challenge for public health will be addressing these health inequalities against a backdrop of the pressures the virus has caused in so many areas. It is likely to take a decade or more to unpack some of the answers to tackling the COVID-19 pandemic and there are some questions that we may never get an answer to.

A lot of hope is pinned on vaccines that have recently been announced, and which seem to have high short term efficacy, although they will need long term follow up to fully evaluate.¹⁶ The first COVID-19 vaccinations were carried out in Belfast in December 2020.¹⁷

COVID-19 has rocked the world, but it has also brought out kindness, compassion and self-sacrifice. It also brought an opportunity to reflect on personal and collective priorities that extend beyond the humdrum of everyday life to more transcendent goals, an opportunity to develop greater resilience, and an opportunity to develop a sense of meaning and purpose in life that is not dependent on the whims of an invisible virus.

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