

Clinical Analysis of Discharge Patterns from HSC Hospitals in Northern Ireland during early 2020 and any Link with COVID-19 Outbreaks in Care Homes

A report to the Minister for Health

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Summary and Overall Conclusion

On 27 February, 2020, authorities confirmed the first case of coronavirus in Northern Ireland and on 19 March the first COVID-19 death in Northern Ireland was reported. At the time of writing (early November 2020), between 716 and 979 deaths have been attributed to COVID-19 in Northern Ireland, depending on the definition used

Care home residents have accounted for about half of all deaths in Northern Ireland. A question has arisen as to whether communication from the Northern Ireland Department of Health led to accelerated discharges from HSC hospitals to free up inpatient capacity, and whether this caused COVID-19 outbreaks in care homes and subsequent excess deaths of care home residents

On 16 September, 2020 I was asked to address these questions by undertaking an analysis of discharge patterns from HSC hospitals across Northern Ireland during early 2020, and exploring any link with COVID-19 outbreaks in care homes. The analysis actually demonstrates a decline in the numbers of people discharged from hospitals, including to care homes, from mid-March onwards, reflecting an overall decline in Emergency Department attendances and hospital admissions

The timing of COVID-19 outbreaks in care homes during the first pandemic surge correlates better with COVID-19 admissions rates during the same week (a surrogate for general community transmission and infection) than with the numbers of people discharged to care homes. This observation would align with conclusions from two national analyses of hospital discharges and COVID-19 outbreaks in care homes in Scotland and Wales

There is no evidence to support a view that Ministerial or Departmental communications changed consultants' discharge decision-making during the first pandemic surge, including decisions to discharge people to care homes. Consultants indicated robustly that they make such decisions independent of any external influence

Worldwide analysis shows that the experience of Northern Ireland's care home residents has closely paralleled those of care home residents throughout the world. Given the diversity of countries, regions and healthcare systems reported, any variances in local policies, guidelines or communications seem to be less plausible explanations of care home outbreaks and consequent deaths, than the virulence of the SARS-CoV2 virus, its ability to spread rapidly in indoor settings and the innate clinical vulnerability of care home residents

Individual conclusions from different sections of the report

1. Through the first surge of the COVID-19 pandemic, front-line clinical teams had more unoccupied beds available to them than usual, reflecting reduced attendances at emergency departments and reduced unscheduled (and elective) hospital admissions. Hence, there was less pressure to accelerate patients' discharge from hospital than is normally the case, other than to minimise the well-known risks associated with being in hospital
2. Extensive communication was circulated by the Minister for Health and Department of Health throughout the pandemic. Selected communications during March 2020 referred to discharge planning - the impact of these communications on subsequent discharge decision-making has been evaluated in this report
3. During the first quarter of 2020, the number and percentage of people discharged to care homes from HSC hospitals in Northern Ireland was very similar to that in all quarters in 2019. The absolute number of people discharged to care homes was lower in the second and third quarters of 2020 than in 2019, reflecting the broader decline in hospital admissions and discharges during 2020
4. During weeks 14 through 22 in 2020, fewer people were discharged to care homes than the usual estimated weekly average, while during weeks 11 and 13, more people were discharged to care homes than the usual weekly average. To evaluate the significance of the latter, patient-level analysis of the 465 people discharged to care homes during weeks 11 and 13 is described in section 3
5. The weekly pattern of care home outbreaks during the first surge appears to be more closely correlated with COVID-19 admissions rates during the same week (a surrogate for general community transmission and infection) than with the rates of unscheduled discharges to care homes
6. Patient-level analysis during weeks when the number of people discharged to care homes was more than usual (weeks 11 and 13), found that only about 1% of those people tested positive for COVID-19 in the fortnight after discharge to a care home. It did not support a hypothesis that this group of people was a substantial cause of COVID-19 outbreaks in care homes

7. The decision to discharge a person after a hospital admission is an important clinical judgment taken by senior medical professionals, typically consultants. It is one that they take seriously, balancing the benefits versus the risks of a person remaining in hospital
8. Very recent new guidance from the Academy of Medical Royal Colleges recommends that a decision to discharge should be the default on any given day, and that objective criteria should be met to justify remaining in hospital. This is a major shift from traditional practice and will take time to embed
9. Subjectively, consultants indicated that Departmental guidance had minimal or no impact on their discharge decisions during the first pandemic surge (nor at any other time). This subjective belief is supported by objective evidence from length-of-stay data
10. Approximately 0.79% of people in Northern Ireland live in care homes, a very similar figure to the rest of the UK. In the first pandemic surge, about 30% of care homes in Northern Ireland reported a suspected or proven COVID-19 outbreak. This is almost identical to the outbreak rates in Wales and Scotland
11. All studies that have reported deaths among care home residents have alluded to difficulties acquiring accurate data, as well as variability in definitions. Care home residents in Northern Ireland were very much more likely to die from COVID-19 than the wider population – more than 60-fold more likely. This excess risk was of similar magnitude to that in England and Scotland as well as in many other countries around the world. The observation that 49% of all COVID-19 deaths in Northern Ireland were in care home residents was also widely reflected worldwide
12. Two separate statistical analyses in Wales and Scotland have identified care home size as the strongest predictor of care home outbreaks. Analyses that adjusted for confounding variables did not identify hospital discharges as a predictor
13. Given the diversity of countries, regions and healthcare systems that have been reported, differences in local policies, guidelines or communications seem to be less plausible explanations of care home outbreaks and consequent deaths, than the virulence of the SARS-CoV2 virus, its ability to spread rapidly in indoor settings and the innate clinical vulnerability of care home residents

INTRODUCTION

Disclosure Statement

I am a full-time clinician working in an acute hospital in a Northern Ireland Health and Social Care (HSC) Trust. I make discharge decisions including about people who are discharged to care homes and including during the first surge of the COVID-19 pandemic

Duty of Candour Statement

All practising doctors in the United Kingdom, including myself, are subject to a Professional Duty of Candour¹, an extract of which reads as follows:

Healthcare professionals must also be open and honest with their colleagues, employers and relevant organisations, and take part in reviews and investigations when requested. They must also be open and honest with their regulators, raising concerns where appropriate. They must support and encourage each other to be open and honest, and not stop someone from raising concerns

This means that the current report will detail all observations candidly, including any potential adverse findings

Background to the Report

On 31 December, 2019, a cluster of patients with pneumonia of unknown cause was reported in Wuhan City, Hubei province, China. Within a few days, a novel coronavirus (SARS-CoV-2) had been identified as the causative agent. The illness was called COVID-19

By 20 January, 2020, there were reports of cases outside China and on 24 January, the first European case was reported in France. By early March, images from Iran and Northern Italy showed that entire health care systems were being overwhelmed by the number of patients requiring inpatient admission and respiratory support

On 27 February, authorities confirmed the first case of COVID-19 in Northern Ireland and on 19 March the first death in Northern Ireland was reported. Depending on the

¹<https://www.gmc-uk.org/ethical-guidance/ethical-guidance-for-doctors/candour---openness-and-honesty-when-things-go-wrong/the-professional-duty-of-candour>

definition used, at the time of writing, there have been between 716² and 979³ deaths attributed to COVID-19 in Northern Ireland, of which about half have occurred among residents of care homes (Table 1)

| | Weekly death statistics published by NISRA ³ |
|---|---|
| Deaths in care homes | 363 |
| Deaths of care home residents in hospital | 88 |
| Total deaths of care home residents | 451 (46% of total) |
| | |
| Deaths of non-care home residents | 528 (54% of total) |
| | |
| Total Covid-19 related deaths | 979 |

Table 1. Reported deaths due to COVID-19 at the time of writing based on the information entered on death certificates, completed by medical professionals. The patient may or may not have previously tested positive for the virus. Sources: COVID-19 Dashboard, DoH and NISRA

As deaths of care home residents accumulated, a question arose as to whether accelerated or greater numbers of people discharged from HSC hospitals to care homes, to free up inpatient capacity during the early stages of the pandemic, contributed to COVID-19 outbreaks in care homes and deaths of care home residents

On 16 September, 2020 I was asked to undertake an analysis of discharge patterns from HSC hospitals across Northern Ireland during early 2020, and any link with COVID-19 outbreaks in care homes

The scope of the Review is as follows:

- I. Compare patterns of discharge from all NI hospitals to care homes in 2019 and 2020. There is scope within the review for the analysis to be extended

² Based on patients having previously tested positive for the virus
<https://app.powerbi.com/view?r=eyJrljoiZGYxNjYzNmUtOTlmZS00ODAxLWE1YTEtMjA0NjZmZmNmN2JmliwidCI6IjJjOWEzMGRILWQ4ZDctNGFhNC05NjAwLTRiZTc2MjVmZjZjNSIsImMiOjh9>

³ Based on the information entered on death certificates, completed by medical professionals. The patient may or may not have previously tested positive for the virus
<https://www.nisra.gov.uk/sites/nisra.gov.uk/files/publications/Deaths%20Registered%20in%20NI%20-%20Week%2042%202020.pdf>

from a time period of one to five years to support the identification of relevant trends

- II. Establish if there was any correlation between hospital discharges (especially discharges in the absence of testing in early stage of pandemic) and subsequent care home outbreaks
- III. Consider the clinical decision-making process in relation to discharges and clarify the relationship (or otherwise) between Departmental guidance on the process to be followed when a discharge decision has been taken, and that decision making process

The following do not form part of the Scope of the Review and are not considered in any detail:

Personal protective equipment (PPE)

COVID-19 testing (although a summary of testing protocols is in Appendix 2)

Regulation and inspections of care homes

Care home staffing, pay and conditions

Finance and funding

Visiting arrangements

SECTION 1
LOCAL CONTEXT

The purpose of this section is to establish the context against which decisions to discharge people to care homes (and elsewhere) took place during the first surge of the pandemic. In particular to review the patterns of emergency department attendances, hospital admissions and discharges, and the impact of these on the availability of hospital inpatient beds and secondly, to understand the relationship between any pertinent discharge guidance and the discharge patterns seen

In this and future sections, weeks of the year will be defined using an epidemiological calendar. Week 1 is defined as ending at the end of the first Saturday in January (January 4 in 2020); subsequent weeks are assigned numbers 2 through 53⁴

The term “first pandemic surge” will be used to describe the time period between week 9 (during which the first case of COVID-19 was reported in Northern Ireland) through week 22 (which ended on 30 May, 2020)

Patterns of attendance at emergency departments

Figure 1 illustrates emergency department (ED) attendances during the first surge of the pandemic. It illustrates a widely reported phenomenon – that the numbers of people attending ED’s fell quite dramatically during the first pandemic surge

The timing is worth noting. The drop in ED attendances began after week 10 (after March 7) coinciding with images of major COVID-19 outbreaks in Northern Italy. There was a drop of 11% during week 11, a further 28% drop during week 12 and in total a 58% drop in ED attendances to the nadir in week 14, when only 6507 people attended compared with 15476 just a few weeks before

⁴ https://wwwn.cdc.gov/nndss/document/MMWR_Week_overview.pdf

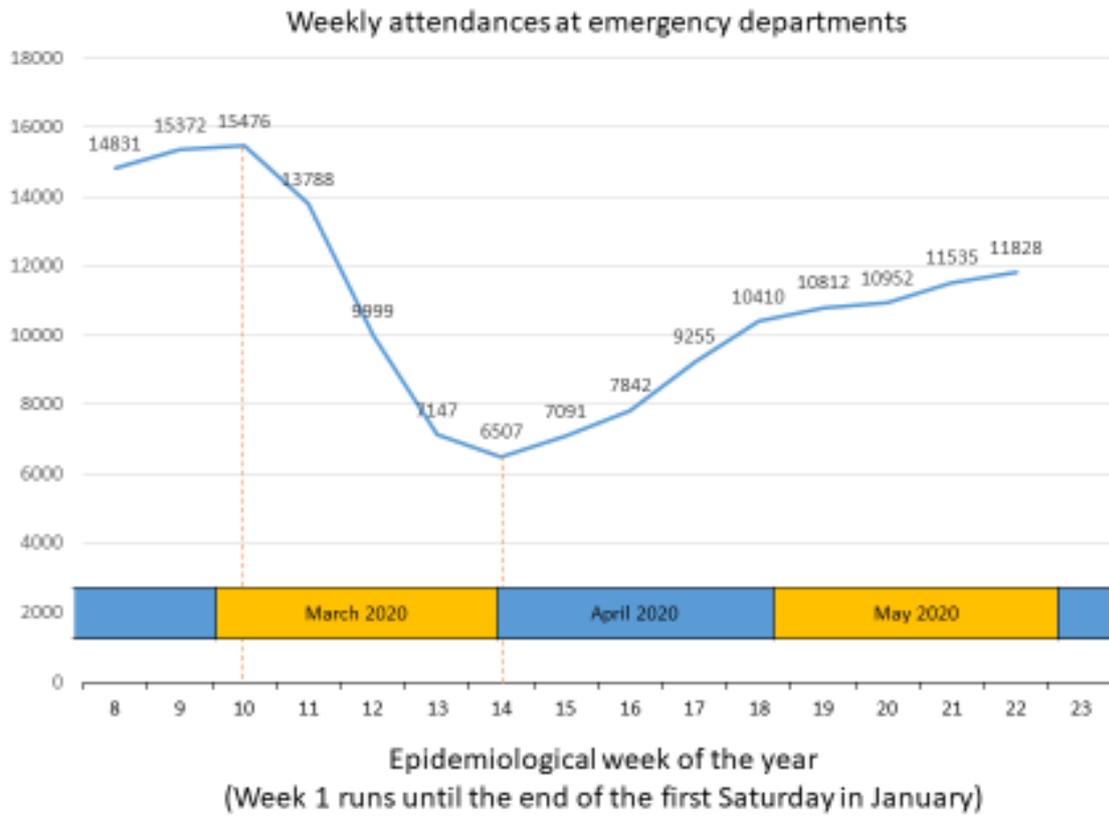


Figure 1. Patterns of attendance at emergency departments in Northern Ireland during the first surge of the pandemic. Source – Information Analysis Directorate, DoH

Figure 2 demonstrates how considerably this pattern differed from recent years. Between 2008 and 2015, ED attendances across Northern Ireland were fairly stable at 50,000 to 65,000 per month, with some seasonal variation. Total monthly attendances gradually rose between 2016 and 2019, getting close to 75,000 on several occasions. The 58% drop in ED attendance seen during March 2020 is unprecedented in recent times



Figure 2. Patterns of monthly emergency department attendances to all HSC hospitals across Northern Ireland, 2008 through 2020. Source - NISRA

Patterns of unscheduled hospital admissions

The marked decline in ED attendances was mirrored by a decline in unscheduled hospital admissions over the same timeframe (Figure 3). Between weeks 10 and 11, unscheduled admissions fell by 11%. There was a further 12% fall the following week and in total a 45% fall between weeks 10 and 14

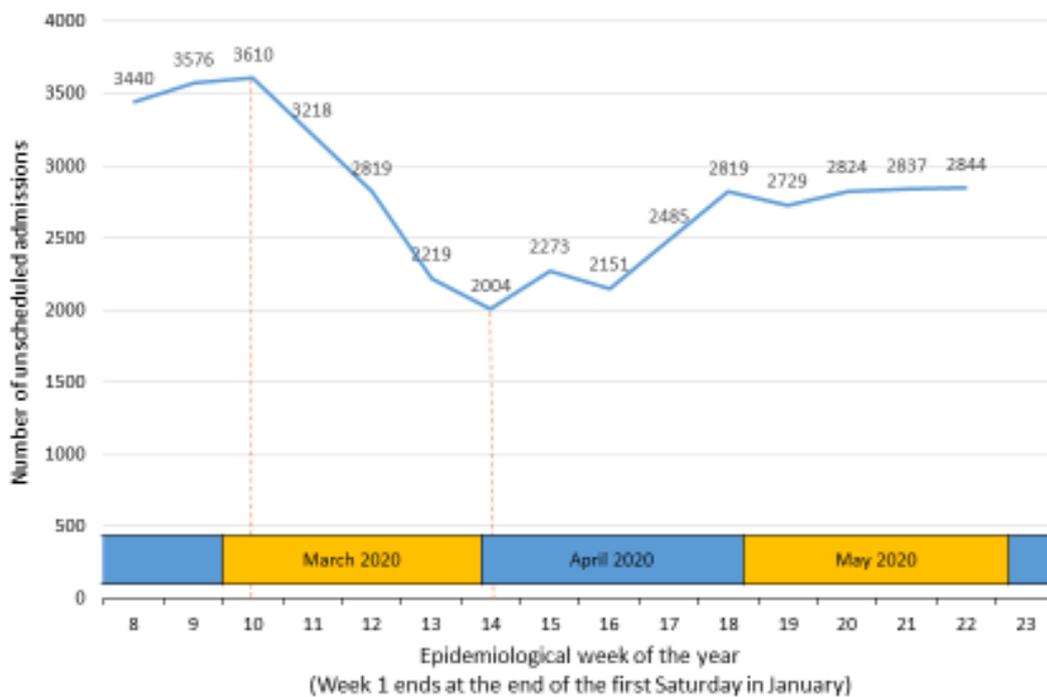


Figure 3. Patterns of unscheduled admissions to HSC hospitals in Northern Ireland during the first surge of the pandemic. Source – Information Analysis Directorate, DoH

Patterns of discharge following unscheduled hospital admission

Perhaps not surprisingly, unscheduled discharge patterns mirrored the attendance and admission patterns in Figures 1 and 3 above, except that the fall in discharges began a week later, reflecting the duration of the hospital stay (Figure 4). Between weeks 11 and 14, discharges after an unscheduled admission fell by 40%

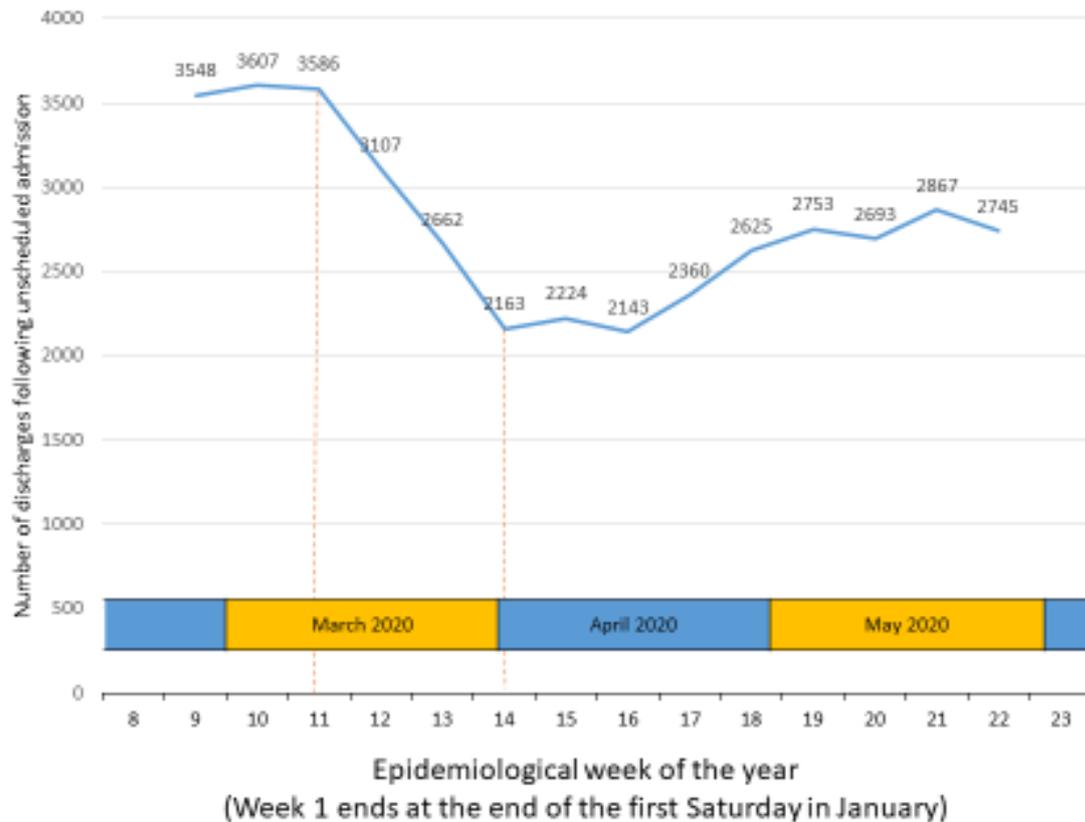


Figure 4. Patterns of discharge following unscheduled admissions to HSC hospitals in Northern Ireland during the first surge of the pandemic. Source – Information Analysis Directorate, DoH

Impact on hospital bed availability

The net impact of the decline in ED attendances and unscheduled admissions was a substantial rise in the number of unoccupied beds in HSC hospitals between weeks 11 and 14 (the first week for which data were available; Figure 5). This bed availability was likely to have been augmented further by reduced elective admissions

The significance of Figure 5 is that from week 11 through to the end of the first surge, front-line clinical teams had more unoccupied beds available to them than is normally the case. Hence, there was less inherent pressure than usual to expedite patients’ discharge from hospital, other than to minimise the well-known risks associated with being in hospital longer than is necessary⁵

⁵ https://improvement.nhs.uk/documents/2898/Guide_to_reducing_long_hospital_stays_FINAL_v2.pdf

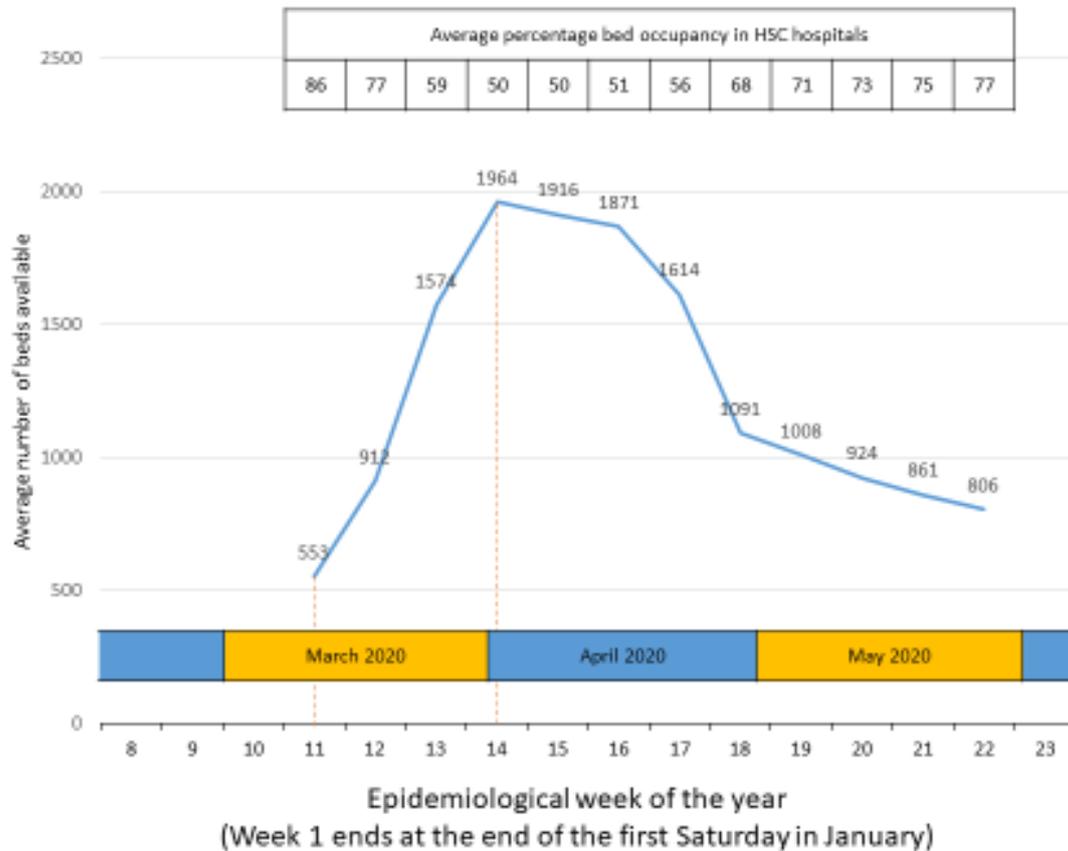


Figure 5. Patterns of bed vacancy in HSC hospitals in Northern Ireland during the first surge of the pandemic. The methodology of collecting bed availability and occupancy data has changed since mid-October 2020, but this curve shows the general pattern. Source – Information Analysis Directorate, DoH

Discharge guidance to HSC Trust teams during the early stages of the pandemic

This section aims to review the communications and guidance that were issued to frontline clinical teams, and to identify any that might have influenced subsequent discharge decision-making

Table 2 enumerates correspondence from DoH to recipients including HSC Trusts, mentioning either “Coronavirus” or “COVID-19” between 24 January 2020 and 30 September 2020. They are available on the DoH website as are Ministerial statements to the Northern Ireland Assembly⁶

⁶<https://www.health-ni.gov.uk/publications/doh-ministerial-announcements-and-statements-2020>

| | Issued from the Office of the Chief Medical Officer⁷ | Issued from other parts of DoH including Ministerial announcements⁸ |
|--------------------------|--|---|
| Month during 2020 | | |
| January | 2 | 2 |
| February | 3 | 1 |
| March | 7 | 13 |
| April | 9 | 15 |
| May | 7 | 11 |
| June | 6 | 15 |
| July | 3 | 12 |
| August | 4 | 11 |
| September | 6 | 11 |
| Total | 47 | 91 |

Table 2. Communications from DoH to recipients including HSC Trusts on the subject of “Coronavirus” or “COVID-19” during 2020

From the various communications, extracts that I considered pertinent are as follows:

- On 2 March (during week 10), the Minister referred to a UK-wide Coronavirus Action Plan⁹ and indicated that the HSCB were leading on surge planning working with Health and Social Care Trusts, informed by existing pandemic flu plans across the Health and Social Care sector
- On 9 March (during week 11), the Minister referred to a UK-wide strategy to flatten the peak of the outbreak in the UK; to delay and spread the impact on the health service; to push the peak away from this time of year and to protect those most at risk

He also described

“a new Directorate which is dedicated to surge planning. At operational level a Regional Surge Planning Sub-group has been established by the PHA and the HSCB to ensure that there is an appropriate and proportionate level of HSC

⁷ <https://www.health-ni.gov.uk/publications/letters-and-urgent-communications-2020>

⁸ https://www.health-ni.gov.uk/publications/date/2020?search=coronavirus&Search-exposed-form=Go&sort_by=field_published_date

⁹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/869827/Coronavirus_action_plan_-_a_guide_to_what_you_can_expect_across_the_UK.pdf

preparedness across the sector in response to Covid-19. Twice-weekly meetings are held and a Covid-19 Surge Planning workshop was held on 5 March. The purpose of the workshop was to consider Trust surge plans and self-assessment checklists in order to share actions and ensure regional consistency where possible”

- On 19 March (during week 12), the Minister outlined planning assumptions for a reasonable worst case scenario as well as a detailed description of measures to increase healthcare resources and capacity in response to the expected surge¹⁰:

“...up to 80% of the Northern Ireland population will be infected during this epidemic. Up to half of these may occur in a period of three weeks centred around the peak. Simply put, no health service in the world is equipped to cope with the volume of cases that we will see if this scenario comes to pass...

Planning assumptions also indicate that 8% of infected people will require hospitalisation, 0.7% will require critical care, and 1% will die – although these figures will vary highly depending on age and other health factors...

This plan summarises the key actions taken by Health and Social Care (HSC) NI that will apply from mid-March to mid-April 2020 to ensure that there is sufficient capacity within the system to meet the expected increase in demand from patients contracting COVID-19 during this period. This is a dynamic plan and will be constantly refined in light of emerging issues...

I am also taking action to increase physical capacity in our hospitals. We have increased inpatient capacity in designated wards that can treat up to 280 adult inpatients with coronavirus. This is only the very first phase of this work. In anticipation of inpatient numbers increasing further, all Trusts are continuing to assess the steps that may be needed to convert additional wards currently used by medical and surgical specialties into areas to treat patients diagnosed with COVID-19”

- On the same day (19 March) DoH published the Health and Social Care (NI) Summary COVID-19 plan for the period mid-March to mid-April 2020¹¹. The section titled *Discharge Planning for Patients in Hospital* reads as follows:

¹⁰<https://www.health-ni.gov.uk/sites/default/files/publications/health/Coronavirus-19-03-2020.pdf>

¹¹ <https://www.health-ni.gov.uk/sites/default/files/publications/health/surge-plans-march-april-2020.pdf>

“Trusts are expediting discharges when patients have been deemed medically fit, through shortening assessment to home care package arrangements, in these circumstances it is acknowledged there may be increased reliance on families in order to facilitate discharges.

Trusts will work to maximise and utilise all spare capacity in residential, nursing and domiciliary home care;

Trusts as part of their contingency plan may need to re-distribute domiciliary care hours. This will include prioritising and targeting care hours to those clients who are at risk and those with the greatest clinical and/or care needs

Trusts are compassionately setting aside the current choice protocols which provide patients with a choice of residential or nursing care homes

- On 26 March (during week 13), the Permanent Secretary for Health issued a letter addressed to the Chief Executives of HSC Trusts headed *COVID-19: Preparations for Surge*¹²

The section titled Urgent discharge of all medically fit patients reads as follows:

“In the weeks and months ahead, it will be more important than ever for Trusts to implement effective discharge arrangements for patients as soon as they are well enough to leave hospital in order to release beds for newly admitted patients. Trusts should also work to maximise and utilise all spare capacity in residential, nursing, and domiciliary care.

We are providing additional flexibilities in the way care home beds are used as well as asking families to accept that patients may be discharged to a nursing home that would not be their first choice or may be discharged home with support from family and friends until a care package is finalised. In addition we have indicated our expectation that requirements around a range of reviews and assessments and regulatory standards will be interpreted flexibly”

¹² <https://www.health-ni.gov.uk/sites/default/files/publications/health/COVID-19%20Letter%20from%20Permanent%20Secretary%20-%20Surge%20Plans.pdf>

- On 15 April (during week 16), the Minister made a statement¹³ in which deaths in care homes were identified as one of several key priority issues:

“I’d like to take a few moments to reassure members that care home providers and staff in Northern Ireland are working extremely hard to keep some of the most vulnerable people in our society safe and I would like to recognise their commitment and dedication here today. I am committed to providing all the support they need to continue this vital work and as such, the Public Health Agency is working very closely with local care homes, providing expert support and detailed advice in the event of infections and outbreaks occurring”

Subsequent references to care homes appeared in Ministerial statements on 30 April (week 18), 14 May (week 20) and 28 July (week 31); these focussed more on care home support and testing strategies than specifically on discharge arrangements

Conclusions from this section

1. Through the first surge of the COVID-19 pandemic, front-line clinical teams had more unoccupied beds available to them than usual, reflecting reduced attendances at emergency departments and reduced unscheduled (and elective) hospital admissions. Hence, there was less pressure to accelerate patients’ discharge from hospital than is normally the case, other than to minimise the well-known risks associated with being in hospital
2. Extensive communication was circulated by the Minister for Health and Department of Health throughout the pandemic. Selected communications during March 2020 referred to discharge planning - the impact of these communications on subsequent discharge decision-making has been evaluated in this report

¹³<https://www.health-ni.gov.uk/sites/default/files/publications/health/statement-to-ad-hoc-committee.pdf>

SECTION 2
(TERMS OF REFERENCE 1)

DISCHARGE PATTERNS IN 2019 AND 2020

Patterns of discharge from all Northern Ireland hospitals to care homes in 2019 and 2020

The purpose of this section is to understand typical patterns of discharges to care homes prior to the pandemic, in order to understand whether there was evidence of a change in pattern during the pandemic

Figure 6 shows the number of people discharged from HSC hospitals to care homes during 2019 and 2020. In any given quarter, the percentage of patients discharged to care homes is relatively small, typically representing about 2 to 3% of all people discharged. The great majority of people (97% to 98%) are not discharged to a care home; most commonly they return to their own home

Discharge to a care home is about 10 times more likely after an unscheduled rather than an elective admission (Figure 6). Consequently, people discharged to care homes make up a higher percentage of total unscheduled discharges (between 5 and 6%); even so, the great majority of people are discharged to their own home after an unscheduled admission

The number of people discharged to a care home in the first quarter of 2020 (3078) was almost identical to the number in the first quarter of 2019 (2995). Substantially fewer people were discharged to care homes during the second quarter of 2020 (1879) compared with the second quarter of 2019 (2893)

Tables 3 and 4 provide more detail about the number of people discharged to care homes (and elsewhere) during the individual quarters of 2019 and 2020

Table 3 reinforces that it is exceptionally uncommon to be discharged to a care homes after an elective admission. There was no evidence that the percentage of people discharged to care homes, after an elective admission, increased unexpectedly during the first or second quarter of 2020. Because the number (and percentage) of people discharged to care homes after elective admission is so small, these will not be considered any further

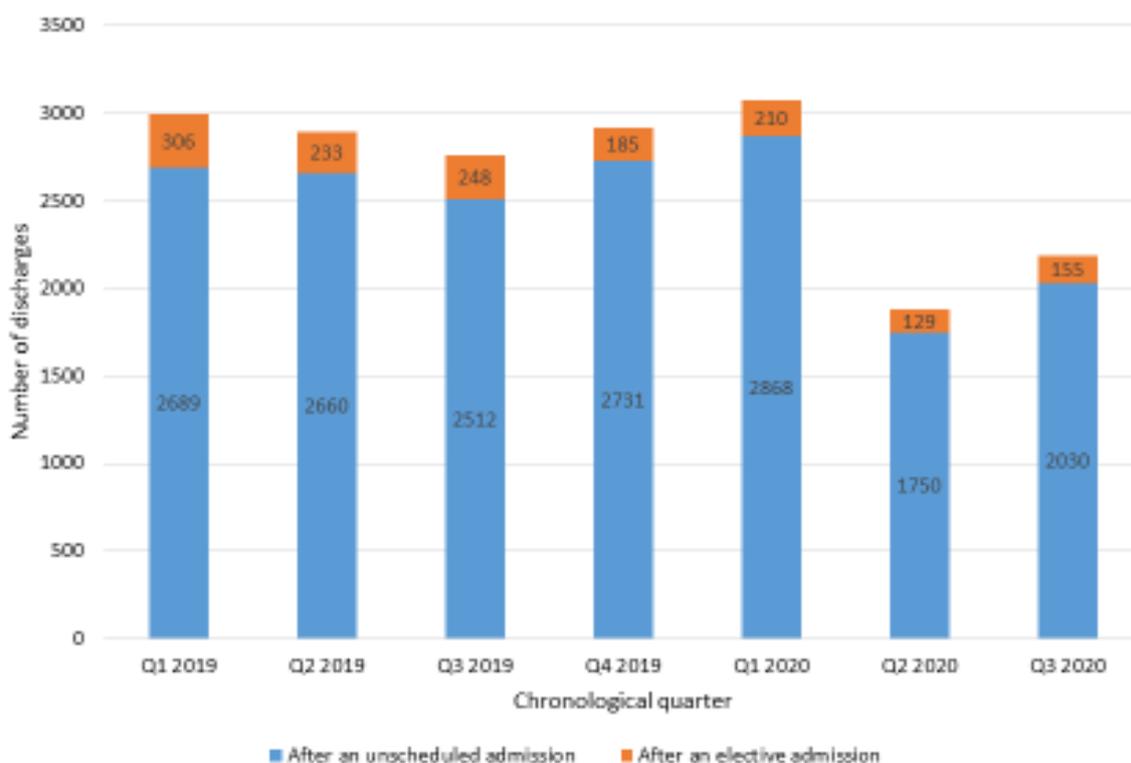


Figure 6. Temporal patterns of hospital discharges from HSC hospitals in Northern Ireland to care homes during 2019 and 2020. Each chronological quarter represents three months. Source – Information Analysis Directorate, DoH

| | People discharged following an elective admission | | | | |
|-------------|--|-------------------------------|---------------------------|---|---|
| | Discharged to a care home | Not discharged to a care home | Total elective discharges | Percentage of people discharged to care homes | Percentage not discharged to care homes |
| 2019 | | | | | |
| Q1 | 306 | 89946 | 90252 | 0.34 | 99.66 |
| Q2 | 233 | 90083 | 90316 | 0.26 | 99.74 |
| Q3 | 248 | 87962 | 88210 | 0.28 | 99.72 |
| Q4 | 185 | 87037 | 87222 | 0.21 | 99.79 |
| 2020 | | | | | |
| Q1 | 210 | 80452 | 80662 | 0.26 | 99.74 |
| Q2 | 129 | 44843 | 44972 | 0.29 | 99.71 |
| Q3 | 155 | 59754 | 59909 | 0.26 | 99.74 |

Table 3. Quarterly patterns of discharge from HSC hospitals following elective admissions during 2019 and 2020. Source – Information Analysis Directorate, DoH

Table 4 shows that during every quarter of 2019 and 2020, either 5% or 6% of people who had an unscheduled hospital admission were discharged to care homes. There was no evidence that the number or percentage of people discharged to care homes increased unexpectedly during the first or second quarter of 2020. Indeed the absolute number of people discharged to care homes fell by 39% between quarter 1 and quarter 2 (from 2868 to 1750), reflecting the broader decline in hospital admissions (Figure 3) and discharges (Figure 4) demonstrated previously

| | People discharged following an unscheduled admission | | | | |
|-------------|---|-------------------------------|------------------------------|---|---|
| | Discharged to a care home | Not discharged to a care home | Total unscheduled discharges | Percentage of people discharged to care homes | Percentage not discharged to care homes |
| 2019 | | | | | |
| Q1 | 2689 | 45328 | 48017 | 6 | 94 |
| Q2 | 2660 | 45309 | 47969 | 6 | 94 |
| Q3 | 2512 | 45080 | 47592 | 5 | 95 |
| Q4 | 2731 | 46395 | 49126 | 6 | 94 |
| 2020 | | | | | |
| Q1 | 2868 | 41433 | 44301 | 6 | 94 |
| Q2 | 1750 | 33152 | 34902 | 5 | 95 |
| Q3 | 2030 | 38319 | 40349 | 5 | 95 |

Table 4. Quarterly patterns of discharge from HSC hospitals following unscheduled admissions during 2019 and 2020. Source – Information Analysis Directorate, DoH

To evaluate patterns of discharges to care homes in greater detail, weekly data covering the first pandemic surge are shown in Table 5 and Figure 7. Assuming 13 weeks per quarter and based on the 2019 data in Table 3, one would expect approximately 193 to 210 people to be discharged to care homes on a weekly basis, following an unscheduled hospital admission

There were two weeks during the first surge when the number of people discharged to care homes was above this range: weeks 11 and week 13, representing 6% and 9% of unscheduled discharges respectively. There were 9 weeks when the number was below this range: weeks 14 through 22, representing 4% through 8% of unscheduled discharges respectively

During every week from week 14 through 22, the number of people discharged to care homes, following an unscheduled hospital admission, was lower than would typically have been the case in a typical week in 2019

| | People discharged following an unscheduled admission | | | | |
|-------------------------|---|-------------------------------|------------------------------|---|---|
| | Discharged to a care home | Not discharged to a care home | Total unscheduled discharges | Percentage of people discharged to care homes | Percentage not discharged to care homes |
| Week during 2020 | | | | | |
| 9 (23/2-29/2) | 207 | 3341 | 3548 | 6 | 94 |
| 10 (1/3-7/3) | 199 | 3408 | 3607 | 6 | 94 |
| 11 (8/3-14/3) | 231 | 3355 | 3586 | 6 | 94 |
| 12 (15/3-21/3) | 206 | 2901 | 3107 | 7 | 93 |
| 13 (22/3-28/3) | 237 | 2425 | 2662 | 9 | 91 |
| 14 (29/3-4/4) | 165 | 1998 | 2163 | 8 | 92 |
| 15 (5/4-11/4) | 117 | 2107 | 2224 | 5 | 95 |
| 16 (12/4-18/4) | 104 | 2039 | 2143 | 5 | 95 |
| 17 (19/4-25/4) | 110 | 2250 | 2360 | 5 | 95 |
| 18 (26/4-2/5) | 118 | 2507 | 2625 | 4 | 96 |
| 19 (3/5-9/5) | 156 | 2597 | 2753 | 6 | 94 |
| 20 (10/5-16/5) | 134 | 2559 | 2693 | 5 | 95 |
| 21 (17/5-23/5) | 131 | 2736 | 2867 | 5 | 95 |
| 22 (24/5-30/5) | 138 | 2607 | 2745 | 5 | 95 |

Table 5. Weekly patterns of discharge from HSC hospitals following unscheduled admissions during 2020, during the first pandemic surge. Source – Information Analysis Directorate, DoH

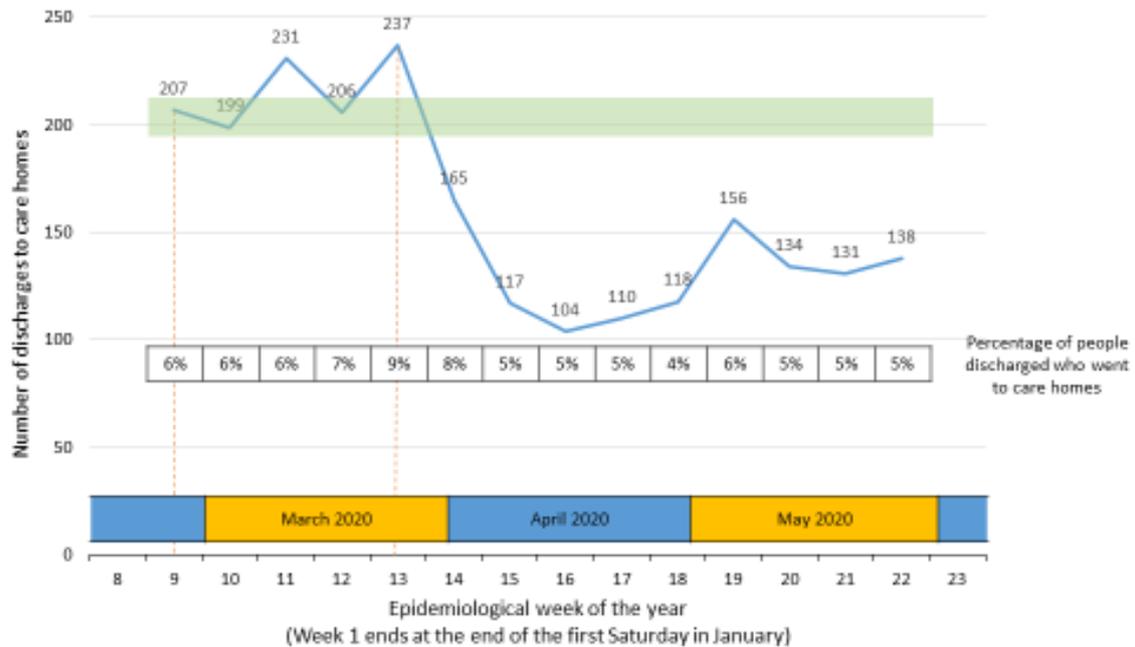


Figure 7. Graphical representation of the data in Table 4. Weekly patterns of discharge from HSC hospitals to care homes following unscheduled admissions during the first pandemic surge. The shaded green area indicates the typical range of such weekly discharges to care homes, extrapolated from quarterly data from 2019 (193 to 210 discharges weekly, assuming 13 weeks per calendar quarter). Source – Information Analysis Directorate, DoH

Conclusions from this section:

3. During the first quarter of 2020, the number and percentage of people discharged to care homes from HSC hospitals in Northern Ireland was very similar to that in all quarters in 2019. The absolute number of people discharged to care homes was lower in the second and third quarters of 2020 than in 2019, reflecting the broader decline in hospital admissions and discharges during 2020
4. During weeks 14 through 22 in 2020, fewer people were discharged to care homes than the usual estimated weekly average, while during weeks 11 and 13, more people were discharged to care homes than the usual weekly average. To evaluate the significance of the latter, patient-level analysis of the 465 people discharged to care homes during weeks 11 and 13 is described in section 3

SECTION 3
(TERMS OF REFERENCE 2)

**CORRELATION BETWEEN HOSPITAL DISCHARGES AND SUBSEQUENT CARE HOME
OUTBREAKS**

Establish if there was any correlation between hospital discharges and subsequent care home outbreaks

Figures 4 and 7 are reproduced below for convenience. Figure 4 showed that weekly unscheduled discharges began to fall after week 11, reflecting the drop in ED attendances and unscheduled admissions that had begun the previous week

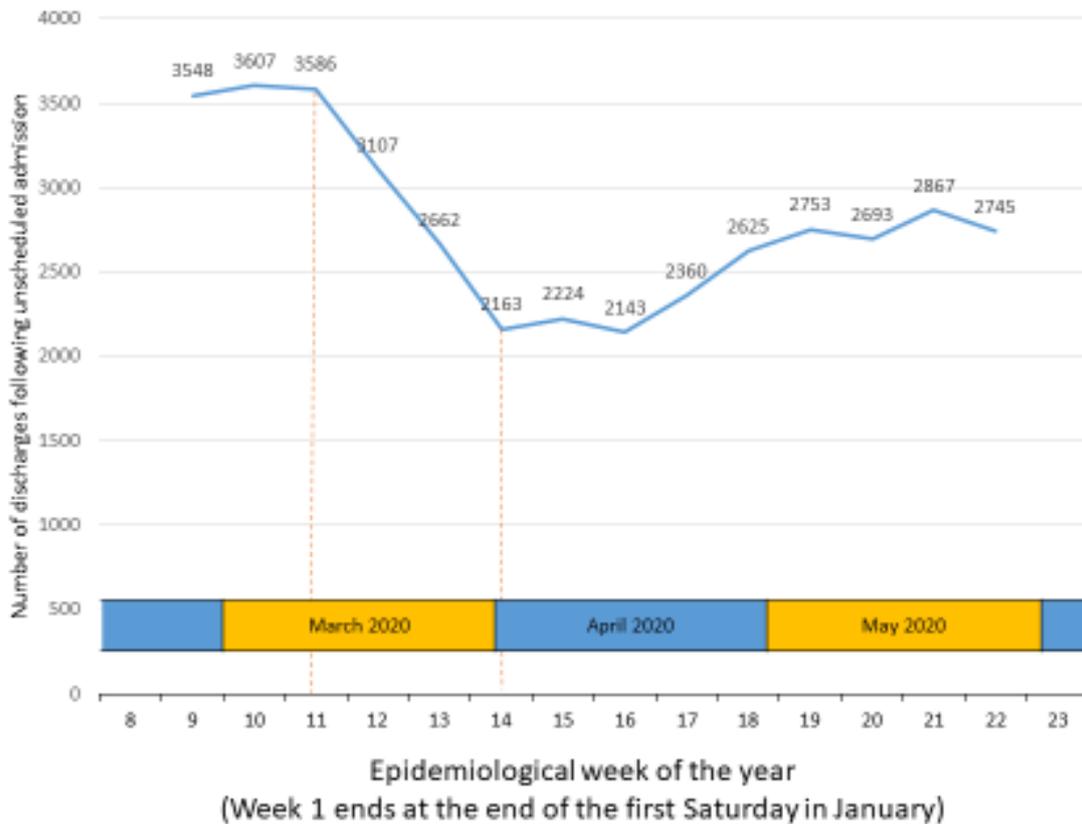


Figure 4 (reproduced). Patterns of discharge following unscheduled admissions to HSC hospitals in Northern Ireland during the first pandemic surge. Source – Information Analysis Directorate, DoH

Figure 7 showed that a similar decline in discharges to care homes occurred but it began later, after peaking in week 13. From week 14 onwards, unscheduled discharges to care homes were fewer than would normally be expected. Weeks 11 and 13 are of interest, because during each of those weeks, more people than usual were discharged to care homes. The purpose of the current section is to understand this pattern in relation to the timeframe of COVID-19 outbreaks in care homes as well as in relation to the timeframe of DoH communications to frontline teams

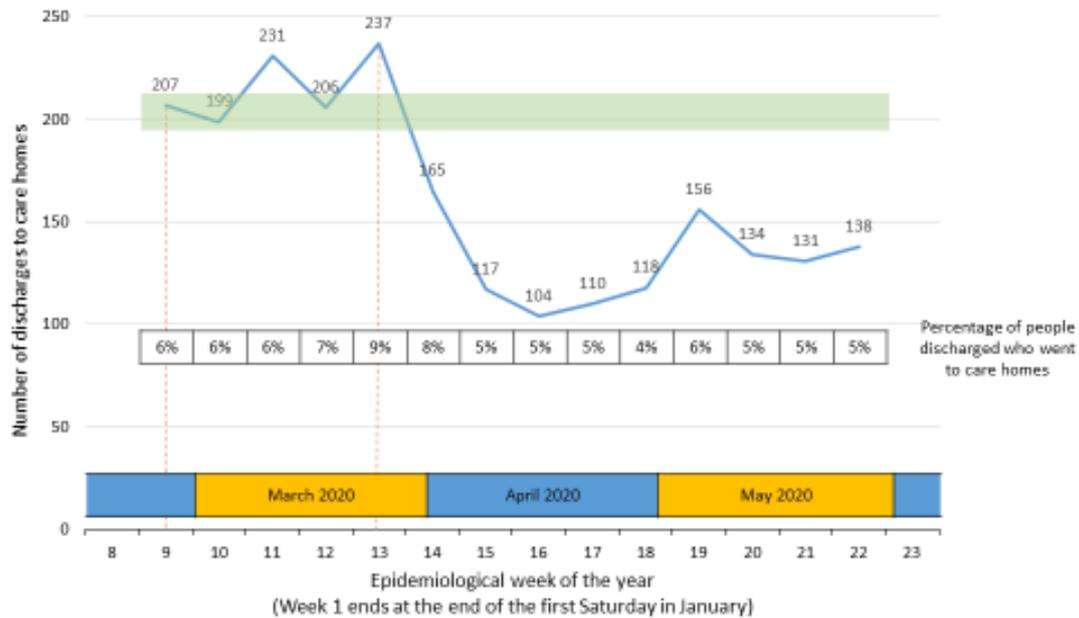


Figure 7 (reproduced). Weekly patterns of discharge from HSC hospitals to care homes following unscheduled admissions, during the first surge of the pandemic. Source – Information Analysis Directorate, DoH

Figure 8 shows the weekly patterns of COVID-19 outbreaks in care homes in Northern Ireland. The definition of an outbreak is two or more cases in a facility which meet the case definition of a possible or confirmed case of COVID-19, within a 14-day period among either the residents or staff in the care home

The first two COVID-19 outbreaks in care homes in Northern Ireland were reported to the duty room of the PHA during week 11. The weekly number of reported outbreaks rose promptly thereafter and there were more than 10 new care home outbreaks every week from weeks 13 through 18, by which time almost 30% of care homes had experienced either a suspected or laboratory-confirmed outbreak with broadly similar percentages across different Trust areas. Following week 18 the number of new outbreaks fell and no new outbreaks were reported in weeks 24 or 25

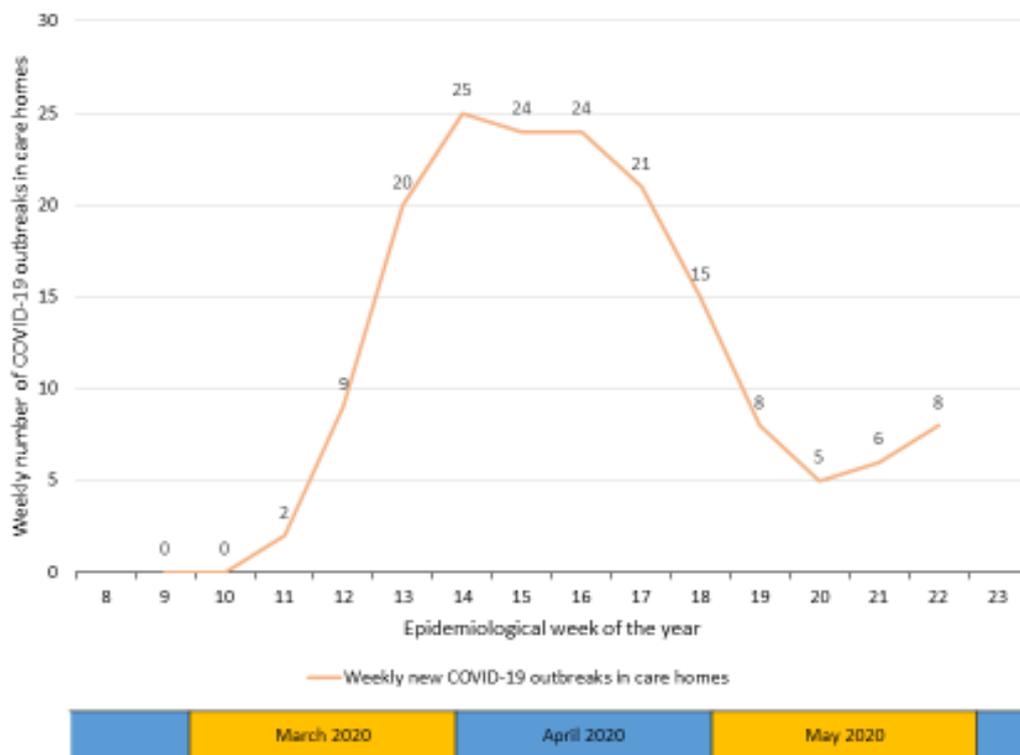


Figure 8. Weekly numbers of new COVID-19 outbreaks in care homes in Northern Ireland. Source – Information Analysis Directorate, DoH

Figure 9 shows the weekly patterns of COVID-19 outbreaks in care homes in Northern Ireland plotted alongside the weekly number of unscheduled discharges to care homes and Figure 10 shows the data in a different way, with the number of unscheduled discharges to care homes plotted against the number of care home outbreaks in the same week. The latter plot aims to detect any visual relationship or correlation between the two parameters

Neither Figure 9 nor Figure 10 shows a clear numerical relationship between discharges to care homes and care home outbreaks. That the peak number of outbreaks occurred while discharges were falling rapidly might reinforce such a conclusion. Even allowing for a one-week to two-week asymptomatic lag phase, it is difficult to see a clear numerical correlation between care home outbreaks and hospital discharges to care homes

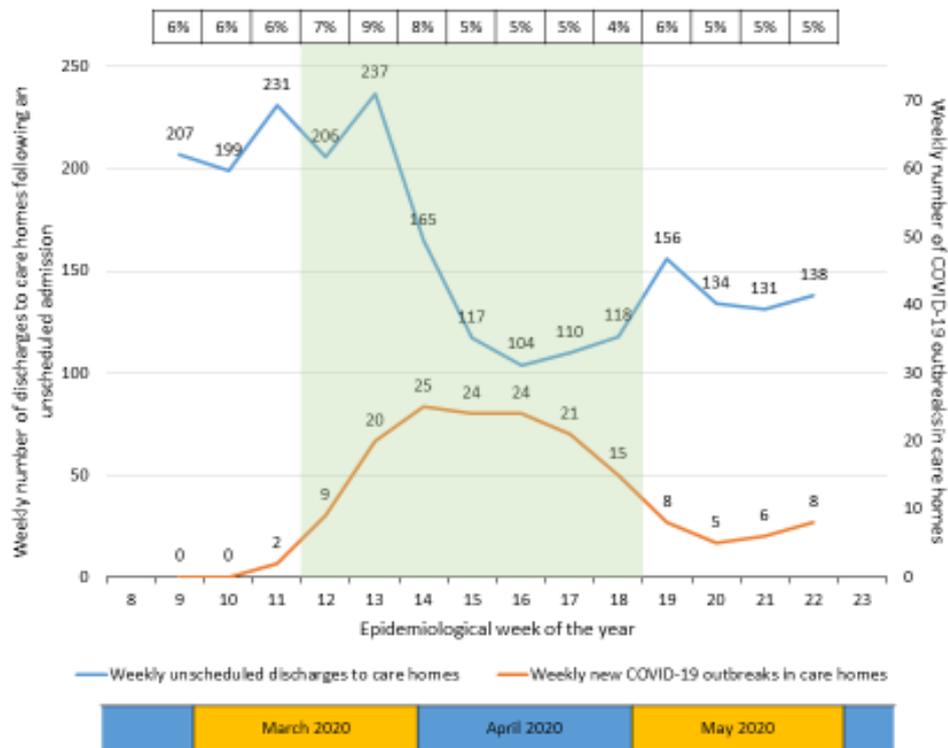


Figure 9. Weekly patterns of discharge from HSC hospitals to care homes following unscheduled admissions, during the first surge of the pandemic (blue line) along with weekly numbers of new COVID-19 outbreaks in care homes (orange line). The green shaded area covers the weeks where more than 10 outbreaks weekly were reported. Source – Information Analysis Directorate, DoH

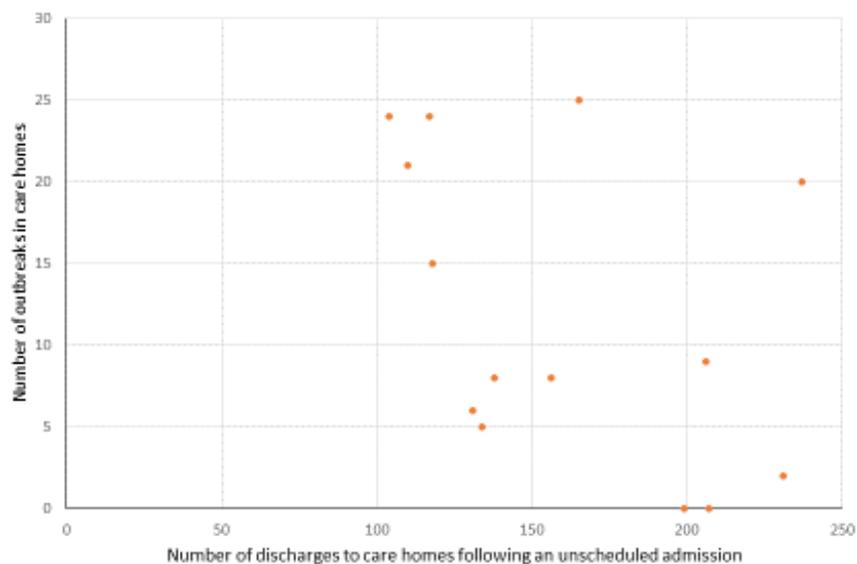


Figure 10. Scatter plot showing the number of new COVID-19 outbreaks in care homes (Y-axis) plotted against weekly discharges to care homes following an unscheduled admission (X-axis). Each data point represents a different epidemiological week. Source – Information Analysis Directorate, DoH

In order to consider the impact of broader community COVID infection rates on care home outbreaks, Figure 11 shows weekly care home outbreaks plotted alongside weekly hospital admissions with confirmed COVID-19 (which I have chosen as an indirect index of broader COVID infection rates)

The relationship between the two curves in Figure 11 seems close, and considerably closer than that seen in Figure 9. The peak weeks for care home outbreaks were weeks 13 through 17, coinciding with the peak weeks of hospital admissions with COVID-19. Similarly, Figure 12 shows a linear relationship between the number of hospital admissions with COVID-19 and the number of care home outbreaks during the same week. The impression from Figures 11 and 12 combined is that the number of care home outbreaks in a given week had a closer correlation with COVID-19 admissions during that week (an index of general community transmission) than with the number of hospital discharges to care homes during the same week (shown in Figures 9 and 10)

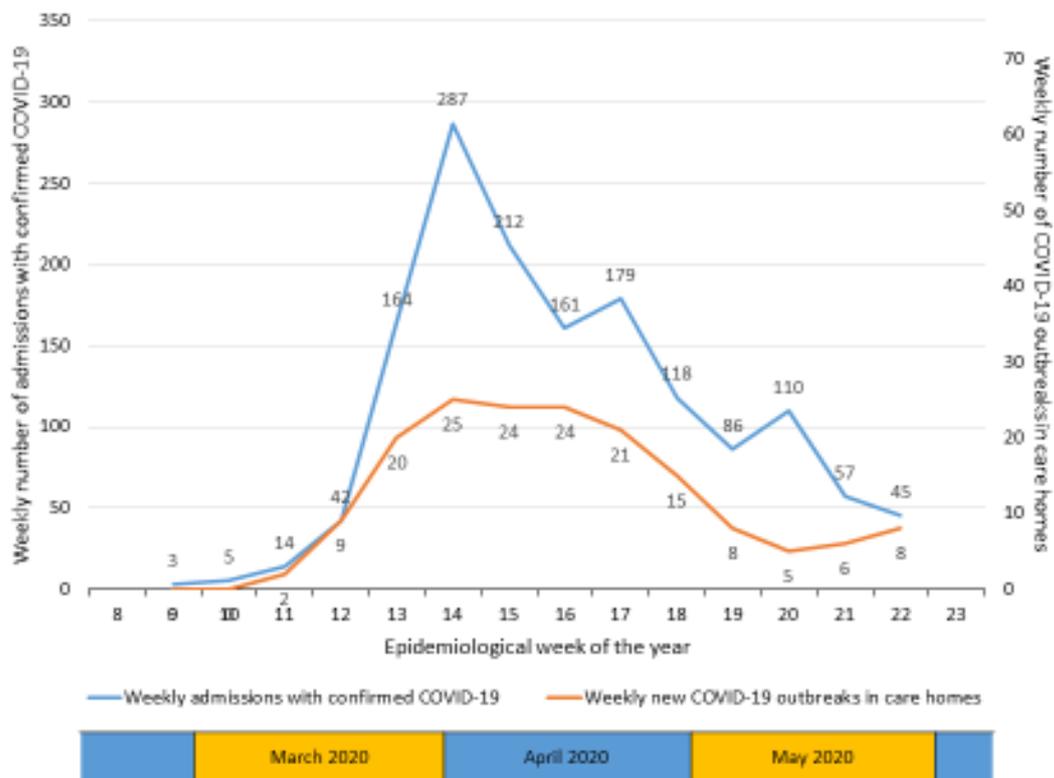


Figure 11. Weekly numbers of new COVID-19 outbreaks in care homes (orange line) along with weekly hospital admissions with confirmed COVID-19 (blue line). Source – Information Analysis Directorate, DoH and COVID-19 Dashboard, DoH

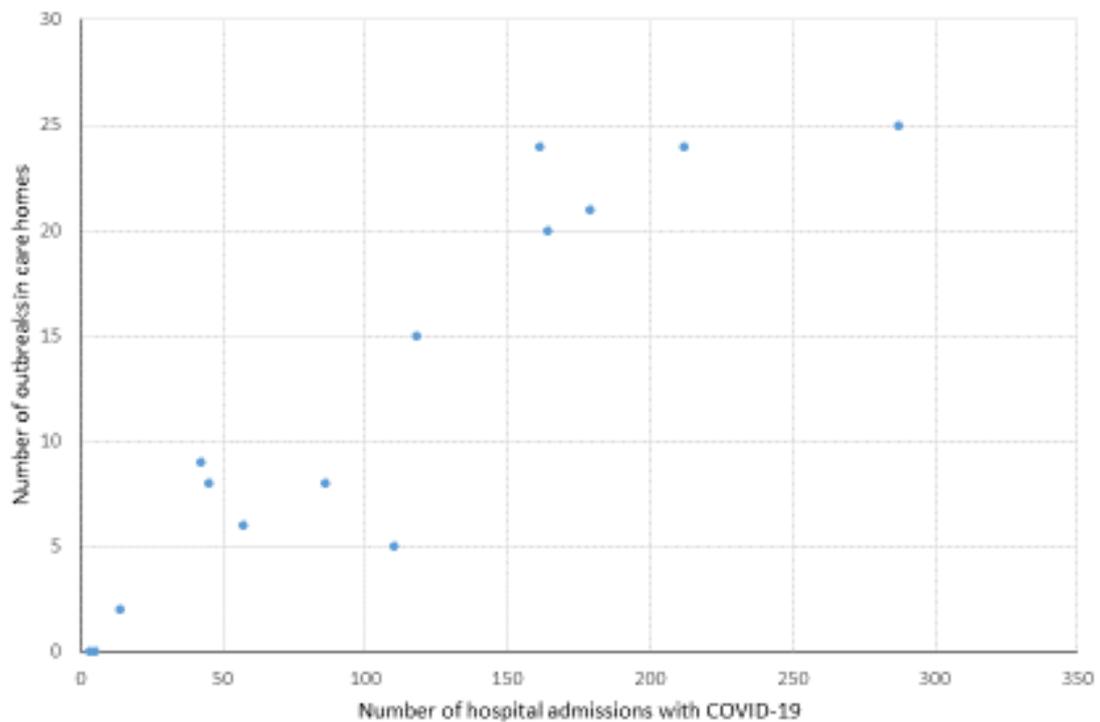


Figure 12. Scatter plot showing the number of new COVID-19 outbreaks in care homes (Y-axis) plotted against weekly hospital admissions with confirmed COVID-19 (X-axis). Each data point represents a different epidemiological week. Source – Information Analysis Directorate, DoH and COVID-19 Dashboard, DoH

In order to test the ability of local data systems to return anonymised patient-level data to inform this report, I asked two further questions shown in Figure 13.

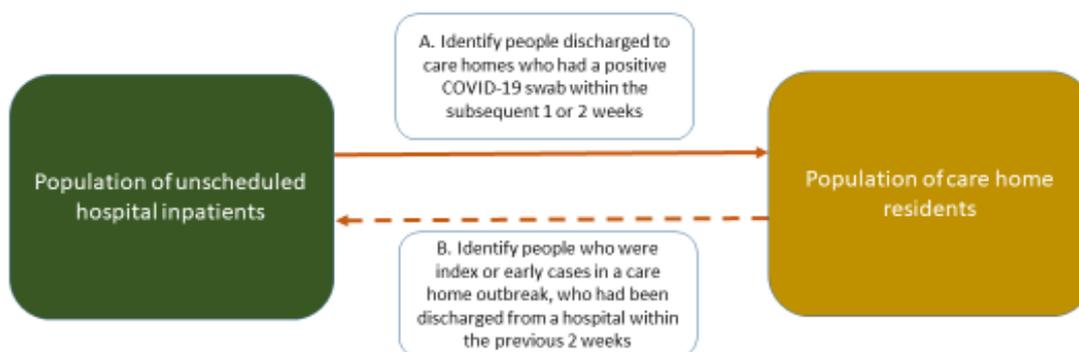


Figure 13. Potential patient-level information that might help address any link between discharges to care homes and subsequent care home outbreaks

To address question A, I specifically focussed on weeks 11 and 13, the two weeks where the number of people discharged to care homes after an unscheduled admission was higher than the typical weekly average (as shown in Figure 7). Among the 468 patients discharged to care homes during these two weeks, there were three duplicates leaving a population of 465. If this population of people had been an important source of COVID-19 outbreaks in care homes after discharge, I would have expected a substantial proportion to have had a positive COVID test in either the first or second week after the date of discharge

Among the 465 people, one tested positive in the first week after discharge and 4 more tested positive in the second week after discharge. Hence in total 5 (1.1%) tested positive within 2 weeks of discharge and 460 (98.9%) did not

| Number of patients | Tested positive for COVID-19 in the first 14 days after discharge to care home | Did not test positive within 2 weeks of discharge |
|--------------------|--|---|
| 465 | 5 (1.1 %) | 460 (98.9%) |

To address question B, I reviewed outbreak reports from some of the early care home outbreaks to determine whether index/early cases in an outbreak were typically documented to a level where any link with recent hospital discharge could be identified. The outbreak reports do not contain this level of detail and so it was not possible to test this question any further

Conclusions from this section:

5. The weekly pattern of care home outbreaks during the first surge appears to be more closely correlated with COVID-19 admissions rates during the same week (a surrogate for general community transmission and infection) than with the rates of unscheduled discharges to care homes
6. Patient-level analysis during weeks when the number of people discharged to care homes was more than usual (weeks 11 and 13), found that only about 1% of those people tested positive for COVID-19 in the fortnight after discharge to a care home. It did not support a hypothesis that this group of people was a substantial cause of COVID-19 outbreaks in care homes

SECTION 4
(TERMS OF REFERENCE 3)

Consider the clinical decision-making process in relation to discharges

Clarify the relationship (or otherwise) between Departmental guidance and the decision-making process

The clinical decision-making process in relation to discharge after hospital admission

A decision to discharge a person from hospital is an integral component of the broader set of clinical decisions that take place during hospital admissions. The decision is typically taken by a senior hospital doctor, most often a consultant

The principal drivers to timely discharge are

- (i) to facilitate patient flow and sustain inpatient capacity for all people who require hospital admission and
- (ii) the well-being of the person being discharged

Although maintaining inpatient capacity and flow is a strong driver for prompt discharge, clinicians are also very aware of the risks that hospitalisation poses, especially for elderly people and those with several health problems. This is summarised clearly here:

“On the whole, unless you are desperately sick or injured, most of us do not want to be in a hospital. As we get older, one of the things important to most people is to remain independent. We dread being taken away from our own homes, from familiar faces and routines. We particularly dread being dependent on others. There is no bed like our own bed. A hospital is a good place to be when you are acutely unwell, but it can bring its own risks, even for the hardy. In every hospital admission, there is a risk of picking up an infection. For the more vulnerable, being in hospital also frequently means losing mobility, losing confidence in the ability to live independently, losing the continuity of whatever care packages are in place. Add this to the likelihood of confusion and disorientation in an unfamiliar environment and daily routine – and it is clear that hospitals are not the place to be, once the acute issue that brought the person in to a hospital bed is resolved”¹⁴

As recently as 16 September 2020, the UK Government, in collaboration with the Academy of Medical Royal Colleges issued updated guidance¹⁵ on the safe and timely

¹⁴https://www.local.gov.uk/sites/default/files/documents/NEW0164_DTOC_Brochure_Online_Spreads_1.0.pdf

¹⁵ <https://www.gov.uk/government/publications/hospital-discharge-service-policy-and-operating-model/hospital-discharge-service-policy-and-operating-model>

discharge of people from hospitals in England. This includes a specific list of clinical parameters, at least one of which must be fulfilled, **to justify the need to remain in an acute hospital setting**. In many ways, this new approach is the inverse of the traditional approach, whereby criteria needed to be met **in order to justify discharge from hospital**

Traditional criteria to justify discharge have included resolution of a patient's symptoms and signs, normalisation of measurements that had been abnormal on admission, completion of outstanding tests or procedures and a full return to the patient's functional and mobility baseline status. The updated approach does not focus on these arbitrary standards but instead defines the criteria to justify remaining in hospital as:

- *“Requiring ITU or HDU care*
- *Requiring oxygen therapy/NIV*
- *Requiring intravenous fluids*
- *NEWS2 > 3 (clinical judgement required in persons with AF and/or chronic respiratory disease)*
- *Diminished level of consciousness where recovery realistic*
- *Acute functional impairment in excess of home/community care provision*
- *Last hours of life*
- *Requiring intravenous medication > b.d. (including analgesia)*
- *Undergone lower limb surgery within 48 hours*
- *Undergone thorax-abdominal/pelvic surgery with 72 hours*
- *Within 24 hours of an invasive procedure (with attendant risk of acute life-threatening deterioration)”¹⁵*

The updated guidance also estimates the anticipated breakdown of different levels of support that people will require after discharge:

Pathway 0 (50%) – simple discharge, no formal input from health or social care needed once home

Pathway 1 (45%) – support to recover at home; able to return home with support from health and/or social care

Pathway 2 (4%) – rehabilitation or short-term care in a 24-hour bed-based setting

Pathway 3 (1%) – require ongoing 24-hour nursing care, often in a bedded setting. Long-term care is likely to be required for these individuals

This recent guidance represents a completely new way to approach decisions to discharge people after unscheduled hospital admissions. Every day, the default decision will be to discharge and then the question becomes “can a decision to keep this person in hospital be justified?” rather than the traditional default, which is to continue admission until such time as discharge can be justified

It mirrors recent developments in “front-door” alternatives to hospital admission, whereby a decision to admit to an inpatient hospital bed is seen as the least desirable outcome. The provision of rapid-access clinical services and ambulatory emergency care units with close links to emergency departments has safely avoided hospital admission for thousands of patients every year

Such major shifts in thinking (and by implication, culture) take time to embed and to become standard practice, and there is usually considerable variation in the speed of implementation between different regions and Trusts. Nonetheless, this appears to be an appropriate and much-needed change in mind set and it is reassuring that it is supported by the Academy of Medical Royal Colleges

The relationship (or otherwise) between Departmental guidance and the discharge decision-making process

Along with every other decision that takes place during an inpatient hospital admission, the answerability for the outcome of a decision to discharge (including any adverse outcome) rests with the consultant who has the named responsibility for that patient's hospital admission. Hence it is a decision that consultants take very seriously, based on years of training and clinical experience. Consultants take adverse clinical outcomes very seriously and often very personally. Intuitively it seems unlikely that consultants would change discharge practice based on guidance from a source that they do not regard as more clinically expert than themselves

To get an understanding of consultants' subjective impression of the relationship between Departmental guidance and their discharge decision-making processes, I conducted a short anonymous survey

In addition, to address the question objectively, I collated data on hospital length-of-stay patterns in the years preceding the pandemic as well as during the first pandemic surge. This was to understand typical lengths-of-stay, normal levels of variation and any disparity between the 2020 pattern and patterns in previous years, including for people discharged to care homes

Anonymous survey of hospital consultants

This short survey was addressed to 130 consultants within the Belfast HSC Trust, most of whom make discharge decisions for unscheduled patients as part of their daily work. I am grateful to the 31 who responded

1. Asked to consider the impact of letters from the DoH, HSCB or PHA on their decisions to discharge patients after an unscheduled hospital admission, the commonest response was "Letters such as this have a minor impact on my clinical

decisions to discharge patients” (14 respondents) and the next most common response was “Letters such as this have no impact on my clinical decisions to discharge patients” (11 respondents)

2. Asked whether they remembered the letter headed "COVID-19: Preparations for Surge" (March 26, 2020) 18 out of 31 said that they did not remember it while 13 did
3. When reminded of the following text from the letter of March 26: "*In the weeks and months ahead, it will be more important than ever for Trusts to implement effective discharge arrangements for patients as soon as they are well enough to leave hospital in order to release beds for newly admitted patients. Trusts should also work to maximise and utilise all spare capacity in residential, nursing, and domiciliary care*" they were asked whether they remembered discharging patients earlier than they thought clinically appropriate following this letter. 29 out of 31 said “no”

Nineteen out of 31 added optional anonymous comments. Some recurrent themes were as follows:

“I discharge patients when they are clinically well enough for discharge and not before”

“I did not think that this letter prompted me or my colleagues to make decisions re medical fitness to discharge beyond our normal practice”

“I work in a high-pressure specialty. Standard practice is for patients to leave hospital as soon as they are well enough; otherwise we would have no beds for emergency admissions”

“I think this letter gave us, the hospital staff, the confidence to enable discharge of patients in an efficient way by allowing us to inform families of the need to support their family member at home. We would never discharge earlier than appropriate. It would be useful to the system if this timely discharge protocol became the accepted cultural norm in Northern Ireland”

Patterns of length-of-stay

Table 6 illustrates typical median lengths of stay during unscheduled admissions over recent years. Among people not discharged to a care home, the median length of stay has been consistently 2 or 3 days and did not fall during 2020. Among people discharged to care homes, the median length of stay is much longer at 8 to 11 days. This also did not fall during 2020

| | Median length of hospital stay (days) | |
|-------------|---------------------------------------|--------------------------------------|
| | People discharged to a care home | People not discharged to a care home |
| 2018 | | |
| Q1 | | |
| Q2 | 9 | 2 |
| Q3 | 8 | 2 |
| Q4 | 9 | 2 |
| 2019 | | |
| Q1 | 9 | 3 |
| Q2 | 8 | 2 |
| Q3 | 9 | 3 |
| Q4 | 9 | 3 |
| 2020 | | |
| Q1 | 11 | 3 |
| Q2 | 9 | 2 |
| Q3 | 9 | 3 |

Table 6. Median length of stay (in days) among people discharged after unscheduled hospital admissions. Source – Information Analysis Directorate, DoH

Figure 14 shows week-by-week detail about length of stay during the first pandemic surge. Median length of stay among people not discharged to a care home was consistently 2 or 3 days throughout. Among people discharged to care homes, the median length of stay was most commonly 8 to 10 days. It peaked at 13 days during week 13 but fell back to more typical levels thereafter. At no stage was there evidence of a reduction in length of stay, which might have indicated a haste to discharge people prematurely, whether in response to Departmental guidance or for any other reason

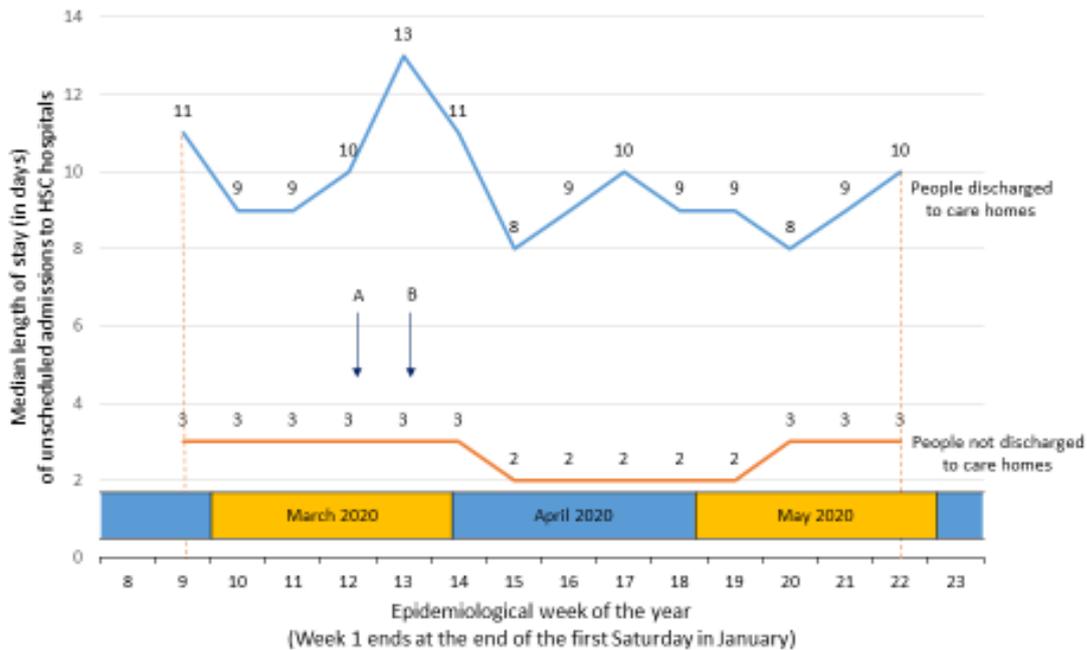


Figure 14. Patterns of median length-of-stay during unscheduled admissions to HSC hospitals in Northern Ireland through the first pandemic surge. Source – Information Analysis Directorate, DoH

Arrowhead A denotes March 19 - the date of publication of the *Health and Social Care (NI) Summary COVID-19 plan for the period mid-March to mid-April 2020*¹¹

Arrowhead B denotes March 26 - the date of issue of the Permanent Secretary’s letter titled *COVID-19: Preparations for Surge*¹²

Conclusions from this section:

7. The decision to discharge a person after a hospital admission is an important clinical judgment taken by senior medical professionals, typically consultants. It is one that they take seriously, balancing the benefits versus the risks of a person remaining in hospital
8. Very recent new guidance from the Academy of Medical Royal Colleges recommends that a decision to discharge should be the default on any given day, and that objective criteria should be met to justify remaining in hospital. This is a major shift from traditional practice and will take time to embed
9. Subjectively, consultants indicated that Departmental guidance had minimal or no impact on their discharge decisions during the first pandemic surge (nor at any other time). This subjective belief is supported by objective evidence from length-of-stay data

SECTION 5
THE WIDER UNITED KINGDOM AND INTERNATIONAL CONTEXT

How did the impact of COVID-19 on Northern Ireland’s care home residents compare with that in other UK regions and other countries?

This section aims to summarise information related to COVID-19 outbreaks in care homes in Northern Ireland and to compare it with comparable data from around the UK and around the world

General information about people in care homes in Northern Ireland

Northern Ireland, with a population of 1.885 million people has 481 care homes, caring for 14 935 residents (0.79% of the population)¹⁶. This compares with approximately 425 408 adult residents in 15 481 care homes in England (0.76% of the population), 35 989 adult residents in 1 057 care homes in Scotland (0.66% of the population) and 23 766 adult residents in 1 056 care homes in Wales (0.76% of the population)

COVID-19 outbreaks in care homes

By early October 2020, 187 care homes in Northern Ireland had reported a suspected or laboratory-confirmed COVID-19 outbreak (39.6% of care homes), amounting to 251 outbreaks in total. The spread was broadly similar across the five Trust areas

Figure 8 is reproduced for convenience. The first two COVID-19 outbreaks in care homes in Northern Ireland were reported during week 11 and there were more than 10 new care home outbreaks every week from weeks 13 through 18, by which time almost 30% of care homes had experienced an outbreak. Following week 18 the number of new outbreaks fell and no new outbreaks were reported in weeks 24 or 25

¹⁶ <https://ltccovid.org/wp-content/uploads/2020/08/COVID-19-mortality-in-long-term-care-final-Sat-29-v1.pdf>

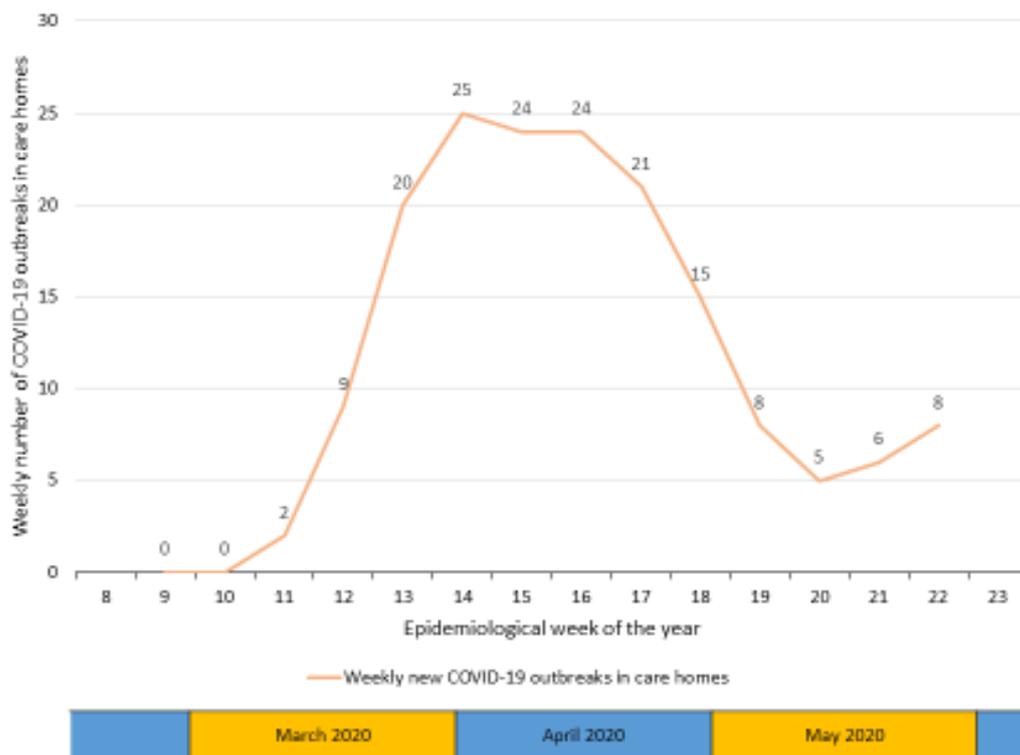


Figure 8 (reproduced). Weekly numbers of new COVID-19 outbreaks in care homes in Northern Ireland. Source – Information Analysis Directorate, DoH

Figure 15 shows the temporal pattern of care home outbreaks in Scotland between 1 March and 31 May, 2020¹⁷. The first reports occurred during week 11; the peak incidence was in weeks 15 and 16 following which the numbers fell gradually to reach a low level in week 21, though not reaching zero until some weeks later. Although the definition of the epidemiological week is slightly different, the similarity with the Northern Ireland pattern in Figure 8 is striking. The actual weekly number of outbreaks was typically 2.5 to 3 fold greater, consistent with the relative populations of the two countries (2.9 fold greater in Scotland)

¹⁷ <https://beta.isdscotland.org/find-publications-and-data/population-health/covid-19/discharges-from-nhsscotland-hospitals-to-care-homes/>

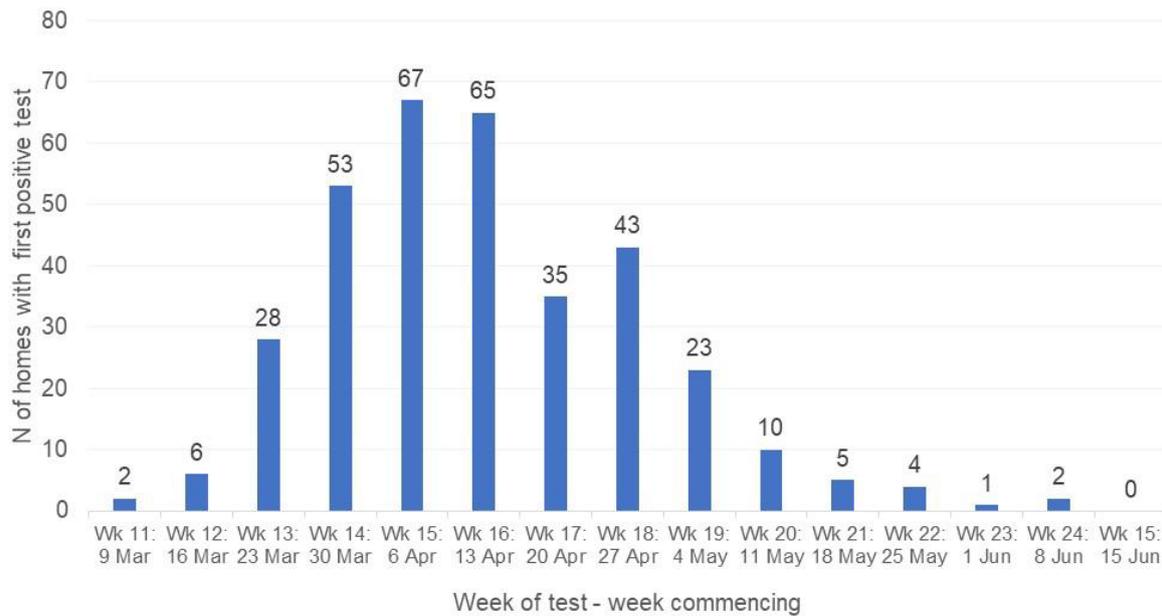


Figure 15. Number of care homes with a new outbreak by week, 9 March to 21 June, 2020 in care homes in Scotland¹⁷

The timeframe of nursing home outbreaks in the Republic of Ireland¹⁸ is also very similar to those in Northern Ireland and Scotland with the first outbreaks being reported during week 12 followed by a peak in weeks 15 and 16 and then a gradual decline to week 21 (graph 3.2 in the published report – not shown here)

¹⁸ <https://www.gov.ie/en/publication/3af5a-covid-19-nursing-homes-expert-panel-final-report/>

Deaths attributed to COVID-19 in care home residents

Table 1 is reproduced for convenience. Even though people living in care homes account for less than 1% of the Northern Ireland population, almost half of all deaths attributed to COVID-19 have occurred among care home residents

| | Weekly death statistics published by NISRA ³ |
|---|---|
| Deaths in care homes | 363 |
| Deaths of care home residents in hospital | 88 |
| Total deaths of care home residents | 451 (46% of total) |
| | |
| Deaths of non-care home residents | 528 (54% of total) |
| | |
| Total Covid-19 related deaths | 979 |

Table 1 (reproduced). Reported deaths due to COVID-19 at the time of writing based on the information entered on death certificates, completed by medical professionals. The patient may or may not have previously tested positive for the virus. Sources: COVID-19 Dashboard, DoH and NISRA

On October 14, 2020 the International Long Term Care Policy Network (ILTCPN) published a valuable summary of COVID-19 mortality in care homes across 21 countries, allowing the Northern Ireland statistics to be viewed in a wider international context¹⁹. They noted that:

“International comparisons are difficult due to differences in testing capabilities and policies, different approaches to recording deaths, and differing definitions of what constitutes a care home...

Despite the difficulties arising from differences in definitions, in almost all countries where there have been deaths linked to COVID-19, a substantial proportion of those deaths were among care home residents. Based on the data gathered for this report, the current average of the share of all COVID-19 deaths that were care home residents is 46% (based on 21 countries)...

¹⁹ <https://ltccovid.org/wp-content/uploads/2020/10/Mortality-associated-with-COVID-among-people-living-in-care-homes-14-October-2020-5.pdf>

Many older people receive care in the community. Currently, there is limited evidence from anywhere in the world on how those individuals have been directly or indirectly affected by COVID-19”

Figure 3 from the published ILTCPN report¹⁹ (not shown here) shows an interesting, linear relationship between the death rate in the non-care home population and the death rate in the care home population. Table 7 below summarises these data from selected comparator countries. The magnitude of excess risk is surprisingly consistent, typically ranging from a 40-fold to 90-fold greater mortality risk among care home residents (with two outliers – Hong Kong: 28-fold and South Korea: 15-fold). The excess mortality risk of death in care homes in Northern Ireland (61-fold) was lower than in Australia, Canada, Israel, New Zealand, Norway, Slovenia, Spain and the USA (although higher than in many other countries)

The percentage of all care home residents who died, with their death attributed to COVID-19, varied from 0.01% (in South Korea) to 6.18% (in Spain). The equivalent figures for Northern Ireland, Wales, England and Scotland were 2.93%, 3.13%, 5.24% and 5.55% respectively (Table 7). The death rate attributed to COVID-19 among care home residents in Northern Ireland was lower than the UK average and lower than in Spain, Sweden, Belgium and the USA (although higher than in many other countries)

Finally Table 7 shows that the percentage of all COVID-19 deaths occurring among care home residents in Northern Ireland (49%) is comparable to that experienced in many other countries, with some examples of higher percentages and some lower

| Country | Percentage of all COVID-19 deaths occurring in care home residents | Death rate in care home population (per 100 residents) | Death rate in non-care home population (per 100,000 residents) | Mortality ratio |
|---------------------------------|---|---|---|------------------------|
| Northern Ireland | 49% | 2.93 | 47.90 | 61 |
| United Kingdom | | | | |
| England | 45% | 5.24 | 89.47 | 59 |
| Scotland | 47% | 5.55 | 78.05 | 71 |
| Wales | 29% | 3.13 | 82.29 | 38 |
| Other countries | | | | |
| Canada | 80% | 1.74 | 19.63 | 89 |
| Belgium | 61% | 5.00 | 88.75 | 56 |
| Australia | 75% | 0.32 | 3.55 | 90 |
| United States of America | 41% | 4.24 | 60.63 | 70 |

Table 7. Examples of mortality statistics among care home residents and non-care home residents in Northern Ireland along with comparator countries from the UK as well as further afield¹⁹

Statistical analyses of deaths in care homes and their relation to hospital discharges

On 26 August, 2020 a research group from Public Health Wales published a national analysis of risk factors for COVID outbreaks in care homes²⁰. Almost all of the 1,073 adult residential and nursing homes in Wales were included, of which 29.4 % experienced a COVID-19 outbreak during the period of study (late February through late June, 2020). There were 544 hospital discharges during that time

Only one marker was identified as being independently predictive of COVID-19 outbreaks in care homes: increasing care home size. By contrast, dementia care, nursing home status, and recent hospital discharges were not independently predictive of the risk of an outbreak

On 28 October, 2020 a research group from Public Health Scotland published a Scotland-wide analysis of discharges from NHS Scotland Hospitals to Care Homes between 1 March and 31 May 2020¹⁷. There were 5 204 discharges to 843 care homes analysed during the 3-month period of study and 348 COVID-19 outbreaks were reported in the entire care home population of 1084 care homes for which data were available during this time period

Statistical analysis following the same techniques as the Welsh study²⁰ showed that the following factors were independently predictive of an increased risk of a COVID-19 outbreak in a care home:

- Care home size (greater risk with increasing number of beds in the care home)
- A care home looking after elderly people, as opposed to other adult services or those with learning disabilities
- Local authority or NHS care homes (as opposed to private or voluntary)
- Providing nursing care

The following factors were not independently predictive of an increased risk of a COVID-19 outbreak in a care home:

- The Risk Assessment Document (RAD) score
- Hospital discharges to care homes (irrespective of whether the patient had had a COVID-19 test prior to discharge)

²⁰ <https://www.medrxiv.org/content/10.1101/2020.08.24.20168955v1.full.pdf>

Conclusions from this section

10. Approximately 0.79% of people in Northern Ireland live in care homes, a very similar figure to the rest of the UK. In the first pandemic surge, about 30% of care homes in Northern Ireland reported a suspected or proven COVID-19 outbreak. This is almost identical to the outbreak rates in Wales and Scotland
11. All studies that have reported deaths among care home residents have alluded to difficulties acquiring accurate data, as well as variability in definitions. Care home residents in Northern Ireland were very much more likely to die from COVID-19 than the wider population – more than 60-fold more likely. This excess risk was of similar magnitude to that in England and Scotland as well as in many other countries around the world. The observation that 49% of all COVID-19 deaths in Northern Ireland were in care home residents was also widely reflected worldwide
12. Two separate statistical analyses in Wales and Scotland have identified care home size as the strongest predictor of care home outbreaks. Analyses that adjusted for confounding variables did not identify hospital discharges as a predictor
13. Given the diversity of countries, regions and healthcare systems that have been reported, differences in local policies, guidelines or communications seem to be less plausible explanations of care home outbreaks and consequent deaths, than the virulence of the SARS-CoV2 virus, its ability to spread rapidly in indoor settings and the innate clinical vulnerability of care home residents

APPENDIX 1

Terms of Reference

Scope of the Review

1. The review is being undertaken at the request of the Minister for Health.

2. The review should focus on the following three areas:
 - I. Compare patterns of discharge from all NI hospitals to care homes in 2019 and 2020. There is scope within the review for the analysis to be extended from a time period of one to five years to support the identification of relevant trends.
 - II. Establish if there was any correlation between hospital discharges (especially discharges in the absence of testing in early stage of pandemic) and subsequent care home outbreaks.
 - III. Consider the clinical decision-making process in relation to discharges and clarify the relationship (or otherwise) between Departmental guidance on the process to be followed when a discharge decision has been taken, and that decision making process.

Output

3. On completion of the review, a report setting out the findings and conclusions should be submitted to the Minister for Health.

Reporting Arrangements

4. Updates on the progress of the review should be provided to the Permanent Secretary for the Department of Health, as and when requested.

Timing

5. The review commenced during week beginning 21 September 2020. The timescale for completion of the review is approximately 6 to 8 weeks; delivery of a report within this timeframe is subject to the required information being made available to inform the review.

APPENDIX 2

Chronology of COVID-19 testing protocols, with a focus on references to care home residents

| Version | Date issued | Epidemiological week | Daily testing capacity (NI) | Protocol references to residents of care homes (each line is in addition to what was included in the previous versions) |
|---------|-------------|----------------------|-----------------------------|---|
| 1 | 19/3/20 | 12 | 200 | Priority testing group 4: clusters of disease in residential or care settings, for example long term care facilities and prisons |
| 2 | 26/3/20 | 13 | 1,000 | Frontline care staff in the community added to the list of health care workers who would be considered for testing |
| 3 | 19/4/20 | 17 | 1,100 | Priority testing group 5: Symptomatic residents in care homes should be tested. Additionally, in advance (48 hours) of hospital discharge to a care home the patient must be tested for COVID-19 |
| 4 | 4/5/20 | 19 | 2,350 | In all new outbreaks in care homes (nursing and residential), all residents and staff should be tested for COVID-19 as part of the initial risk assessment of each outbreak All new admissions to care homes from community settings, including from supported living accommodation, should have their COVID-19 status checked 48 hours before admission to the care home The surveillance programmes underway for COVID 19 in Northern Ireland Include outbreaks in nursing homes |
| 5 | 23/5/20 | 21 | 2,200-2,300 | Priority testing groups 4 and 5 become groups 3 and 4 If there is an outbreak (two or more cases) in a supported living facility, all staff and residents should be tested for COVID-19 |
| 6 | 9/7/20 | 28 | 2,600-2,700 | No new changes |
| 6.1 | 23/7/20 | 30 | 2,600-2,700 | No new changes |

| | | | | |
|---|----------|----|-------|--|
| 7 | 12/10/20 | 42 | 8,200 | <p>Guidance is available on appropriate infection prevention and control (IPC) precautions for COVID-19 patients recovering or recovered from COVID-19 and remaining in hospital, or being discharged to their own home or residential care</p> <p>Testing in advance (48 hours) of hospital discharge to a care home does not require the use of CEPHEID rapid testing in the HSC Trust</p> <p>HSC laboratories are to be used for testing when an outbreak happens in either a hospital or care home setting. Whole genome sequencing testing should be arranged when appropriate</p> <p>A planned programme of regular COVID-19 testing for all residents and staff in care homes in Northern Ireland without an outbreak (Green Homes) came into operation across Northern Ireland with effect from Monday 3 August 2020. It is recommended that all staff are tested for COVID-19 every 14 days, and all residents are tested for COVID-19 every 28 days</p> <p>The number of testing rounds to be undertaken in a care home with a suspected or confirmed COVID-19 outbreak will be determined taking into account the specific circumstances of that care home</p> <p>New detailed guidance for care homes with a single symptomatic individual and with two or more symptomatic individuals at the same time</p> |
|---|----------|----|-------|--|

APPENDIX 3

Glossary of Terms and Abbreviations (alphabetical)

b.d. – *bis die* (Latin); twice a day

COVID-19 - coronavirus disease 2019; the infectious disease caused by the most recently discovered coronavirus

DoH – The Northern Ireland Department of Health

ED – emergency department

GMC – The General Medical Council; the UK regulator of medical practitioners

HDU – high dependency unit

HSC – The Health and Social Care system of Northern Ireland

HSCB – the Northern Ireland Health and Social Care Board

IAD – Information Analysis Directorate of the DoH

ICU/ITU – intensive care unit/intensive therapy unit

NEWS – the National Early Warning Score

NISRA – The Northern Ireland Statistics and Research Agency

NIV – non-invasive ventilation

PHA – the Northern Ireland Public Health Agency

SARS-CoV-2 – severe acute respiratory syndrome coronavirus 2; the strain of coronavirus that causes COVID-19

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