Epidemiology of Covid-19 Outbreaks in Residential Care Facilities (RCF) in Ireland

Report prepared by Public Health, Health Protection

An overview report of Covid-19 outbreaks in Nursing Home Settings to 8th May 2020

This report has been prepared by Public Health, Health Protection, on the epidemiology of cases and outbreaks of Covid-19 within residential care facilities in Ireland.

While most people with Covid-19 will have mild disease and recover. A minority will unfortunately develop more serious illness, have more significant clinical sequelae and be at higher risk of mortality from their infection. People at higher risk of developing serious illness include:

- Older people – the risk increases progressively in people above the age of 60 years and is particularly high among individuals aged in their 70s and 80s
- Those who are immunocompromised
- Those with underlying medical conditions

Residents within residential care facility settings are vulnerable to becoming infected with Covid-19 should there be a case within the setting amongst staff or residents (because of the group setting they live in and immunological compromise), and, are more vulnerable to severe clinical sequelae from their infection. Public health departments have been actively engaging with residential care facilities across the country and managing cases and outbreaks within these settings. Further, a mass testing process of staff and residents was commenced on April 18th 2020, nationally.

This report provides:

- a summary of national level data on outbreaks and clusters of Covid-19
- an outline of the epidemiology of outbreaks within residential care facilities in Ireland, at national and regional level.
- An outline of the epidemiology of outbreaks within nursing homes specifically
- provides an enhanced epidemiological analysis of a sample of outbreaks managed within residential care facilities and
- preliminary results from Public Health Departments on the outcome of the mass testing process.

Note: Data are provisional and confidential

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Summary

This report includes all data extracted from CIDR on 11th May 2020 at 08:34 and includes all 0utbreaks and cases notified on CIDR up to and including Saturday 9th May 2020 by midnight (00:00). Weekly data reports include data notified up to week 19 (week ending 09/05/2020).

All data relating to the mass testing process in RCF as available and processed by Departments of Public Health up to Friday 9th May 2020.

Number of COVID-19 outbreaks notified in all settings	**754**
Number of COVID-19 outbreaks notified in RCF	**418**
Number of COVID-19 outbreaks notified in NH	**241**
Number of tests undertaken in NH mass testing	**42,380**
Covid-19 positivity of mass testing undertaken in residents in regional NH	**5.5%**
Covid-19 positivity of mass testing undertaken in staff in regional NH	**3.0%**
Covid-19 positivity of mass testing undertaken in Dublin NH (staff and residents)	**13.6%**

Table of Contents

Covid-19 Outbreak Definition

For the purposes of public health action, the threshold for an outbreak of Covid-19 in an RCF is defined as*:

- a single suspected case of Covid-19 in a resident or staff member in the RCF **OR**
- one confirmed case of Covid-19 in a resident or staff member in the RCF.

For the purposes of epidemiological surveillance, an outbreak of Covid-19 is defined as*:

- two or more cases of illness consistent with Covid-19 infection in residents or staff members and at least one person is a confirmed case of Covid-19 **OR**
- two or more cases of illness consistent with Covid-19 infection in residents or staff members and there is a strong suspicion that it is caused by Covid-19 (do not report as outbreak of ARI at this time)

**These definitions may be subject to change as the* Covid-19 *pandemic evolves*

Guidelines on the prevention and management of Covid-19 cases and outbreak sin RCF is available on the HPSC website: https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/guidance/outbreakmanagementguidance/ Outbreaks are recorded on Ireland's Computerised Infectious Disease Reporting System (CIDR). The COVID-19 case definition is detailed on the Health Protection Surveillance Centre (HPSC) website: https://www.hpsc.ie/a-z/respiratory/coronavirus/novelcoronavirus/casedefinitions/.

Section 1: Epidemiological report on outbreaks of Covid-19 in Ireland

These data will be presented by

- 1.1: Outbreaks / Clusters of Covid-19 in Ireland
- 1.2: Outbreaks in all settings,
- 1.3: Outbreaks in RCFs and
- 1.4: Nursing home specific outbreaks
- 1.5: Conclusion

1.1: Outbreaks/Clusters of Covid-19 in Ireland

- Restriction of visiting at hospitals, long term care settings, mental health facilities, prisons, and spacing measures in homeless shelters were implemented by the Department of Health on 12th March 2020.
- The first outbreak of Covid-19 in a residential care facility (RCF) was notified in a nursing home on 16th March 2020 (week 12).
- **754** outbreaks/clusters of Covid-19 were notified in Ireland in all HSE-Areas on CIDR up to midnight 09/05/2020 (Figures 1 and 2)
  - **418 (55%)** Covid-19 outbreaks were reported in **residential care facilities (RCFs)** including nursing homes, community hospitals, long stay units and residential institutions[1].
  - **241 (32%)** Covid-19 outbreaks were reported in **nursing homes.**

During week 19 2020 (week ending 09/05/2020), 33 new Covid-19 outbreaks were notified in RCF (table 1), compared to 42 during week 18 2020 and 79 during week 17 2020.

As of 11th May 2020, 44 (5.8%) of 754 notified Covid-19 outbreaks (up to midnight on 09/05/2020) were reported as closed on CIDR.

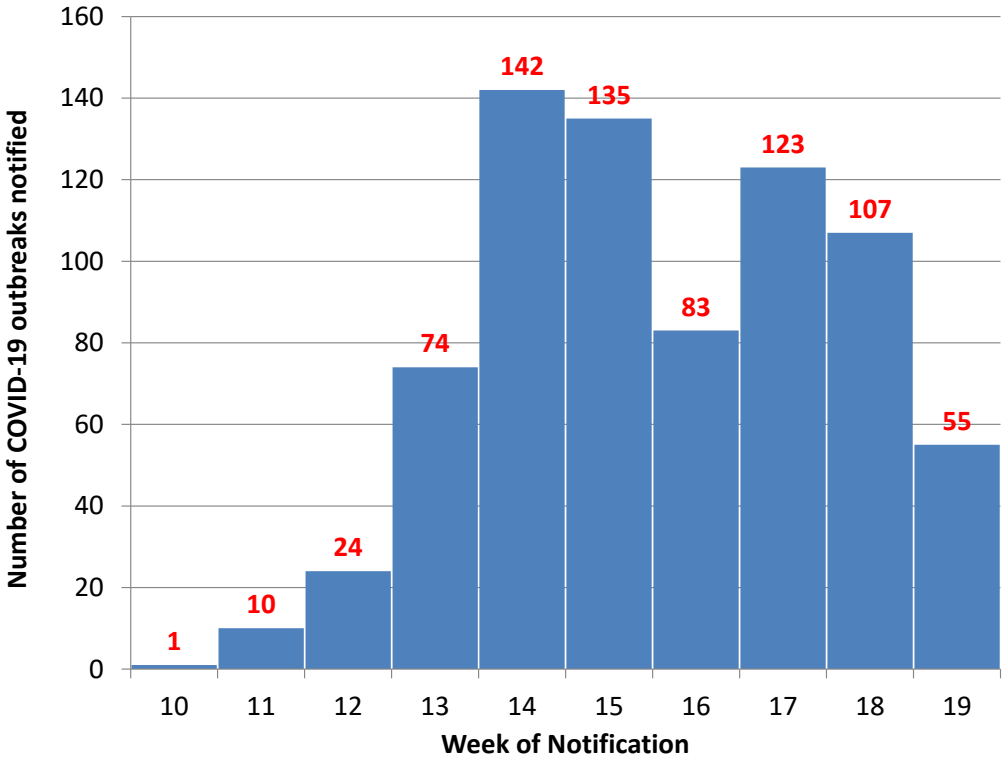
[1] Residential institutions include mental health facilities, prisons and direct provision centres.

1.2: Covid-19 outbreaks in all settings

Table 1: Number of Covid-19 outbreaks notified in Ireland by outbreak setting and by week of notification, up to midnight on Saturday 09/05/2020, N=754.

Outbreak setting	Week of Outbreak Notification										
	10	11	12	13	14	15	16	17	18	19	Total
Nursing home	0	0	4	19	55	69	22	39	16	17	**241**
Community Hospital/Long-stay unit	0	0	0	0	11	5	0	10	3	1	**30**
Residential institution	0	0	0	6	26	23	24	30	23	15	**147**
Hospital	0	2	4	16	23	14	12	8	9	1	**89**
Community outbreak	0	0	0	3	2	3	2	0	2	1	**13**
Hotel	0	0	0	1	0	0	0	0	0	1	**2**
Public house	0	0	0	2	1	0	0	1	0	0	**4**
Retail outlet	0	0	0	0	1	0	0	0	2	0	**3**
Workplace	0	1	2	1	1	5	5	8	8	1	**32**
Travel related	1	4	6	5	4	0	0	1	0	0	**21**
Extended family	0	1	4	3	2	1	0	4	0	1	**16**
Private house	0	2	4	16	15	12	14	20	43	16	**142**
Other	0	0	0	2	1	3	3	2	0	1	**12**
Not Specified	0	0	0	0	0	0	1	0	1	0	**2**
Total	**1**	**10**	**24**	**74**	**142**	**135**	**83**	**123**	**107**	**55**	**754**

Figure 1: Epi-curve of Covid-19 outbreaks in all settings notified in Ireland by week of notification, up to midnight on 09/05/2020, N=754. Data source: CIDR



Note: Data are provisional and confidential

Figure 2: Number of Covid-19 outbreaks in all settings notified in Ireland by HSE-Area and week of notification, up to midnight on 09/05/2020, N=754. Data source: CIDR

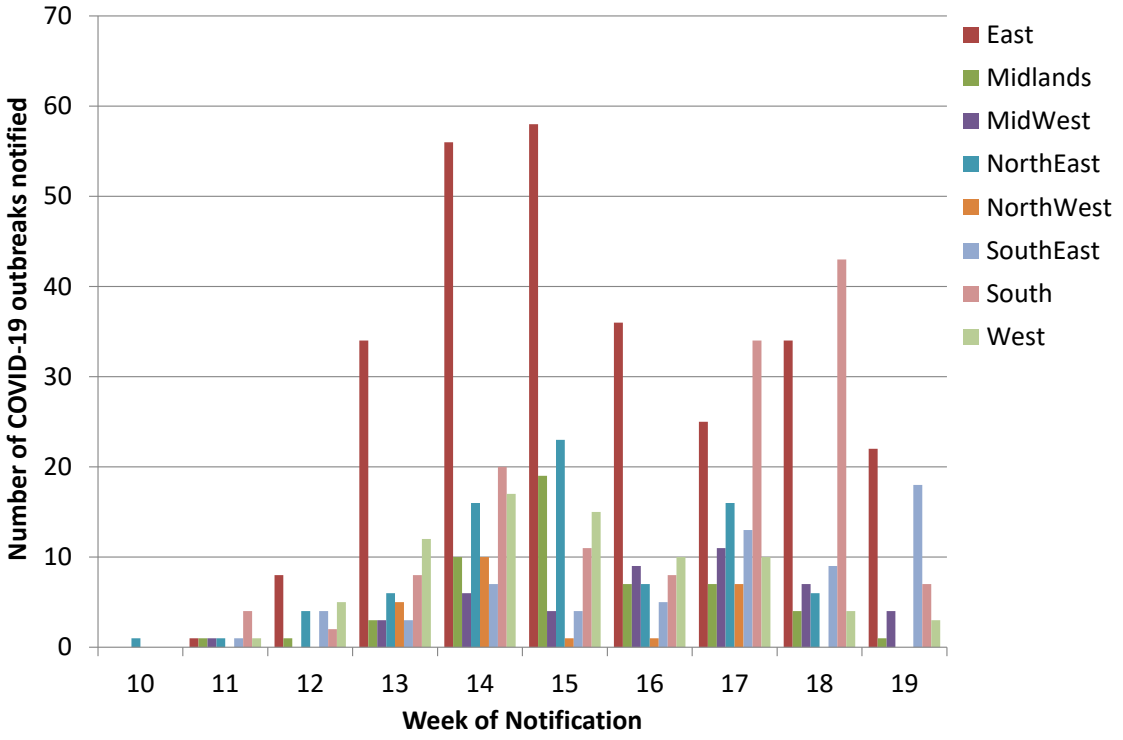
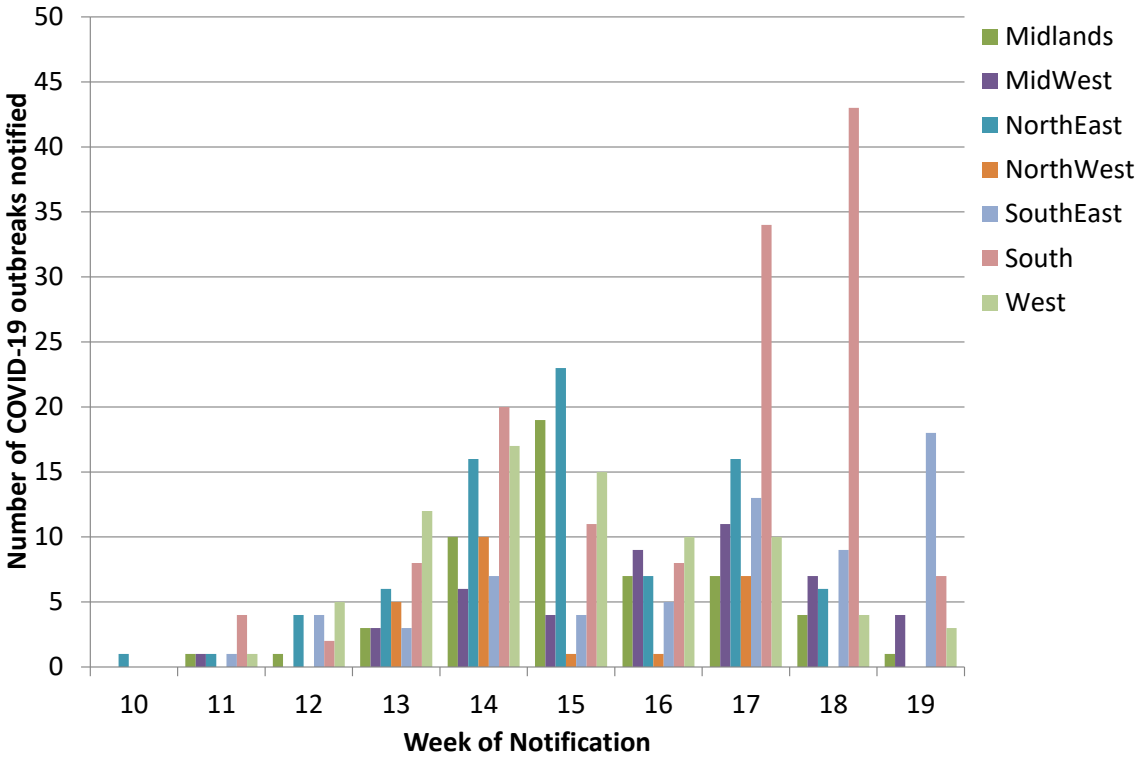


Figure 3: Number of Covid-19 outbreaks in all settings notified in Ireland by HSE-Area (excluding HSE-East) and week of notification, up to midnight on 09/05/2020, N=480. Data source: CIDR



Note: Data are provisional and confidential

1.3: Covid-19 Outbreaks/Clusters in Residential Care Facilities in Ireland

Key Dates

Red arrows indicated on figures below indicate the start dates for visiting restrictions to nursing homes on 11th March 2020 and mass testing on 18th April 2020.

Table 2: Number and percentage of Covid-19 outbreaks in Residential Facilities including Nursing Homes, Community Hospitals/Long Stay Units and Residential Institutions by HSE-Area notified in Ireland up to midnight on 09/05/2020, N=418. Residential Institution includes mental health facilities, prisons and direct provision centres. Data source: CIDR

HSE Area	Nursing Homes		Community Hospital / Long-stay units		Residential institutions		All Residential Facilities	
	Number	%	Number	%	Number	%	Number	%
East	112	46.5	6	20.0	83	56.5	201	48.1
Midlands	16	6.6	4	13.3	13	8.8	33	7.9
MidWest	11	4.6	0	0.0	4	2.7	15	3.6
NorthEast	38	15.8	0	0.0	11	7.5	49	11.7
NorthWest	5	2.1	4	13.3	3	2.0	12	2.9
SouthEast	15	6.2	15	50.0	9	6.1	39	9.3
South	9	3.7	8	26.7	20	13.6	37	8.9
West	35	14.5	4	13.3	4	2.7	43	10.3
Total	**241**	**100.0**	**30**	**100.0**	**147**	**100.0**	**418**	**100.0**

Note: Data are provisional and confidential

Figure 4: Epi-curve of Covid-19 outbreaks in all residential facilities notified in Ireland by week of notification, up to midnight on 09/05/2020. Data source: CIDR

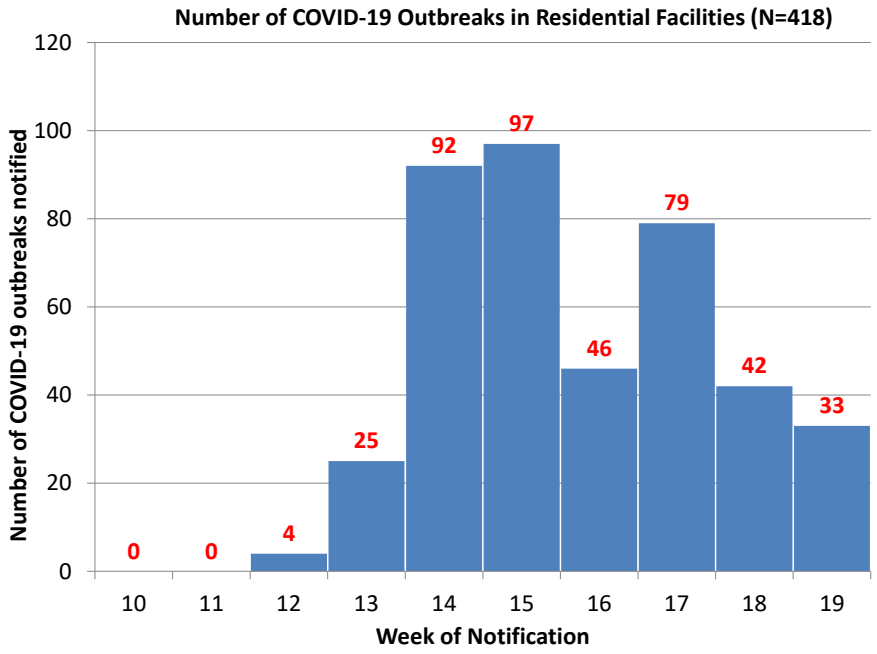


Figure 5: Epi-curve of Covid-19 outbreaks in all residential facilities by facility type notified in Ireland by date of notification, up to midnight on 09/05/2020. Data source: CIDR

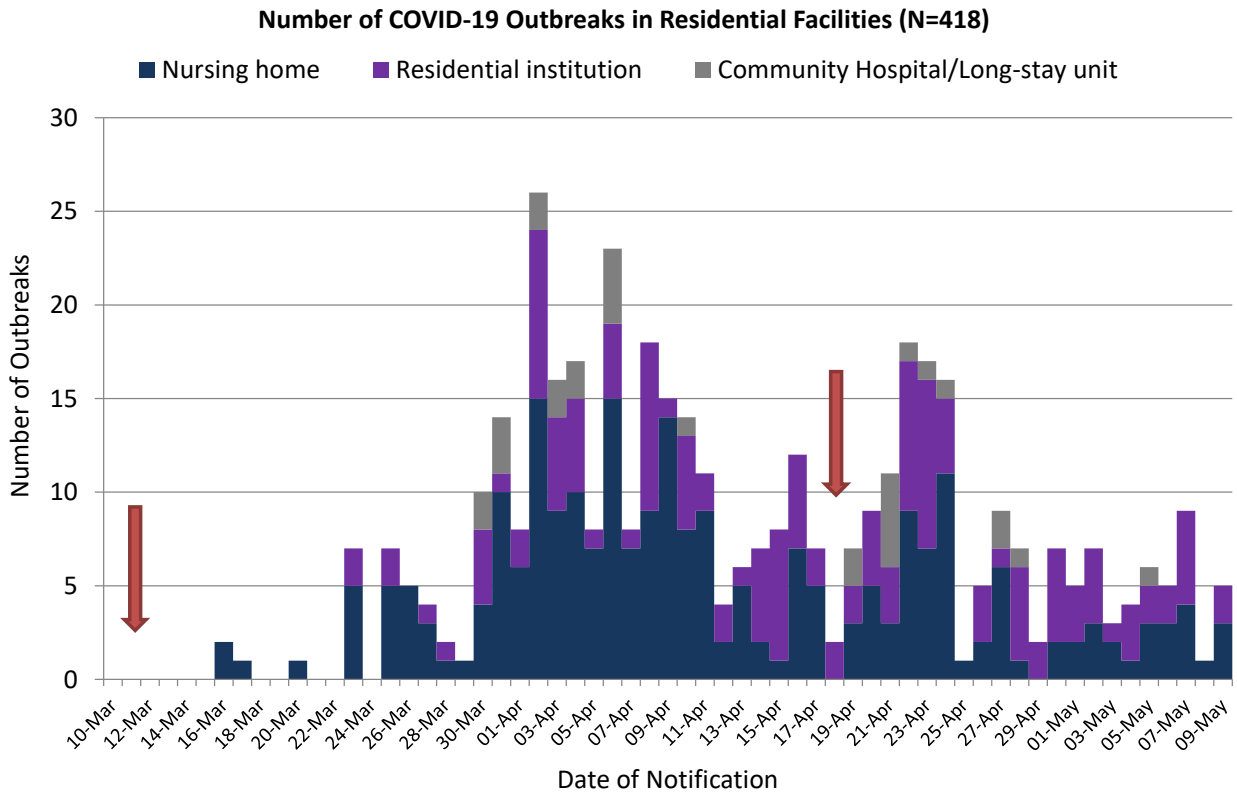
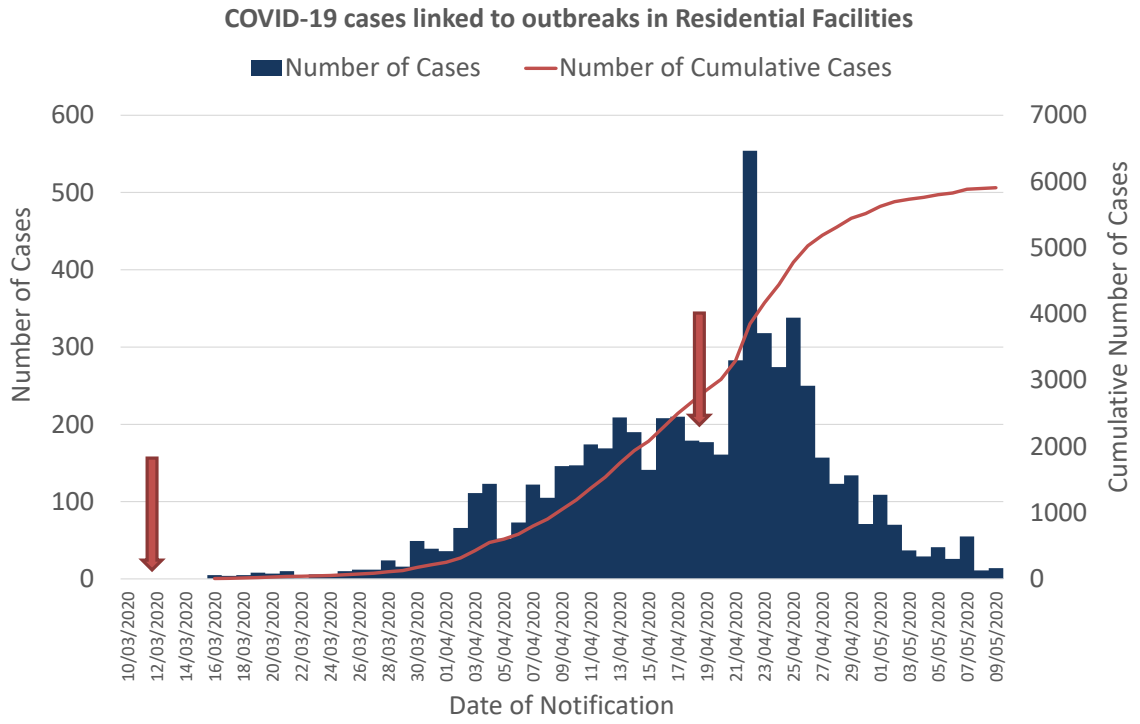


Figure 6: Epi-curve of Covid-19 confirmed, probable and possible cases linked to outbreaks in Residential Facilities and cumulative number of cases by date of notification, up to midnight on 09/05/20.



Note: Data are provisional and confidential

Figure 7: Epi-curve of Covid-19 confirmed, probable and possible linked to outbreaks in Residential Facilities by age group (<65 year and ≥ 65 years) and by date of notification, up to midnight on 09/05/2020. Data source: CIDR

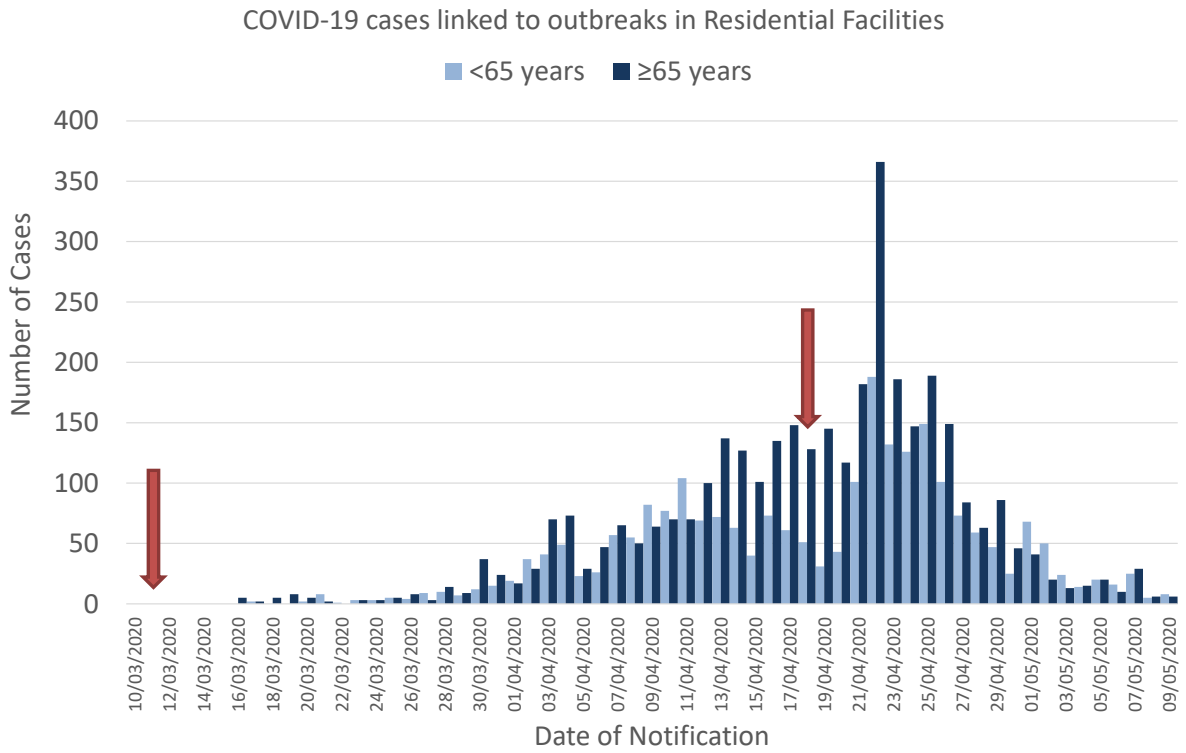


Table 3: Total number of notified Covid-19 cases linked to Covid-19 outbreaks in Residential Facilities including Nursing homes, community hospitals, long stay units and residential institutions by HSE-Area and case classification (possible, probable and confirmed), up to midnight on 09/05/20, N=5907 cases. Data source: CIDR

HSE Area	COVID-19 Case Classification			
	Confirmed	Probable	Possible	Total
East	3218	9	103	3330
Midlands	319	1	0	320
MidWest	307	6	0	313
NorthEast	967	32	5	1004
NorthWest	199	15	1	215
SouthEast	183	12	0	195
South	269	0	0	269
West	236	23	2	261
Total	**5698**	**98**	**111**	**5907**

Note: Data are provisional and confidential

1.4: Covid-19 outbreaks notified in Nursing Homes

Of 241 Covid-19 outbreaks in nursing homes notified in Ireland and reported on CIDR up to midnight on 09/05/2020, a total of 5369 ill cases were reported. The number of ill cases reported refers to an aggregated summary total reported for each outbreak.

A total of 4488 laboratory confirmed Covid-19 cases were notified and linked to outbreaks in nursing homes, 297 of these cases were hospitalised, 133 of these hospitalised cases died and a total of 624 laboratory confirmed cases that were linked to outbreaks in nursing homes died (Table 8).

Summary data on the total numbers ill, number of staff, number of clients, number of symptomatic staff and symptomatic patients/clients, based on aggregated enhanced data reported for each outbreak are reported. Covid-19 outbreaks in nursing homes are summarised in tables 4 and 5. *Note these outbreak data are provisional and validation of all COVID-19 outbreak data is ongoing*

Table 4: Number of Covid-19 outbreaks in Nursing Homes by HSE-Area notified in Ireland up to midnight on 09/05/2020, N=241 outbreaks, including summary aggregated data on the total number ill and case-based data on cases linked to each outbreak on the number laboratory confirmed cases, hospitalised cases, hospitalised cases that died and total number of laboratory cases that died. ***Data source: CIDR***

HSE Area	Number of Nursing Home outbreaks	Number Ill*	Number of Laboratory Confirmed Cases linked to Nursing Home outbreaks			
			All Cases	Hospitalised Cases	Hospitalised Cases that Died	Total Cases that Died
East	112	3493	2600	127	54	389
Midlands	16	123	210	15	7	19
MidWest	11	261	268	44	16	36
NorthEast	38	630	933	67	36	122
NorthWest	5	37	100	18	8	17
SouthEast	15	235	134	10	5	13
South	9	103	68	4	2	10
West	35	487	175	12	5	18
Total	**241**	**5369**	**4488**	**297**	**133**	**624**

**The total number ill refers to an aggregated summary total reported for each outbreak and cannot be reported by case classification status.*

Table 5: Number of Covid-19 outbreaks in Nursing Homes by HSE-Area notified in Ireland up to midnight on 09/05/2020, N=241 outbreaks, including summary aggregated data on the total number of staff, total number of clients, total number of symptomatic staff and symptomatic patients/clients, based on aggregated enhanced data reported for outbreaks. ***Data source: CIDR***

HSE Area	Number of Nursing Home outbreaks	Number staff	Number clients	Number staff symptomatic	Number clients symptomatic
East	112	6700	7013	1481	1921
Midlands	16	536	859	85	106
MidWest	11	507	452	121	143
NorthEast	38	381	387	33	55
NorthWest	5	120	126	14	8
SouthEast	15	83	188	65	110
South	9	179	171	10	23
West	35	592	747	197	287
Total	**241**	**9098**	**9943**	**2006**	**2653**

Note: Data are provisional and confidential

Key Dates

Red arrows indicated on figures below indicate the start dates for visiting restrictions to nursing homes on 11th March 2020 and mass testing on 18th April 2020.

Graphs below show the number of outbreaks in nursing homes by week of notification, and date of notification.

Figure 8: Epi-curve of Covid-19 outbreaks in nursing homes notified in Ireland by week of notification, N=241 up to midnight on 09/05/2020. Data source: CIDR

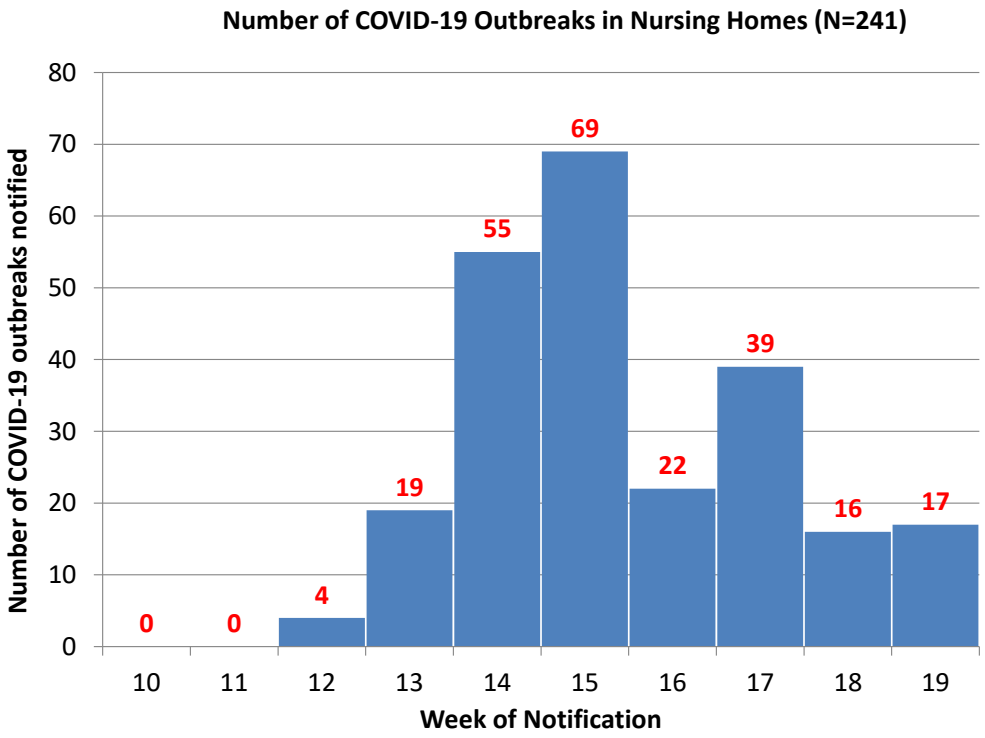


Figure 9: Epi-curve of Covid-19 outbreaks in Nursing Homes notified in Ireland by date of notification, up to midnight on 09/05/2020. Data source: CIDR

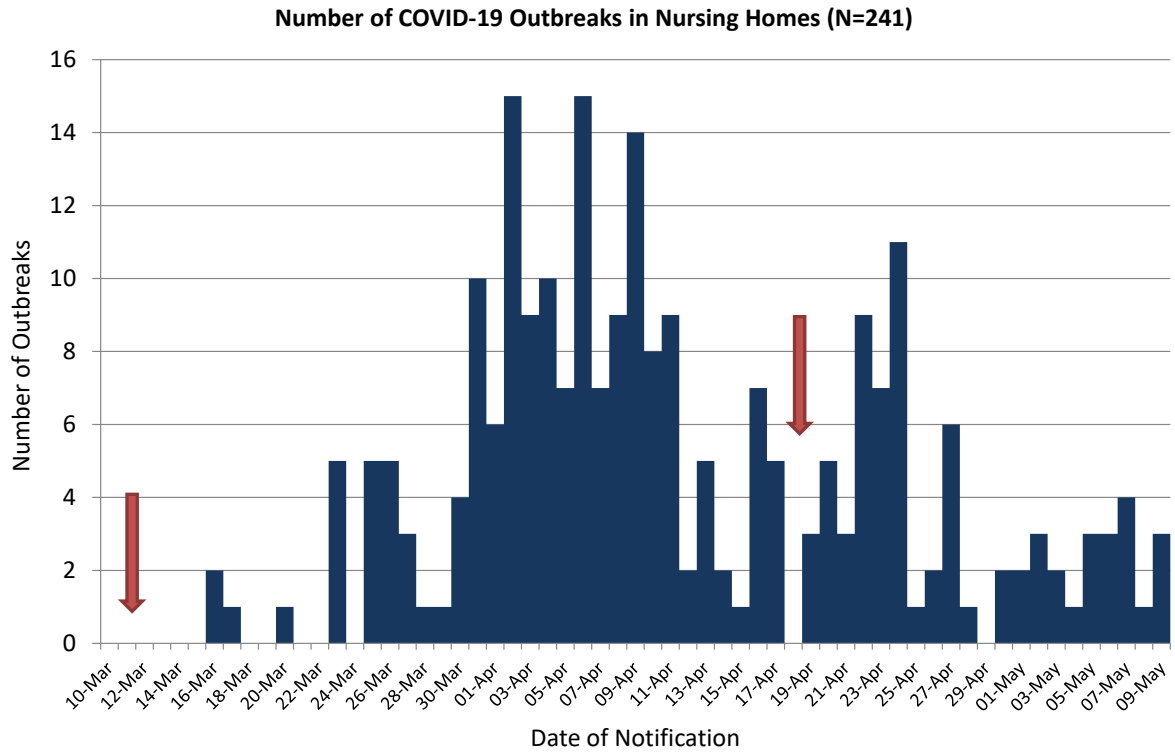
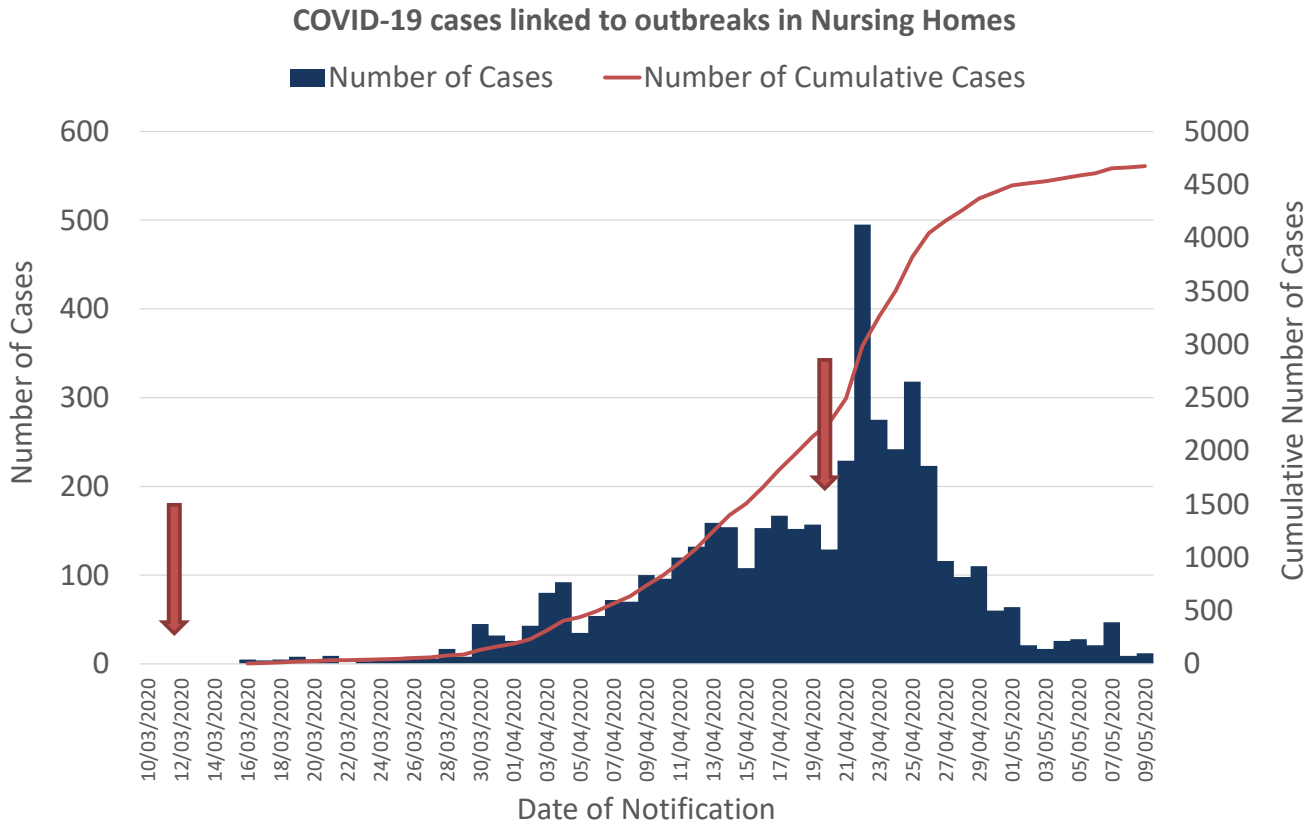
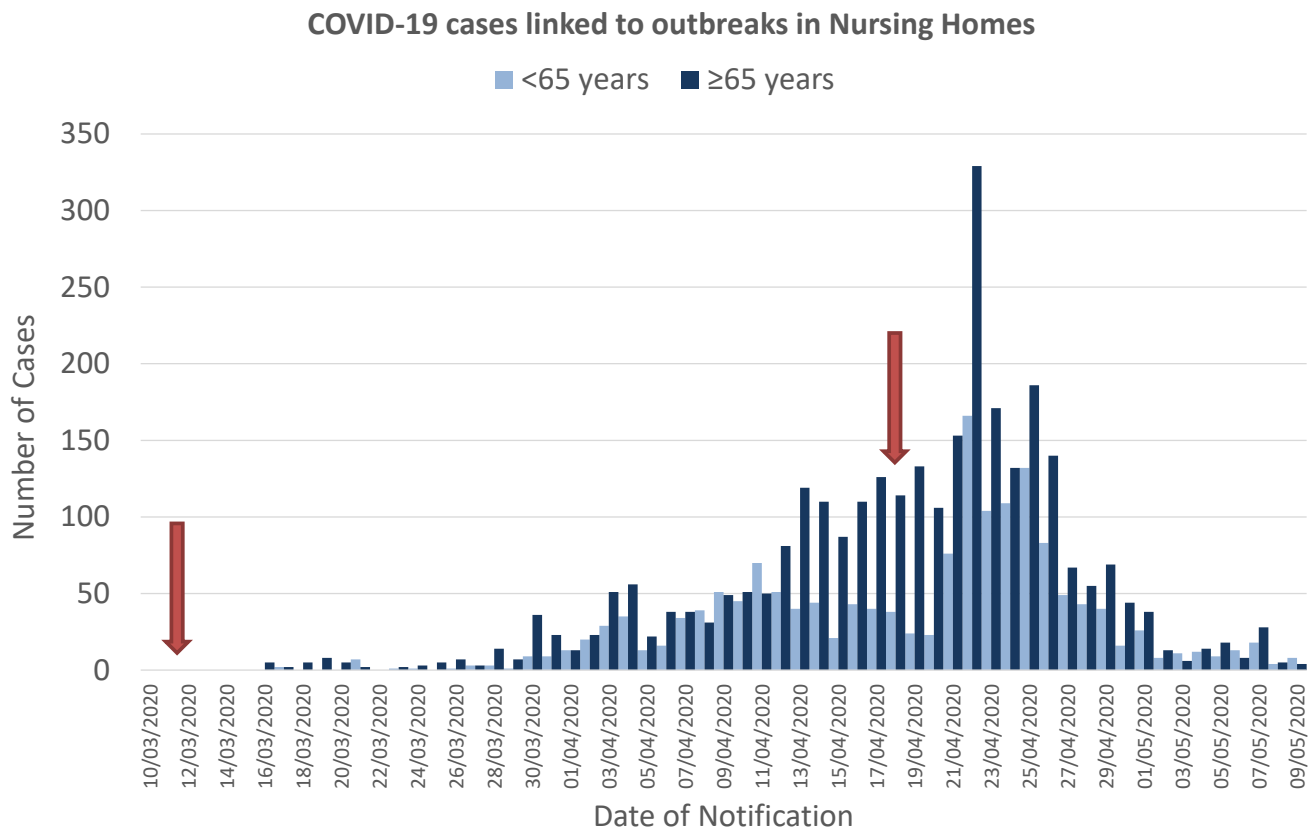


Figure 10: Epi-curve of Covid-19 confirmed, probable and possible cases linked to outbreaks in Nursing Homes and cumulative number of cases by date of notification, up to midnight on 09/05/2020.



Note: Data are provisional and confidential

Figure 11: Epi-curve of Covid-19 confirmed, probable and possible cases linked to outbreaks in Nursing Homes by age group (<65 year and ≥ 65 years) and by date of notification, up to midnight on 09/05/2020. Data source: CIDR



1.5: Conclusion

Outbreaks occurring in all settings peaked in weeks 14 and 15 but remained elevated to week 18. Week 19 displays the first real decrease in new outbreaks notified. For residential care facility settings and nursing homes, data clearly display an increase in notification of outbreaks in weeks 14, 15 and 17, with weeks 18 and 19 at a lower stable level. This is reflected in the total number of cases linked to outbreaks in nursing homes. These data are interesting in the context that national mass testing started on 18th April and results did not start to return until later in week 17. The bulk of result from the mass testing programme have been received in week 18 and 19.

Section 2: A brief epidemiological analysis of specific outbreaks in residential facilities across Ireland

Brief epidemiological analyses were undertaken on ten outbreaks in residential facilities in Ireland, seven first reported early in the pandemic, and three more recently. None of these outbreaks are 'closed' and thus may have additional cases. Data may also be incomplete even on known cases. All data were extracted from CIDR as of 6pm May 7th 2020.

It is important to note that the outbreaks selected are not representative of all Covid-19 outbreaks notified in residential facilities. The intent was to provide some insight into outbreaks based on a detailed analysis of a small number of the larger outbreaks. Five of the larger nursing home outbreaks first reported in weeks 12 and 13 were selected for analyses (3 from HSE-E and one each from HSE-W and HSE-NE). Two relatively large residential institution outbreaks were included from HSE-E to provide insight into outbreaks in facilities with a different client profile. An additional three large nursing home outbreaks first reported in weeks 17 and 18 were selected to develop an understanding of factors that might be contributing to outbreaks at this later time (one each from HSE-E, HSE-M and HSE-MW).

2.1: Brief summary of epidemiological findings

Summary findings for the ten outbreaks selected are reported in tables 8 & 9.

The ten outbreaks are all still 'open', with the most recent case in all instances reported within the last 13 days. The duration of the selected outbreaks first reported in weeks 12 and 13 range from 26 to 45 days based on the date of notification for linked notified cases. For outbreaks first reported in weeks 17 and 18, they range in duration from seven to ten days. As none of these outbreaks are closed, they may still have additional cases.

Using aggregate data provided through outbreak reporting, overall attack rates of 13-76% were reported. Among HCWs, this ranged from 13-60% and among residents from 11-90%. These high attack rates reflect the fact that these outbreaks represent some of the largest residential care facility outbreaks of Covid-19 notified.

For the nursing home outbreaks selected, the percentage of notified cases linked to outbreaks that were 65 years or older was 53-69%, with the percentage of females ranging from 61-74%. Linked cases from both residents and HCWs were identified. Deaths were largely confined to residents over 65 years of age, with one death in a HCW in one of the outbreaks.

Nursing home outbreaks in weeks 12 and 13 were reported early in the pandemic, with their first cases occurring within 14 days of the introduction of the control measures, and thus there could have been a variety of sources of introduction of the virus. Once the virus was introduced, it appears to have spread readily in these facilities.

The source of introduction to the NH for one of the more recent outbreaks is believed to be a resident returning after an in-patient stay for a non-Covid-19 related illness; the resident developed Covid-19 like symptoms a few days after returning and was tested and found to be positive for SARS-CoV-2, although they had previously tested negative at discharge from the hospital.

For the two outbreaks in residential institutions, the age profile was younger, and the ratio of males to females more evenly split. The lower number of deaths in these facilities likely reflect the younger age profile of clients.

2.2: Factors reported by departments of public health as contributing to the introduction or spread of Covid-19 in NH outbreaks, or as creating challenges in NH outbreak management

- For earlier outbreaks, HCWs and residents not being referred for testing by GPs if they did not meet the criteria. The algorithm in March for testing RCFs was specific and limited in who should be tested.
- Delays in obtaining testing services, cancellation of tests, and long turn-around-times in March meant that outbreaks sometimes became established in the interim.
- A culture of HCWs working through minor or major respiratory symptoms is prevalent and contributes to outbreak spread.
- Discharge of hospital in-patients who were contacts or undiagnosed cases of Covid-19, into RCFs, particularly more in the earlier stages of Covid-19.
- Nursing homes did not always have adequate PPE at the early stages of concerns, though this was rectified once the outbreak was declared.
- Staff numbers were decimated and additional staffing was extremely difficult to get
- Senior nursing staff were amongst those ill and excluded from work; including key decision makers.
- In the early stages, NHs stated they had some difficulty accessing guidance around Covid-19.
- One NH reportedly lacked a preparedness plan for large outbreak, and suitable IPC.

Table 6: Summary findings for the ten outbreaks selected, CIDR data

Outbreak	Week outbreak notified	HSE-area	Outbreak location	Total number ill	Overall attack rate (number ill /(number staff + number clients))	Attack rate HCW (number staff ill) /number staff)	Attack rate clients (number clients ill /number clients)	% cases in HCW (number staff ill/(number staff ill + number clients ill)
A	12	E	Nursing home	61	39%	27%	48%	31%
B	13	E	Residential institution	33	13%	13%	13%	79%
C	13	E	Residential institution	30	NC	NC	NC	NC
D	12	E	Nursing home	119	NC	NC	34%	63%
E	12	E	Nursing home	65	29%	36%	23%	55%
F	13	NE	Nursing home	40	31%	20%	49%	32%
G	13	W	Nursing home	48	76%	60%	96%	44%
H	17	E	Nursing home	39	26%	14%	39%	28%
I	17	M	Nursing home	NR	NC	NC	11%	NC
J	18	MW	Nursing home	NR	NC	NC	NC	NC

Note: Data are provisional and confidential

Table 7: Summary findings for the ten outbreaks selected, analyses based on notified cases linked to outbreaks

Outbreak	Number of cases	% >65 yrs	% Female	% confirmed	Number in-patients	Number deaths	Duration -1st to last case by notification date (days)	Days since last notified case
A	42	69%	74%	100%	0	5	45	7
B	12	17%	42%	100%	1	1	32	2
C	46	2%	50%	100%	8	0	41	2
D	120	53%	67%	95%	9	25	46	5
E	64	70%	61%	95%	0	14	37	8
F	50	62%	70%	98%	9	14	35	7
G	48	56%	63%	85%	0	5	26	13
H	40	65%	63%	98%	2	3	7	5
I	37	62%	73%	100%	5	3	10	0
J	73	60%	63%	100%	8	8	9	6

Note: Data are provisional and confidential

Section 3: Data pertaining to the mass testing process undertaken in RCF across Ireland

As of 18th April 2020, the HSE implemented the recommendation from the National Public Health Emergency Team (NPHET) on the following testing strategy in residential care facilities (RCF):

- In the event of a single confirmed case in an RCF, all residents and all staff should be tested for Covid-19.
- In a RCF where there are current outbreaks of Covid-19, all residents and staff who have not yet been tested, should also be tested.
- In a RCF where there are currently no cases, all staff should be tested.

Note: Previously positive and recovered Covid-19 cases (residents and HCW) should NOT be retested during the mass testing described above.

3.1: Overview of the Mass Testing process

Structures

- Testing processes were organised within the HSE, outside of public health governance.
- Testing was undertaken largely by National Ambulance Services.
- Laboratory testing was undertaken predominantly by Enfer laboratory, however many local laboratories were also used.

Process

- Testing of residents and staff was voluntary.
- The testing was undertaken without clear pathways and data processes in place.
- Testing for staff off-shift was organised primarily through community testing.
- Data pertaining to symptomatic status were not defined, recorded and received by departments, therefore no test results can be related to symptomatic status.

Resulting Process

- Results were returned through the NVRL line-listing and local laboratory line listings, depending on the laboratory the sample was sent to.
- Results were not batched and received per residential care facility tested.

- Results for each facility were not completed and returned at one time point, but received over several days (up to 10 days was reported between the first and last result for a facility being received).
- Results were not always marked as being aligned to a residential care facility. The unique facility identifier number for facilities was not in the line listing received.
- Results pertaining to individual RCFs could only be identified on the various laboratory line listings through searching known information parameters (several e.g. name, date of birth, address were required to be used). These data could then be separated into spreadsheets for individual facilities.
- This had to be done each day, for all facilities tested, for several days as the results were not batch returned.
- The results were then required to be acted upon with cases and outbreaks appropriately managed.
- Result giving process varied across departments.
    - Two departments contacted all detected and not-detected health-care workers directly (by either phone for both of phone and text message if negative).
    - Two regions contacted all detected results when able, but if late results, no numbers and competing pressures arose some were distributed directly to facilities. Not detected results were batch provided for facilities to distribute.
    - Three departments contacted all detected results for health care workers directly and sent not-detected results to facilities directly.
    - One department received external help to contact staff and facilities – but without accompanying phone numbers recorded for health-care workers at time of testing being available to departments of public health, many had to be distributed back to the facilities.

Data presented

- Not all results are returned to public health departments yet, therefore the data pertains to the results which are returned to departments.
- Optimal epidemiological presentation of synthesised national results, by specific desired variables, is not possible given that clear pathways and data processes were not put in place prior to commencing testing.
- Full data on total number of residents and staff were not available in a minority of facilities (estimated at <10%). In this case total numbers of residents swabbed were used. This will be a small underestimate of the total number of residents.
- Data for Dublin are presented separately given the volume and complexity of results and data challenges that existed.

Notes for interpretation

As staff who were not on-site at the time of testing were tested through community settings, the results were received over a period of time, were not always timely to the mass testing time, and could not easily be matched and identified at scale back to the facility for the purposes of data recording. Of note this did not affect the clinical integrity of the clinical management processes for detected cases undertaken within departments of public health, just the ability to record it easily.

Facility, resident and staff identifiers and variables were inconsistent. Often they were also incomplete. This complicated the process for data recording within departments of public health.

As no data at the time of testing were completed in an agreed, defined and systematic method, it is not possible to provide data by symptom status for the mass testing process. Symptomatic status of confirmed cases is presented as part of usual CIDR surveillance data.

Six of the eight departments presented data for completed results. Two presented data for facilities where results were not complete. Completed data within these two areas accounted for 65% and 70% of testing respectively. This was accounted for in the analysis within these departments.

The testing process interfered with public health management of known outbreaks, which accounted for almost all the detected results identified in the process. Results therefore obtained and attributed to the mass testing would mostly have been obtained in a timelier manner, as part of usual outbreak management processes.

3.2: Current status:

Testing within nursing home and long stay facilities nationally is close to completion (98% undertaken).

Not all results have been communicated back from laboratories to Public Health departments.

3.3: Results

Results presented are for nursing homes and long stay elderly residential care facilities

Testing

There are 581 facilities listed for older age residential, long stay care facilities and nursing homes nationally.

As of 8th May 2020, 515 are accounted for (88.6%) within the results process. There are 493 with some or all results presented for (85%) within the following data.

Regional results

Results from the seven departments of public health outside of Dublin from the mass testing process amongst residents of nursing homes and long stay elderly residential care facilities are presented in table 8.

Table 8: Regional department of Public health results for residents

Region	Number of facilities with results	Total number of residents	Total number of residents swabbed	Total number Covid-19 detected	% Residents swabbed Covid 19 detected
NW	17	688	501	83	16.5
M	33	1461	1393	51	3.7
W	56	2192	1432	112	7.8
MW	59	2349	2316	50	3.2
NE	44	2351	1226	200	16.3
SE	24	1246	1106	5	0.5
S	163	4360	2870	24	0.3
Total	**396**	**14647**	**10844**	**591**	**5.5**

Results from the seven departments of public health outside of Dublin from the mass testing process amongst staff of nursing homes and long stay elderly residential care facilities are presented in table 9.

Table 9: Regional department of Public health results for staff

Region	Number of facilities with results	Total number of staff	Total number of staff tested	Total number Covid-19 detected	% Staff swabbed Covid 19 detected
NW	17	1005	691	69	10.0
M	33	2035	1973	35	1.8
W	56	2884	1833	98	5.4
MW	59	2391	2328	31	1.3
NE	44	3110	2165	142	6.6
SE	24		1382	3	0.2
S	163	6861	3419	21	0.6
Total	**396**	**19402**	**14892**	**455**	**3.0**

Results from Nursing Homes in the Dublin area (CHOs 6,7 & 9)

Calculated Covid-19 detected positivity across residents and staff **- 19.7%**

Estimated Covid-19 detected positivity across residents and staff **- 13.6%**

Across Dublin 11,554 staff and residents were tested. This is an underestimate of the actual staffing numbers as CHO9 could not estimate the staff cohort. Covid-19 was detected in 2,273 staff and residents. Detected positivity was 19.7%. However this excludes the staff cohort in the denominator. It also does not include 22 facilities with no positive results, and for whom there is no denominator. An estimate using resident to staff ratios experienced in CHO6 (also in Dublin) was made to account for the unavailability of staff cohort in CHO9.

The denominator for staff and residents in facilities tested is therefore 16,643. Detected positivity reduces to 13.6%.

It was not possible to estimate the staff and resident numbers for the 22 facilities for whom there were no cases of Covid-19 detected.

Results Summary

These data show that of 13,907 residents swabbed within residential care facilities, 5.2% tested positive for Covid-19. The range in positivity varied across the country from 0.3% in the South, to 16.5% in the North West. Of note the North West had the fewest facilities within the regions, and it had known outbreaks of infection

Data for residents and health-care workers were combined from Dublin as it was not possible to identify data for these groups separately. Dublin data covers CHOs 6,7 and 9 and displayed a much higher level of Covid-19 detection. This is in keeping with the national picture, where the burden of cases are known to predominate in the

East. However, the data presented will be an overestimate as outlined above, because data recording are not complete for 22 residential care facilities for whom there were no cases.

The data for health-care workers shows a similar picture across the regions with an overall Covid-19 detection rate of 2.9%, ranging from 0.2% in the South East to 10% in the North West. Again, the results for the North West are in keeping with those seen for residents, with a smaller number of facilities and already known outbreaks.

3.4: Conclusions

The low positivity identified nationally for both residents and health-care workers is re-assuring, given that the process was undertaken at a time where many facilities were experiencing outbreaks. The results of the outstanding 15% of institutions will likely lower further this Covid-19 detected positivity as the process prioritised testing facilities first where there were known outbreaks of Covid-19.

Process findings and discussion

The arrangements put in place for the testing process did not allow for data to be collected by staff member, resident or by symptom class. In addition there was no clear process for resulting defined, which led to a decision after testing had commenced to send all unfiltered results to public health departments to deal with.

Virtually no outbreaks nationally were identified that were otherwise unknown and not being actively investigated or managed by public health departments.

Testing in public health and clinical situations was slowed inappropriately as a result of mass testing. The impact of this is unmeasured but strongly felt within departments of public health. This is a clinical risk.

The results of the mass testing took a minimum of four days to achieve, with some results not arriving until 10 days after the first results for a single facility. Therefore the ‘snap-shot’ was out-of-date before departments received the result. The clinical utility of results requires preferably same day results, to allow for optimal cohorting and outbreak management.

The pace of testing should be matched to both laboratory capacity ***and*** the capacity for public health departments to deal with the results, and not interfere with their clinical and ***statutory*** responsibility to manage outbreaks.

Testing is physically uncomfortable and unpleasant for elderly people. Some have reported they would not have a test again. This is challenging given there may be future outbreak settings in which it needs to occur.

There are significant opportunity costs of public health teams processing mass testing data and results, with little unexpected findings. High levels of positivity were identified in facilities already known to have outbreaks. There were very low levels of positivity in other facilities.

3.5: Recommendations

1. There should be an agreed national approach to Covid-19 testing which includes clear guidance on who should be tested and how often. This should include guidance on testing of healthcare workers across all facilities.

2. Testing in residential care facilities should be informed by a public health risk assessment and directed by Public Health. Clear processes need to be in place for clinical governance, consent, testing process, collection of necessary data, epidemiological analysis and communication of results.

3. A single confirmed case of Covid-19 in a nursing home warrants testing of all residents and staff to aid outbreak control.

4. Timeliness of results is essential to infection control and management. The turnaround times for Covid-19 test results needs to be improved to ensure necessary public health actions can be taken

5. If a mass testing exercise in respect of Covid-19, or any other serious infection, is undertaken in the future- it must be based on sound public health principles and planning and directed by public health. The implementation of any mass testing event must never compromise essential public health case and outbreak management.

6. The Covid-19 pandemic response has exposed serious resource constraints in Public Health across the country, which must be addressed in strategic workforce planning as a matter of urgency.