IEMAG briefing

31 March 2021

Coronavirus COVID-19 Public Health Advice

Cases, numbers in hospital and intensive care

There is progress against all indicators of disease, though cases and the number of people requiring hospital care remain high. The numbers of people in hospital and ICU continue to decrease slowly. The number of deaths per day is stable.

Coronavirus **COVID-19** Public Health Advice

	Apr 2020	Summer 2020	Oct 2020	Dec 2020	Jan 2021	3 Mar	10 Mar	17 Mar	24 Mar	31 Mar	Daily count 31 Mar
Cases confirmed per day	859 18-04	8.7 25-06	1158 21-10	262 12-12	6520 10-01	620	487	520	564	533	411
14-day incidence *per 100,000 population*	212 19-04	3.0 04-07	306 26-10	79 09-12	1532 15-01	199	163	148	159	161	
Hospital in-patients	862 17-04	9 02-08	333 01-11	198 16-12	1949 24-01	542	415	351	345	313	297
Hospital admissions per day	*85* *04-04*	*<1* *10-07*	*27* *26-10*	*11* *13-12*	*158* *15-01*	*23*	*24*	*23*	*24*	*22*	*16*
ICU confirmed cases	150 14-04	4 04-08	43 04-11	26 27-12	217 28-01	127	100	86	81	68	67
ICU admissions per day	*14* *31-03*	*<1* *03-06*	*4* *03-11*	*1* *16-12*	*20* *17-01*	*4*	*4*	*3*	*3*	*3*	*5*
Deaths confirmed per day	46 22-04	<1 30-07	7 01-12	4 17-12	57 03-02	18	20	10	9	9	6

Data are 7-day averages (the indicated day and the preceding 6 days, rounded to the nearest whole number) with the exception of 14 day cumulative incidence, which is the total number of cases in the preceding 14 days per 100,000 population. The highest and lowest values of each indicator are given for each wave of the pandemic, along with the date on which that value was recorded, as well as the data for recent weeks. The historic incidence data may change due to denotification of cases.

HSE

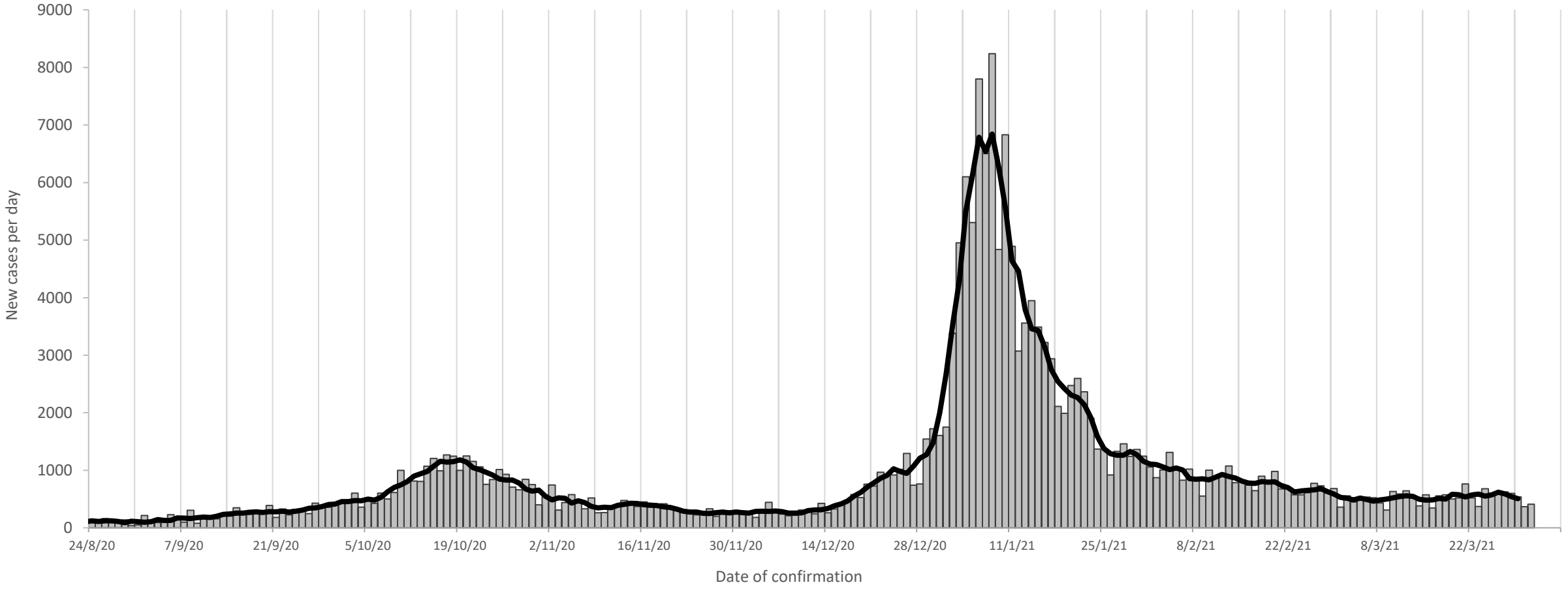
Rialtas na hÉireann
Government of Ireland

Confirmed cases each day

Daily and weekly count and 5-day rolling average. The 5-day average peaked at 1186 on 21 October, reached a low of 251 on 28 November, peaked again at 6847 on 8 January, reached a low of 476 on 8 March, and is now 509

Coronavirus COVID-19 Public Health Advice

Cases per week	796	912	1303	1947	2059	3031	4457	7398	7073	4838	3424	2583	2580	1798	2028	1964	3368	6597	15722	45617	25116	14811	8924	7145	6028	5527	4550	3630	3536	3843	3986



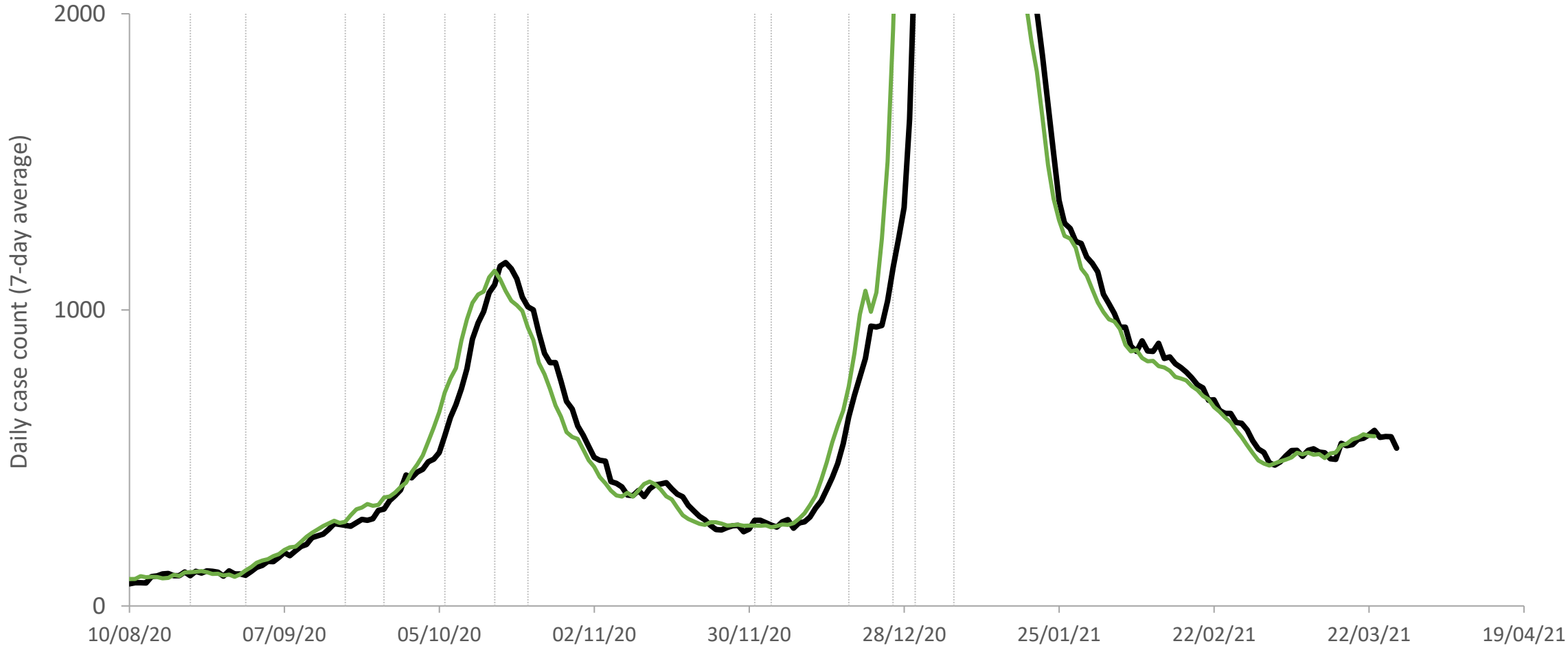
Daily count (bars) 5-day average (line) and weekly counts of the number of laboratory confirmed new cases by date on which they were confirmed by HPSC. Case counts may change due to denotification of cases. Weekly case counts are by notification (event) date and standard epidemiological week.

Rialtas na hÉireann Government of Ireland

Daily incidence

Daily incidence is currently twice what it was in early December, and approximately 50 times what it was in late June 2020. Incidence is plateaued or increasing slowly at approximately 500-600 cases per day.

Coronavirus **COVID-19** Public Health Advice



Daily cases by notification (event) date (black, the date the case was entered on the CIDR database) and specimen collection date (green). The vertical dashed lines indicate the dates of escalation and de-escalation of public health restrictions. Data are 7-day moving averages.

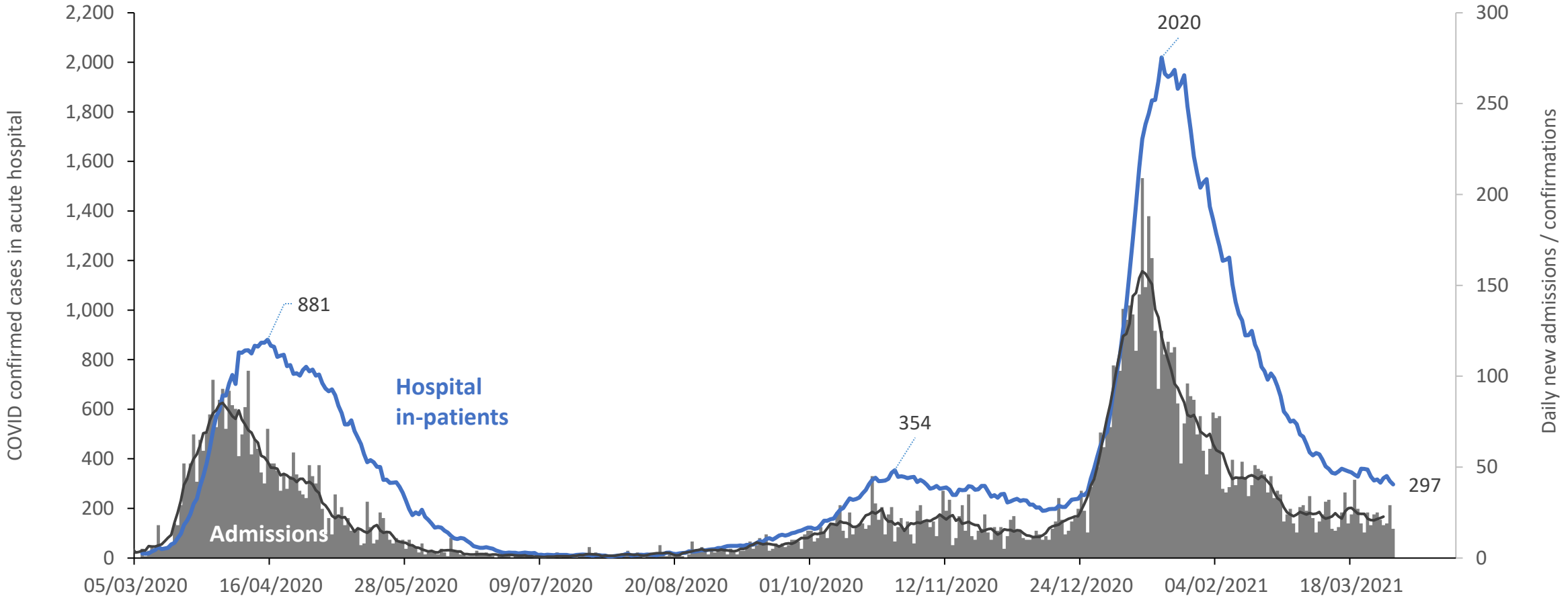
HSE

Rialtas na hÉireann
Government of Ireland

Confirmed cases in acute hospitals

The number of people in hospital with confirmed SARS-CoV-2 infection. The number of people in hospital is decreasing slowly, but The number of admissions and newly confirmed cases in hospital per day is plateaued at 20-25 per day.

Coronavirus **COVID-19** Public Health Advice



Hospital in-patients: Daily count of number of COVID-19 confirmed cases in acute hospitals. Admissions: New COVID-19 confirmed admissions and new laboratory confirmations of suspected cases in preceding 24 hours (7-day moving average also shown). Data from HSE PMIU-SDU, 8am census.

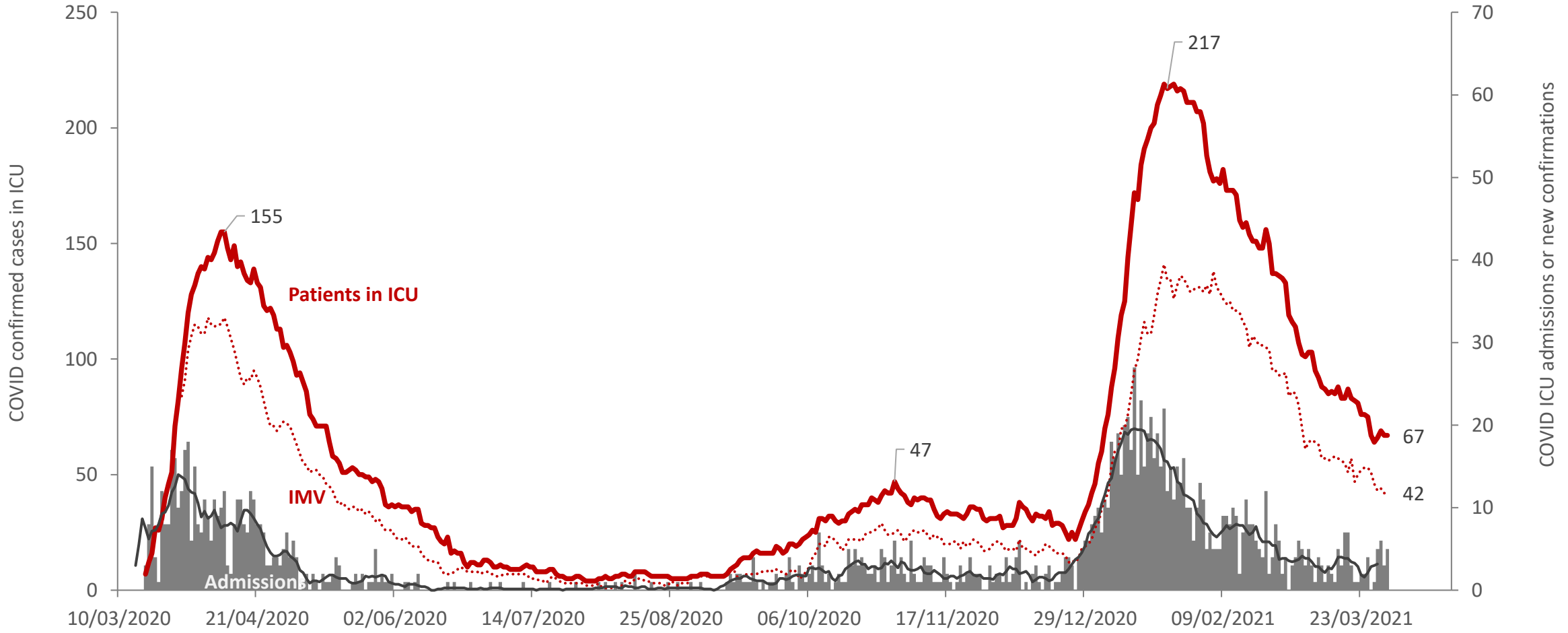
HSE

Rialtas na hÉireann
Government of Ireland

Confirmed cases in intensive care

The number of people in ICU with confirmed SARS-CoV-2 infection continues to decrease slowly.

Coronavirus COVID-19 Public Health Advice



Patients in ICU: Daily count of number of COVID-19 confirmed cases in ICU. IMV: Daily count of number of COVID-19 patients requiring invasive mechanical ventilation. Admissions: daily new COVID-19 confirmed admissions to ICU and new laboratory confirmations of suspected cases in ICU (7-day average also shown). Data from morning census from NOCA

HSE

Rialtas na hÉireann
Government of Ireland

Incidence across different age groups (excluding HCW and LTRC)

Incidence has increased in those aged 0 -12 years over the last four weeks though this may have stabilised in the last week.

Coronavirus COVID-19 Public Health Advice

Week	Age band								
	0-4	5-12	13-18	19-24	25-39	40-64	65-74	75-84	85+
47	22.0	34.1	59.7	79.4	34.6	33.0	28.9	39.7	62.2
48	23.2	31.3	45.5	66.4	33.8	29.6	22.2	36.1	40.0
49	28.4	36.8	37.7	40.5	33.2	30.1	25.4	29.0	41.4
50	21.4	39.9	44.1	57.4	39.8	35.0	22.5	31.0	22.2
51	51.9	58.5	74.5	128.3	87.9	81.1	54.3	54.5	51.8
52	77.5	76.9	120.0	326.1	176.0	134.5	95.6	95.2	119.9
53	218.1	236.6	514.0	1401.5	760.8	636.1	423.8	350.1	361.2
1	183.7	208.9	569.2	1330.0	791.1	721.6	497.7	446.8	556.6
2	130.6	126.7	303.0	580.0	414.7	419.9	301.2	409.2	578.8
3	93.5	81.3	168.7	330.6	254.3	243.6	170.5	252.4	414.5
4	74.2	60.9	127.6	228.9	154.2	147.2	118.9	161.8	267.9
5	78.1	72.9	126.5	208.3	127.0	123.2	85.9	116.0	210.2
6	91.7	85.1	124.6	224.3	117.4	100.9	68.5	90.1	125.8
7	87.5	76.5	96.6	253.0	106.5	88.5	59.4	78.9	114.0
8	87.8	69.8	89.6	185.7	94.3	76.9	43.4	55.0	87.3
9	66.7	57.0	64.9	125.3	75.7	57.9	44.7	45.8	41.4
10	68.2	68.0	90.7	146.4	79.2	59.2	39.4	40.7	41.4
11	108.0	90.6	78.6	87.9	86.5	62.3	46.0	55.0	60.7
12	107.4	102.1	85.8	104.8	94.4	69.7	41.0	43.3	45.9

Heat map shows age-specific incidence (cases per week per 100,000 population). Healthcare workers and cases associated with outbreaks in long-term residential care are excluded, so that the analysis reflects the pattern of cases in the community. Cases dated by specimen collection date.

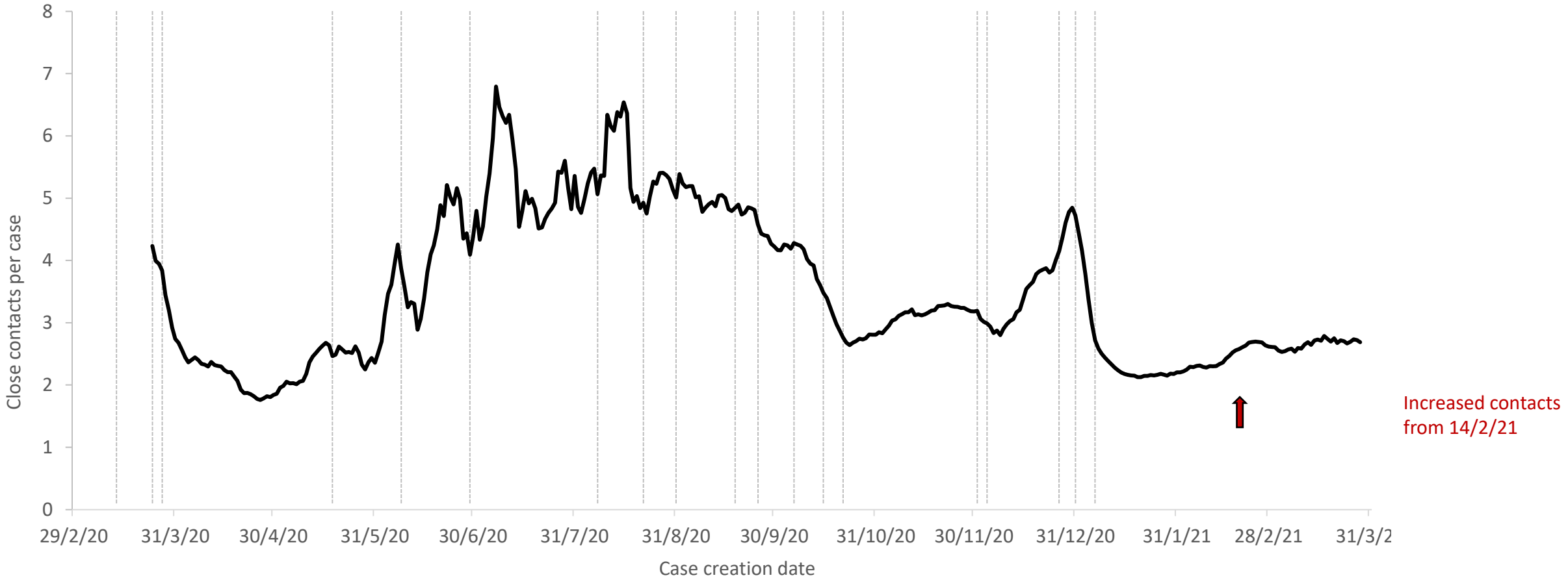
HSE

Rialtas na hÉireann
Government of Ireland

Close contacts of adult confirmed cases

The mean number of close contacts per confirmed case. The number of contacts was very low (2 or less) during April, but increased to 5-6 per case during the summer. The public health measures during October was associated with a progressive reduction in close contacts, to below 3. The number of close contacts remained below 3.3 on average until early December, rose to almost 5 on average by 28 December and fell to 2.1 in January. It has increased in recent weeks to ≈ 2.6

Coronavirus **COVID-19** Public Health Advice



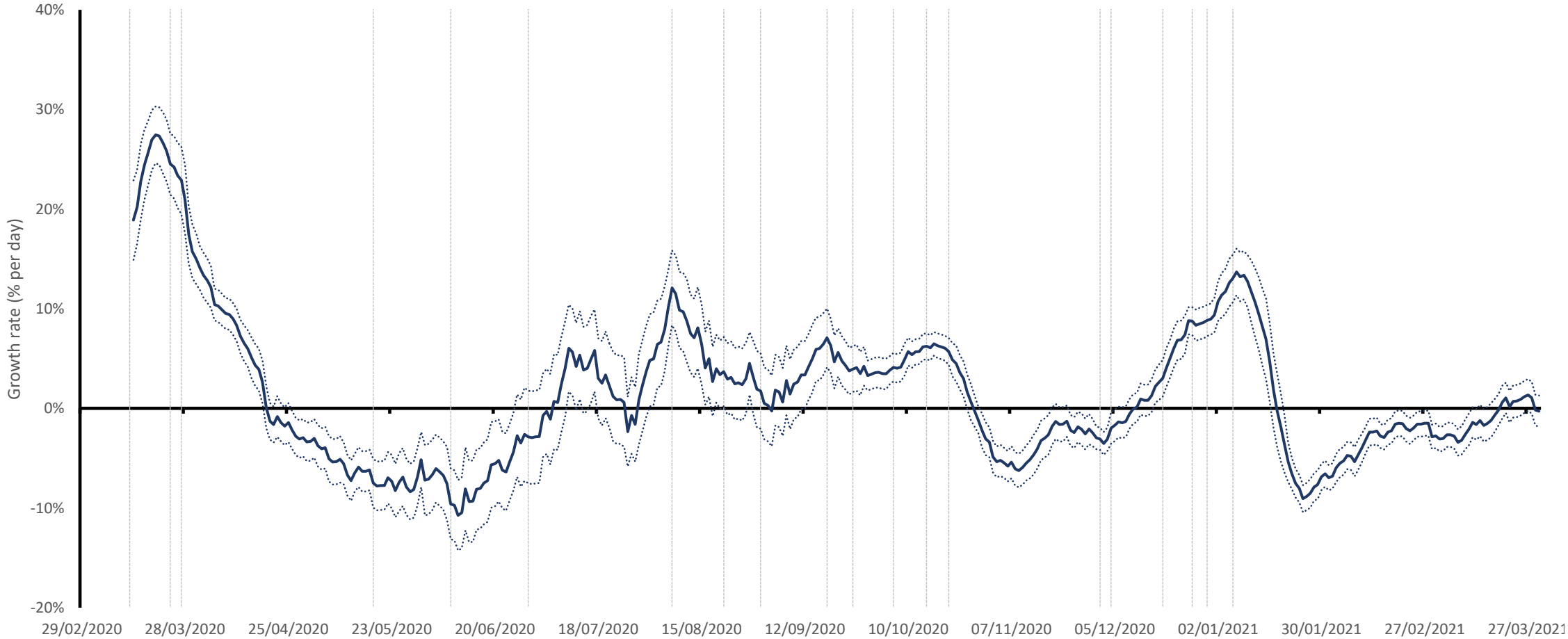
The average number of close contacts per confirmed case. Data from COVID-19 Care Tracker (CCT). Cases dated by case creation date. Cases (but not contacts) aged 18 and younger are excluded. Data are 7-day trailing averages except for the months of June – August where a 21-day trailing average is used due to very low case counts.

HSE | Rialtas na hÉireann Government of Ireland

Growth rate for case numbers

Growth rate peaked at 13% per day over the 21-day period up to 10 January 2021. While case numbers decreased very rapidly in January (-6 to -10% per day) case numbers are have been decreasing more slowly. The growth rate is currently estimated at 0% to +2% per day.

Coronavirus **COVID-19** Public Health Advice



Growth rate calculated as the average growth rate over a 21-day trailing window,with 95% credible interval; cases dated by notification (event) date.

Rialtas na hÉireann
Government of Ireland

Week-on-week decline in cases

Case counts increased by 9% between week 10 and 11, and 4% between week 11 and 12

Coronavirus **COVID-19** Public Health Advice

Week	Cases	Week-on week change
2021 - 1	45,617	
2	25,116	-45 %
3	14,811	-41 %
4	8,924	-40 %
5	7,145	-20 %
6	6,028	-16 %
7	5,527	-8 %
8	4,550	-18 %
9	3,630	-20%
10	3,536	-3%
11	3,843	+9%
12	3,986	+4%

HSE Rialtas na hÉireann Government of Ireland

Estimates of effective reproduction number (R)

Reproduction number is above 1.0 with high levels of uncertainty in its estimation; it is currently estimated at 1.0 – 1.3

Coronavirus COVID-19 Public Health Advice

Method	Estimate	95% confidence interval
SEIR model-inferred	1.44	1.14 – 1.92
Bayesian model	1.01	0.59– 1.72
Time-dependent R	1.07	0.98 – 1.16
GAM estimate 15 Mar 2021	1.12	0.92 – 1.31
GAM estimate 23 Mar 2021	1.23	0.95 – 1.50

Estimates generated 31 March 2021, refer to IEMAG technical notes for methodology. Estimates are unreliable when case numbers are low or variable. SEIR-inferred estimate is slow to respond to changes in R. The time-dependent R estimate lags behind other estimates.These R estimates relate to viral transmissions and infections that occurred approximately 7-14 days ago. The estimate of R is influenced by different patterns of transmission in large outbreaks, smaller clusters, and individual transmission.

HSE

Rialtas na hÉireann
Government of Ireland

Modelling the impact of the vaccination programme

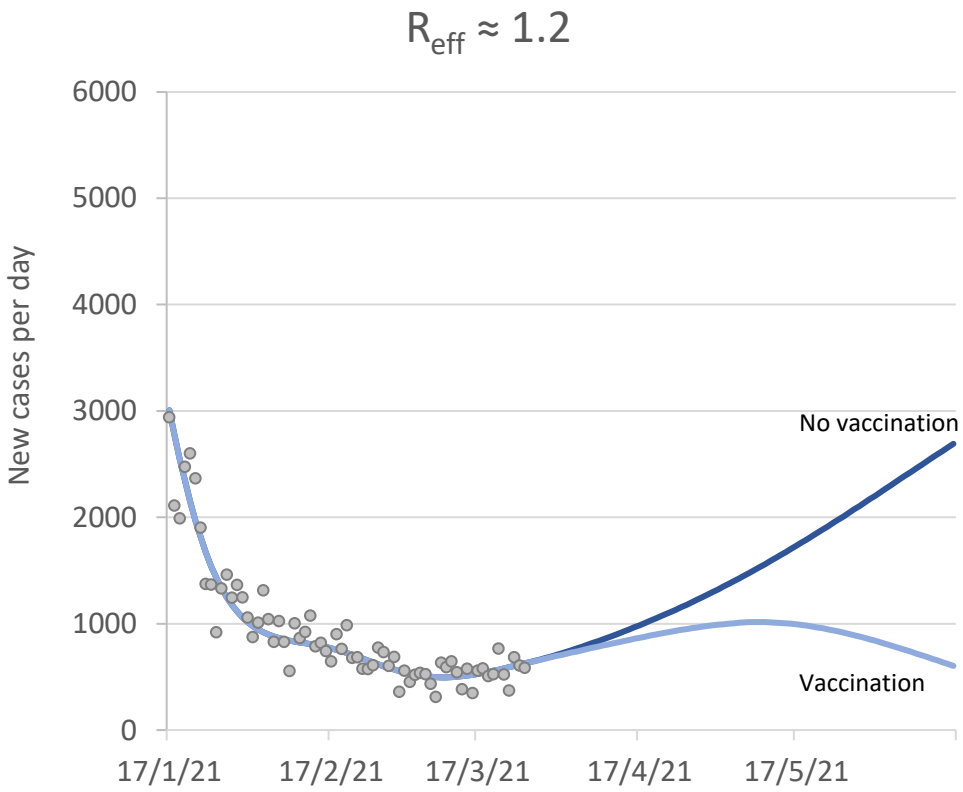
Coronavirus COVID-19 Public Health Advice

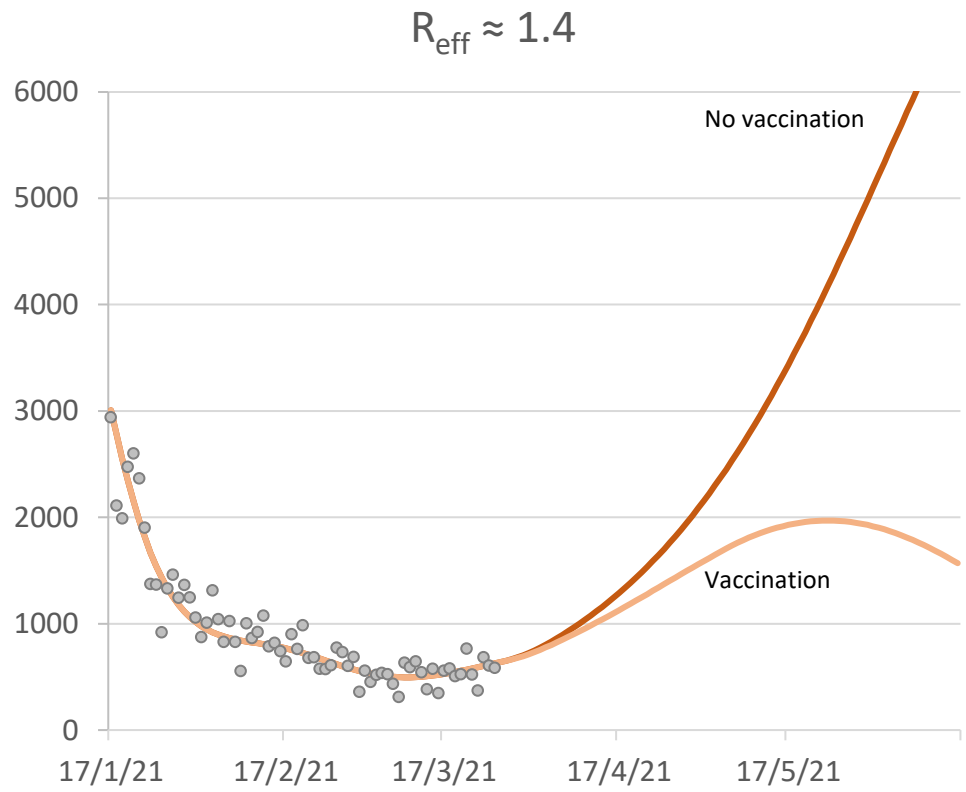
- Three scenarios
  - R_{eff} = 1.3 - base conservative scenario
    - schools open and minimal additional social contact
  - R_{eff} = 1.5 - low additional close contact
    - similar to early summer 2020 but with B.1.1.7
  - R_{eff} = 2.0 - moderate additional close contact
    - Similar to late summer 2020 but with B.1.1.7

Vaccination progressively suppresses infections and cases

The effect of vaccination on numbers of cases where initial effective reproduction number (R_{eff}) is 1.2 – 1.4. Given that R_{eff} is currently estimated at 1.0 – 1.3, these are no- or minimal-change scenarios; with vaccination proceeding to schedule we could anticipate peak daily cases of 1000-2000 per day even with a very modest increase in close contact

Coronavirus **COVID-19** Public Health Advice





The effect of vaccination on disease trajectories over the coming weeks. Scenarios are shown for an initial effective reproduction number, Reff, of 1.2 which corresponds to current estimates of transmission levels, and a small increase in transmission initial effective reproduction number of 1.4. The darker lines are scenarios without vaccination, the pale lines with vaccination. The scenarios without vaccination show 2000-4000 cases by the end of May 2021. Vaccination attenuates these trajectories, and by late May starts to suppress transmission, assuming a constant level of public health restrictions.

Rialtas na hÉireann
Government of Ireland

Scenarios

Coronavirus COVID-19 Public Health Advice

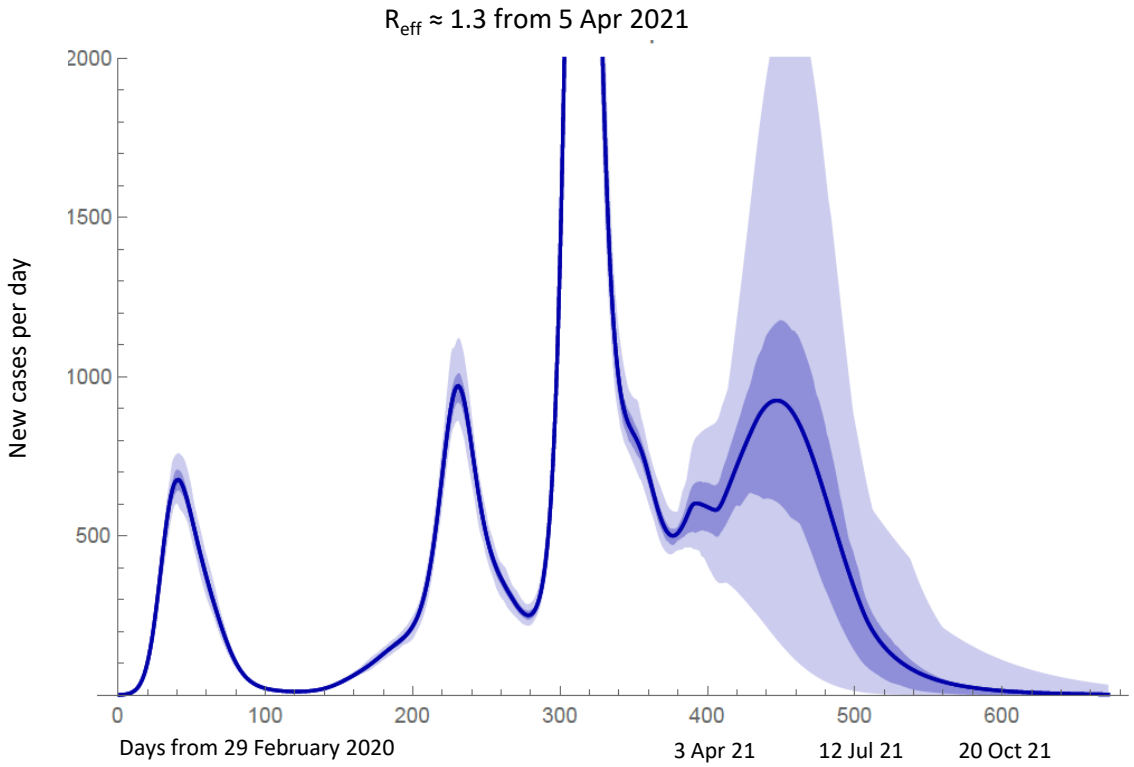
- Three scenarios
  - R_{eff} = 1.3 - base conservative scenario
    - schools open and minimal additional social contact
  - R_{eff} = 1.5 - low additional close contact
    - similar to early summer 2020 but with B.1.1.7
  - R_{eff} = 2.0 - moderate additional close contact
    - Similar to late summer 2020 but with B.1.1.7

The possible fourth wave

Conservative scenario (schools open, minimal additional close contact from 5 April 2020, initial effective reproduction number in early April 2021 (R_{eff})approximately 1.3. This results in 80,000 additional cases (interquartile range 50,000 – 101,000) over the period 5 April – 30 September 2021

Coronavirus COVID-19 Public Health Advice

A. 80,000 (50,000 – 101,000) cases



First 8 weeks of 2021

- 117,746 cases
- 6263 hospitalisations
- 598 ICU admissions
- 2109 deaths (confirmed)

500 cases per day to end-July = 60,000 cases

Homogeneous population SEIR model scenario estimates of new cases per day; credible intervals generated from 1000 runs of the model with different assumptions. The solid line is the ensemble average of all runs, dark ribbon the interquartile range, and the light ribbon the 2.5 and 97.5 percentiles. The effect of vaccination included according to current vaccination plan, with average vaccine effectiveness assumed to be 85% 28 days from first dose and uptake 80-90%. The stated R_{eff} applies on 5 April 2020 – transmissibility is held constant in the model from that point, but measured R_{eff} will decrease as immunity increases

Rialtas na hÉireann
Government of Ireland

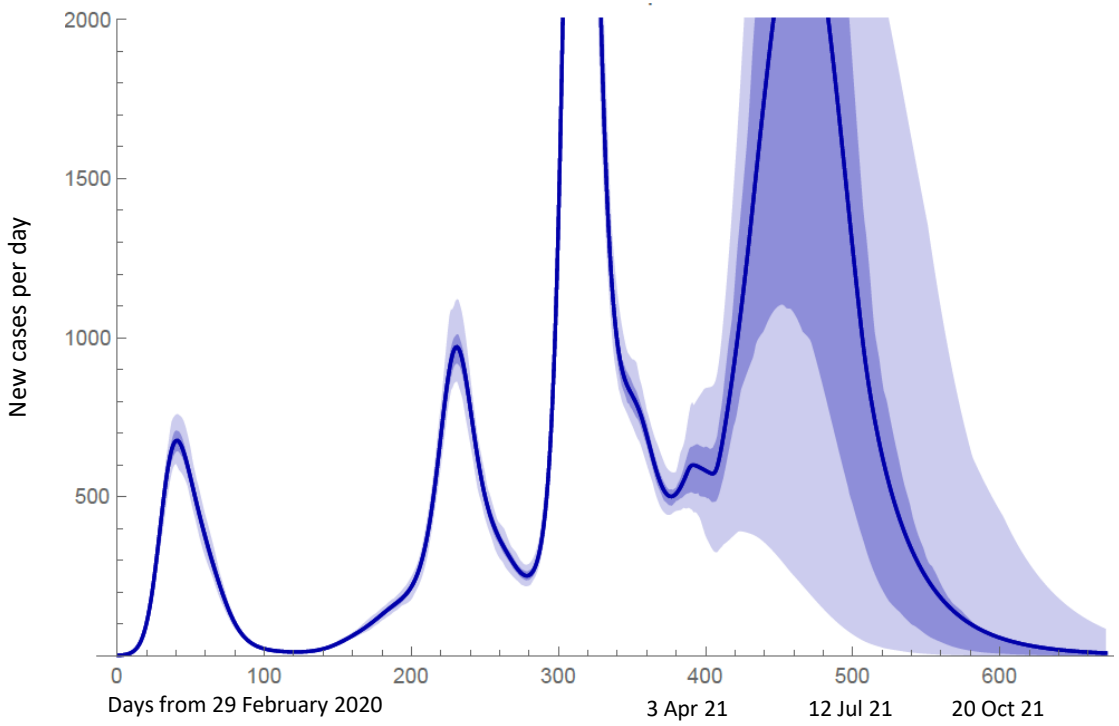
The possible fourth wave

The low additional close contact scenario (initial $R_{eff} \approx 1.5$) and moderate additional close contact scenario (initial $R_{eff} \approx 2.0$). The former results in 199,000 additional cases (interquartile range 95,000 – 279,000) and the latter in 578,000 additional cases (interquartile range 278,000 – 792,000) over the period 5 April – 30 September 2021. The outcome, with B.1.1.7 transmissibility, is very sensitive to the level of social contact.

Coronavirus **COVID-19** Public Health Advice

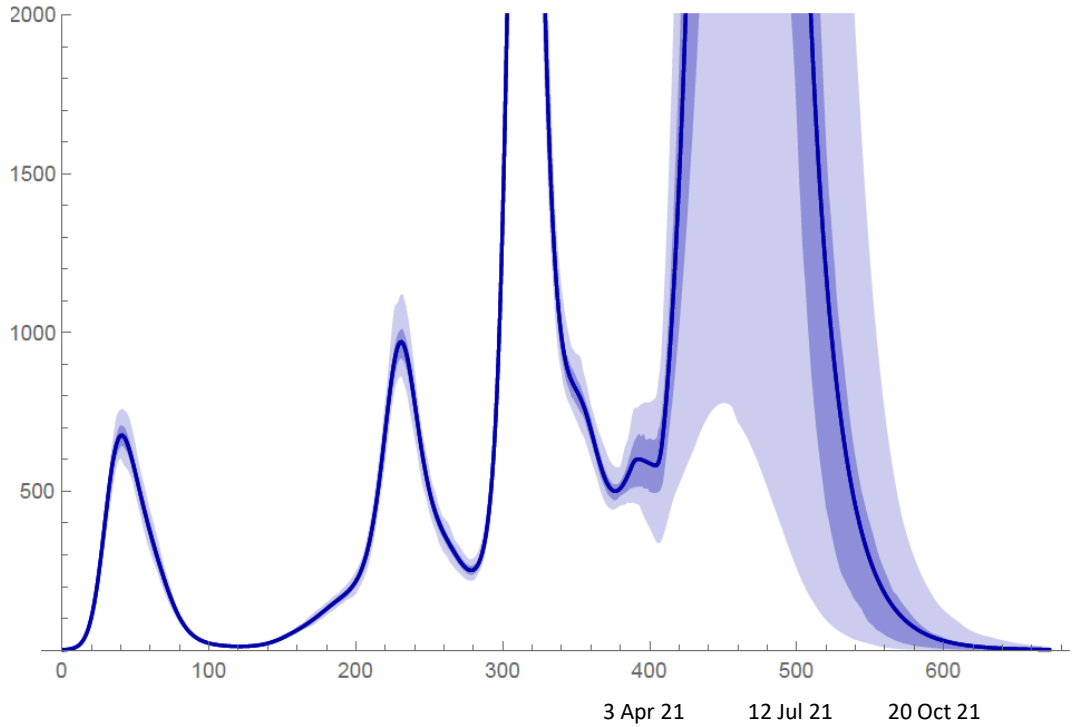
B. 199,000 (95,000-279,000)

$R_{eff} \approx 1.5$ from 5 Apr 2021



C. 578,000 (278,000 – 792,000)

$R_{eff} \approx 2.0$ from 5 Apr 2021



Homogeneous population SEIR model scenario estimates of new cases per day; credible intervals generated from 1000 runs of the model with different assumptions. The solid line is the ensemble average of all runs, dark ribbon the interquartile range, and the light ribbon the 2.5 and 97.5 percentiles. The effect of vaccination included according to current vaccination plan, with average vaccine effectiveness assumed to be 85% 28 days from first dose and uptake 80-90%. The stated R_{eff} applies on 5 April 2020 – transmissibility is held constant in the model from that point, but measured R_{eff} will decrease as immunity increases.

HSE | Rialtas na hÉireann Government of Ireland

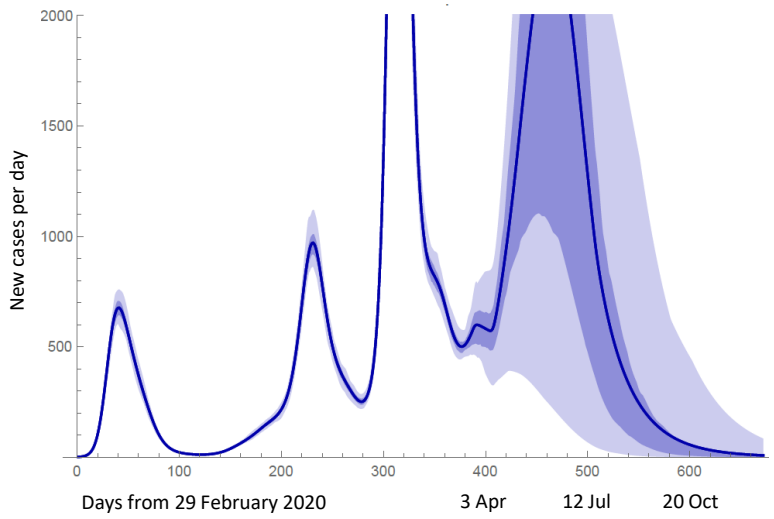
A delay of weeks greatly attenuates any fourth wave

These model runs delay the low additional close contact scenario (initial Reff ≈ 1.5) by four weeks (B1) and eight (B2) weeks, reducing anticipated case numbers and risk by approximately 25% and 50% respectively.

Coronavirus **COVID-19** Public Health Advice

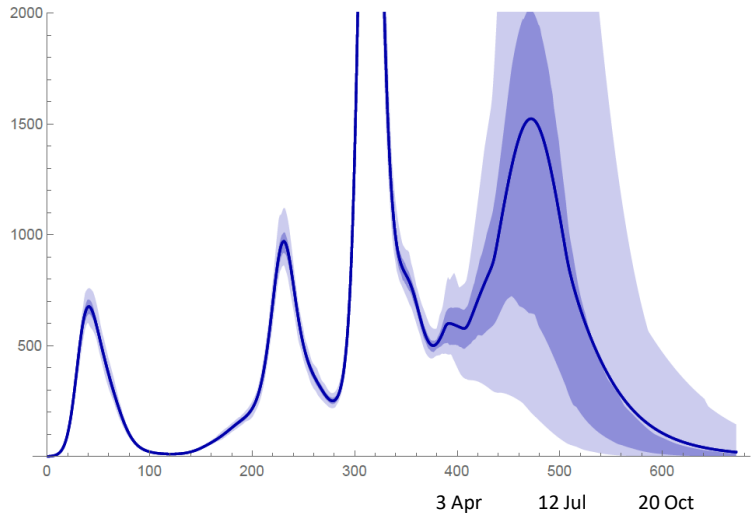
B. 199,000 (95,000-279,000) cases

R_{eff} ≈ 1.5 from 5 Apr 2021



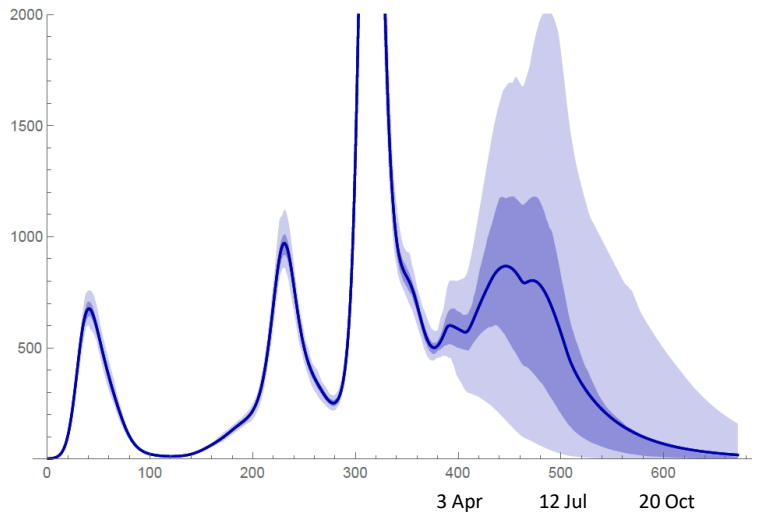
B1. 152,000 (69,000-185,000) cases

R_{eff} ≈ 1.3 from 5 Apr, 1.5 from 3 May



B2. 96,000 (51,000-129,000) cases

R_{eff} ≈ 1.3 from 5 Apr, 1.5 from 31 May



Homogeneous population SEIR model scenario estimates of new cases per day; credible intervals generated from 1000 runs of the model with different assumptions. The solid line is the ensemble average of all runs, dark ribbon the interquartile range, and the light ribbon the 2.5 and 97.5 percentiles. The effect of vaccination included according to current vaccination plan, with average vaccine effectiveness assumed to be 85% 28 days from first dose and uptake 80-90%. The stated R_{eff} applies on 5 April 2020 – transmissibility is held constant in the model from that point, but measured R_{eff} will decrease as immunity increases; transmissibility is then increased from 3 May or 31 May, and the stated R_{eff} is that which would have applied, for that level of transmissibility, on 5 April 2021. The actual measured R_{eff} will be lower due to increased population immunity

Rialtas na hÉireann
Government of Ireland

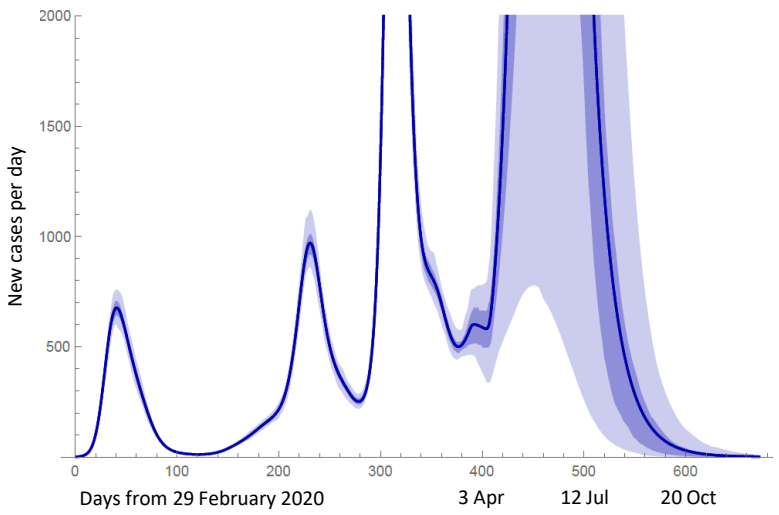
A delay of weeks greatly attenuates any fourth wave

These model runs delay the medium additional close contact scenario (initial $R_{eff} \approx 2.0$) by four weeks (C1) and eight (C2) weeks, reducing anticipated case numbers and risk by approximately 50% and 70% respectively.

Coronavirus **COVID-19** Public Health Advice

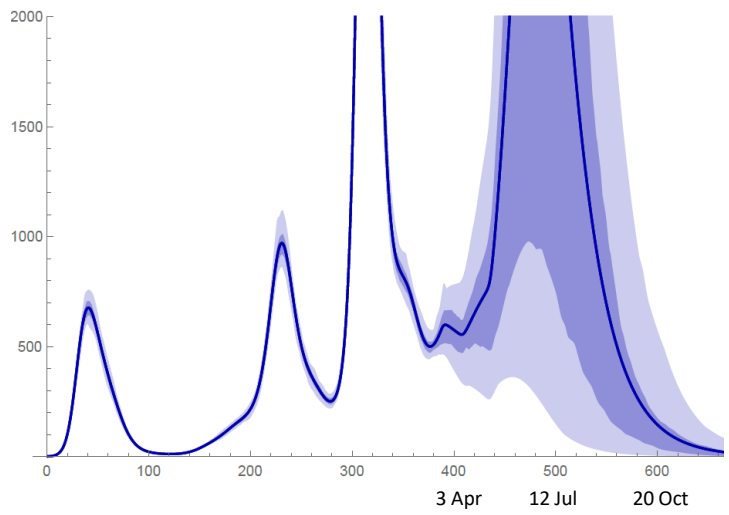
C. 578,000 (278,000 – 792,000) cases

A. $R_{eff} \approx 2.0$ from 5 Apr 2021



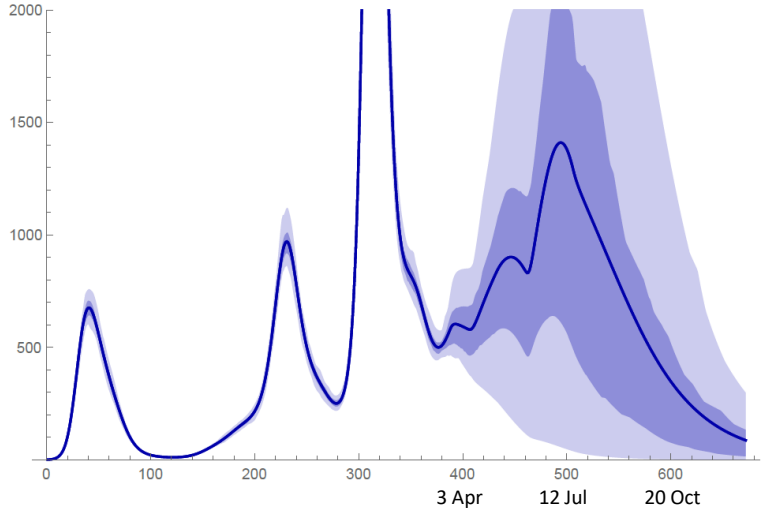
C1. 291,000 (96,000-417,000) cases

B. $R_{eff} \approx 1.5$ from 5 Apr, 2.0 from 3 May



C2. 177,000 (80,000-252,000) cases

C. $R_{eff} \approx 1.5$ from 5 Apr, 2.0 from 31 May



Homogeneous population SEIR model scenario estimates of new cases per day; credible intervals generated from 1000 runs of the model with different assumptions. The solid line is the ensemble average of all runs, dark ribbon the interquartile range, and the light ribbon the 2.5 and 97.5 percentiles. The effect of vaccination included according to current vaccination plan, with average vaccine effectiveness assumed to be 85% 28 days from first dose and uptake 80-90%. The stated R_{eff} applies on 5 April 2020 – transmissibility is held constant in the model from that point, but measured R_{eff} will decrease as immunity increases; transmissibility is then increased from 3 May or 31 May, and the stated R_{eff} is that which would have been measured, for that level of transmissibility, on 5 April 2021. The actual measured R_{eff} will be lower due to increased population immunity.

HSE | Rialtas na hÉireann Government of Ireland

Cases and risk

Coronavirus COVID-19 Public Health Advice

Risk per 1000 cases in unprotected population

- 50 hospitalisations
- 5 admissions to ICU
- 11 deaths

Risk per 1000 cases with all over 70 fully protected

- 30 hospitalisations
- 4 admissions to ICU
- 2 deaths

Age band	Cases	Hospitalisations per 1000 cases	ICU admissions per 1000 cases	Deaths per 1000 cases
0-12	10900	12	0.4	0.1
13-18	8980	10	0.5	0.1
19-24	17622	12	0.2	0.1
25-39	33257	19	1.2	0.3
40-49	18757	27	4	1
50-59	17654	46	8	3
60-64	6161	75	17	12
65-69	4203	126	25	28
70-74	3182	217	28	54
75-84	4297	361	24	113
85-	2007	491	5	214
0-18	19880	11	0.4	0.1
19-69	97654	32	5	3
70-	9486	340	21	115
All cases	127020	52	5	11

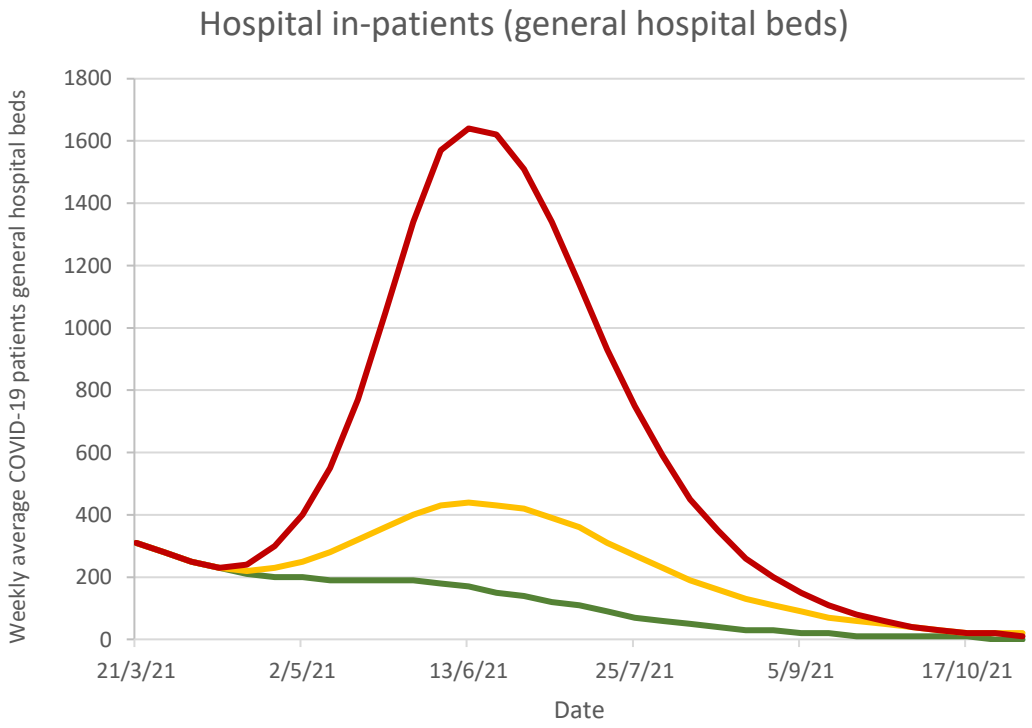
Hospitalisation, ICU admission, and deaths per 1000 cases by age group for all cases notified 29 Nov 2020 – 1 Mar 2021

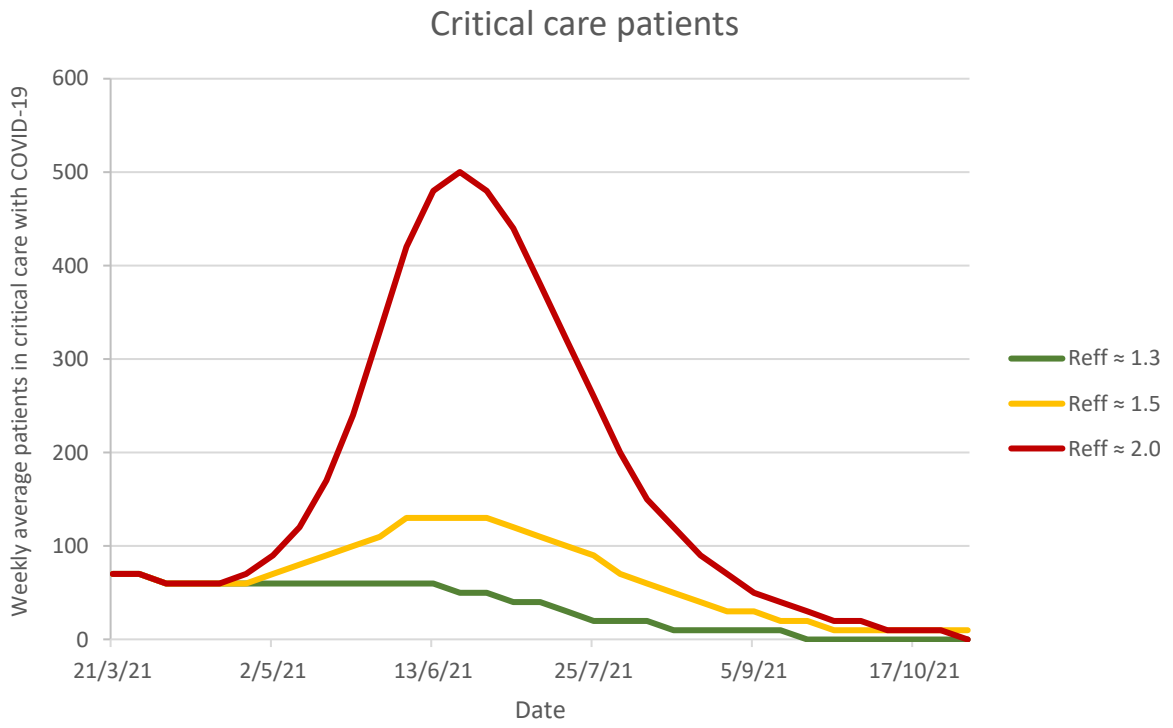
Rialtas na hÉireann
Government of Ireland

Vaccination has a larger effect on hospitalisation

The vaccination programme protects more vulnerable adults first, and thus will reduce hospitalisations more rapidly than it will reduce numbers of infections and cases. The conservative scenario results in minimal additional demand on healthcare services. The low additional close contact scenario gives a peak in demand similar to October 2020, and the moderate additional indoor mixing scenario gives a peak in demand similar to January 2021.

Coronavirus COVID-19 Public Health Advice





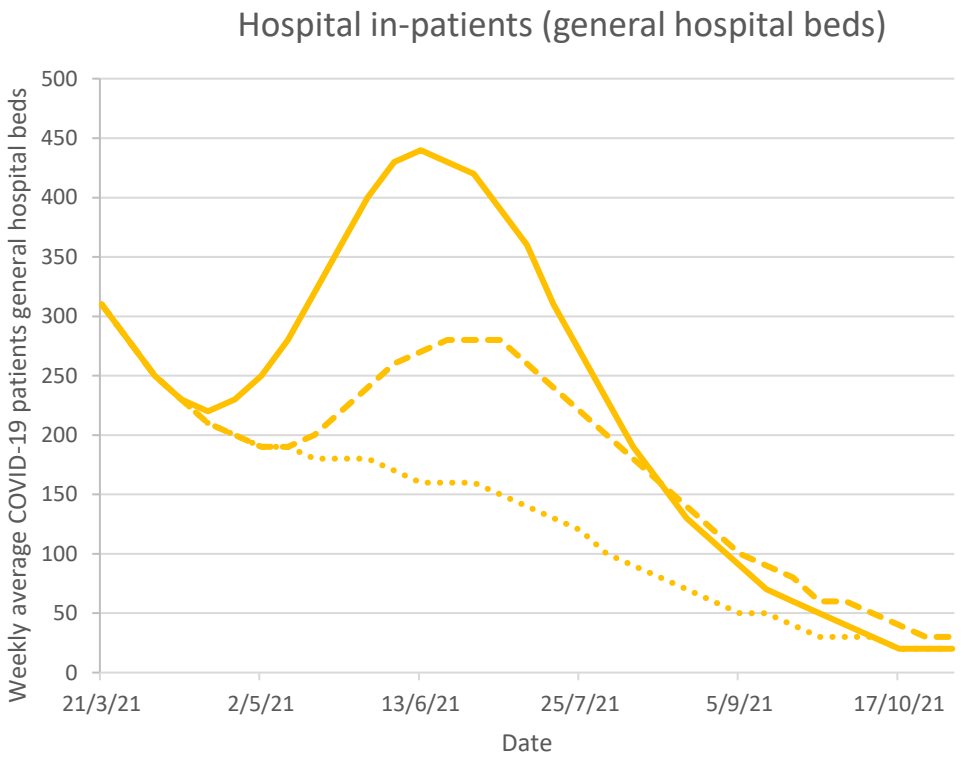
The number of people requiring care in acute hospital (left panel, numbers in general hospital beds, right panel, those requiring critical care, including intensive care and advanced respiratory support) for base conservative (Reff = 1.3), low additional close contact (Reff = 1.5) and medium additional close contact (Reff = 2.0) scenarios. Data from ESRI CHUP model.

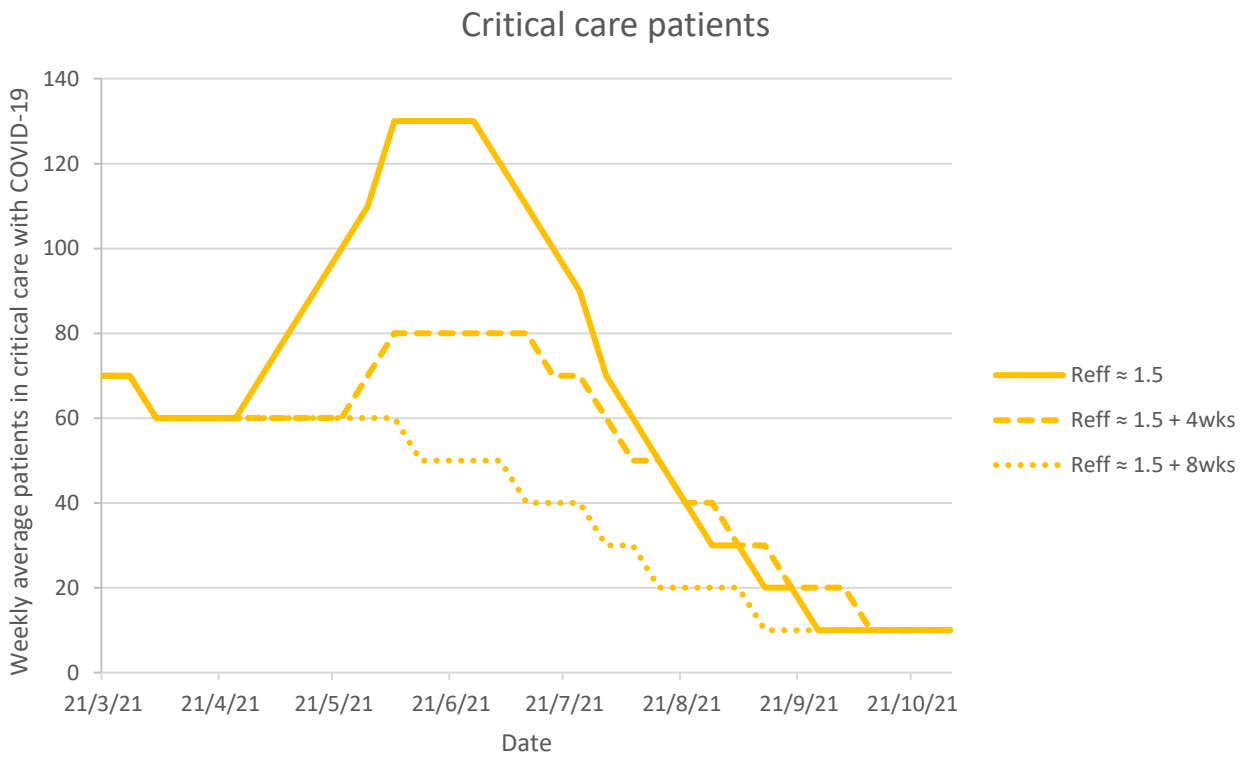
HSE | Rialtas na hÉireann Government of Ireland

Delay protects people and the health service

A 4-8 week delay in the transition from current levels of close social contact to low additional close contact attenuates or eliminates any resultant surge in demand for hospital and critical care.

Coronavirus **COVID-19** Public Health Advice





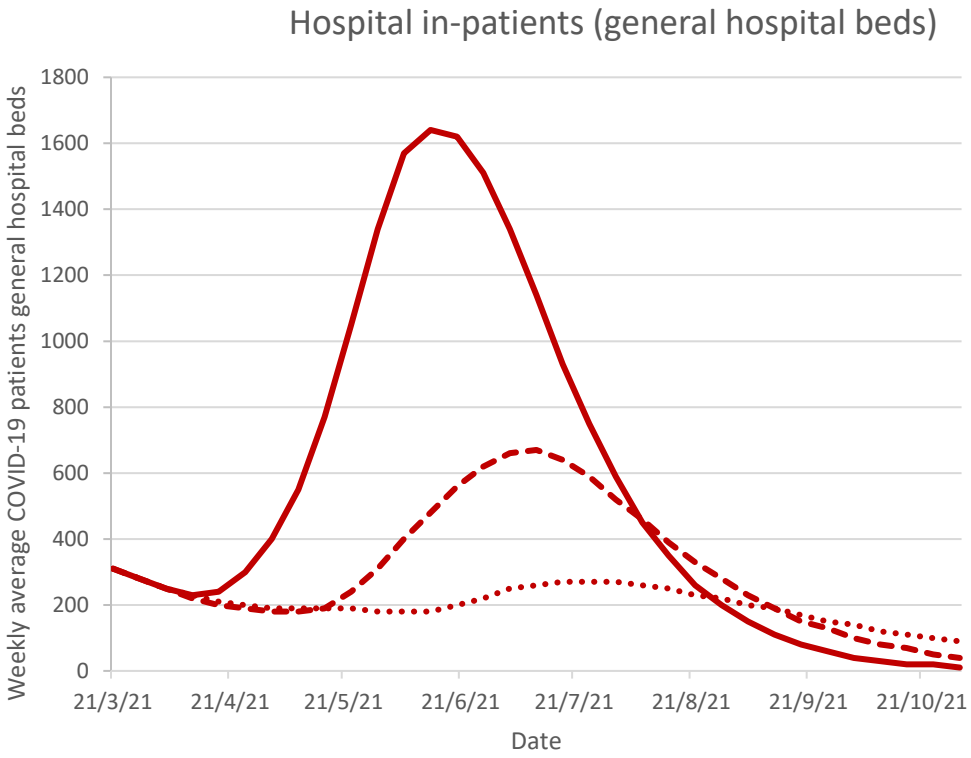
The number of people requiring care in acute hospital (left panel, numbers in general hospital beds, right panel, those requiring critical care, including intensive care and advanced respiratory support) for low additional close contact (Reff = 1.5) from 5 April 2021 (solid line), or delayed by 4 weeks (dashed line) or 8 weeks (dotted line). Data from ESRI CHUP model.

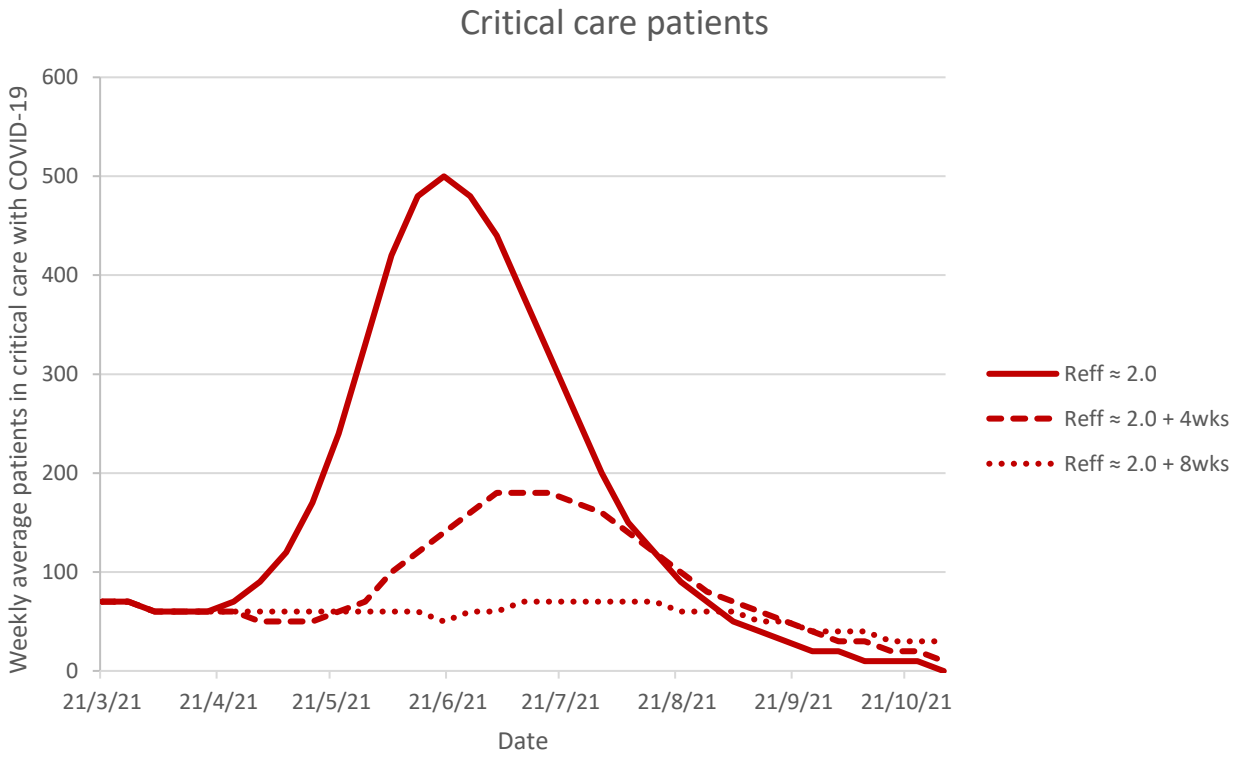
Rialtas na hÉireann
Government of Ireland

Delay protects people and the health service

A 4-8 week delay in the transition from current levels of close social contact to medium additional close contact attenuates any resultant surge in demand for hospital and critical care.

Coronavirus COVID-19 Public Health Advice





The number of people requiring care in acute hospital (left panel, numbers in general hospital beds, right panel, those requiring critical care, including intensive care and advanced respiratory support) for medium additional close contact (Reff = 2.0) from 5 April 2021 (solid line), or delayed by 4 weeks (dashed line) or 8 weeks (dotted line). Data from ESRI CHUP model.

HSE

Rialtas na hÉireann
Government of Ireland

Situation analysis 31 March 2021

Coronavirus COVID-19 Public Health Advice

- Incidence has plateaued and remains high
- Cases (5-day average) 509 cases per day; 14-day incidence 161 per 100,000
  - Reproduction number (R) is uncertain and estimated at 1.0 – 1.3, growth rate in case numbers 0 to +2% per day; if epidemic is growing again doubling time estimated at 35 days or longer
- Level of close contact is constant
  - The efforts of the majority of the population continue to result in a 75-85% suppression of viral transmission
- While evidence of protective effect of vaccination in LTRC and HCW the wider population is not yet protected
- Vaccination will
  - significantly and quickly reduce risk over a short period of time from May 2021 to August 2021
  - radically reduce mortality when those over 70 are fully protected
  - have a smaller effect on hospitalisation and critical care until the wider adult population is protected
  - need to be supported by ongoing non-pharmaceutical interventions
- There is a critical window over the next 8 weeks where any significant increase in social contact is likely to lead to a significant additional wave in the range of that experienced in October 2020 or January 2021
- Equally, a delay of 4-8 weeks significantly reduces the risk profile