An Roinn Sláinte
Department of Health
Office of the Chief Medical Officer

Mr. Stephen Donnelly TD,
Minister for Health,
Department of Health,
Miesian Plaza,
50-58 Lower Baggot Street,
Dublin 2.

29th March 2021
Via email to Private Secretary to the Minister for Health

Dear Minister,
I write further to today's meeting of the COVID-19 National Public Health Emergency Team (NPHET). The NPHET reviewed the latest epidemiological data and the following key points were noted:

- A total of 3,992 cases have been notified in the 7 days to 28th March, which is a 3% increase on the previous 7 days in which there were 3,864 cases.
- As of 28th March, the 14-day incidence rate per 100,000 population has increased to 165; this compares with 155 on the same day last week and 148 at the last NPHET meeting on 18th March. The 7-day incidence per 100,00 population has increased to 84 from 81 on the same day last week, and 77 at the last NPHET meeting on 18th March.
- Nationally, the 7-day incidence as a proportion of 14-day incidence is 51%, demonstrating that there have been more cases in the last 7 days compared with the preceding 7 days.
- The 5-day rolling average of daily cases has decreased from a peak of 6,831 on 10th January 2021 to 620 on 28th March. However, the 5-day average has increased from 587 a week ago, and from 481 at the last NPHET meeting on 18th March. To note, daily incidence is currently twice what it was in early December 2020, and approximately 50 times what it was in late June 2020.
- Incidence has increased in those aged 0-12 years over the last four weeks (noting it is not clear to what extent this is due to increased infection, increased ascertainment, or both), though this may have stabilised in the last week.
- Of cases notified in the past 14 days, 74% have occurred in people under 45 years of age; and 8% were aged over 65. The median age for cases notified in the same period is 32 years.
- While 14-day incidence rates remain high across the country, 14 counties have a 7-day incidence as a percentage of the 14-day rate of more than 50%, indicating more cases notified in those counties in the last 7 days compared with the previous 7 days.
- Of the 7,834 cases reported in the last 14 days, 3% (202) were healthcare workers.
- The best estimate of the reproduction number (R) is 1.0–1.3. The rate of growth of the disease is continuing at 0% to +2%. R is uncertain and difficult to estimate at this time.
- There were 119,565 tests undertaken in the last week (as of 27th March). The 7-day average test positivity rate has decreased to 3.6% on 28th March, which is down from 4.0% on the same day last week and from 3.8% on 18th March. However, it is noted that a recent increase in test referrals (potentially due to factors such as heightened vigilance around education and childcare as well as testing of asymptomatic persons) may be diluting the positivity rates in recent days.
- Excluding acute, serial and mass testing in response to outbreaks, the community test positivity rate has remained stable over the last week; the rate remains high at 10% over the 7 days to 26th March, which is a decrease from 12% observed on 15th March before the last NPHET meeting, noting the point made previously about the potential for dilutionary effect in relation to test positivity at the moment.
- According to contact management programme data, 9 counties have community positivity rates (excluding acute, serial and mass testing in response to outbreaks) greater than 10%. Over the seven-day period, 19th-25th March, demand for testing in the community increased by 19.3%.

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- According to contact management programme data from 8th-14th March, where results were available for Test 1, 20.1% (1,283/6,375) were positive. Household close contact positivity rate remains at 34%.
- According to contact management programme data from 1st-7th March, where results were available for Test 2, 5.7% (148/2,607) were positive. Household close contact positivity rate was 9.5%.
- There were 331 confirmed COVID-19 cases in hospital this morning, compared with 345 on 18th March; this is a 4% decrease since the last NPHET meeting. There have been 19 newly confirmed cases in hospital in the 24 hours preceding this morning.
- There are currently 68 confirmed cases in critical care, compared with 82 on 17th March. There have been 6 admissions in the previous 24 hours.
- To date, there have been 167 deaths notified with a date of death in March. This compares with 803 and 1,371 deaths notified (to date) with a date of death in February and January, respectively. Of the 167 deaths in March to date, 28 have thus far been associated with hospital outbreaks and 31 have been associated with nursing home outbreaks.
- In total, 31 cases of B.1.351 (variant first reported in South Africa) have been confirmed by whole genome sequencing.
- Twelve confirmed cases of P.1 (variant first reported from Brazil) have been identified in Ireland to date.
- Other variants of note/under investigation confirmed in Ireland to date: 15 B.1.525 cases, 5 B.1.526 cases, 13 P.2 cases, and 1 B.1.1.7 with E484K mutation.

It should be noted that in week 12, (21st - 27th March 2021), a significant number of outbreaks (92), were added that related to cases notified before 1st March. Outbreaks and associated cases are based on those notified up to midnight on 27th March 2021 and since 22nd November 2020.

<u>Healthcare setting outbreaks:</u>

- There were 6 new outbreaks notified in hospitals in week 12 of 2021; Week 12 2021 is the week ending 27th March 2021.
- As of the week ending 27th March, 37 hospital outbreaks remained open. There have been 508 cases linked to these open outbreaks.
- There were 2 new outbreaks notified in nursing homes/community hospitals in week 12; this compares with 2 outbreaks in these settings in week 11.
- By the end of week 12, 54 outbreaks in nursing homes remained open. There are 17 open outbreaks in community hospitals and long stay units.
- There are currently 87 open clusters associated with all residential institutions with 6 new outbreaks notified in week 12, of which 4 were in direct provision centres (also mentioned in vulnerable groups section)
- Within other residential institutions at the end of week 12:
    - There were 2 new outbreaks in centres for disabilities; there were 47 open outbreaks in centres for disabilities.
    - There were no new outbreaks reported in mental health facilities and there were 4 open outbreaks in these settings.
    - There were no new outbreaks reported in Children's / TUSLA residential centres with 4 open outbreaks.

<u>Outbreaks associated with educational settings and childcare facilities:</u>

- There were 49 outbreaks notified associated with school children and/or school staff in week 12 with a range of between 1-14 cases linked cases. Over the period of 14th – 20th March 2021, 3,142 tests were completed in 120 primary schools resulting in a 2.7% positivity rate and 817 tests were completed in 52 post-primary facilities resulting in a 1.8% positivity rate. The number of cases detected, positivity rates, and numbers of cases associated with outbreaks in schools remain low despite intense oversight and increased testing. It is important to note that detection of a case or declaration of an outbreak in a school does not imply that transmission has occurred in the school setting.

- There were 19 outbreaks newly notified in childcare facilities in week 12 with a range of between 0-9 linked cases per outbreak. Over the period of 14th – 20th March 2021, 1,236 tests were completed in 71 childcare facilities resulting in a 9.6% positivity rate.

Vulnerable groups, Travelling Community, Direct Provision & Prison Outbreaks:

- There were 30 new outbreaks reported in vulnerable populations in week 12.
- There remains a high number of Irish Traveller outbreaks with 21 new outbreaks in week 12, compared with 42 new outbreaks in week 11.
- There were 4 new outbreaks notified in direct provision centres in week 12.
- There has been 1 outbreak in a Homeless facility in week 12, 1 outbreak in the Roma community, and 1 outbreak in other vulnerable populations (emergency accommodation).

Workplace outbreaks:

- There were 12 workplace outbreaks reported in week 12 across a variety of settings, which is a reduction on the number of outbreaks identified in week 11 (19).

In summary, the current epidemiological situation in Ireland is concerning. Disease incidence has plateaued at a high level and may now be increasing. Although incidence has increased in those aged 0-12 years over the last four weeks, this may have stabilised in the last week. Community test positivity rates, which had previously been reducing, have flattened at persistently elevated levels over recent weeks. Of particular concern, there continues to be a significant disease burden on the acute healthcare system. The total number of confirmed cases of COVID-19 in hospital has been slowly decreasing but remains high, at a level approximately equivalent to the highest observed in wave 2 in late 2020. The total number of cases in critical care has also been gradually reducing but is still substantially above the highest levels seen in wave 2. While indicators of population mobility have continued to drift upwards over recent weeks, the mean number of close contacts per adult confirmed case remains at approximately 2.6. The latest estimate of the reproduction number (R) is uncertain but is estimated at 1.0-1.3, with growth rate at zero to +2%.

Summary of Epidemiological Situation

Ireland's epidemiological situation remains precarious. There are a number of reasons for this. First, the level of infection is high, with a 5-day average case count of 620 cases per day and a 14-day cumulative incidence of 165 per 100,000. This is substantially higher than when restrictions were eased after previous waves of infection - approximately twice that experienced in early December 2020, and 50 times that in late June 2020. Table1 below outlines the epidemiological situation when measures were eased previously.

Date of measures	18/05/20 Phase 1	08/06/20 Phase 2	29/06/20 Phase 3	25/11/20	18/12/20	NOW (29/03/21)
14 day incidence	54	13	3	105	101	165
7 day incidence	24	3.4	1.7	45	58	84
5 day average	183	23	13	274	416	620
Number in hospital	386	122	22	269	206	322
Numbers in ICU	55	34	12	36	34	667

Table 1: Epidemiological situation when measures were eased previously

Second, the dominance of the more transmissible B.1.1.7 variant means that, for similar levels of close social contact, viral transmissions and effective reproduction number (R_{eff}) will be 30%-70% greater than in 2020. This

is already clearly evident in close contact testing data where the positivity rate for all close contacts has nearly doubled compared to late 2020 from just over 10% to around 20% now. In particular, the levels of transmission within households has increased, with more than one third of household contacts contracting the virus. Third, R is estimated to already be at or above 1.

The high level of infection significantly increases the risk associated with any increase in social contact and reproduction number. If reproduction number increases, the number of new infections per day will rise very quickly from this high baseline. This is illustrated in Figure 1 which shows SEIR model runs where effective reproduction number increases to 1.6 from a baseline of 10, 200 or 600 cases per day. The high starting point of 600 cases per day means that case numbers rise rapidly to over 2,000 per day within 4 weeks. Starting at 200 cases per day, case counts increase to 700 cases per day after 4 weeks, it takes 7 weeks to reach 2,000 per day. Starting at 10 cases per day, even after 11 weeks case counts only increase to 500 per day. Unfortunately, the significant 'headroom' that was available last summer when case counts were very low isn't available now, and any increase in transmission will have significant impacts in a short space of time.

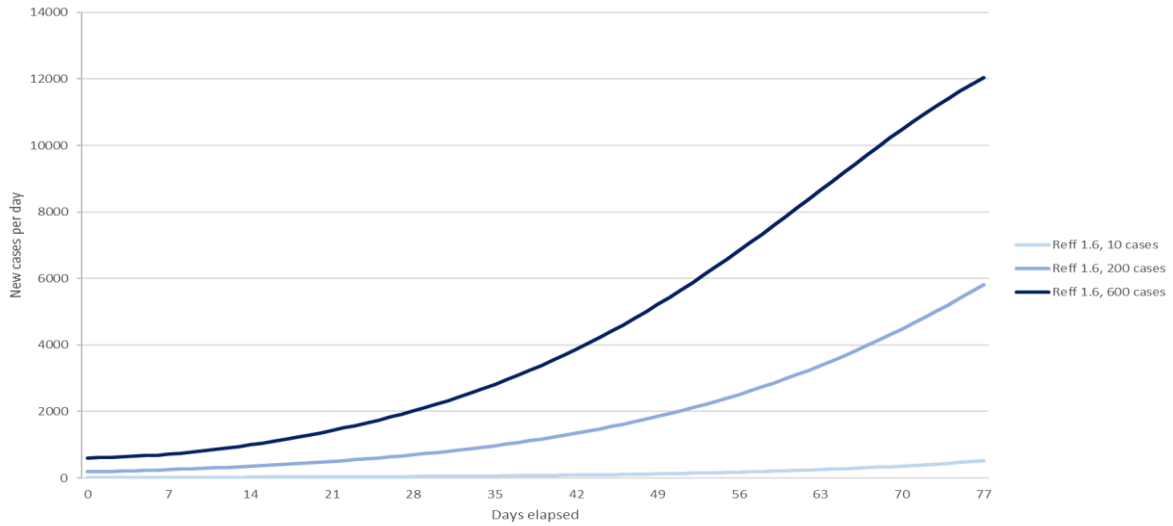


Figure 1: SEIR model projections of the number of new cases per day over an 11-week period where effective reproduction number increases on day 0 to 1.6 from baseline case numbers of 10 per day (pale blue, similar to conditions in late June 2020), 200 per day (medium blue, similar to early December 2020) and 600 per day (dark blue). There is no vaccination programme in this model.

In summary, R is now estimated to be at or above 1 and combined with the current high baseline of incidence and a more transmissible virus, **the risk of a fourth wave of infection in the coming weeks is very high** if public health measures are relaxed too quickly. Detailed modelling of different scenarios is provided below.

Health System Resilience and Impact of Vaccination on Hospitalisations

Our health system remains extremely fragile and the health care workforce is exhausted following the most recent wave of infection. The number of COVID-19 patients in hospital and critical care remains high and in the case of critical care, at levels greater than the peak of the second wave.

The third wave of infection also caused extensive disruption to the delivery of non-COVID care including the deferment of all but essential time-critical elective care in hospitals and the pausing/reduction of some community services in order to meet the highest priority needs in residential, community and home delivered services. Waiting lists have grown significantly across acute and community services both since the beginning of this third wave and since the outset of the pandemic more generally, and the position is further exacerbated as services are operating with reduced capacity as a result of infection prevention and control measures. Headline impacts include:

- The number of patients on hospital waiting lists has increased considerably since Feb 2020 – by 21% for inpatient/day case, 12% for outpatients and 62% for GI scopes.
- There was a 27% reduction in the number of clients seen by community therapies during 2020, resulting in increased waiting times across all services.
- Older person day care services have not resumed, and disability and mental health services are operating at reduced capacity.

We are now just beginning the process of reopening non-COVID health and social care services. The HSE's "Safe Return to Health Services Plan" outlines a three phased plan for the proposed restoration of services over 2021. The document is clear that, due to the challenges of a COVID-19 environment, there are limits on the level of activity that can be provided. Any resurgence in COVID-19 will cause inevitable further disruption to non-COVID services. It is also important to note that the roll-out of the vaccination programme also is likely to further displace non-COVID care over the coming period.

While vaccination will significantly reduce the impact of COVID-19 on the hospital system, it will take some time before this benefit fully materialises. It can be anticipated that vaccination will radically reduce mortality when those over 70 are fully protected, but will have a smaller effect on demand for hospital and critical care until the wider population is progressively protected. This is due to the relationship between age and risk – approximately 50% of those hospitalised and 70% of those in ICU since the beginning of the pandemic are under 70 years old, compared to only 20% of deaths. The table below shows estimates for hospitalisations, ICU admissions and deaths per 1,000 cases in an unprotected population (assuming age mix similar to recent wave) and for every 1,000 cases in those aged under 70 (assuming that vaccination offers those aged 70 and over 100% protection):

	Entire Unvaccinated Population	**Under 70 population unvaccinated**
Hospitalisations (per 1,000 cases)	50	30
ICU admissions (per 1,000 cases)	5	4
Deaths (per 1,000 cases)	11	2

It is important to note that the subsequent phases of the vaccination programme, as they protect other older adults before younger cohorts, should quickly further suppress the numbers of severe infections, with the number of cases hospitalized falling faster than the total number of infections and cases as vaccination continues.

Reproduction number: the effect of variants and immunity

When comparing the risks of levels of social mixing now and over the coming months with those which applied in 2020, we need to take into account not just the increased transmissibility of the B.1.1.7 variant, but also changing levels of immunity in the population as a result of past infection and vaccination. The effective reproduction number changes pro-rata to the level of immunity in the population. If we have the same level of close social contact, and the transmissibility of the virus is constant, if half the population becomes immune, the opportunities for the virus to transmit are halved, and the effective reproduction number is half that which would be observed if there were no immunity in the population.

For example, the current effective reproduction number is in the range 1.0 to 1.3. The higher transmissibility of the B.1.1.7 variant is forcing this parameter upwards, and the level of immunity in the population is starting to force it downwards. Current best estimates are that B.1.1.7 is 40-90% more transmissible than the variants dominant in 2020 and that 15% of the population are no longer susceptible to infection. Therefore, if there was no prior immunity in the population, we would currently have an effective reproduction number in the range 1.2 – 1.5. If we did not have B.1.1.7 dominant, and were dealing with the variants circulating in 2020, for the current level of close social contact we would probably have an effective reproduction number in the range 0.8-0.9.

This demonstrates the different relationship between close social contact, viral transmission and effective reproduction number now compared to that which applied throughout 2020, and this relationship will change further over the coming months as vaccination further reduces risk and places further downward pressure on R.

Modelling – Cases and Hospitalisations

A range of scenarios have been modelled to assess the impact of increased close social contact which may arise as a result of easing of restrictions against the backdrop of the vaccination programme. Assumptions are as follows:

- As of late March/early April, 15% of the population are immune
- The current effective reproduction number (R_{eff}) is estimated at 1.0 – 1.3
- For modelling purposes, a simplistic assumption has been made that on average, vaccination offers 85% protection against infection 28 days after the first dose is administered and remains constant thereafter
- That vaccine uptake is between 80% and 90%, (increasing with age) and that the age-related risk of severe disease is the same for infections in vaccinated and unvaccinated populations.
- It is not yet clear the extent to which vaccination reduces transmission, so this parameter is allowed vary over a wide range.
- The vaccination programme will continue according to the current supply schedule
- The projection period is 5th April to 30th September 2021

The following scenarios have been examined:

- A: R_{eff} = 1.3 as the *base conservative scenario – this* ***corresponds to the current situation*** *along with full school reopening and some very modest additional social contact;*
- B: R_{eff} = 1.5 as a *low additional close contact scenario – this corresponds to summer 2020 levels of social contact and interhousehold mixing*;
- C: R_{eff} = 2.0 as a *moderate additional close contact scenario – this corresponds to December 2020 levels of social contact and interhousehold mixing*.
- B and C have been examined under three separate scenarios – (1) the impact of an increase in close contact commencing on the 5th April, (2) a delayed increase in close contact by 4 weeks (to 3 May 2021) and (3) a delayed increase in close contact by 8 weeks (to 31 May 2021)

It should be noted that in all the scenarios above vaccination is associated with continuing controls on viral transmission through non-pharmaceutical interventions (reduced contacts, physical distancing, face coverings, hygiene and ventilation) and such measures will need to remain in place in some form unless and until herd immunity is achieved through vaccination.

Detailed charts of these scenarios are included in Appendix 1.

Modelling Results: Cases

The base conservative scenario, with current or marginal increases in close social contact from 5th April 2021 onwards, is associated with an additional 80,000 cases (credible interval(CI) 50,000-101,000 cases) between 5th April 2021 and 30 September 2021 and with a peak of 920 cases per day (CI: 640 – 1,180) – see Figure 2. The low additional close contact scenario is associated with 2.5 times that level of infections - an additional 199,000 cases over the period (CI 95,000-279,000 cases) and a peak of 2,400 cases per day (CI: 1,100 – 3,500), while the moderate scenario is associated with 7 times the level of infection in the base scenario with 578,000 cases (credible interval 278,000-792,000 cases) over the period and a peak of 9,500 cases per day (CI: 4,100 – 35,200). **Across all three scenarios, cases initially increase until vaccination starts to suppress transmission from the end of May 2020.**

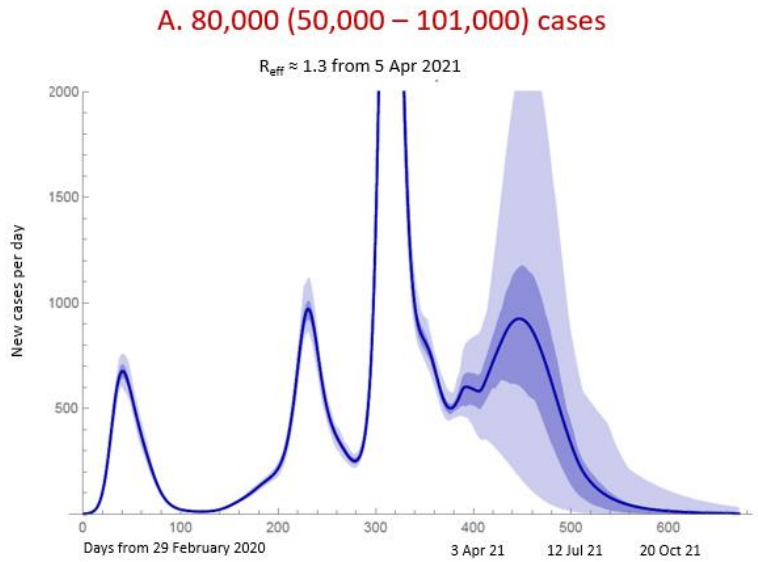


Figure 2: Scenario A - R_{eff} of 1.3. The solid line is the ensemble average of all runs, dark ribbon the interquartile range, and the light ribbon the 2.5 and 97.5 percentiles.

If an increase in close contact levels is delayed, the projected case numbers and risk are significantly lower. Projected cumulative case numbers are reduced by 25% (4-week delay) to 50% (8-week delay) for the low additional close contact scenario. The effect of delay is greater if the anticipated increase in close contact levels is greater, so that in the medium additional social contact scenario, a 4-week delay decreases projected cumulative case numbers by 50%, and an 8-week delay by 70%. See table below for summary of projections and Appendix 1 for relevant charts.

Scenario	Effective 5th April	4-week delay (3rd May)	8-week delay (31st May)
A: R_{eff} 1.3 Base	80,000		
B: R_{eff} 1.5 Low	199,000	152,000 (- 25%)	96,000 (- 50%)
C: R_{eff} 2.0 Moderate	578,000	291,000 (- 50%)	177,000 (- 70%)

Table 2: Projected cumulative cases for the period 5 April – 30th September

Modelling Results: Hospitalisations

The vaccination programme will protect more older adults aged 55-70 years, and vulnerable adults, before younger adults are vaccinated, and thus will reduce hospitalisations more rapidly than it will reduce numbers of infections and cases.

The conservative scenario even though it is associated with a modest increase in case numbers as outlined above, results in minimal additional demand on healthcare services over and above the current level. The low additional close contact scenario is estimated to result in a peak level of hospitalisations and ICU admissions similar to the October 2020 wave (though sustained for a longer period of time), while the moderate additional close contact scenario is estimated to result in a peak similar to the January 2021 surge (though, again, for a longer time). This is outlined below in Figure 3.

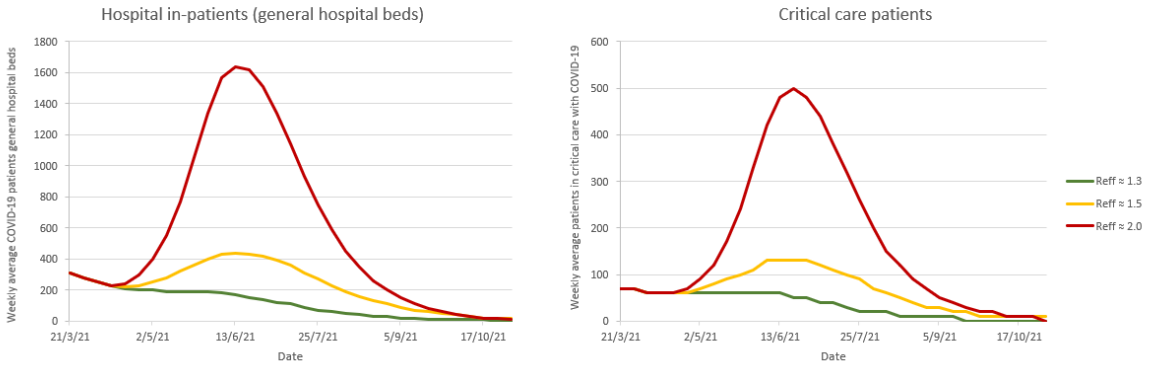


Figure 3: The number of people requiring care in acute hospital (left panel, numbers in general hospital beds, right panel, those requiring critical care, including intensive care and advanced respiratory support) for base conservative (Reff = 1.3), low additional close contact (Reff = 1.5) and medium additional close contact (Reff = 2.0) scenarios. Data from ESRI CHUP model.

Similar to case numbers, a delay in any increase in close contact also greatly reduces the risk of severe disease and the projected demand for hospital care. A delay of 4 weeks is estimated to significantly reduce any surge in healthcare demand, and a delay of 8 weeks almost eliminates any surge, because the majority of vulnerable adults are protected by vaccination. See Appendix 1 for relevant charts.

Modelling Summary

Vaccination will significantly and quickly reduce risk over a short period of time from May 2021 to August 2021. It will radically reduce mortality when those over 70 are fully vaccinated but will initially have a smaller effect on hospitalisation and critical care until the wider adult population, especially vulnerable adults and those aged 50-69 years, are protected by vaccination.

There is a critical window over the next 8 weeks where any significant increase in close contact is likely to lead to a significant additional wave of infection in the range of that experienced in October 2020 or January 2021. Equally, a delay of 4-8 weeks significantly reduces the risk profile both in terms of case numbers and hospitalisations.

Comparison with international experience

In 2021, all European Union (EU)/European Economic Area (EEA) Member States have commenced vaccination of their populations against COVID-19, initially prioritising those groups deemed to be at greatest risk of severe complications and/or exposure to infection. However, vaccination coverage is still low in relative terms across most European countries, and the vast majority of EU/UK countries are experiencing a very concerning and worsening disease profile. As of 27th March 2021, 19 countries in the EU/UK (noting exclusion of Spain as explained in figure below), have observed a deterioration in their 14-day incidence rate compared with the previous two-week period (range + 3% to + 96%). Ireland has observed a 3% increase over the same time period. Significant restrictive measures remain in place in the majority of EU/EEA countries and a number of countries have recently moved to increase restrictions as the continent responds to a new wave of infections.

The current very challenging experience of most other countries in the EU highlights the progress made in Ireland to control viral transmission and disease impact since the beginning of the year. To further place the epidemiological situation in Ireland within an EU/UK context, the figure below illustrates that the 14-day incidence rate/100,000 population in Ireland most recently diverged from the EU/UK average in early February 2021, with incidence plateauing and then increasing on average across European countries in contrast to a reducing rate in Ireland. As of 24th March 2021, if Ireland's incidence rate corresponded to the EU/UK average, the rate would be 526 (3.4 times the rate in Ireland of 153 at the time of analysis). At this EU/UK average, Ireland would be reporting 1,854 cases per day (3.1 times the 5-day moving average in Ireland at the time of analysis). To further note, in addition to incidence, if at the EU/UK average based on available data, Ireland would be experiencing significantly higher levels of hospitalisations, critical care admissions and mortality.

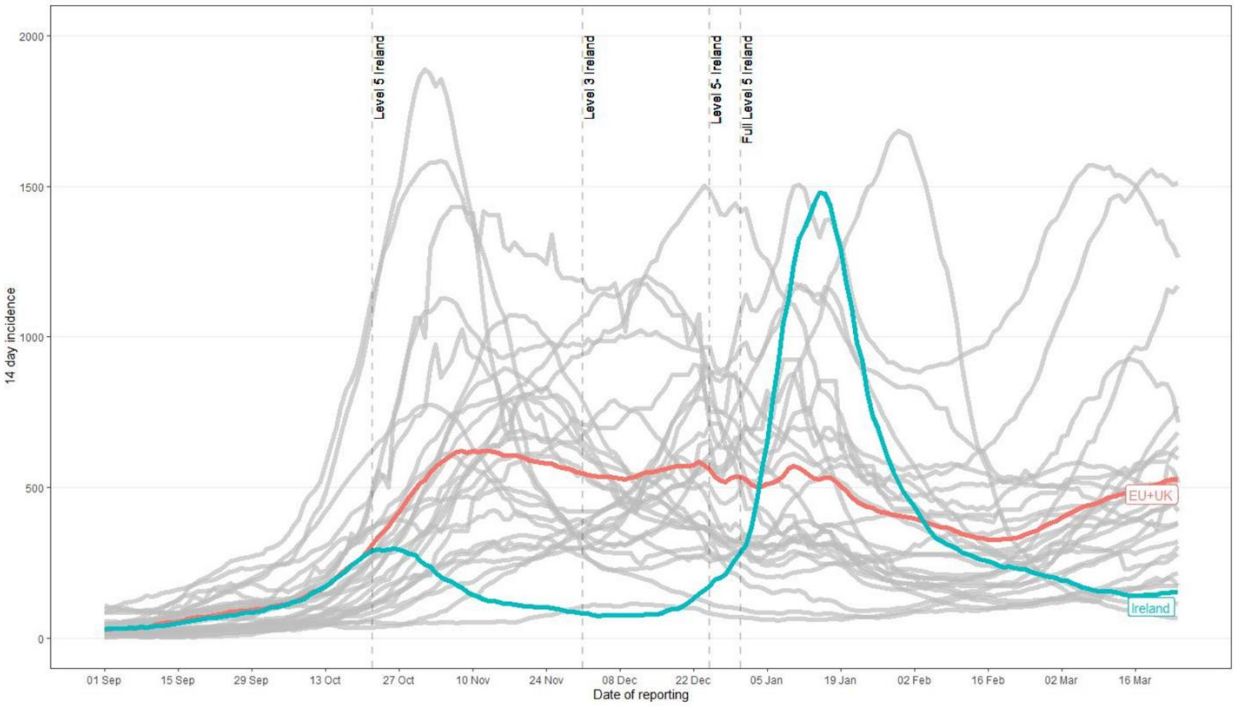


*Figure 4. 14-day incidence/100,000 in Ireland compared with EU/UK average, September 2020-24th March 2021**

*As of 16th Dec 2020, incidence data are sourced from Our World In Data (OWID) instead of ECDC due to ECDC moving to weekly reporting. OWID source their confirmed cases and deaths data from the COVID-19 Data Repository by the Center for Systems Science and Engineering (CSSE) at Johns Hopkins University (JHU). https://github.com/owid/covid-19-data/tree/master/public/data; Spain has been excluded from this figure due to reconciliation of double counted cases in the region of Catalonia as reported by OWID, making the incidence rates potentially unreliable.

Most recent international guidance from the ECDC and WHO continues to urge caution and calls for a continuation of the public health measures that have been deployed over the last year until incidence levels have been reduced to the lowest levels possible and vaccination has reached a critical mass and has been shown to work.

Other key considerations in relation to the easing of measures

The NPHET also noted the emerging evidence in relation to the longer-term effects of infection with Sars-CoV-2. While the evidence base is limited to date, a small number of studies are available and are reporting a high level of residual effects in hospitalised patients lasting for more than 3 months, noting that studies may be limited by responder bias. A drop in quality of life including greater difficulty doing usual activities and increases in anxiety, depression and pain is reported. It is also reported that outcomes are significantly worse in working age females than males. The long-term impact of post-COVID syndromes on the working age population is not well understood but it may be very significant.

Levels of fatigue with restrictions are understandably growing but evidence from behavioural studies show that a majority of people remain supportive of the overall approach and compliant with measures and advice (see paper attached at Appendix 2). While recent data show people are staying at home less and there has been an increase in social activities and social contacts, these trends are generally driven by a minority. These studies also identify the following as factors that most drive compliance with restrictions – (1) levels of worry, (2) perceived coherence of restrictions and (3) relative importance attached to preventing spread of the virus versus the burden of restrictions (i.e. fatigue alone isn't a driver but relative willingness to act in the public interest is). Data also highlights a decline in wellbeing during the recent third wave, in particular among younger adults. The population appears to expect a slow reopening, with a majority expecting some easing in April but expecting it to be at least over 9 months before all restrictions are eased. A majority still believe the general approach to

reopening is appropriate or should be more cautious, but there is a growing minority that believe it should be quicker.

While it is acknowledged that the pandemic may feel interminable as we have collectively withstood the past three months in Level 5 restrictions, the situation will improve significantly in the months ahead as set out in the modelling above. Vaccines will play a critical role in protecting the population against COVID-19 and vaccine roll-out will ramp up considerably from April. Considerable progress has already been made across the first four priority groups and based on current delivery schedules 8 out of 10 adults in Ireland will have at least one dose of vaccine available to them by the end of June. This gives real hope that there can be a much more widespread easing of measures during the summer months. However, vaccine coverage is still low, with just 4.2% of the population having received two doses to date (as of 23rd March) and it will be some time before the initial priority groups will be fully protected.

Overall Assessment and Advice

As a country, we have succeeded in significantly reducing infection levels through widespread commitment and adherence to the public health measures since the start of the year. However, progress in further reducing incidence has plateaued and the epidemiological position continues to be very precarious as detailed above. In its revised Plan, COVID-19 Resilience and Recovery 2021 – the Path Ahead, the Government set out four conditions to enable a significant easing of measures. Having reviewed the most recent data, the NPHET advises that these conditions have not been met:

- Disease incidence remains high and R is now estimated to be at or above 1. Case numbers have not reduced to a level which can be fully managed and controlled by public health.
- The numbers in hospital and critical care remain high and the overall health system remains fragile.
- While vaccination across the first four priority groups is well advanced, as it stands, it will be some time before vulnerable groups are fully protected through vaccination – e.g. end May for the over 70s.
- Variants of concern and further potential mutations of the virus continue to pose a significant threat. The numbers of cases of variants of concern remains low but is growing. The impact of these variants on transmission, severity of disease and vaccine efficacy remains uncertain.

Furthermore, modelling shows that any significant increase in close contact is likely to lead to a significant additional wave of infection in the range of that experienced in October 2020 or January 2021. Equally, modelling shows that a delay of just 4-8 weeks significantly reduces the risk profile both in terms of case numbers and hospitalisations.

The available data on vaccine efficacy and effectiveness, and projected timeline of the vaccination programme offer real hope for a very considerable improvement in our position in the coming months. But any immediate change in public health measures, in advance of vaccination having the opportunity to provide more widespread protection against COVID-19, is very high risk and can be expected to result in a fourth wave of infection and place considerable pressure on our health care system which is still working under the strain and impact of the third wave.

It is therefore advised that the approach in the near term must continue to be one of extreme caution, with the focus remaining on protecting the gains of the last three months and protecting core national priorities until vaccination can offer more widespread protection. As advised in February, the NPHET recommends a cautious, slow and phased approach, with sufficient time between any easing of measures to assess impact and to respond if the epidemiological situation changes, so as to protect core priorities and reopened services.

First and foremost, we must do everything possible to protect our core priorities:

- Protect the most vulnerable: These groups have been prioritised for vaccination. Vaccination has completed for the vast majority of group 1 (people aged 65 years and older who are residents of long-term care facilities), is well underway for group 2 (frontline healthcare workers), will complete for group 3 (people aged 70 and older) in mid-May and has commenced for group 4 (people aged 16-69 with a medical condition that puts them at very high risk of severe disease and death) (dependent on supply forecasts being met). Until these programmes have completed, it is critical that the disease is kept under control.

- Protect the health service: The health service remains extremely fragile. There continues to be high levels of COVID-19 patients in hospitals and ICU, health care workers are exhausted and non-COVID services continue to be severely impacted. The only way to prevent further pressure on the system and to enable the resumption of non-COVID services is by keeping the disease under control.

- Protect education and childcare services: In-school education and childcare resumed on a phased basis since the start of March. Childcare services will fully resume on the 29th March, while remaining classes in second level are due to return on the 12th April. Our focus must remain on ensuring and protecting the full resumption of these services in recognition of the enormous cross societal impact of such services and their impact on youth mental health and wellbeing. This will be subject to ongoing review. It will be critical that there is a concerted effort across sectors and society generally to work together to ensure that the reopening of schools on the 12th April results in the minimum possible upward pressure on the reproduction number; this will require, in particular, **a renewed focus on the importance of working from home and the avoidance of inter-household mixing outside of the school environment.**

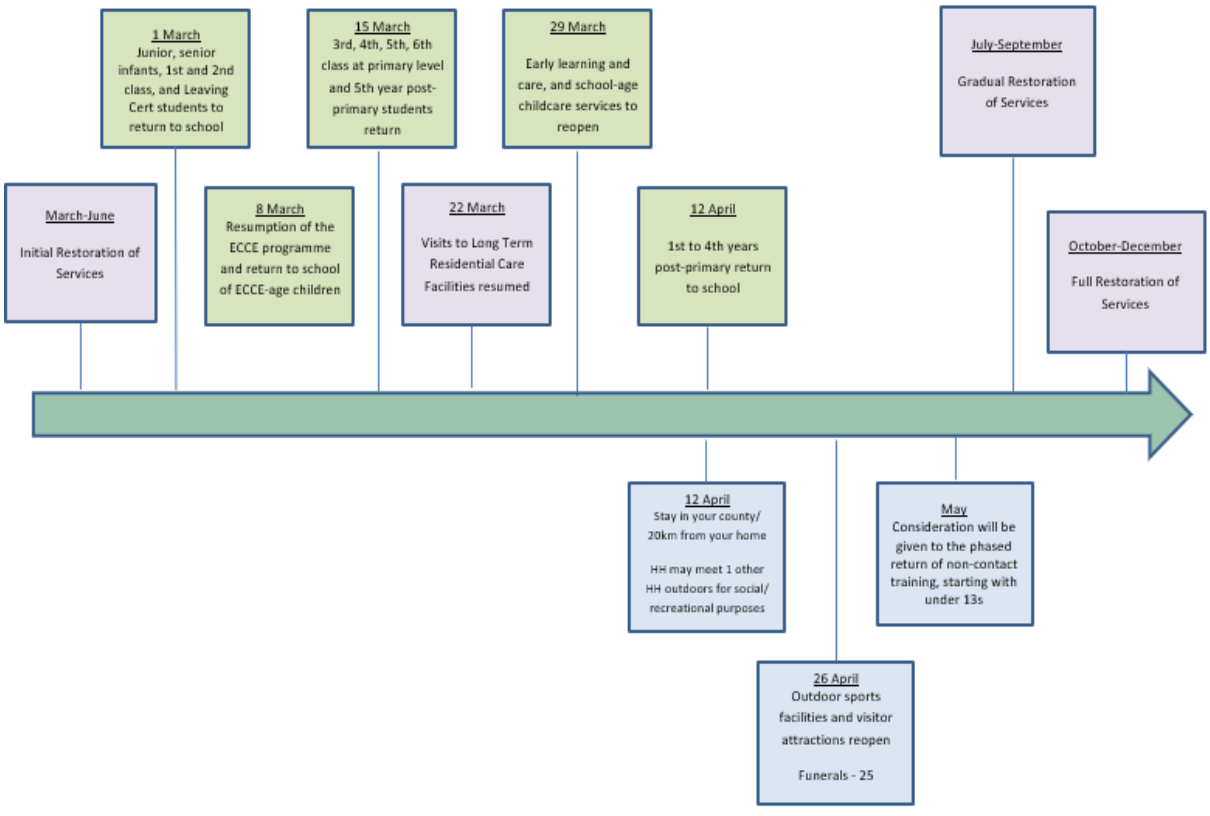
The epidemiological situation remains very finely balanced and the NPHET advises that there is very limited scope for any easing of measures at this time. However, the NPHET also recognises the enormous impact that this protracted period of restrictions is having across society and advises that a very limited relaxation of measures in April, outside of the resumption of the above priority services, are warranted to improve societal wellbeing and quality of life. The NPHET therefore advises that:

- Level 5 measures should be extended for a further period of time. This should be reviewed again at the end of April, once there has been time to assess the impact of the full return of in-school education on the 12th April
- There should be no relaxation of measures before the full return of in-school education on the 12th April.
- From the 12th April:
    - Two households can meet up with one another outdoors for social and recreational purposes (this does not include private gardens). Any meetings outdoors should be safe, with continued practicing of social distancing and other safe behaviours. Masks should be worn in crowded outdoor spaces.
    - Travel restrictions can be relaxed to enable travel within own county or within 20km of residence if crossing county boundaries (the latter (20k) should only be adopted if deemed to be operationally enforceable)
- From 26th April:
    - Outdoor sports facilities can reopen (e.g. pitches, golf courses and tennis courts, other facilities as appropriate). Activities should take place between a maximum of two households. Facilities including club houses and any indoor facilities (e.g. changing rooms, showers, kitchens, meeting rooms), apart from essential toilet facilities must remain closed. There should not be any return to team sports or training activities.
    - Outdoor visitor attractions can reopen (i.e. zoos, open pet farms, heritage sites but not amusement parks) – indoor areas should remain closed and hospitality should only be open for take-away services. Robust protective measures, including appropriate capacity limits, should be in place.
    - Recognising the significant impact of restrictions on funeral services, maximum attendance at funerals can increase to 25 on compassionate grounds. Given the known transmission risks associated with funerals, it is essential that this measure is fully complied with and that all necessary protective measures are taken. It is also essential that linked gatherings do not take place before or after funeral services.
- Consideration will also be given to the phased return of non-contact outdoor training, starting with under 13s, in May.
- New guidance has issued in relation to visiting in long-term residential care facilities which will provide the framework for visiting over the coming months. It is therefore no longer deemed necessary to include visiting under the Framework for Restrictive Measures.
- No further relaxation of measures should take place over the coming month.
- All those working from home should continue to do so.

While these measures are in of themselves relatively low risk if all appropriate protective measures are taken, it is essential that they are not interpreted as a signal that wider socialisation and inter-household interactions are acceptable or appropriate at this time. The NPHET also advises that even with a continuation of all other Level 5 measures it is likely that the profile of the disease will deteriorate at least to some extent over the coming weeks.

The NPHET is conscious of the upcoming Easter holiday period and acknowledged the particular burden that restrictions place on the population over traditional festive periods. However, the NPHET stressed the importance of continued public buy-in and adherence to all measures over the period. Given the current disease profile, it is essential that there is no increased mobility or socialisation, inter-household and/or intergenerational mixing should be avoided, and people should remain in their normal place of residence over the Easter period.

While it is appreciated that the proposals are modest, they will enable people to do more outdoors and to engage in a modest level of safe socialisation in the immediate term. Moreover, if as a population, we can continue to persevere and adhere to the public health measures for a relatively short period of time (fully acknowledging the difficulties this poses for people and their families), we can be confident that we will be in a much better position as we enter the summer months.



Advice for those that are fully vaccinated

The NPHET also gave consideration as to whether it is appropriate at this time to provide revised or new guidance to those that are fully vaccinated. It was noted that the level of vaccine coverage was still low and further evidence was needed on vaccine impact on transmission, the period of vaccine induced immunity and the risk of reinfection, and the impact of virus variants on vaccine effectiveness. It was also noted that only a small number of countries have issued differentiated advice for those that are fully vaccinated. While there is an undoubted level of individual protection provided by vaccination, given the above considerations and the current epidemiological situation, the NPHET advises that a cautious and step-wise approach is adopted and recommends the following:

- Current guidance for those most vulnerable to the severe impacts of COVID-19 – the over 70s and the medically vulnerable - should be aligned with that for the general population. This means that when they are fully protected from vaccination, they can be advised:
    - To use public transport for essential purposes
    - To go to shops
    - To meet up with one other household outdoors for exercise
    - These cohorts should continue to work from home where possible and if this is not possible, they should talk to their employer
    - To continue to follow Level 5 restrictive measures along with the rest of the population and continue normal protective measures
    - It should also be emphasised that full protection is not in place if it has been less than 2 weeks since the second dose, or if a second dose is still awaited and enhanced protected measures should continue to be applied.
- Those that are fully vaccinated may visit with other fully vaccinated people (from one other household only) indoors without wearing masks or staying 2 metres apart. The HPSC will develop guidance in this regard.
- The HSE should review relevant policy and guidance for healthcare workers who are fully vaccinated including with regard to close contact status and return to work for medically vulnerable who have been cocooning.
- Increased communications in relation to the importance of adhering to all public health measures and advice after vaccination, especially for those that have received a first dose, as there are some reports internationally of a rise in infections shortly after vaccination.

This advice will be kept under review, taking account of the evolving epidemiological situation, further evidence in relation to vaccine efficacy, duration of vaccine-induced immunity and impact of novel variants, and international advice and practice.

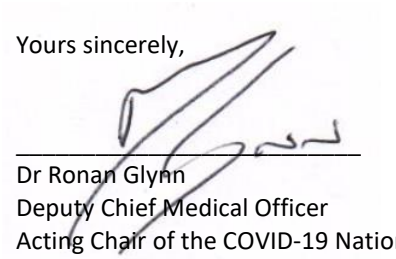
Strengthening elements of the response

The NPHET noted a number of positive developments in relation to various aspects of the public health response, including:

- Retrospective contact-tracing/source investigation will commence on the 31st March for cases where the source of infection has not been initially identified
- Follow-up calls to confirmed cases commenced in mid-March on Day 4 of their period of isolation to reiterate public health advice and to sign-post to supports. This will also be rolled-out to close contacts in time.
- Initial pilot of walk-in testing centres targeting asymptomatic people started last week.
- A Working Group involving the HSE and relevant Government Departments has been established to develop pilot/feasibility projects for antigen testing on asymptomatic individuals in post-primary and third level facilities.
- Whole genomic sequencing capacity has been ramped up significantly. 1,200 samples were sequenced in the last week.
- A wastewater surveillance programme has been developed, sampling is already happening at three plants and will roll-out to a further 65 plants from mid-April.
- The implementation of mandatory hotel quarantine.

The NPHET, of course, remains available to provide any further advice and recommendations that may be of assistance to you and Government in relation to ongoing decision-making processes in respect of the COVID-19 pandemic. As always, I would be happy to discuss further, should you wish.

Yours sincerely,

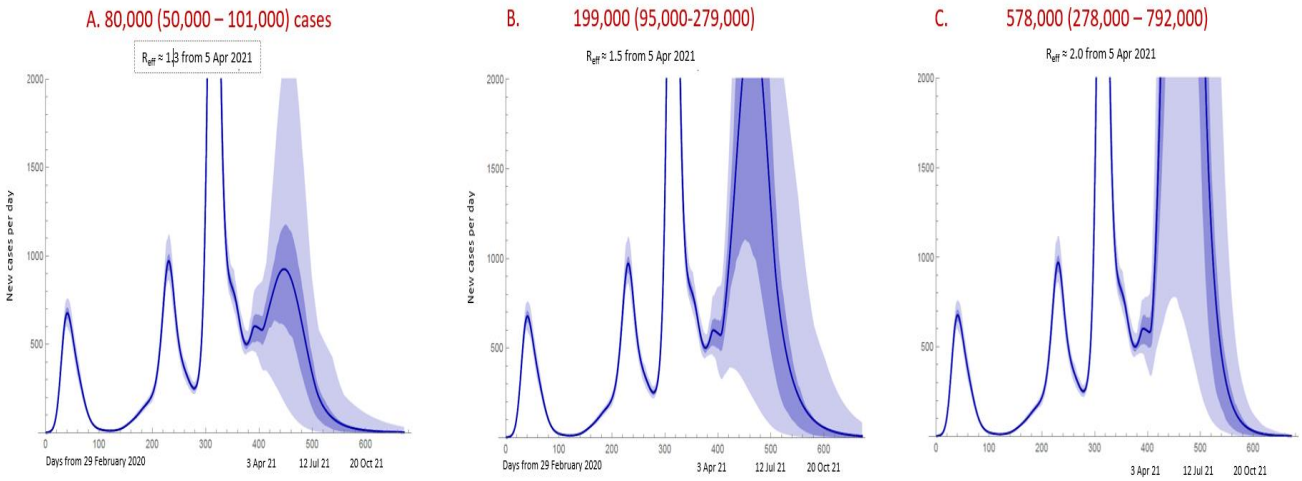


Dr Ronan Glynn
Deputy Chief Medical Officer
Acting Chair of the COVID-19 National Public Health Emergency Team

cc. Ms Elizabeth Canavan, Department of the Taoiseach and Chair of the Senior Officials Group for COVID-19

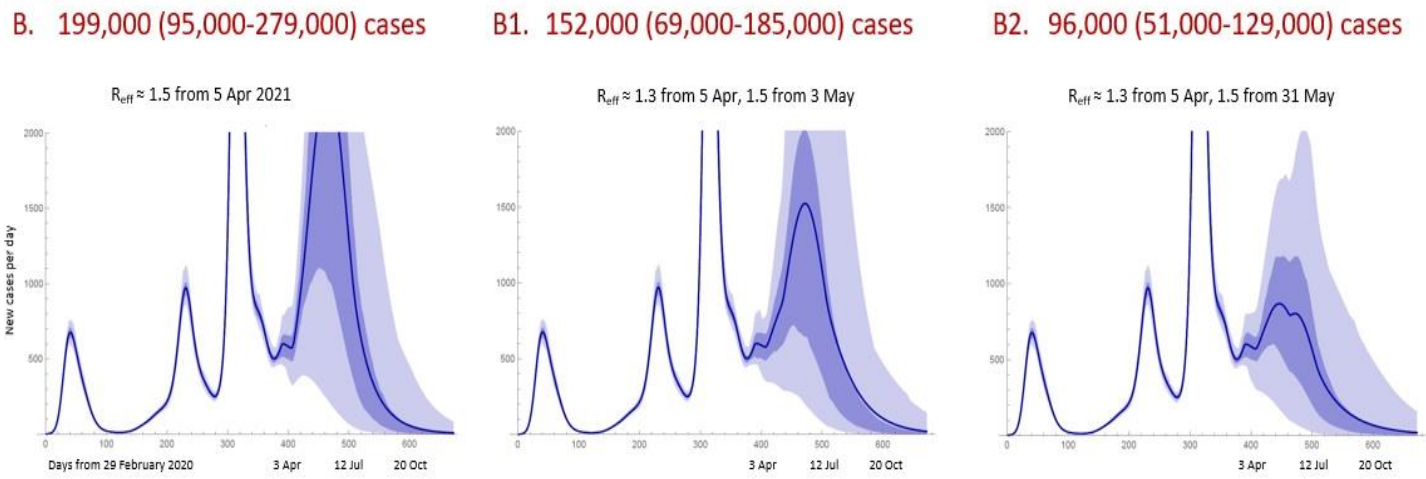
Appendix 1: Additional Modelling Charts

1. Cases Projections for 3 Scenarios, with scenarios effective from 5th April



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.

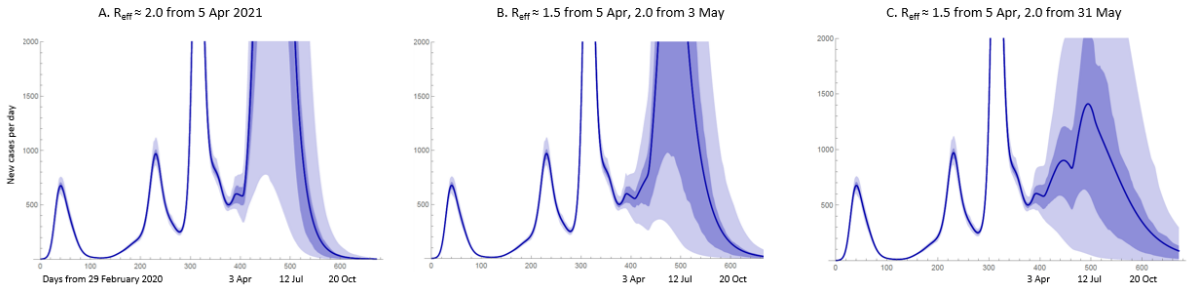
2. Case Projections for low additional close contact scenario (initial Reff ≈ 1.5), with effective date delayed by four weeks (B1) and eight (B2) weeks



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

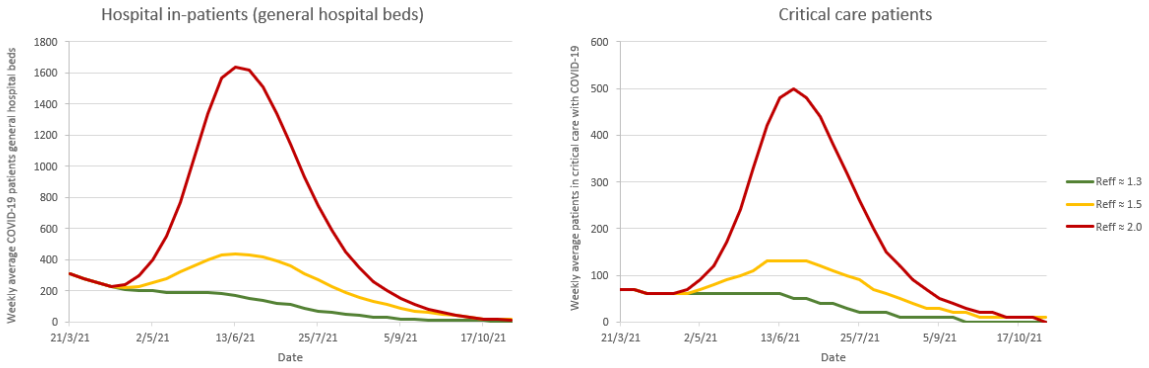
3. Case Projections for moderate additional close contact scenario (initial Reff ≈ 2.0), with effective date delayed by four weeks (C1) and eight (C2) weeks

C. 578,000 (278,000 – 792,000) cases C1. 291,000 (96,000-417,000) cases C2. 177,000 (80,000-252,000) cases



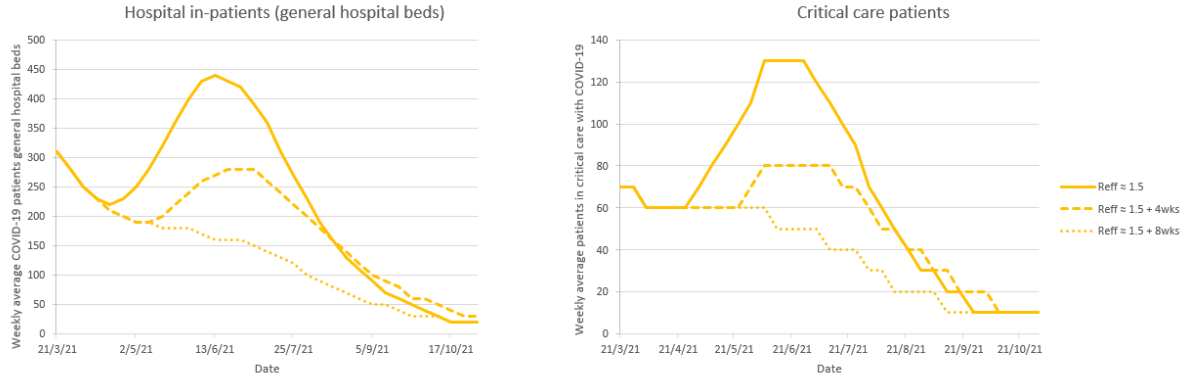
Homogeneous population SEIR model scenario estimates of new cases per day; credible intervals generated from 1000 runs of the model with different assumptions. The solid line is the ensemble average of all runs, dark ribbon the interquartile range, and the light ribbon the 2.5 and 97.5 percentiles. The 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; 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.

4. Hospital and Critical Care Projections for 3 Scenarios, with scenarios effective from 5th April



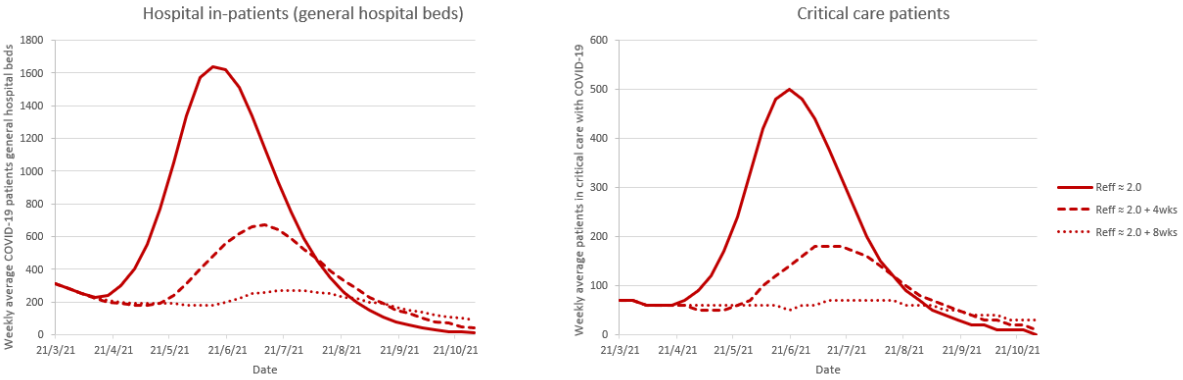
The number of people requiring care in acute hospital (left panel, numbers in general hospital beds, right panel, those requiring critical care, including intensive care and advanced respiratory support) for base conservative (Reff = 1.3), low additional close contact (Reff = 1.5) and medium additional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

5. Hospital and Critical Care Projections for low additional close contact scenario (initial Reff ≈ 1.5), with effective date delayed by four weeks (B1) and eight (B2) weeks



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.

6. **Hospital and Critical Care Projections for moderate additional close contact scenario (initial Reff ≈ 1.5), with effective date delayed by four weeks (B1) and eight (B2) weeks**



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.

Appendix 2: Summary of Behavioural Evidence – March 2021

Pete Lunn, Deirdre Robertson and Shane Timmons

Behavioural Research Unit, ESRI

Introduction

Ireland finds itself in a challenging phase of the pandemic. Following the extension of Level 5 restrictions to April 5th 2021, the decline in Covid-19 case numbers since the second week of January stalled in early to mid-March. New confirmed cases remain relatively high. People have been living with quite severe public health restrictions for approaching three months. The proportion of the population who have been vaccinated is increasing, but the vaccination programme remains at an early stage. There is a strong desire to avoid a "fourth wave", which could have serious consequences, were it to materialise before widespread vaccination.

This research note summarises recent evidence from behavioural studies that is of relevance to the decisions Ireland now faces. The findings are arranged by research question in numbered sections as shown below. Sections are designed to be self-contained, so that readers can easily find evidence relevant to specific questions. There is a brief description of data sources in a short Appendix.

1. How has social activity changed under Level 5 restrictions?
2. How is behaviour related to close contacts?
3. How well are people following public health guidelines?
4. What factors drive more risky behaviour?
5. How is personal wellbeing holding up?
6. What are public expectations for restrictions?
7. What is the public's opinion on re-opening?
8. Do the public want the COVID-19 vaccine?

1. How has social activity changed during the period of Level 5 restrictions?

More than one data source indicates that social activity has increased in recent weeks. While to some extent the reopening of schools made some increased activity inevitable, the data we report here suggest a more widespread rise in activity. The Amárach Tracking Survey (hereafter ATS) for the Department of Health asks each week whether people are staying at home rather than going out. The left panel of Figure 1 shows that while most of the population reports staying at home (note the scale on the vertical axis), this proportion began to fall from the beginning of February through to mid-March.

The ESRI's Social Activity Measure (hereafter SAM) for the Department of the Taoiseach has been undertaken every two weeks since the week beginning January 25th. It records visits to specific locations. The centre and right panels of Figure 1 plot the proportion of the adult population that visited each of the 8 most popular destinations within the previous week. In 7 of 8 cases, there is an upward trend. These data from the ATS and SAM are also broadly consistent with Google and Apple mobility reports, which have similarly recorded shallow upward trends.

Perhaps the most concerning trend in Figure 1 is the increase in visits to other homes (right panel, green). SAM records whether people visited other homes and whether they received visitors to their own home. Respondents describe visits as social, professional, care or childcare related. Figure 2 shows the proportion who were involved in any kind of home visit during the day prior to

participating in the study (which is conducted evenly across both week and weekend days). This was almost one-in-four for the week beginning March 8th, with more than one-in-ten involved in a social visit. Most of these visits involved time spent indoors. This is the most substantive behavioural change recorded during the period.

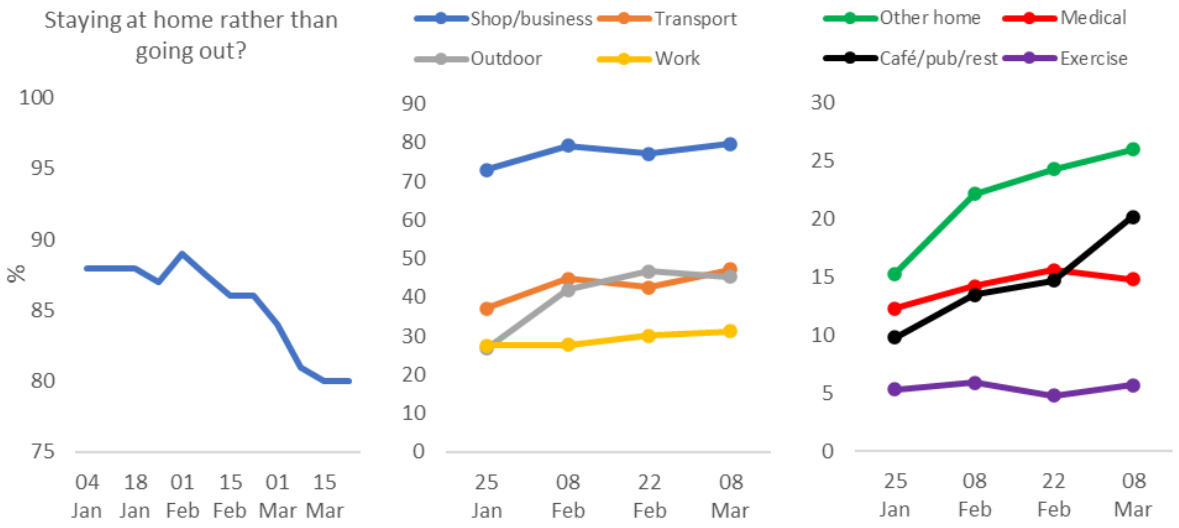


Figure 1. Increases in social activity. Note the changing scale of vertical axis. Left panel (Amárach Tracking Survey, ATS) reveals that people began to report going out more following the beginning of February. Centre and right panels (ESRI Social Activity Measure, SAM) show proportions who visited the 8 most popular types of location during the previous week. In 7 of 8 cases, there is an upward trend. (Note that almost all visits to cafés, pubs or restaurants were to collect take-away).

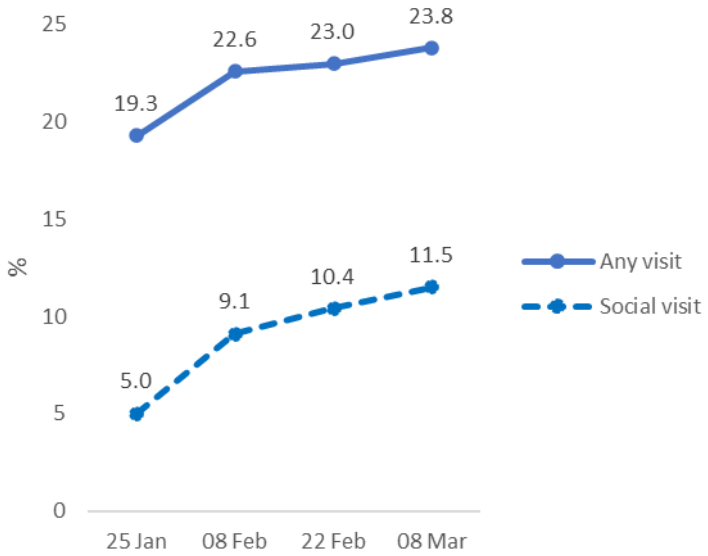


Figure 2. Increase in home visits (SAM). The figures refer to the proportion of the population who had either visited another home/garden or had received a visitor to their home/garden during the previous day. SAM classifies visits as social, professional, care or childcare related. The rise is driven by social home visits.

2. How is behaviour related to close contacts?

Unsurprisingly, this higher social activity is associated with meeting more people from other households. Between the weeks beginning February 8th and March 8th, SAM recorded that the mean number of people from other households that an individual has met up with over the previous 48-hours rose from 1.89 to 2.23, or 1.38 to 1.67 for meetings with people not within a "support bubble". This may not initially appear to be a large difference, but it is a 21% increase in social encounters between households. The distribution is strongly skewed: approximately half the population meets up with nobody from another household over a 48-hour period, while just under one-in-ten meet up with 7 or more. The trend is driven by a minority.

For each meeting, SAM asks respondents detailed questions, including how long the meeting lasted, whether a distance of 2m was kept, and whether it took place outdoors or indoors (ventilated or not). From the responses, we can define meetings as "close contacts" where they last for more than 15 minutes without a 2-metre interpersonal distance or more than 2 hours in an indoor location without ventilation. Figure 3 shows a steep increase in the proportion of the population who had a close contact with someone from outside their household the previous day, to more than one-in-four during the week beginning 8th March.

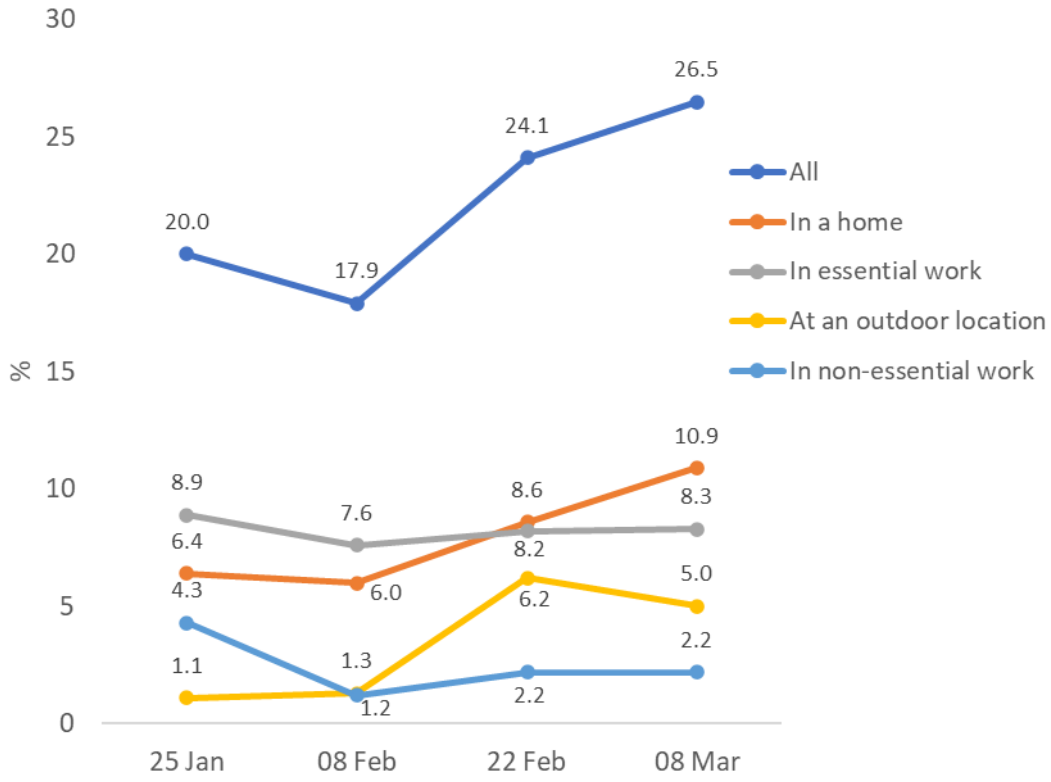


Figure 3. Close contacts (SAM). Close contacts are defined as those that lasted more than 15 minutes where a 2-metre distance was not maintained, or more than 2 hours in an indoor space that was not well ventilated. The overall increase in close contacts has been mainly driven by meetings in homes.

Figure 3 also breaks close contacts down by location. In recent weeks, as the number of home visits has risen, close contacts in homes have surpassed those in workplaces and are the primary reason for the overall increase, although close contacts in outdoor locations are also a contributory factor.

The SAM data show that when close contacts occur in homes, it is far less likely that individuals are wearing facemasks than when close contacts occur in workplaces.

3. How well are people following public health guidelines?

Self-reported compliance with public health guidelines has declined since early 2021 (Figure 4, left). In the ATS in January, 59% of people gave a maximum 7 response that they 'very much so' follow Department of Health and HSE advice for preventing the spread of the virus. This proportion declined slightly in February and more substantially in March, to 49%. A very similar decline was observed in the SAM data. However, the fall in average scores between January and March has been less pronounced (from 6.4 to 6.2 in both sources). This is because the vast majority continue give responses of at least 5 or above on the 7-point scale (Figure 4, left, top line). Thus, these changes do not mean that a proportion of the population has rejected the public health advice or now has complete disregard for it. Rather, a minority have begun to push the boundaries of compliance more – we say more about the drivers of this change below. Almost everyone continues to report following guidelines to a substantial degree.

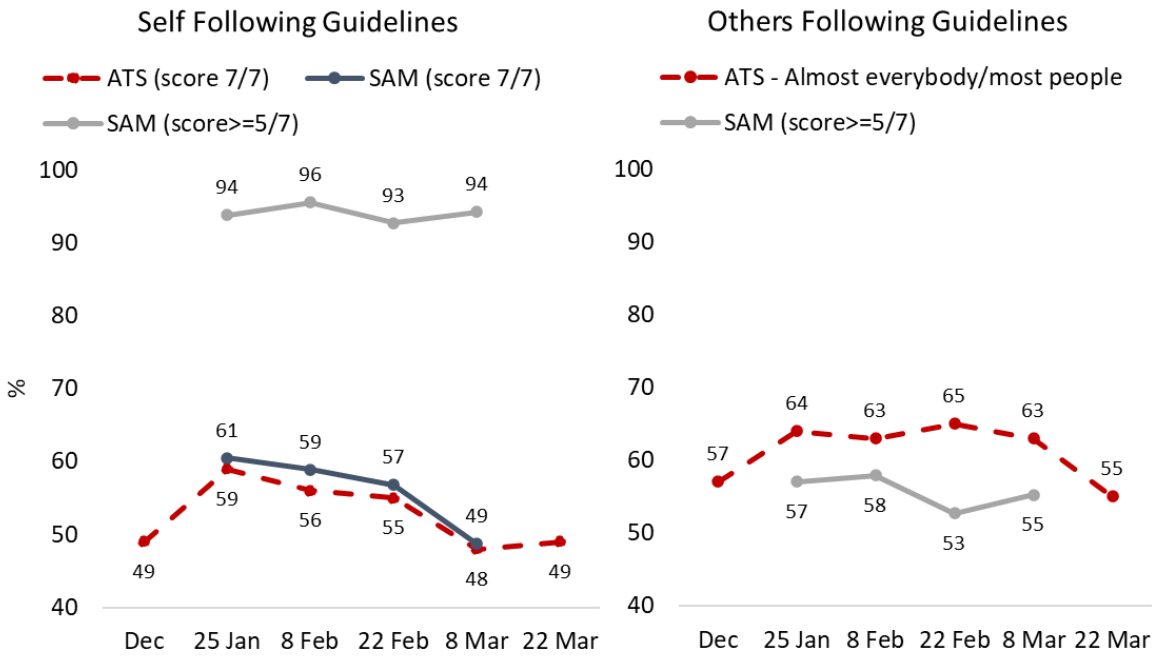


Figure 4. Compliance trends (ATS, SAM). Percentage of respondents responding 7 out of 7 ('very much so') or at least 5 out of 7, on a 7-point scale, in answer to a question asking to what extent they and others "follow the recommendations from the Government to prevent spread of coronavirus".

Self-reported compliance is strongly related to recorded behaviours in SAM, but could nonetheless be overestimated if respondents attempt to paint themselves in a good light. Hence Figure 4 (right), plots people's perceptions of how much others follow the public health guidelines. The ATS asks specifically about the extent to which others are following social distancing guidelines and shows that, following a peak in February, perceived compliance fell. Responses about how much others are

following guidelines in SAM show a minor (not statistically significant) decrease between late January and early March. The overall trend is similar to that for self-compliance.

The difference in level between the grey lines in the left and right panels of Figure 4 gives an indication of a strong misperception that we observe for multiple variables in the SAM data. Individuals generally believe that they are following guidelines more than average, even when they are not. As well as reported compliance, this pattern emerges in relation to how many people from other households individuals meet and the likelihood that they have a close contact. Those engaging in risky behaviour appear not to believe that they are taking more risks than their fellow citizens.

Overall, data on compliance broadly match the pattern in relation to behaviour: there has been some slippage in compliance among a minority in recent weeks.

4. What factors drive more risky behaviour?

The misperception just referred to may be one factor that broadly influences behaviour. SAM was partly designed to allow researchers to investigate the determinants of specific risky behaviours. Using the sample of 4,000 from the first four rounds of data collection from January 25th to March 8th, statistical models were built to investigate which factors are most strongly related to: how many people individuals met from outside their household, whether they were involved in a social home visit, and whether they had a close contact.[1]

In addition to standard socio-demographic background characteristics (gender, age, educational attainment, etc.), the following psychological variables were tested in the models: confidence in government, engagement with news media, fatigue with restrictions, perceived ease of following restrictions, perceived coherence of restrictions, perceived likelihood of being caught breaking restrictions, self-reported relative importance of preventing spread of the virus versus the burden of restrictions, subjective wellbeing, understanding of Covid-19 transmission (both subjective and assessed via multiple choice questions), worry (about the virus in general).

Of these variables, three turn out to have strong associations with behaviour: how worried people are in general, how coherent (versus contradictory) they perceive the restrictions to be, and how important they judge preventing spread of the virus to be versus the burden of restrictions. The strength of these relationships can be seen in Figure 5. Closely similar results obtain for how these variables relate to the number of people from other households an individual has met up. Worry is consistently the strongest predictor of behaviour, confirming the importance of fear as a motivator.

Both SAM and ATS have recorded a steady decline is worry as case numbers have fallen since January. Given these findings, there can be little doubt that reduced fear of the virus is an important factor in the recent increase in social activity. Around the time of the announcements of the extension to Level 5 and the phased reopening of schools in late February, SAM recorded a fall in the perceived coherence of the restrictions. Although this has mostly recovered in the March 8th data, it may also have contributed to social activity.

An important point surrounds fatigue. The statistical models do not find a significant association between being tired of sticking to the restrictions and engaging in risky behaviours; those who say that sticking to restrictions is very tiresome are not more likely to meet others or have a close contact than those who say it is not tiresome. Rather, what matters is the relative importance people place on the burden of restrictions versus the need to prevent the spread of the virus. That

[1] Here we present a descriptive summary. More detailed output is presently being prepared for a paper and can be obtained from the authors upon request.

is, most the population is willing to act in the public interest, including a majority of those who are most tired of the restrictions. What matters is the willingness to make the trade-off and act selflessly, regardless of how tiring the restrictions are. SAM finds that this willingness has slipped somewhat in recent weeks, contributing to increased social activity.

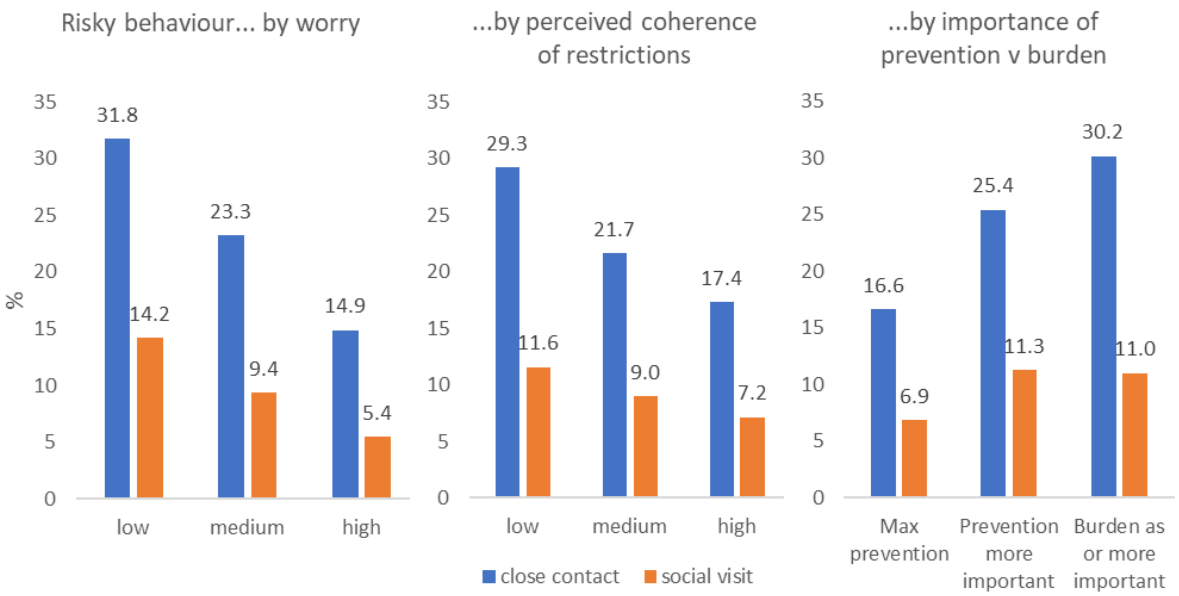


Figure 5. Three key psychological variables (SAM). Charts show the proportion of the population that had a close contact or engaged in a social visit at home during the previous 24 hours. Risky behaviour is most strongly associated with how worried people are in general by the virus. It is also consistently related to how coherent (versus contradictory) people perceive the restrictions to be and how they judge the trade-off when asked directly to compare preventing the spread of Covid-19 against the burden of restrictions.

Once these three factors are controlled for, the remaining psychological variables listed above are not significantly related to risky behaviour in our models. This does not mean that they do not matter – effects may emerge as sample-size increases – but it does imply that they are less strongly related to behaviour (and perhaps have no impact at all). Many psychological factors measured are also quite highly correlated, making it difficult to tease them apart clearly.

Similarly, we do not find strong relationships between behaviour and socio-demographic background characteristics. Once we control for the above psychological factors and whether individuals work (including involvement in essential work), behaviour is not significantly related to educational attainment, social grade, or household size and composition. There are some relationships of specific behaviours with age and gender, most notably a higher likelihood of close contacts among young adults. Unlike the psychological variables described above, however, gender and age effects are not consistent across different kinds of risky behaviour and may largely reflect differential patterns of work and caring.

In short, engagement in risky behaviour is linked more strongly to individual psychological characteristics than to social background or social group membership.

5. How is personal wellbeing holding up?

Data from the CSO and ATS show that the third wave of infection has had a detrimental impact on wellbeing, with ATS and SAM data recording further declines in wellbeing as Level 5 restrictions have been extended.

The CSO's Impact of COVID-19 Survey (February 2021) found that average life satisfaction was at its lowest since the survey began in 2013. Declines in wellbeing were evident between the periods of Level 5 restrictions in November 2020 and February 2021, with increases in the proportion of people with low life satisfaction (35.6% vs. 41.7%) and who felt downhearted or depressed all or most of the time (11.5% vs. 15.1%). Younger adults (aged 18 to 34) fared substantially worse than older adults on all indicators of wellbeing. They were approximately four times more likely to report feeling downhearted or depressed (20.5% vs. 5.7%) and lonely (18.1% vs 4.6%), all or most of the time.

Data from SAM (pooled from January 25th to March 8th) in Figure 6 shows that when people are asked to compare their current wellbeing to before the pandemic, there is a very strong difference by age. Almost 60% of those aged 18 to 29 report that their mental health has worsened, versus 25% of those aged over 70. Note that this difference is not unique to the youngest adults, but varies linearly across the age range. It could be associated with multiple factors, including restrictions on social activity, increased unemployment, worry about spreading virus, or capacity to adapt to restrictions.

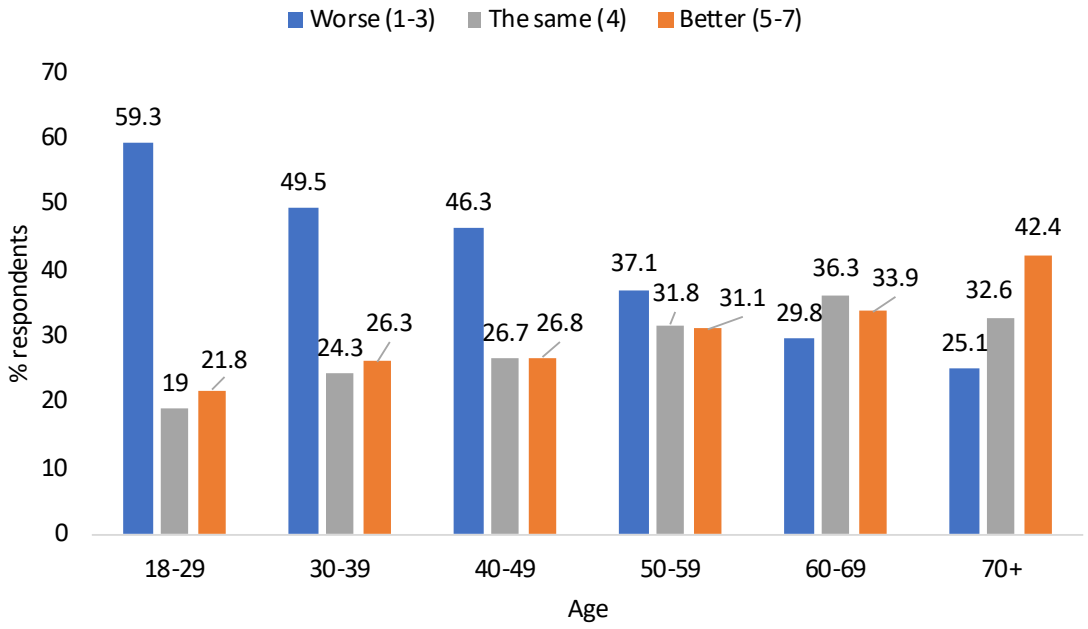


Figure 6. Self-reported mental health compared to before the pandemic (SAM). Response could vary from 1 (very much worse) to 7 (very much better). There is a clear and strong age effect.

The ATS asks respondents about emotions they experienced "a lot of the day" the day before completing the survey. Positive emotions (e.g. enjoyment and happiness) were at their highest in Summer 2020, when cases were low and there were relatively few restrictions. Reported enjoyment was then at a (pandemic) peak of 51% of respondents. Figure 7 (left) shows more recent data. In early February, enjoyment was reported by 39% - the lowest since March 2020. Despite increasing

again throughout late February and early March, as cases fell and weather improved, experience of enjoyment and other positive emotions declined again in late March.

Similarly, negative emotions were at their lowest in summer 2020 but are now at their highest since the onset of the pandemic. Figure 7 (right) shows that boredom rose from 21% in December and has remained at about 40% since January, matching levels in April 2020. The latest ATS (March 22nd) shows peaks in frustration, anger and despair, with corresponding to declines in hope and happiness.

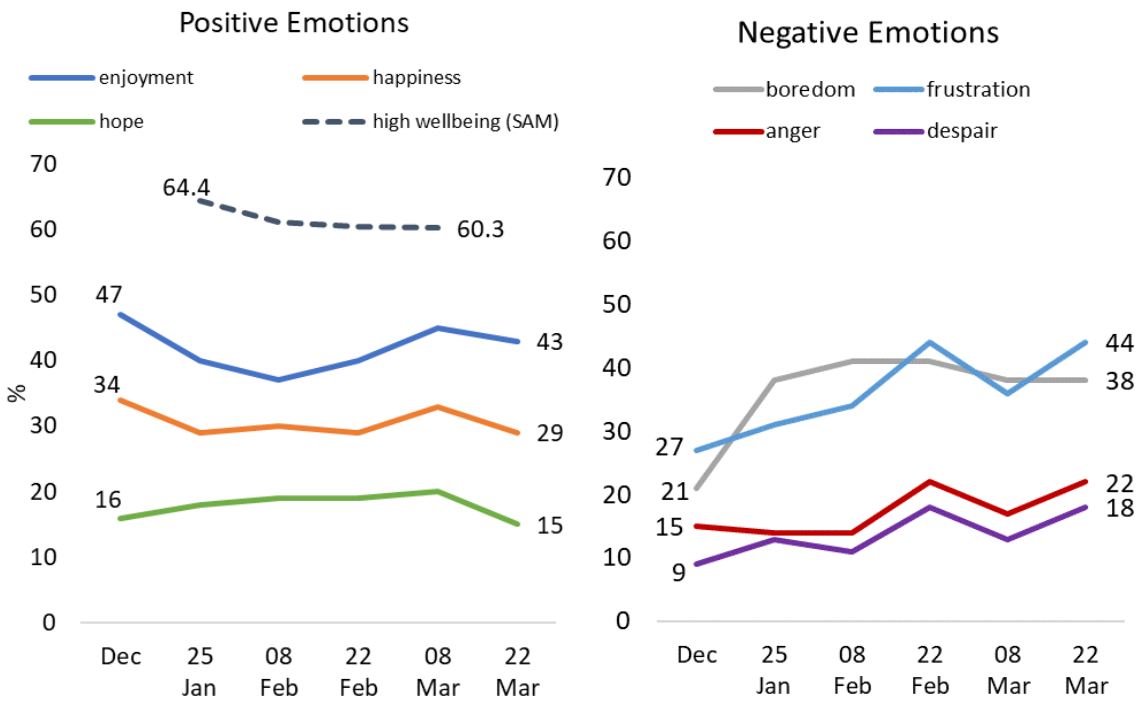


Figure 7. Reports of emotional experience (ATS, SAM). Positive emotions (left) had increased slightly since January but have dropped in late March. Negative emotions (right) have been trending upwards since December. (Other negative emotions recorded in the ATS, including anxiety, worry, stress, sadness, loneliness, fear, pain and intolerance, display broadly similar patterns but are excluded for brevity).

SAM data are included in Figure 7 (left), confirming the decline in wellbeing during this third wave of infection. The proportion rating their recent mental health and wellbeing positively (at 5 or above on a scale from 1 ‘very poor’ to 7 ‘very good’) decreased from 64.4% in late January to 60.3% in early March (data from late March, which shows the most drastic declines in the Amárach data, is not yet available). Supporting the CSO data, young people report significantly worse mental health than

older respondents, with 41.8% of those aged 18-29 giving a high rating for the recent mental health compared to 84.7% of those aged over 70.

6. What are public expectations for restrictions?

There are both short- and long-term expectations for the pandemic. Data from SAM (Figure 8) shows that in the first half of February more than 40% of the population expected restrictions to be eased in March, but that this optimistic view fell away later in the month. During March, there is an expectation among the majority that there will be some easing in April, while most of the rest expect there to be no change; only a few think restrictions will be tightened.

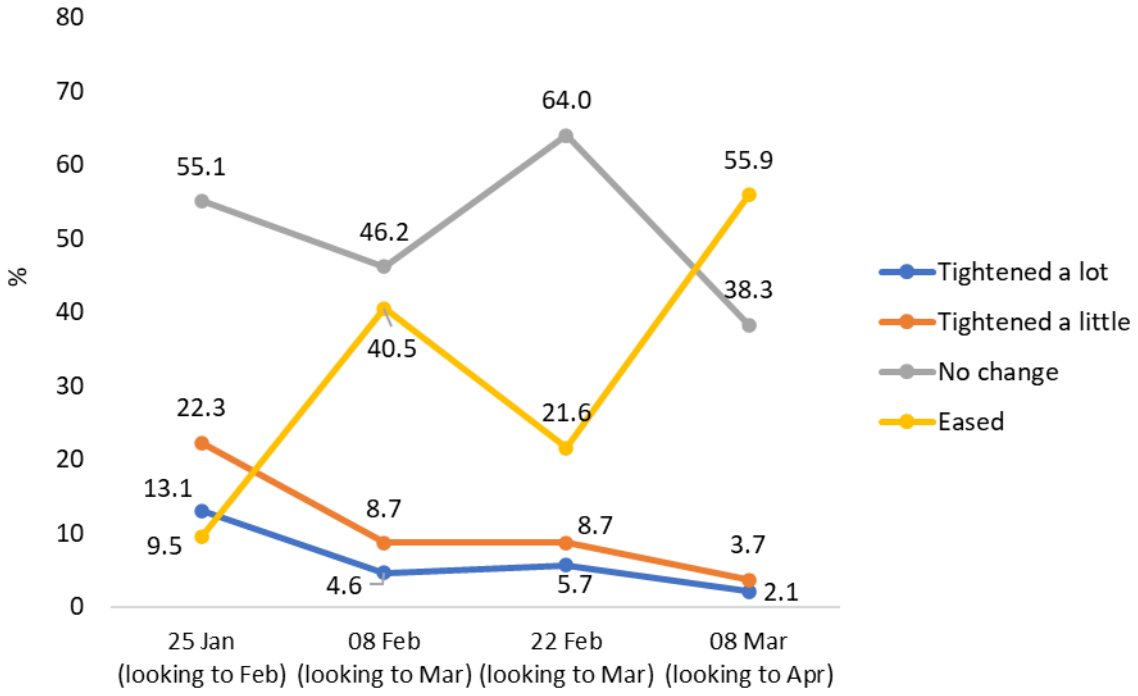


Figure 8. Short-term expectations (SAM). In each round, participants are asked about their expectations for restrictions in the following month.

Even if Level 5 restrictions are lifted, CSO data from February recorded that nearly two-thirds of people expect that they will be re-imposed again before the end of the year. SAM data reveal that most people think that restrictions will last another 9-12 months, with a large proportion expecting it to be between December 2021 and November 2022 before life returns to normal (Figure 9). Less than 1 in 10 believe restrictions will be fully lifted in the next 3 months.

The CSO data also record a large shift in expectations for international travel. In November 2020, 1 in 2 believed that their next international flight would be in 2021, but by February 2021 that had dropped to just 1 in 6. Most people now think that their next international flight will not take place until 2022.

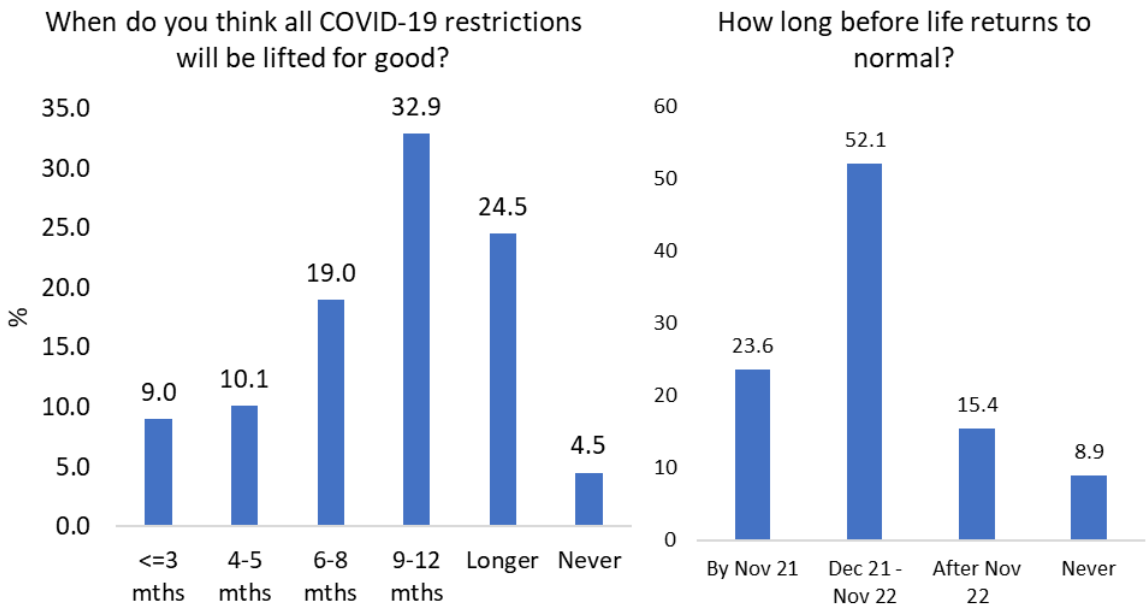


Figure 9. Expectations for lifting restrictions and life returning to normal (SAM).

7. What is the public's opinion on re-opening?

Public opinion about the level of restrictions and whether Ireland is opening at the right pace is mixed and is not straightforward to measure, as it depends on how the question is asked. Figure 10 plots a range of responses from ATS.

Throughout the pandemic, one average, the public has wanted a more cautious approach to controlling the virus, but during the current protracted period of Level 5 restrictions that picture has altered. The top left panel of Figure 10 shows that the most common response (37%) to a direct question is that Ireland is trying to return to normal at about the right pace. Since the middle of 2020 and into January 2021, substantially more people believed that Ireland was trying to go to fast than too slow. This gap has now narrowed and even marginally reversed: combing the categories, 34% now believe Ireland is opening too slowly versus 29% too quickly. The top right panel of Figure 10 confirms that the proportion wanting more restrictions has simultaneously fallen, although data collected in late March shows a slight increase as case numbers have begun to edge up again, from 32% on 15 March to 37% on 22 March.

During the long period of Level 5 restrictions, while the proportion of the population who believe that the Government's response is too extreme has grown, especially following the extension of Level 5 announced in February, it remains a fairly small minority. As of 22 March, the bottom left panel of Figure 10 shows this is just 1-in-5, versus 4-in-5 who believe the Government's response is either appropriate or insufficient, with an even split between them. A question specific to social distancing measures reveals that most people support the current measures and, while the gap has narrowed, a larger proportion think they are too weak than too strong.

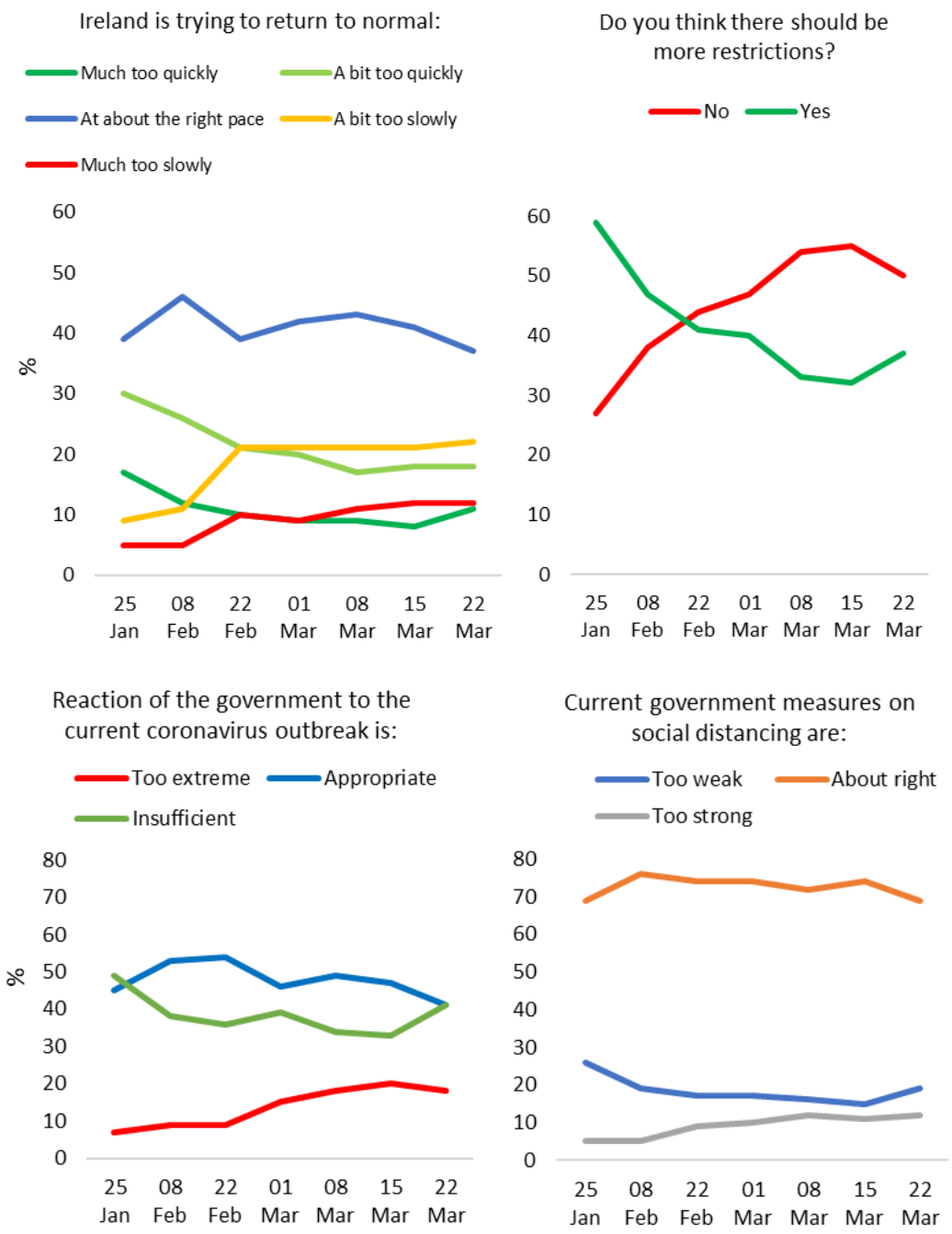


Figure 10. Opinions on the Government response (ATS).

8. Do the public want the Covid-19 vaccine?

Multiple data sources suggest a high level of Covid-19 vaccine acceptance. Because survey questions differ slightly in wording and available response categories it is not straightforward to compare across different studies. Figure 11 reports data from three sperate studies: the ATS on March 22nd, SAM on March 8th, CSO, February 2021. (Differences in questions mean that this comparison should not be used to infer anything about trends, which are considered below; it aims only to inform on absolute levels). We have created 3 categories to harmonise: the unsure/probably/don't know

category is for those who express any doubt about whether they will take the vaccine, even those who say they probably will. Across all data sources only around 5% of people say they do not want to take the COVID-19 vaccine. An important point to note is that there is still a significant proportion who have not completely made up their mind.

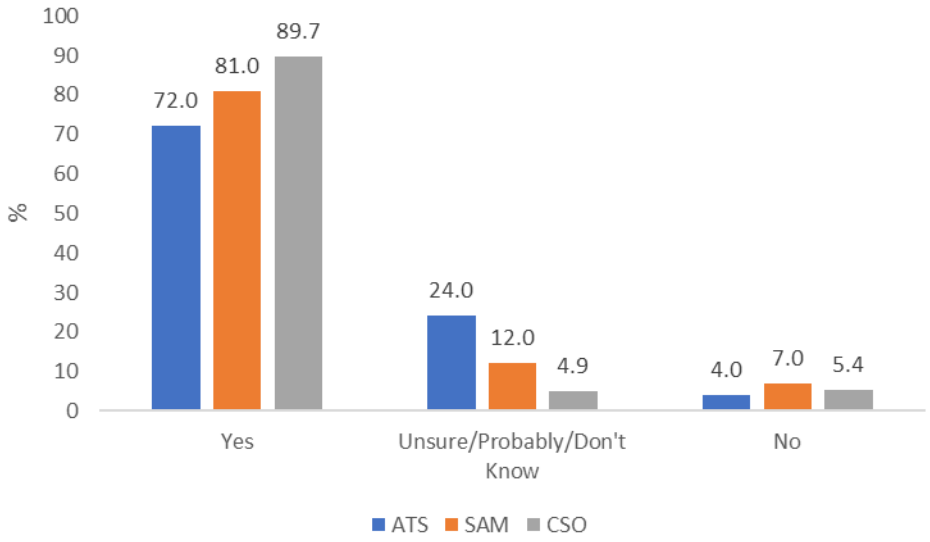


Figure 11. Vaccine acceptance levels from three separate studies (ATS, SAM, CSO).

Figure 12 plots trends over recent weeks. While the numbers intending to accept the vaccine have only varied slightly since January and survey data are understandably noisy, there is a discernible upward trend in willingness to take the vaccine that is a continuation of the pattern from late 2020. However, there was a small decrease in the percentage reporting that they would definitely take the vaccine on March 15th (from 72% to 67%), following news about the temporary halting of the AstraZeneca vaccine. The figure recovered immediately the following week. Some caution is required here, as fluctuations almost as large have been seen at previous points, but the implication may be that ongoing news stories about vaccine safety are potentially still influential in Ireland's vaccination programme.

The most common reason for not getting the COVID-19 vaccine are concerns about possible side effects. SAM data shows that those who follow the latest news about COVID-19 in Ireland (e.g. daily cases), are more likely to want the COVID-19 vaccine. CSO data from February also found that, in February, almost 1 in 2 of those who want to take the vaccine reported being very worried about having a long wait before getting vaccinated.

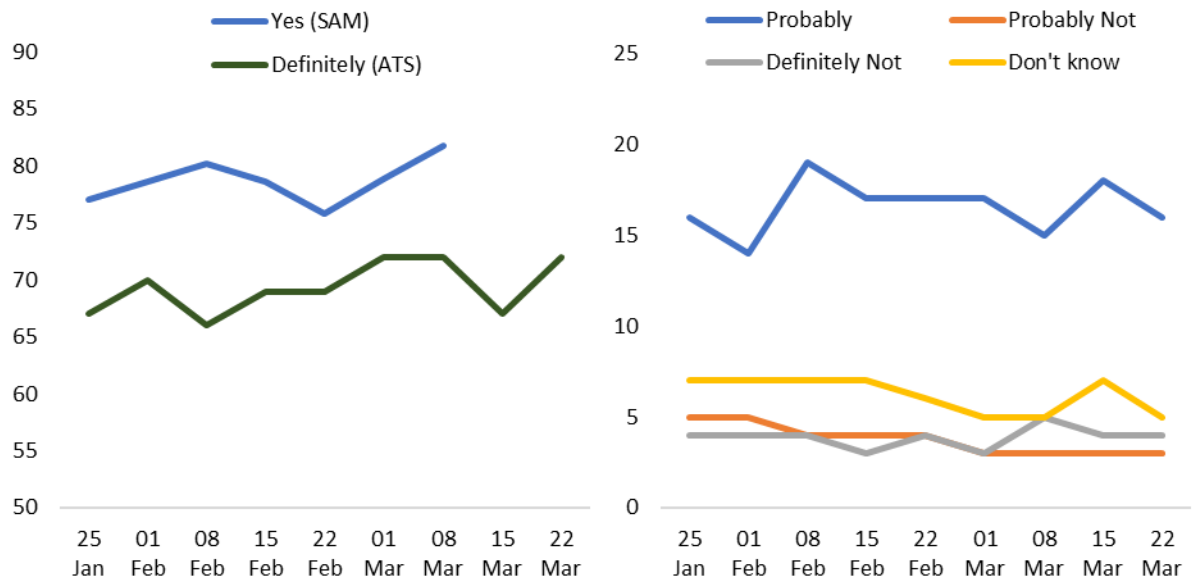


Figure 12. Intention to take the COVID-19 vaccine over time. (Note the different scales on the vertical axes of the two charts)

Discussion

The organisation of this paper into sections based on research questions is intended to allow readers to look directly at a concise version of the latest relevant evidence. Given this, the main findings will not be summarised again here in the Discussion. Rather, we use this space to make some important points that apply across different sections.

Firstly, there is a danger when looking at population trends to view changes in proportions and averages as indications of "where the public is at". In the context of the behavioural response to Covid-19, this is a mistake. Most of the key variables that we discuss in the body of this paper are highly skewed, with many responses at extremes, e.g. the high proportion of people not meeting up with anyone from other households, the high proportion engaging in social visits, the large majority that value preventing the spread of the virus over the burden of restrictions, etc. Most of the changes that we report are due to minorities of individuals changing their behaviour, while the majority continue to persevere under Level 5 restrictions as before.

Secondly, even though the increases in social activity and declines in compliance are small in proportional terms, they translate into substantive changes in the risk of transmission. For instance, while it is not possible to be precise, given the accuracy of sample measures of small proportions, the increase in home visits that we report here probably translates into more than 150,000 additional home visits in Ireland every day. It is very likely that this behaviour change is linked to the faltering in the downward trend of case numbers in recent weeks, after the long decline from mid-January. Some of this change may not yet have appeared in the case numbers. If and when some restrictions are lifted in April, efforts to communicate the negative impact of home visits may be vital.

Thirdly, it is important to distinguish how people feel from how they behave. The behavioural data show that, on average, people are tired of restrictions and are experiencing low wellbeing, but they also show that these are not the main drivers of behaviour. Continued recognition of and support for the sacrifices that the majority of people are making is likely to help people to sustain their behaviour.

Fourthly, there remain systematic misperceptions among the public and within public debate. Generally, people believe that others are more active than they in fact are. Similarly, despite the widely reported difficulties associated with the extension of Level 5, there remains broad support for the more cautious approach to containing the virus undertaken since the surge following Christmas. Making efforts to correct such misperceptions may be beneficial.

Finally, we have reported previously on how the public has typically taken a long-term view of the pandemic and how long it is likely to have an impact on their lives. Given the optimism associated with the vaccine, providing timeframes for vaccination where possible and emphasising progress in the vaccine programme are likely to be important in helping people to cope with the ongoing hit to their wellbeing.

Appendix – Data Sources

Amárach Tracking Survey (ATS)

Throughout the pandemic, Amárach Research have conducted a weekly Public Opinion Tracking Survey for the Department of Health. The sample is approximately 1,600 each week. A quota-based system is used to match the socio-demographic characteristics of the sample to the national adult population based on Census figures. Data are then weighted to further improve the match. Responses are collected from Amárach's SmartPoll panel, which is an online panel of 6,000 adults throughout Ireland, regularly refreshed through recruitment. Panellists receive text messages and email invitations to complete surveys via phone, tablet, laptop or desktop computer. Results are published at https://www.gov.ie/en/collection/6b4401-view-the-amarach-public-opinion-survey/.

Social Activity Measure (SAM)

The Social Activity Measure (SAM) is a behavioural study that records the public response to the risk of Covid-19 infection over time. The study aims to offer insight into where and how risks of Covid-19 transmission arise. The research was designed by the BRU in consultation with the Department of the Taoiseach, which funds the study. Every two weeks, a nationally representative sample of 1,000 people aged 18 and over is recruited from one of two pre-existing online panels. The data recorded is completely anonymous. Respondents are asked neutral, factual questions about activities outside the home, followed by a series of questions that probes psychological factors associated with behaviour, attitudes and experiences during the pandemic. Results are published at https://www.gov.ie/en/collection/a7ee4-see-the-results-of-the-social-activity-measure-behavioural-study/.

Central Statistics Office (CSO)

The Central Statistics Office (CSO) have undertaken a series of surveys to measure the impact of COVID-19 on Irish society. The data referenced in this report were taken from the Social Impact of COVID-19 Survey November 2020 and February 2021. A nationally representative sample of people aged 18 and over living in private households in Ireland took part in the Labour Force Survey in 2019. A sub-sample of 1,585 people who had taken part in that survey and who had provided an email address answered questions for the COVID-19 survey in November 2020, and a similar sample of 1,621 in February 2021. Results are published at https://www.cso.ie/en/releasesandpublications/ep/p-covid19/covid-19informationhub/.