



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

16th December 2021

Dear Minister,

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

Epidemiological update

- A total of 29,595 confirmed cases have been reported in the 7 days to 15th December 2021 (cases notified to midnight 14th December), which is a 10% decrease from last week when 33,003 cases were reported in the 7 days to 8th December, and a 5% decrease compared to the last NPHE meeting on 2nd December when there were 31,751 cases reported.
- As of 15th December, the 14-day incidence rate per 100,000 population is 1,315; this compares with 1,360 reported a week ago and 1,320 at the last NPHE meeting on 2nd December. The 14-day incidence rate, at 1,314 per 100,000, is 86% of its highest value to date (1,531 in January 2021).
- Nationally, the 7-day incidence per 100,000 population as a proportion of 14-day incidence per 100,000 population is 47%, demonstrating that there have been fewer cases in the last 7 days compared with the preceding 7 days.
- The 5-day rolling average of daily cases is 4,294 as of today, a 4% decrease from that reported at the last NPHE meeting on 2nd December (4,475).
- Of the 62,598 cases notified in the 14 days to midnight 14th December 2021, 75% have occurred in people under 45 years of age; and 5% were aged 65 years and older.
- Of the cases reported in the 14 days to 15th December 2021, 0.5% (336) were healthcare workers.
- From 8th – 14th December, there have been approximately 206,996 laboratory tests reported in community, private, and acute laboratories. It is noted that Storm Barra caused a two-day reduction in demand for testing during the relevant time period. The 7-day test positivity rate in the community has increased from 17.4% last week to 20.0%.
- The demand for testing has fallen significantly in those aged 12 years and under.
- Test positivity is stable or falling across most age groups but has increased in recent days in those aged 19-24 years.
- All parts of the testing pathway are operating at close to maximum surge capacity (referrals, swabbing, laboratory testing and contact tracing).
- According to the Contact Management Programme (CMP), from 6th – 12th December 2021, the total number of close contacts was 56,402, a decrease of 10.6% on 63,121 in the previous week. The average number of cases managed per day decreased from 4,653 to 4,384, a decrease of 9% over the same time period.
- For close contacts created the week ending 28th November, Test 1 results were available at the time for 15,962 close contacts; 3,348 (21.0%) of these had a positive result. Test 2 results were available for 3,535 close contacts, 428 (12.1%) of these had a positive result.

- The highest proportions of close contacts testing positive by age group were amongst those aged 5 to 12 (30.0%), 65 to 74 (29.6%) and 0 to 4 (28.8%).
- The mean number of close contacts per case (including cases with zero close contacts) for the week ending 28th November was 2.0, a decrease from 2.2 the previous week (week ending 12th December). The mean number of close contacts per case (excluding cases with zero close contacts) for the week ending 12th December was 3.0, a decrease from 3.1 the previous week.
- There were 443 confirmed COVID-19 cases in hospital this morning, compared with 532 last week on 9th December. The effect of booster vaccination is seen in a decreasing percentage share of those cases admitted to hospital being aged 65 years and older.
- There have been 50 newly confirmed cases in hospital in the 24 hours preceding this morning. There has been an average of 54 newly confirmed cases in hospital per day over the last 7 days. Of the 1,272 COVID-19 cases (aged 12 and over) in November who were hospitalised and where vaccination status is known, 281 (22%) were unvaccinated and 956 (75%) were considered to be fully vaccinated (had an epidemiological date 14 days or more after receiving all recommended doses of vaccine).
- The number of cases of hospital acquired infection has remained lower compared to previous weeks but continues to be of concern. There were 25 hospital acquired COVID-19 infections in the week ending 5th December 2021, compared to 21 in the week ending 28th November, and 47 in the week ending 21st November.
- There has been a continued reduction in the number of cases in acute hospital staff though there are still significant numbers being reported. There were 175 laboratory confirmed cases in hospital staff in the week ending 5th December 2021, compared to 250 in the week ending 28th November, and 324 in the week ending 21st November.
- There are currently 108 confirmed cases in critical care as of this morning, compared with 115 last week on 9th December. There were 6 new admissions to critical care in the 24 hours preceding this morning. Of the 157 COVID-19 cases (aged 12 and over) in November that were admitted to ICU and where vaccination status is known, 71 (45%) were unvaccinated and 79 (50%) were considered to be fully vaccinated (had an epidemiological date 14 days or more after receiving all recommended doses of vaccine).
- As of 15th December, there have been a total of 5,835 COVID-19 related deaths notified in Ireland. This is an increase of 47 notified deaths since the previous weekly update on 8th December. To 15th December, 57 deaths had been notified which occurred in December 2021, 217 in November 2021, 211 deaths in October and 178 in September. Deaths per day are at approximately 6 per day, or 180 deaths per month.
- Over the period 27th June to 4th December 2021, 253 out of 690 (36.7%) notified COVID-19 related deaths were in people who were not fully vaccinated (including those who had an epidemiological date less than 14 days after receiving all recommended doses of vaccine).
- On 26th November 2021, the WHO designated the variant B.1.1.529 a variant of concern (VOC) on the basis of advice from the WHO's Technical Advisory Group on Virus Evolution. The variant has been given the name Omicron. As of 16th December 2021, 39 cases of Omicron have been confirmed through whole genome sequencing (WGS) in Ireland. As of 16th December, S gene target failure (SGTF) data (a proxy for Omicron) indicate that approximately 27% of new cases in Ireland are due to the Omicron variant (based on laboratory specimen date of 14th December).
- SARS-CoV-2 WGS capacity has been increased by 33% over the last fortnight and the HPSC is working to further increase capacity for sequencing at six 'spoke' hospitals in the first quarter of 2022. Further information on SARS-CoV-2 WGS in Ireland is available in appendix 1.
- According to a recent CSO analysis on the current employment status of COVID-19 cases notified up to 27th November 2021, the highest 14-day incidence rates were observed in the following employment sectors: 'Accommodation and Food Service Activities', 'Administrative and Support Service Activities', 'Public Administration and Defence' and 'Construction'. These data do not

indicate that cases were linked to workplace outbreaks or that infection acquisition occurred in these settings.

- Five laboratory confirmed influenza cases - four influenza A (not subtyped) and one influenza B cases - were notified to HPSC during week 49 2021; bringing the season total to 15 laboratory confirmed influenza cases notified during weeks 40-49 2021. Notified influenza cases in Ireland during the 2021/2022 season to date have predominately been associated with influenza A in those aged ≤65 years. In the European region, influenza activity remains low, however it has increased, and is predominately associated with influenza A(H3). Respiratory syncytial virus (RSV) continues to circulate in Ireland. Rhinovirus/enterovirus and other respiratory viruses also continue to circulate, with coinfections of respiratory viruses reported.
- A range of mobility data suggest that mobility across a number of settings remains at or close to levels observed pre-pandemic with a small decrease in activity levels in recent days, noting however the recent likely impact of Storm Barra on population mobility.

Outbreaks for week 49 (5th – 11th December) are based on those reported up to midnight on 11th December 2021.

In week 49 there were a total of 164 COVID-19 outbreaks notified. It should be noted that regional Departments of Public Health are prioritising public health risk assessments and outbreak investigations in settings that have the greatest clinical need or would benefit most from public health intervention such as healthcare settings. For this reason, outbreaks in some settings may be underestimated. Detail on outbreaks in prioritised settings:

Healthcare setting outbreaks:

There were 13 new nursing home and 5 new community hospital/long-stay unit outbreaks reported in week 49. A total of 43 cases were linked to open outbreaks in these settings in week 49.

- There were 5 new acute hospital outbreaks reported in week 49 with a total of 10 cases linked to open outbreaks in acute hospital settings in week 49.
- There were 29 new outbreaks reported in residential institution settings (9 in centres for disabilities, 7 in direct provision centres, 6 in mental health facilities, 4 in children's/TUSLA residential centres, 2 in prisons and 1 in a homeless facility) in week 49. A total of 71 cases were linked to open outbreaks in these settings in week 49.
- There were 12 new outbreaks in 'other healthcare services' (10 among clients of disability day services, 1 among clients of homecare services and 1 among clients of a mental health facility). A total of 15 cases were linked to open outbreaks in these settings in week 49.

Outbreaks associated with school children and childcare facilities:

- There were 9 outbreaks newly reported in childcare facilities in week 49, with a total of 13 cases linked to open outbreaks in childcare settings in week 49.
- There were 37 new outbreaks associated with schools notified in week 49 (22 in primary schools, 13 in special education schools and 2 in a post-primary school). A total of 25 cases were linked to open outbreaks associated with schools in week 49.

Workplace outbreaks:

- There were 3 new outbreaks associated with workplaces (2 associated with food/meat processing and 1 in 'other' workplace settings) reported in week 49. A total of 70 cases were linked to open workplace outbreaks in these settings in week 49

Additional details are available in relation to outbreaks in vulnerable groups and key populations:

- There were 13 new outbreaks reported involving members of the Irish Traveller community in week 49, with 21 cases linked to open outbreaks in this group in week 49.
- There were 3 new outbreaks reported involving members of the Roma community in week 49, with 2 cases linked to open outbreaks in this group in week 49.

The epidemiological assessment as presented should be considered within the context of the significant additional public health threat posed by the Omicron variant. As of 16th December 2021, 39 cases of Omicron have been confirmed in Ireland through whole genome sequencing. S-gene target failure data (SGTF; proxy for Omicron) indicate that the prevalence of Omicron has risen rapidly in Ireland over recent days, with the latest data indicating that approximately 27% of new cases are due to the Omicron variant. An evidence review with regard to current scientific understanding of the Omicron variant is included in appendix 2.

COVID-19 incidence across the country is high, and while it has reduced in recent days, the situation remains very fragile given the very high case volumes. Daily growth rate of cases is currently estimated at -0.5 to -1% per day, with R at just below 1.0. The demand for testing and incidence in children aged 5-12 years has fallen significantly. The impact of recent booster vaccination in reducing disease incidence in those aged 65 and over is clear. The effect of booster vaccinations is also seen in a decreasing percentage share of those cases admitted to hospital being aged 65 years and older. The demand for testing remains very high and test positivity has stabilised at a high level. Test positivity is stable or falling across most age groups, but has increased in recent days in those aged 19-24 years old. All parts of the testing pathway are operating at close to maximum surge capacity (referrals, swabbing, laboratory testing and contact tracing).

While there has been a recent reduction in the number of confirmed cases in hospital and ICU, these levels remain high overall, and particularly in terms of occupancy in ICUs which are operating to full capacity. The high number of COVID-19 cases currently in the community and in hospitals continues to place a significant burden on a range of care being delivered to the greatest extent possible by dedicated staff and services across the wider health and social care system. It is critical that the ongoing significant impact from COVID-19 is considered within the wider context of the anticipated increasing burden on health and social care services over the course of the winter period (for example, due to the circulation of respiratory viruses such as influenza), and also, in terms of the significant threat posed by Omicron.

COVID-19 mortality is at approximately 6 deaths per day, or 180 deaths per month. This may rise further, given the high case counts and risk from Omicron, though booster vaccination may mitigate against this. There continues to be a significant number of outbreaks reported in settings with vulnerable populations.

In summary, the overall epidemiological situation in Ireland remains concerning and delicately balanced. The key core public health priorities, which include the protection of vulnerable groups, the provision of care across all areas of the health and social care system, as well as education and childcare, remain vulnerable to a further significant deterioration in the disease profile. This risk depends on a number of factors, including levels of social contact over the coming days and weeks, adherence to basic public health protective measures and levels of immunity across the population, and the potential for significant impact from the recently identified Omicron variant which is already circulating at significant levels in the community and rapidly increasing.

Modelling

It remains difficult to model the possible impact of the Omicron variant on levels of infection and severe illness with SARS-CoV-2. The emerging data from, for instance, South Africa, Denmark and the United Kingdom suggest that the growth rate and speed at which omicron can spread is greater than early estimates, and this means that the level of infection may exceed that anticipated in our earlier scenario models. While we know that Omicron spreads rapidly, and that this is probably due both to its ability to evade the immunity conferred by vaccination and prior infection and being intrinsically more transmissible, we do not know the relative contribution of these two mechanisms. This is material. If Omicron spreads rapidly largely because it evades the immune defenses against infection, assuming the immune mechanisms protect against severe disease, we will see larger numbers of milder infections, and fewer of these people will require hospital or critical care. Conversely, if Omicron spreads because it is simply more transmissible, a larger fraction of infected people will become seriously ill. Given that we do not know, this increases the uncertainty in any estimates of how numbers of people infected might translate into requirements for hospital and critical care.

We have examined a very wide range of scenarios, using assumptions based on the limited data currently available. These scenarios show that as Omicron becomes dominant, which is likely to happen over the coming week, **the risk of a surge in disease is very high, and any such surge is amplified by increased effective social contact over the Christmas period.** It should be noted that the level of infection is such that at peak, between 2% and 5% of the population could be infected, and between 6% and 25% of the population could be a close contact of an infected person. The consequences of this for essential services and the wider economy are significant. **The risk of excess demand for healthcare is difficult to estimate, but is considered very high.** This will be increased further if the level of infection-induced immunity in the population is lower (or if Omicron evades immunity from prior infection with other variants). The more optimistic scenarios show 8,000-10,000 cases per day, 500-750 people requiring general hospital care, and 150-250 people requiring critical care, or 650-1,000 people in total in hospital at peak. The more pessimistic scenarios show in excess of 20,000 cases per day, over 1,500 people requiring general hospital care, and in excess of 400 people requiring critical care, or more than 2,000 people in total in hospital overall at peak. Further information is included in appendix 3.

Health System Preparedness

Sustained pressure is being seen across the health system. Across hospitals there is high demand for both COVID-19 and non-COVID care. Some key points to note include:

- Critical care units are continuing to run at very close to full capacity (109 adult COVID-19 patients on 14 December, with 291 critical care beds occupied in total), with high numbers of patients (270-280) receiving advanced respiratory support on a ward setting. In comparison to the same period in 2020, there is now an increased COVID-19 hospitalisation demand and increased non-COVID scheduled care demand, and managing these competing demands is a significant challenge for the health service.
- Implementation of additional surge capacity in critical care units will entail redeploying staff from other areas. However, the scope to redeploy staff to support critical care is reduced when compared to earlier waves of the pandemic, particularly given the need to care for high numbers of seriously ill patients on wards and the ramping up of the booster vaccination campaign. At the same time, critical care staff and staff being redeployed are experiencing exhaustion and stress, as indeed are frontline workers in other parts of the system. The current rate of community transmission is having a very significant impact on the levels of COVID-19 related absence

amongst staff with the resulting challenges in maintaining levels of service. Approximately 5,000 staff are currently absent across the system.

- Increased Emergency Department admissions are intensifying existing pressure on general hospital capacity, with limited numbers of vacant beds being seen across the system. Furthermore, the HSE CEO's direction to hospitals in relation to the prioritisation of unscheduled, COVID-19 and urgent time-sensitive care has now been extended beyond its initial two-week period. As a result, scheduled care has now been impacted for a number of weeks. The ongoing curtailment of scheduled care is highly likely to impact the ability of the acute hospital system to deliver elective care between now and year end and is impacting on the ability of hospitals to meet patient needs. Delivery of time-critical services, such as cancer surgeries, may also be challenging in the context of limited theatre and critical care access, and the redeployment of staff. The HSE and the Department are in discussions with the private hospitals in relation to extending the Safety Net arrangement in 2022.
- Primary care and wider community services remain under pressure. Redeployment of staff to support the booster vaccination programme will further impact on service delivery. In light of the urgent need to accelerate the pace of administration of boosters, GPs have agreed to provide additional vaccination clinics over the coming weeks. Notwithstanding the urgent necessity for this, it will impact on the routine delivery of care in GP settings and may therefore have an impact on Emergency Departments and on likelihood of hospital admission. While the rollout of the vaccination programme in residential care settings is having a positive impact, the continued risk of transmission and outbreaks remains.

Combined, the above illustrates a system under significant strain with limited capacity to respond to any additional increases in COVID-19 activity.

In addition, as noted by the World Health Organisation (WHO), while the precise number of people affected with longer term sequelae after acute COVID-19 remains unknown, published reports indicate that approximately 10-20% of people diagnosed with COVID-19 experience lingering symptoms for weeks to months following acute infection. Therefore, an additional risk associated with a significant increase in caseload due to the emergence of the Omicron variant is that a proportion of those infected with SARS-CoV-2 may experience significant longer-term sequelae, so-called 'long covid'.

International guidance

During the past week, the EU's Health Security Committee (HSC) (8th December), the WHO (10th December) and the ECDC (15th December) have published updated position papers with regard to the emergence of Omicron. The WHO noted that the overall risk related to Omicron is very high with preliminary evidence suggesting potential immune escape against infection and high transmission rates, which could lead to further surges with severe consequences.

The HSC meanwhile, highlighted the need for a precautionary approach, and highlighted a number of crucial public health measures – to be implemented as a multi-layered approach – including increasing testing capacities to rapidly identify Omicron, enhanced contact tracing measures and stricter management of contacts. It further noted that timely reinforced implementation of non-pharmaceutical interventions (NPIs) is now more important than ever and emphasised the importance of avoiding the occurrence of possible 'super spreader events', such as sport events, concerts and large gatherings.

The ECDC's updated rapid risk assessment (RRA) noted that the possibility of further spread of Omicron is **very high**, with the potential impact of that spread also deemed to be **very high**, resulting in an assessment that the overall risk to public health from Omicron is **very high**. The RRA noted the ECDC's serious concerns with regard to the preliminary reports of significant growth advantage and potential immune escape versus Delta. It further noted that community transmission is already ongoing in EU/EEA, with further rapid increases in Omicron cases expected in the next two months and concluded that Omicron's increased transmissibility and resulting exponential growth of cases will rapidly outweigh any benefits of a potentially reduced severity. The RRA concluded that it is very likely that Omicron will cause additional hospitalisations and fatalities, in addition to those already expected with Delta and cautioned that these fatalities will only be observed with delay after the Omicron has become dominant. In light of these concerns, the ECDC observed that:

- **Strong and immediate reductions in contact rates are required** to avoid a high spike in Omicron cases and to keep COVID-related health and mortality burden manageable in the short term, even with immediate acceleration of vaccine rollout. This is particularly relevant given the upcoming period that usually involves **intergenerational mixing across different households, with the risk of super-spreading events**
- Without reduction of contact rates through the implementation of NPIs and increased booster vaccination, levels of transmission could rapidly overwhelm EU/EEA healthcare systems
- Given the impending probable dominance of Omicron, **NPIs need to be further strengthened without delay**, including avoiding large public or private gatherings, encouraging use of face masks, reducing contacts between groups in social or work settings, teleworking, expanded testing and strong contact tracing
- Immediate planning should be considered to increase healthcare capacity to treat the expected higher number of cases. **Hospital surge capacities should be re-assessed** according to emerging epidemiological data on the severity of Omicron
- **Testing of individuals with symptoms**, irrespective of their vaccination status, together with isolation of those testing positive, continues to be important in limiting the spread of SARS-CoV-2
- **Vaccination remains a key component** of the multi-layered approach needed to reduce the impact of Omicron
- **Risk communication** activities remain vital.

Separately, in the UK, the Scientific Advisory Group for Emergencies (SAGE), at its meeting of December 7th, stated that it is likely, once hospitalisations begin to increase at a rate similar to that of cases, four doublings (a 16-fold increase) or more could already be "in the system" before interventions that slow infections are reflected in hospitalisations. The latest technical briefing on the Omicron variant (December 10th) reported an estimated growth rate of Omicron based on adjusted S-gene target failure counts of 35% per day, with continued rapid growth in all regions of England. On 13th December the UK's Secretary of State for Health and Social Care noted that the UK Health Security Agency had estimated that the current number of daily infections are around 200,000, and on December 15th the UK reported its highest daily number of infections in the pandemic to date. In London, where Omicron is now dominant, hospitalisations have increased by 30% in a week.

A summary of measures currently in place in other countries is included in appendix 4.

Existing measures

In considering further recommendations, the NPHET is cognisant of the very significant impact that the pandemic, adherence to public health advices and restrictive measures have had on individuals, families, communities and businesses in Ireland. Due regard was given to the guiding principles of solidarity, fairness and proportionality in considering additional public health restrictions. Solidarity has been a hallmark of the Irish response to COVID-19. This collective national effort in which people have acted in mutual support of each other has allowed us to protect our healthcare services and the educational opportunities of our children to the greatest extent possible. These actions, and in particular, efforts over recent weeks to reduce R to 1, have undoubtedly saved many lives.

However, because of the emergence of the Omicron variant, the NPHET must again emphasise the importance of individuals and families adhering to basic public health protective measures in the weeks ahead. In particular, the NPHET reiterates its existing advices that:

- Those with symptoms of COVID-19 should stay at home, isolate and arrange a PCR test – do not go to work or socialise with others.
- Those who are eligible for a first, second or booster dose, should avail of it as soon as it is available to them.
- It is very difficult at this time of year, but people should try to reduce their contacts as much possible in the days and weeks ahead. Keep groups small and try to meet the same people regularly rather than meeting people from multiple households.
- Visits to private homes should be kept to a maximum of three other households, recognising the need for some flexibility depending on individual circumstances. In general, people are advised to keep gatherings small and to take particular cognisance of protecting those aged 50 years and older and those with underlying conditions who may not yet have received their booster vaccine.
- Those who are meeting regularly with people from other households should regard this as high risk and should therefore consider using antigen tests twice weekly & before they socialise with others (including immediately prior to gatherings over the Christmas and New Year Period).
- People should avoid crowds and any indoor environment where they may not be able to maintain their distance from others.
- People should meet outdoors if possible. If indoors, windows should be opened regularly to ensure adequate natural ventilation and people should avoid poorly ventilated indoor spaces.
- People should wear a mask in indoor settings or outdoors where they may not be able to maintain their distance from others.
- People should ensure they are wearing the mask most appropriate to them. In particular those aged over 70 years, those who are medically vulnerable, and those with symptoms of COVID-19 or who are close contacts in a household setting should use medical grade face masks.

In addition, the emergence of the Omicron variant requires a renewed and enhanced emphasis by all sectors and organisations on ensuring widespread compliance with, and adherence to, measures which will protect the public and employees. In particular, the NPHET reiterates previous advices with regard to:

- **Mask wearing:** Continuing efforts should be made to ensure the correct wearing of masks by staff and, where mask wearing is mandatory or advised, including crowded outdoor settings (e.g. outdoor spectator events).

- **Workplaces:** Employers should accommodate employees to work from home where their attendance on site is not essential. For those who must attend workplaces in person, there should be ongoing communication to employers and employees regarding protective measures in the Work Safely Protocol e.g. staggered shifts and breaks, appropriate mask wearing, not attending if symptomatic, pod system for staff, and mitigation measures if sharing transportation.
- **Physical distancing:** All sectors should ensure that there are sufficient measures in place to ensure appropriate physical distancing.
- **Ventilation:**
 - Relevant Departments/Agencies should review their communications on ventilation to ensure appropriate messaging, advice and guidance in relation to ventilation is available and accessible;
 - There should be a significant strengthening of communication to households and relevant sectors, outlining the importance of good ventilation and the practical steps that can be taken to improve ventilation;
 - An assessment of ventilation should form a core component of inspection of premises under the Work Safely Protocol and other sectoral guidance; and
 - Renewed consideration should be given to the provision of mechanisms and incentives to support businesses and organisations to improve ventilation.

The NPHET also emphasised the importance of continued clear and targeted communications over the coming period and noted the various communications campaigns that are underway.

Key Considerations and Advice

In its most recent correspondence of the 2nd December, the NPHET expressed its significant concern in relation to the potential trajectory of COVID-19 over the coming weeks with three key risk factors identified – the impact of the Omicron variant, increased social mixing over the Christmas and New Year period and the impact of influenza and other respiratory illnesses. It was emphasised that each of these factors constituted a real but as yet unquantifiable risk to the management of COVID-19, and that taken together in the context of an already significant burden of disease and force of infection, they had the capacity to present serious challenges in the weeks ahead. This remains the case and the level of concern is in fact heightened as further evidence in relation to the potential increased transmissibility and immune escape of the Omicron variant is becoming available. This is further illustrated in the updated modelling scenarios set out above.

The NPHET recognises the significant efforts being made across society to follow current public health advice including reducing levels of social mixing and the sacrifices that this entails. This has been making an impact over recent weeks as the epidemiological situation has remained relatively stable and will continue to make an essential contribution over the coming weeks. However, given the scale of cases projected as the Omicron variant becomes dominant in the days ahead, it is unlikely to be sufficient to protect against the expected surge in infection levels. As advised by ECDC and others, even if this variant results in less severe infection, the increased transmissibility and resulting exponential growth of cases will rapidly outweigh any benefits of a potentially reduced severity. This is likely to place considerable burden on our healthcare system, and may also have very disruptive effects in terms of workforce sustainability across healthcare (including the vaccination programme), the educational and childcare systems and other essential services.

For these reasons, and in line with advice outlined above from ECDC, WHO and the EU Health Security Committee, the NPHET strongly advises the continued adoption of a proactive and precautionary approach. In addition, the NPHET recommends the early introduction of additional measures to slow down the spread of the Omicron variant while the booster programme advances, and its full impact can take effect.

Given the likely magnitude and speed of Omicron transmission over the coming weeks, the objective of the measures below is to protect the most vulnerable and to flatten the curve of this projected wave to protect the core functioning of essential services by minimising synchronous absenteeism (i.e. large numbers of people missing from the workplace at the same time) in particular in health and social care, education and childcare systems.

The NPHET acknowledges that additional measures will impose a further burden on certain sectors and also on society more generally. The measures outlined below are intended to reduce the volume of social contacts, especially in higher risk settings which present super spreader opportunities and those that involve inter-household and intergenerational mixing. **The NPHET recommends that the following additional measures should be considered by Government:**

- **All restaurants and bars, excluding take-away or delivery services, should close at 5pm. This should also apply to hotel restaurants and bars,** except for overnight residents. These reduced operating hours will significantly lessen the substantial volume of high-risk social contact taking place in these settings. The NPHET recognises that closing hospitality at 5pm will result in some element of displacement of socialisation into private households. However, this displacement is likely to result in substantially less social contact overall than would occur in restaurants and bars operating as they do at present. All existing legal requirements and guidelines applicable to restaurants and bars should be fully implemented during these reduced hours.
- **There should be no indoor events, including entertainment, cultural, community and sporting events, after 5pm in line with advice above for the hospitality sector.** In relation to events happening earlier in the day, **attendance should be limited to 50% of venue capacity or 1,000 attendees, whichever is the lower.** There should also be strict application of the full range of protective measures. In particular, the reduction in attendance should be used to maximise physical distancing in venues (i.e. attendees should not be seated together in a portion of the venue), and masks should be worn during performances.
- **Attendance at outdoor events, including entertainment, cultural, community and sporting events, should be limited to 50% of venue capacity or 5,000 attendees, whichever is the lower.** In addition, there should be robust implementation of the full range of robust protective measures, including mask wearing.
- There should be an **appropriate limit on the number of attendees at weddings if they are to proceed.** The higher risk of transmission and potential for super spreading events with Omicron should inform these considerations.
- The NPHET reiterated its advice on workplaces that **employers should accommodate employees to work from home** where their attendance on site is not essential.
- **Full implementation of all previously advised protective measures across all sectors,** including retail, public transport and religious services.
- In the coming days, **specific public health advices will be provided to support people in gathering safely over the Christmas/New Year period.** This will cover the range of advices set out earlier, including that people may consider the use of an antigen test in advance of visiting other households over the coming weeks.

- **Restricted movement advice for all close contacts** (regardless of primary vaccination status) should be enhanced as follows:
 - For those that have received a booster (effective from one week after receiving the booster dose): Restrict movements for 5 days with 3 antigen tests.
 - For those that have not received a booster (including those not fully vaccinated): Restrict movements for 10 days. The HSE will be asked to consider the most appropriate testing schedule for this cohort.
- It was noted that there are specific arrangements already in place for healthcare workers that are close contacts and that this will continue.
- **No changes are advised in relation to school holidays.**

The NPHET advises that these measures should be implemented as soon as possible, and in any event no later than midnight on Sunday, 19th December. The NPHET recommended that the above measures remain in place until January 30th, however given the current uncertainty regarding the trajectory and characteristics of the Omicron variant and in line with the procedural value of responsiveness, it was deemed important that public health advice would be kept under close review, with the potential for revising advice should further evidence become available.

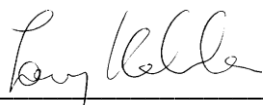
In relation to the Covid Pass system, and acknowledging the impact of Omicron, it was noted that NPHET will give consideration to the application of expiry dates for primary vaccination and inclusion of booster doses in the Covid Pass for domestic use. It was noted that there are ongoing discussions at EU level on these matters in relation to the DCC and travel.

In relation to international travel and other measures that were advised in specific risk assessments prepared in response to the emergence of Omicron, the NPHET noted that the latest such assessment which I submitted to you on the 15th December advises on the removal and/or amendment of many of these measures in the light of the significant increase in the proportion of PCR positivity attributable to SGTF, a reliable marker of Omicron incidence.

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 Tony Holohan
Chief Medical Officer
Chair of the COVID-19 National Public Health Emergency Team

Appendix 1: Whole Genome Sequencing

Information Note for NPHE

National SARS-CoV-2 Surveillance and Whole Genome Sequencing Programme

16th December 2021

The National SARS-CoV-2 Surveillance and Whole Genome Sequencing Programme is overseen by the HPSC, and an approach to screening for Omicron is being developed by the steering group in conjunction with the Variant of Concern Oversight Group. While the NVRL is currently the primary laboratory supporting the programme, a national hub and spoke model has been developed, with additional support from the EU HERA grant system. This is the preferred model as it aligns with Slaintecare, public health reform and ensures close working relationships between public health and hospital colleagues, as well as facilitating short turnaround times (TATs) to inform public health actions in particular incidents and outbreaks. Six spoke laboratories (one in each RHA) have been identified and three of these will commence sequencing in late December/early January; University Hospital Limerick, St. James Hospital and Galway University Hospital. The other three spoke hospitals are due to commence sequencing in February 2022; Cork University Hospital, St Vincent's University Hospital, and Beaumont Hospital.

The current SARS-CoV-2 WGS capacity at the NVRL is approximately 1500 sequences per week, which facilitates detection of a SARS-CoV-2 variant at a prevalence of 1% in line with ECDC guidance. The spoke hospitals will provide additional capacity of up to 600 sequences per week. Assuming a weekly case count of around 30,000 of which typically between 50% and 60% will be suitable for sequencing, Ireland is sequencing between 5% and 10% of cases each week. This is set within the present context of very high levels of RT-PCR testing for SARS-CoV-2 in response to a surge in transmission.

Due to the emergence of Omicron and to build resilience into the programme while awaiting the spokes to commence sequencing, the steering group has linked with the HSE's Laboratory Taskforce to recommend additional WGS capacity be provided by private partners. This will bring weekly WGS capacity to between 2,200 and 2,500 per week. While this increase in capacity will not materially affect the power of our surveillance system, it will provide necessary resilience and contingency to the programme over the Winter period. To facilitate an enhanced real-time focus on current events in Ireland, some residual samples from

November have also been redirected to ECDC for sequencing, which continues to provide support to Member States on an as-needed basis.

In relation to TATs, the elapsed time between sample date and sequence result ranges from <1 week (as evidenced by the recent rapid identification of Omicron) to approximately 3-4 weeks. As such, it should not be considered a public health control measure: nonetheless, the proposed increase in capacity should also lead to reduction in overall TATs. In addition, as the spoke labs come onstream, this will allow for local real time investigation of hospital-based/community outbreaks to facilitate prompt public health intervention at the local level.

At the national level, the sequencing TAT is less relevant, as we currently possess significant laboratory capacity (accounting for about 20,000 samples per week, or roughly 10% of the national testing capacity) to test for s-gene target failure (a marker for Omicron) at the NVRL Satellite Laboratory at Backweston. This is a cross-government initiative - funded by the HSE - comprising a high throughput laboratory, operated by UCD NVRL, in laboratory space provided by DAFM. The TaqPath assay being used at NSLB has played a significant role over the last year in monitoring and tracking the emergence of previous variants, including Alpha and Delta.

Appendix 2: Rolling summary of the evidence in relation to the Omicron (B.1.1.529) variant

HIQA Scientific Evidence Summary

Key points

- On 26 November 2021, the World Health Organization (WHO) designated the variant B.1.1.529 a variant of concern (VOC) named 'Omicron', following its discovery in South Africa. There are many unknowns relating to the Omicron variant, including its transmissibility, its virulence (severity of disease), and its capacity for immune escape. Studies are rapidly emerging to address these areas; information available as of 11.59pm, 14 December 2021 is summarised in this report. Studies and assessments emerging in the following days may present information that supersedes the contents of this report.

Transmissibility and Transmission:

- Based on mutational analysis, it is biologically plausible that Omicron is more transmissible than Delta. One (preprint) laboratory assay study examining infectivity found that Omicron had four times the infectivity of wild type SARS-CoV-2 and twice the infectivity of Delta; these findings require confirmation.
- In South Africa, there was an increase in the effective reproductive number (R_e) in November, indicating potential higher transmissibility of Omicron. Omicron is now the dominant strain in South Africa. As of 14 December 2021, based on specimens collected on 11 and 12 December 2021, 51.8% of cases of SARS-CoV-2 in London represented SGTF cases (a proxy for Omicron), suggesting that Omicron was at this time the dominant strain in London.
- Omicron has been classified by the UK Health Security Agency (UKHSA) as at least as transmissible as Delta. It is currently displaying a growth advantage over Delta in the UK, with increased household transmission risk, increased secondary attack rates, and increased growth rates compared to Delta. There is high confidence that this growth advantage results from immune evasion, and it is plausible that an increase in transmissibility is also contributing.
- Several 'superspreading events' associated with the Omicron variant have been reported in settings such as restaurants, concerts, parties, schools, a cruise ship, a boat, a gym, a wedding, a convention and a detention centre. However, it is not possible to ascertain from the reports of these events whether the

Omicron variant is associated with greater transmissibility compared with other strains of SARS-CoV-2.

- Little has been published regarding the potential for higher rates of aerosol transmission than observed previously. However, one study from Hong Kong indicated a high likelihood of airborne spread based on one transmission incident, which occurred in a quarantine hotel. Airborne transmission is suspected due to the lack of contact or shared space/items (as demonstrated by CCTV footage) between the two cases.

Virulence:

- The UKHSA risk assessment of Omicron, published 9 December 2021, stated that there were insufficient data available to inform an assessment of infection severity, as is expected in the early period of the emergence of a new variant. A similar statement was also made in the ECDC rapid risk assessment published 15 December 2021.
- Early experience from South Africa (largely a younger, less vaccinated cohort) does not indicate a more severe form of illness. To date, as with infections associated with other variants in South Africa, the majority of infections have been reported to be mild.
- On the 14 December 2021, the ECDC noted that all Omicron cases within the EU/EEA, for which there was information available on severity, were either asymptomatic or mild. The ECDC highlighted that these data should be assessed with caution, as the number of confirmed cases was too low to understand if the spectrum of disease in Omicron differs from previously detected variants of concern. While the ECDC report noted at this time no Omicron-related deaths in the EU/EEA, as of 14 December 2021 at least one death was reported within the UK from data available to 12 December 2021.
- Early data on Omicron hospitalisations in Denmark are being published on a daily basis. Based on data to 11 December 2021, 0.8% of Omicron cases (38 of 4,498) had been hospitalised, of which nine were classified as hospital-acquired infections. The number of cases currently hospitalised as of 14 December 2021 was 12, with fewer than five patients with Omicron in ICU.
- The proportion of Omicron cases currently observed to be mild should be considered in light of the extent to which Omicron demonstrates greater infectivity and greater capacity for immune escape, and the extent to which the population possesses immunity (from either prior infection or vaccination). The virulence of Omicron may not be fully understood by observing patterns of

severity in the overall population, as this includes those with natural or vaccine-derived immunity, who will have less severe infections if they occur.

- It is important to consider that if transmission were to increase substantially, any significant wave of infection, irrespective of changes in virulence or immune escape, would very likely result in increased hospitalisations and mortality.

Immune escape:

- Multiple mutations in the spike protein of the Omicron variant indicate a high likelihood of reduction of neutralising activity by antibodies induced by infection or vaccination.
- Early data from South Africa indicate a higher risk of reinfection than that experienced with previous variants. The UKHSA Technical Briefing, published 10 December 2021, noted that there was, as yet, no evidence of increased reinfection risk at the population level (all cases of reinfection), but preliminary analyses using data from those confirmed to be reinfected with SARS-CoV-2 indicated approximately three- to eight-fold increased risk of reinfection from the Omicron variant compared to other variants. The UKHSA analyses were based on case data in England collected prior to 8 December 2021.
- Several epidemiological reports have noted the occurrence of breakthrough infections including a case series from South Africa that reported the occurrence of breakthrough infection in seven individuals who had received COVID-19 booster doses.
- As of 14 December 2021, two vaccine effectiveness studies have been reported (Andrews et al., preprint, England, and Discovery Health, press release, South Africa).
 - Andrews et al. published a preprint reporting a test negative case control study in England, which is also described in the UKHSA Technical Briefing published 10 December 2021. The study suggested that vaccine effectiveness against symptomatic disease was significantly lower for Omicron than for Delta. However, a moderate to high vaccine effectiveness of 70% to 75% was seen in the early period after a booster dose.
 - The health insurer Discovery Health, South Africa, reported a study within a press release published on 14 December 2021. It included analysis of data from the first three weeks of Omicron in South Africa. While little detail on methodology was provided, individuals who

received two doses of the Pfizer-BioNTech vaccine were reported to have had 70% protection against hospital admission, compared with 93% protection observed during the Delta wave. These are the first data that represent vaccine effectiveness for the outcome of hospitalisation with Omicron (a proxy for severe disease).

- As of 14 December 2021, fourteen laboratory studies have been reported that examined the neutralisation activity of vaccines, and or prior infection against the Omicron variant. Currently, most of these data examine neutralisation following the Pfizer vaccine (BNT162b2). Overall, these studies found that:
 - Sera from those who had received two doses of any COVID-19 vaccine (Pfizer BioNTech BNT162b2, Moderna/Spikevax mRNA-1273, AstraZeneca ChAdOx1) or one dose of Janssen Ad26.COV2.S, produced limited, if any, neutralisation activity against Omicron, with up to 127-fold reductions reported in one study for Pfizer BNT162b2 compared with the ancestral strain.
 - Sera from those who had received three doses of vaccine had higher neutralisation activity against Omicron compared with those receiving two doses, but activity was still lower overall compared with previous strains. The reported increase in neutralising antibodies against Omicron ranged from 25-fold to greater than 130-fold between the second vaccine dose and the Pfizer BNT162b2 booster. However, the neutralisation activity of the booster dose against the Omicron variant was still reduced compared with previous strains, with estimates ranging from 2.5-fold to 37-fold reductions across studies.
 - Immunity resulting from a combination of prior infection plus full vaccination was associated with greater neutralisation activity against Omicron compared with prior infection alone (in two studies) or two-dose vaccination alone (in three studies).
 - Though based on limited data, lower neutralisation activity against Omicron was observed for sera from AstraZeneca (ChAdOx1) and Janssen (Ad26.COV2) versus sera from mRNA vaccinees. For a high proportion of the former, neutralising activity fell below the limit of quantification in the assay.
 - Caution is urged in the interpretation of these neutralisation assay studies as the results represent in vitro analysis (as opposed to clinical or epidemiological studies), involve small sample sizes, and often have limited information to support their interpretation. Reductions in

neutralisation activity do not directly equate to reductions in vaccine effectiveness in real-world settings, and these studies do not consider the impact of conserved non-neutralising antibodies or memory T cell responses which likely contribute to protection from severe disease.

- The UKHSA risk assessment of Omicron published 9 December 2021 concluded with high certainty that Omicron displays a reduction in immune protection against infection, relative to Delta. This risk was assigned 'red' status (i.e., high risk), and was based on neutralisation data from multiple laboratories and preliminary assessment of real-world vaccine effectiveness in the UK (Andrews et al. study).

Treatment efficacy:

- Current treatments for COVID-19, which are used in the hospital setting, include those which target the SARS-CoV-2 virus, and those which target the host immune response. Generally, treatments that target the SARS-CoV-2 virus itself, and specifically, regions of the virus in which the Omicron variant possesses mutations (for example, monoclonal antibodies which bind to certain virus sites), may experience altered efficacy against Omicron. Treatments that target the host immune response rather than the virus (for example, non-specific treatments such as corticosteroids) will not be affected.
- Several treatments are being evaluated to understand their likely efficacy against Omicron. The antiviral drug remdesivir, and some treatments which are not yet licensed for use in Ireland, for example, the antiviral drug molnupiravir, are not expected by their manufacturers to be impacted by Omicron. Recent neutralisation assay results have suggested the activity of the monoclonal antibody sotrovimab is preserved, or somewhat reduced.
- Several neutralisation assays have been published which suggest substantially reduced, or abolished, activity against Omicron for several neutralising antibody drugs developed to target SARS-CoV-2. These include the combination monoclonal antibody treatments casirivimab plus imdevimab, and etesevimab plus bamlanivimab. This reduction in activity is thought to be due to mutations at the virus site to which the antibodies bind.

Test accuracy:

- Current available tests are expected to be capable of identifying the Omicron variant as SARS-CoV-2. However, the designation of two genetically distinct sublineages of Omicron (BA.1 and BA.2), and the finding that BA.2 does not exhibit S-Gene Target Failure (SGTF), has implications for detection of the

Omicron variant as distinct from the prevailing dominant strain. The absence of S-Gene Target Failure with BA.2 renders RT-PCR assays ineffective at early surveillance; genomic sequencing (requiring several days) is required to identify Omicron from such samples.

- Use of single-target PCR tests that target mutated regions in Omicron will result in false negatives. The FDA has identified two such tests, both of which fall under Emergency Use Authorization in the US.

Overall assessments of risk and impact:

- An updated risk assessment by the Norwegian Institute of Public Health (NIPH), published 13 December 2021, stated that the situation in Norway is becoming increasingly serious. The NIPH stated there is an urgent need to curb the COVID-19 epidemic with significant measures, with the aim of avoiding the Omicron variant causing an epidemic wave that results in a large disease burden and overloads the health service.
- A study that aimed to model the potential impact of Omicron in England, published as a preprint on 11 December 2021, projected a wave of COVID-19 transmission for all scenarios modelled. In the most optimistic scenario, the authors concluded that bringing in control measures early in 2022 which are equivalent in stringency to 'Step 2' of the UK roadmap (involving restrictions on indoor hospitality, closure of some entertainment venues, and restrictions on gathering sizes) would be sufficient to substantially control this wave.
- On 15 December 2021, the ECDC published a rapid risk assessment. The following overall risk assessment was made: 'Based on the currently available limited evidence, and considering the high level of uncertainty, the overall level of risk to public health associated with the further emergence and spread of the SARS-CoV-2 Omicron VOC in the EU/EEA is assessed as very high'. The assessment stated that non-pharmaceutical interventions (NPIs) should be strengthened without delay, and noted that, without increased booster vaccination and reduction of contact rates through the implementation of NPIs, levels of transmission could rapidly overwhelm EU/EEA healthcare systems.

Appendix 3: Model structure and assumptions

Model structure

The scenarios have been implemented in the homogeneous population SEIR model and the age-cohorted SEIR model, and the outputs of these models translated into healthcare demand using the ESRI CHUP model, as previously described and published. The assumptions in regard to the dynamics of SARS-CoV-2 infection and transmission are also as previously published. This includes the assumption, validated in prior model runs, that children under 12 years of age contribute less to overall transmission (50% less) of the virus than adults. The delta variant is assumed to have a transmission advantage of 1.97 over ancestral (wild-type) SARS-CoV-2, that is, delta is almost twice as transmissible. The results presented here are from the age-cohorted model and have been cross-validated to the homogeneous model, which in general generates more pessimistic scenarios because social contact is not constrained by age in the same way. The models are calibrated to 9 December 2021.

Assumptions

Vaccine effectiveness

The models assume high baseline levels of vaccine effectiveness against symptomatic infection (95% for Pfizer-BioNTech and Moderna, 80% for AstraZeneca and 67% for Janssen) and higher effectiveness against severe outcomes (97% for Pfizer-BioNTech and Moderna, 94% for AstraZeneca and 67% for Janssen). The delta variant is associated with reduced vaccine effectiveness against symptomatic infection (a 37% reduction in effectiveness with one dose only, a 10% reduction with two doses). Vaccine protection against severe outcomes is not altered for delta. Vaccine effectiveness wanes over time: starting 28 days after vaccination, effectiveness in preventing symptomatic infection declines exponentially to 40-60% of peak effect with a half-time of 90 days; vaccine effectiveness against severe disease declines to 80-90% of peak with a similar time course. Booster vaccination rapidly restores effectiveness against symptomatic infection to above 90% and severe disease to above 95%.

Vaccination

The data on uptake of primary vaccination, and additional doses administered to date, are taken from the HSE CoVax system. It is assumed that booster vaccination of those aged 50 and older will be substantially complete by end-December 2021, with booster vaccination continuing down to those aged 16 and older in the first 10 weeks of 2022. The uptake of booster vaccination ranges from 50% in those aged 16 years to 90% in those aged over 85 years. Vaccination of children aged 5-11 years is assumed to effectively begin in early January 2022 with uptake of 60% achieved over three months.

Omicron

It is assumed that omicron is becoming dominant at present and will account for 50% of transmissions by 18 December 2021, with a growth rate of 30% per day and a doubling time of 2.3 days; depending on assumptions on how many days it takes for one person to infect another (generation time) this means that omicron is spreading 2-4 times faster than delta.

The emergent data on vaccine effectiveness against symptomatic infection suggests that two doses of the AstraZeneca (Vaxzevria) vaccine offers little protection against becoming infected, while the effectiveness of the Pfizer (Cominarty) vaccine is reduced by at least 35%. An mRNA booster vaccination, following either of these primary vaccinations, restores vaccine effectiveness in preventing symptomatic infection to at least 70%. It appears that omicron can also evade the

immunity conferred by prior infection with other variants, and the data are compatible with at least a 50% loss in immunity against symptomatic infection.

We have no reliable data on how effective vaccines, or prior infection, are in preventing a severe disease and hospitalisation. It is plausible to assume that protection against severe outcomes is maintained. Equally there is no reliable data on whether omicron is intrinsically more or less virulent than delta. The fact that a significant proportion of omicron infections appear to be mild can be explained by it evading immune protections against infection while immune protection against severe disease is maintained, so that people are easy to infect, but less likely to become severely ill.

Given this uncertainty, we have explored a wide range of scenarios in relation to the characteristics of the variant.

- Vaccine effectiveness in preventing infection (3 scenarios)
 - Primary course of adenoviral vector vaccine has zero effectiveness, effectiveness of primary course of mRNA vaccines reduced 35%, booster mRNA vaccine restores effectiveness to 70% (central)
 - Primary course of adenoviral vector vaccine has zero effectiveness, effectiveness of primary course of mRNA vaccines reduced 35%, booster mRNA vaccine restores effectiveness to 90% (more optimistic)
 - Primary course of adenoviral vector vaccine has zero effectiveness, effectiveness of primary course of mRNA vaccines reduced 65%, booster mRNA vaccine restores effectiveness to 70% (more pessimistic)
- Loss of infection-induced immunity (2 scenarios)
 - Protection from symptomatic infection with omicron due to prior infection with other variants reduced by either 50% or 75%
- Transmission advantage (3 scenarios)
 - Omicron is assumed to be marginally more transmissible (5% transmission advantage) significantly more transmissible (40% advantage) or highly transmissible (70% advantage)
- It is assumed that virulence of omicron and delta are similar
- Vaccine effectiveness in preventing severe disease is the same for omicron and delta, with booster vaccination increasing vaccine effectiveness in preventing severe outcomes to 97% for delta and omicron. This is a strong assumption, and if vaccine effectiveness in preventing severe disease is lower, healthcare demand for any level of infection will be higher.

Effective social contact

The models examine 4 different scenarios with respect to effective social contact over the Christmas period:

- effective social contact remains at the level estimated for the week ending 28 November 2021;
- effective social contact decreases by 10% from 29 November 2021 and is maintained at that low level;
- effective social contact increases by 10% in early December, and further increases, for late December and early January 2021, to the levels seen at Christmas 2020; and,

- effective social contact increases by 10% in early December, and further increases, for late December and early January 2021, to 20% above the levels seen at Christmas 2020

It should be noted that ‘effective social contact’ in these models is an estimate not only of the level of close social contact, but also the risk of transmission associated with those contacts, including the non-pharmaceutical interventions (NPI) taken to reduce transmission, and the changing risk of social contact in the winter compared to the summer.

A total of 72 possible scenarios were thus explored.

Results

Figure 1 shows one set of scenarios, using the central assumptions on vaccine effectiveness. The risk of a large surge of infection is high, and is amplified by increased social contact over the Christmas period. The fundamental conclusion is that even if we reduce effective social contact by 10%, and all of the characteristics of omicron are favourable, we are likely to see a peak of 8-10,000 infections per day, and even modest increases in effective social contact, or higher levels of immune escape or transmission advantage for the virus, lead to much larger peaks of infection.

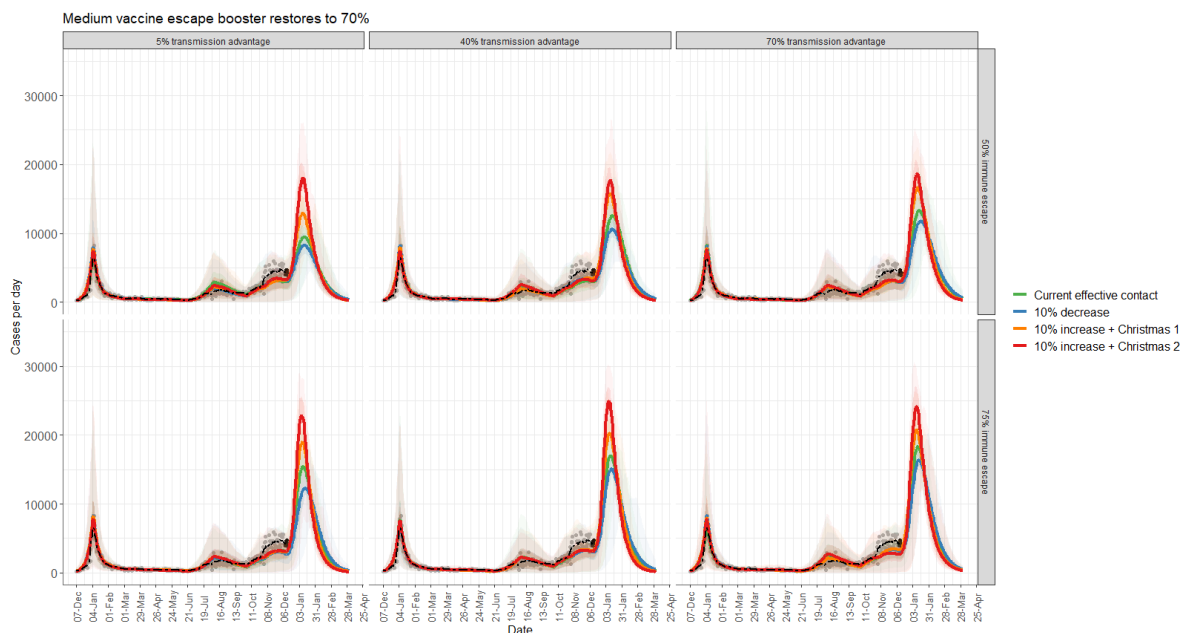


Figure 1: Age-cohorted SEIR model scenarios for case numbers with different levels of effective social contact, and transmission advantage and immune escape for omicron. It is assumed that the primary course of an adenoviral vector vaccine has zero effectiveness against infection with omicron, the effectiveness of a primary course of mRNA vaccines is reduced 35%, and booster mRNA vaccine restores effectiveness to 70%. The risk of a large surge of infection is high, and is amplified by increased social contact. Christmas 1 = effective social contact over Christmas period similar to Christmas 2020; Christmas 2 = effective social contact over Christmas period 20% greater than Christmas 2020.

Figure 2 and Figure 3 show possible demand for general hospital and critical care under these same scenarios. These estimates are very uncertain. If omicron spreads primarily by escaping immunity against infection, the demand for healthcare will be lower, but if there is any significant decrease in vaccine effectiveness in preventing severe disease with omicron, the level of severe disease will be considerably higher. If all characteristics of omicron are favourable, the surge may be associated with 500-750 people in hospital at peak, and 150-200 people in ICU, but if social contact increases or

the viral characteristics are unfavourable, the demands on the healthcare system could be unsustainably high.

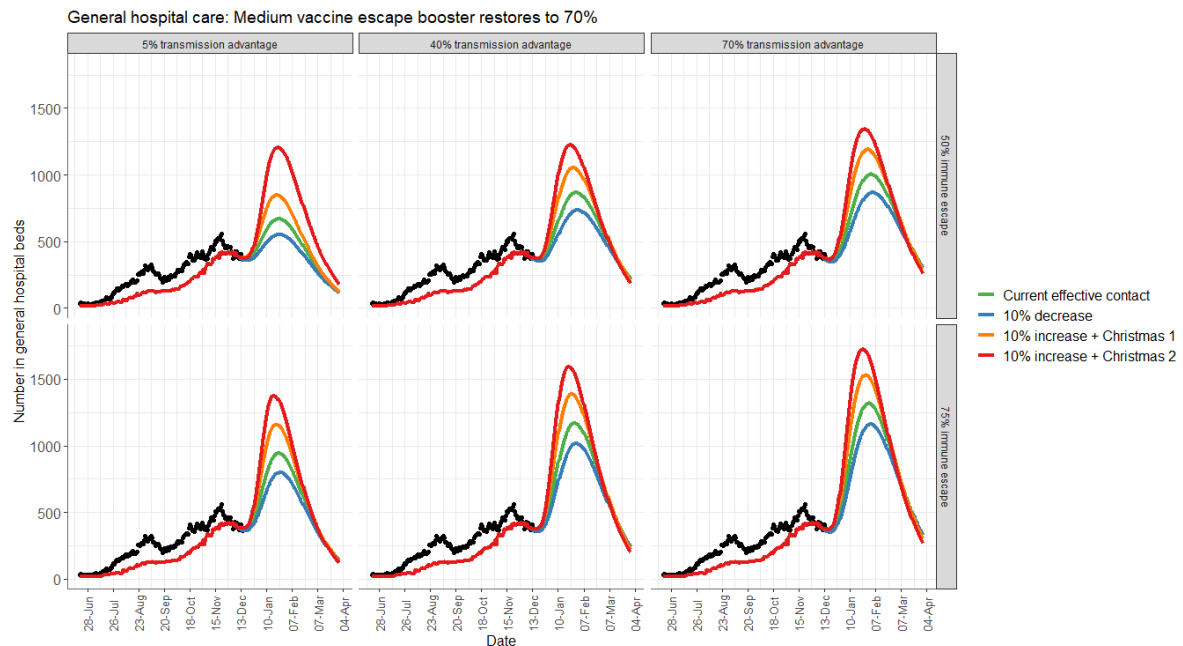


Figure 2: The estimated number of people requiring general hospital care (excluding those requiring critical care) for the scenario set shown in Figure 1, where it is assumed that the primary course of an adenoviral vector vaccine has zero effectiveness against infection with omicron, the effectiveness of a primary course of mRNA vaccines is reduced 35%, and booster mRNA vaccine restores effectiveness to 70%. Christmas 1 = effective social contact over Christmas period similar to Christmas 2020; Christmas 2 = effective social contact over Christmas period 20% greater than Christmas 2020.

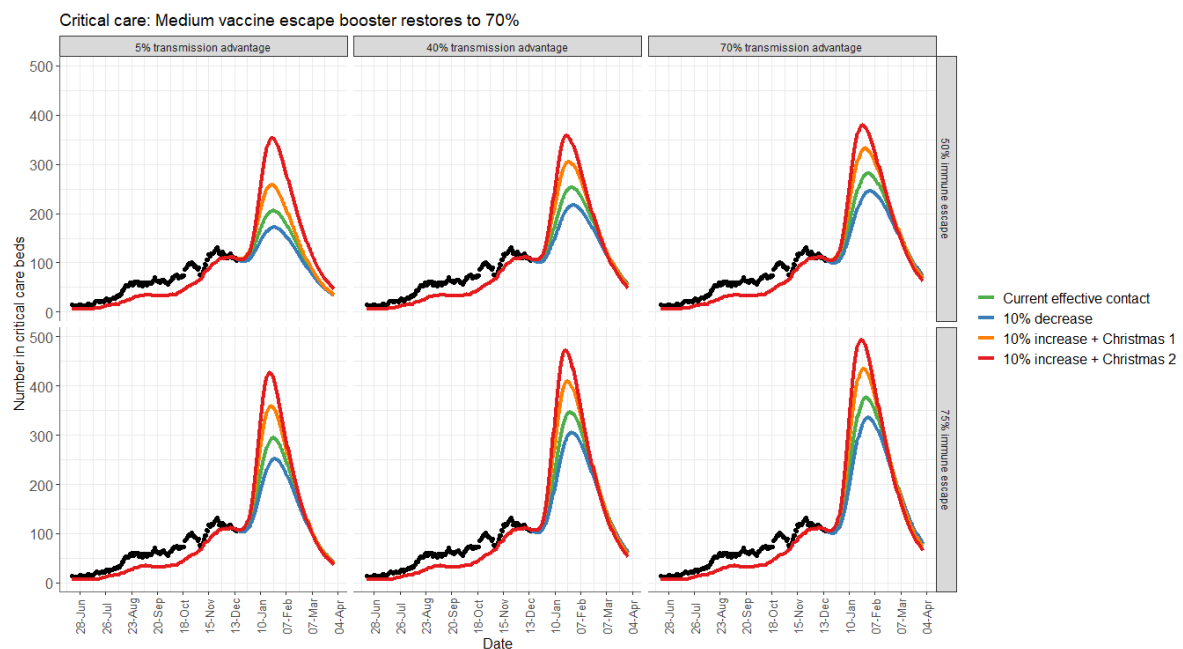


Figure 3: The estimated number of people requiring critical care for the scenario set shown in Figure 1, where it is assumed that the primary course of an adenoviral vector vaccine has zero effectiveness against infection with omicron, the effectiveness of a primary course of mRNA vaccines is reduced 35%, and booster mRNA vaccine restores effectiveness to 70%. Christmas 1 = effective social contact over Christmas period similar to Christmas 2020; Christmas 2 = effective social contact over Christmas period 20% greater than Christmas 2020.

Figure 4, Figure 5 and Figure 6 show the full range of scenarios for cases per day and the number of people requiring care in general hospital and critical care settings. The more optimistic scenarios show 8-10,000 cases per day, 500-750 people requiring general hospital care, and 150-250 people requiring critical care, or 650-1000 people in hospital at peak. The more pessimistic scenarios show in excess of 20,000 cases per day, over 1500 people requiring general hospital care, and in excess of 400 people requiring critical care, or more than 2000 people in hospital overall at peak.

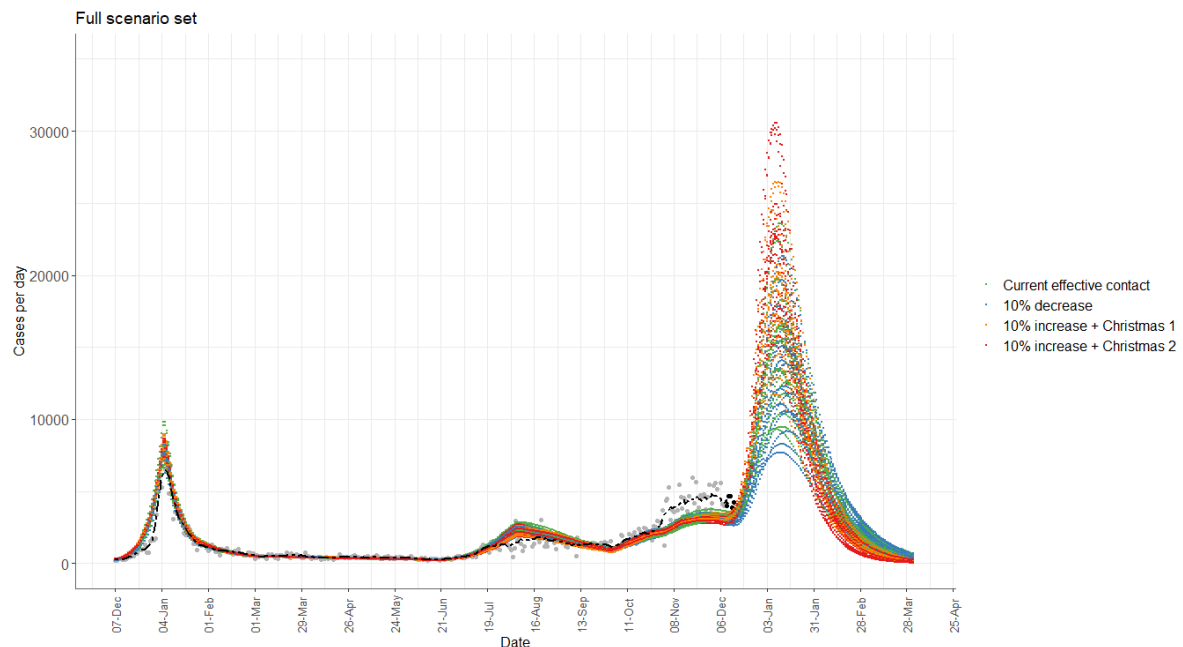


Figure 4: The number of cases per day across the full range of scenarios. The more optimistic scenarios show 8-10,000 cases per day, the more pessimistic exceed 20,000 cases per day.

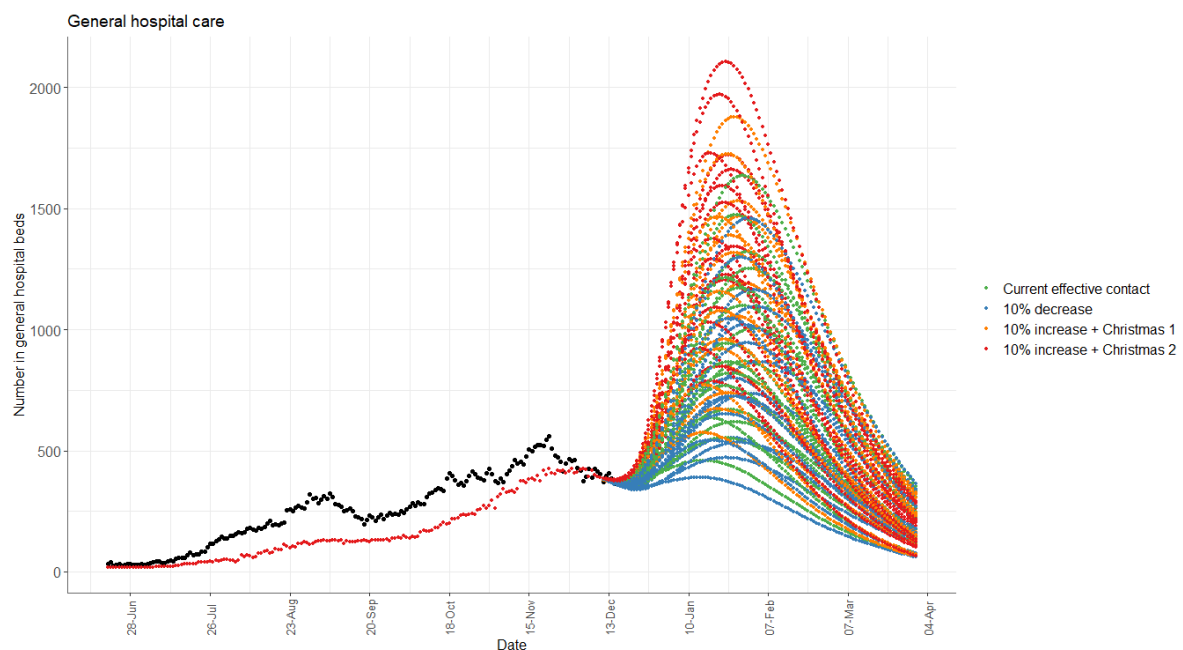


Figure 5: The estimated number of people requiring general hospital care across the full range of scenarios. The more optimistic scenarios show 500-750 people requiring general hospital care, the more pessimistic exceed 1,500.

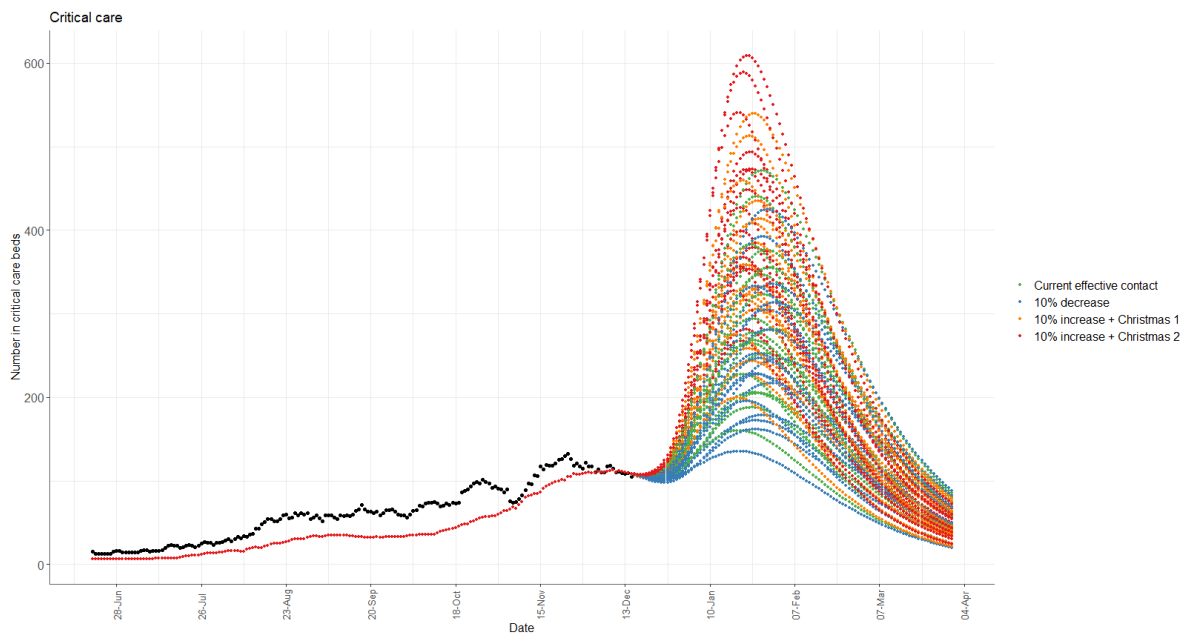


Figure 6: The estimated number of people requiring critical care across the full range of scenarios. The more optimistic scenarios show 150-250 people requiring critical care cases, the more pessimistic exceed 400.

These scenarios show that as omicron becomes dominant, which is likely to happen over coming week, **the risk of a surge in disease is very high, and any such surge is amplified by increased effective social contact over the Christmas period.** It should be noted that the level of infection is so high that at peak between 2% and 5% of the population could be infected, and between 6% and 25% of the population could be a close contact of an infected person. The consequences of this for essential services and the wider economy are significant. **The risk of excess demand for healthcare is difficult to estimate, but is considered very high.** increased further if the level of infection-induced immunity in the population is lower (or if omicron evades immunity from prior infection with other variants). The more optimistic scenarios show 8-10,000 cases per day, 500-750 people requiring general hospital care, and 150-250 people requiring critical care, or 650-1000 people in hospital at peak. The more pessimistic scenarios show in excess of 20,000 cases per day, over 1500 people requiring general hospital care, and in excess of 400 people requiring critical care, or more than 2000 people in hospital overall at peak.

HIQA Public Health Guidance Summary

Key points

Changes in public health measures are being advised or taken internationally following the identification of the Omicron variant. This report provides a summary of all **changes to mitigating measures from 26 November 2021**, when the Omicron variant was declared a variant of concern. Changes to public health measures reflect efforts to reduce the ongoing risks posed by the Delta variant as well as the threat posed by Omicron. This report is accurate to 14 December 2021.

Movement of people

- The ECDC recommends reducing contacts between groups of individuals in social or work settings and that authorities should consider advising reduced inter-household mixing.
- It is recommended that people limit the number of visitors to their home. This ranges from four visitors a day in the Netherlands, three households at a time in Scotland and no more than 10 guests in your home in Norway.
- It is also recommended in the Netherlands and Scotland to self-test before visiting others; being particularly careful when children 12 years or under come into contact with those aged 70 years or older.

Social or mass gatherings

- The ECDC recommends that large public or private gatherings should be avoided.
- Restrictions introduced relating to social or mass gatherings depend on the type of event and whether it is being held indoors or outdoors, these include for example maximum attendance numbers, reduced opening hours and social distancing. In the Netherlands, event venues are closed between 17.00 and 5.00 until 14 January 2022.
- Additionally, a COVID-Pass is now required to attend events in Finland, Italy, Portugal and Switzerland. This may be a 2G pass (proof of vaccination or recovery) or a 3G pass (proof of vaccination or recovery and negative test), depending on the country.

Primary schools

- In Belgium, Denmark and the Netherlands, the Christmas holiday period has been extended for primary schools.
- In Portugal, face-to-face classes have been suspended from 2-9 January 2022.

- In general, face masks are to be worn by children in primary school; the age from which they should be worn ranges from, all children in primary school in Germany, to those aged 11 years or older in England.

Second-level education

- There are similar mitigation measures in second-level education as those in primary schools, with some additional measures.
- In Belgium, in addition to extending the Christmas holidays, lessons should be delivered using a mix of online and face-to-face teaching.
- In the Netherlands, pupils and staff should do a self-test at home twice a week and everyone should wear a face mask indoors, except when in classrooms.

Higher and adult education

- Mitigation measures in higher and adult education are the same as those for primary and second-level education.
- In addition, Italy requires proof of vaccination, recovery or a recent negative test to access university. All face-to-face classes have been suspended in Portugal from 2-9 January 2022 and the Netherlands have introduced a maximum group size of 75 people per room.

Business activities

- In general, all countries advise working from home where possible. A number of countries have restricted opening hours for certain business.
- The opening hours in the catering industry are from 5 a.m. (in Belgium, Czechia, Denmark and the Netherlands) to 5p.m. (in the Netherlands) 10 p.m. (in Czechia), 11 p.m. (in Belgium) and 12 midnight (in Denmark).
- In Germany, people who have not been vaccinated or do not have proof of infection are only allowed to shop in grocery shops and pharmacies. In all other shops, only vaccinated and recovered people are allowed to enter.
- In Italy, proof of vaccination, recovery or a recent negative test is required to access workplaces and shopping malls.

Amateur sport and recreation

- In general, access to sports facilities is only possible through proof of vaccination, recovery or a negative test.
- In Belgium, audiences are not permitted at indoor sporting activities and in the Netherlands, amateur sports matches and training are not permitted between 5 p.m. and 5 a.m.
- In Austria, operators of sports and recreation centres have to collect contact details, appoint a COVID-19 officer and create a COVID-19 prevention protocol.

Professional sport

- Similar to amateur sport, access to professional sports is only possible through proof of vaccination, recovery or a negative test.
- In Italy, spectator capacity is reduced to 60% indoor and 75% outdoor. In Germany the maximum number of spectators is 5,000 indoors and 15,000 outdoors.

Religious activities

- COVID certification or proof of vaccination or recovery is required to attend religious ceremonies in Italy, Portugal and Switzerland (where there are more than 50 people attending).
- In Czechia, the number of people that can take part in religious activities is limited to 100 people.

Public transport

- FFP2 masks are now required on all public transport in Austria, with face masks required by law in England and Norway, and recommended in Sweden if congestion cannot be avoided.
- COVID certification or proof of vaccination or recovery is required in specified circumstances in Italy (inter-regional rail transport) and Austria (cable cars and cogwheel railways, on bus trips and on excursion boats).
- The Swedish Public Health Agency has recommended that, where possible, all adults should use public transport outside of rush hour or they should use other modes of transport, such as walking, cycling or driving.

International travel

- Twelve of the countries (Austria, Belgium, Czechia, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Portugal and Spain) included in this review have introduced stricter travel restrictions for some or all of the following countries: Angola, Botswana, Eswatini, Lesotho, Malawi, Mauritius, Mozambique, Namibia, Nigeria, South Africa, Zambia and Zimbabwe due the Omicron variant. These restrictions vary, however, most include a negative PCR or antigen test result prior to travel along with a requirement to quarantine regardless of vaccination status.
- As of 14 December 2021, there are no countries on the red list in the UK.
- In Germany, all people over the age of 12 who do not have a recovery or vaccination certificate and who are coming from abroad must now provide a negative test upon arrival even if the country is not listed as a high-risk or virus variant area.

Domestic travel

- No updated guidance identified.

Culture, leisure and entertainment

- In general there are restrictions on the capacity allowed at indoor and outdoor cultural, leisure and entertainment events. In Czechia the maximum attendance at leisure activities for children and adults has reduced to 100 participants.
- Nightclubs have closed in Denmark from 10 December 2021, for a 4-week period from 9 December 2021 in France and have been closed since 26 November in Belgium.
- In Germany, Italy and Switzerland, restaurants, cinemas, theatres and other leisure facilities are now only accessible to vaccinated or recovered individuals.
- In Germany, there is a national requirement to close nightclubs and discos when the 7-day incidence increases to greater than 350 per 100,000 inhabitants.

Changes in infection, prevention and control guidance

- The ECDC recommends that for probable or confirmed cases of Omicron infection, contact tracing should be prioritised, regardless of vaccination status.
- In Denmark, stricter guidelines were introduced in response to the Omicron variant. Close contacts are recommended to self-isolate regardless of vaccination status. They should also get a PCR test on days 1, 4 and 6. Self-isolation can be ended with a not-detected result from the last test on day 6.
- In residential facilities and hospitals in Austria, employees and visitors must be vaccinated, recovered or have a negative test (PCR or lateral flow). FFP2 masks are compulsory in all closed rooms, unless other suitable protective devices are available. Operators have to collect contact details and residents can have a maximum of two visits per day in residential facilities or one visit per day in hospitals.
- In Finland, COVID-19 testing has been recommended for a broader range of situations including; patients admitted to hospital, those exposed to COVID -19 in the previous two weeks, those at risk from severe COVID-19, people who have not yet received their booster vaccine dose and health and social care workers and residents of care units for older people.

Face coverings

- The WHO and ECDC continue to advise that the use of masks (in addition to physical distancing, ventilation of indoor spaces, crowd avoidance and hand hygiene) remains key to reducing transmission of SARS-CoV-2 even with the emergence of the Omicron variant.
- In general, face coverings are recommended in all indoor and crowded outdoor spaces. In Austria, it is mandated that FFP 2 masks are to be used if physical contact with people cannot be ruled out.
- In Switzerland, the requirement to wear a mask applies in all situations where a COVID-19 certificate requirement applies - except at private gatherings.

COVID-19 Pass

- A number of countries announced changes to COVID-19 passes relating to the vaccination status requirement.

- France reduced the duration of validity to less than 48 hours for PCR and antigen test results.
- Five countries (Austria, Czechia, Denmark, France and Italy) recently announced expiry dates for COVID-19 Passes which range from 7 months to 270 days, after the final dose of a COVID-19 vaccine series or recovery. Austria and Denmark reduced the duration of validity of vaccination certificates. However, Austria announced that the reduction from 360 days to 270 days did not apply for people who are vaccinated at least once and also recovered. In France, people aged 18 to 64 who had their last dose of vaccine before 17 June 2021 must have their booster by 15 January 2022, so that their pass is not deactivated. Czechia announced the booster dose will extend vaccination certificates validity for an unlimited period.
- For people who were given the Janssen vaccine, an additional dose is required to maintain the validity of COVID-19 passes in Belgium and France.

Vaccination programme

- The ECDC recommends administration of a booster dose 3 months from completion of the primary vaccination.
- Depending on the country, individuals can have booster doses administered two (England) to six (Czechia) months after the primary vaccination schedule has been completed.
- Access to booster doses for over 18s was announced in Scotland and England.
- Children aged between five and 11 who live in Spain will be offered a vaccine.

Christmas and or end of year arrangements

- The ECDC recommends setting limits for the number of participants in social and public events during end-of-year celebrations.
- In Denmark, Christmas lunches and major social events (excluding those in private homes) should be cancelled. Everyone who attends a private home Christmas get-together should be vaccinated, and may take a self-test beforehand.
- In Norway, up to 20 guests can gather in one household once during the Christmas and New Year holidays, but there should be a 1 metre distance between the guests.

