

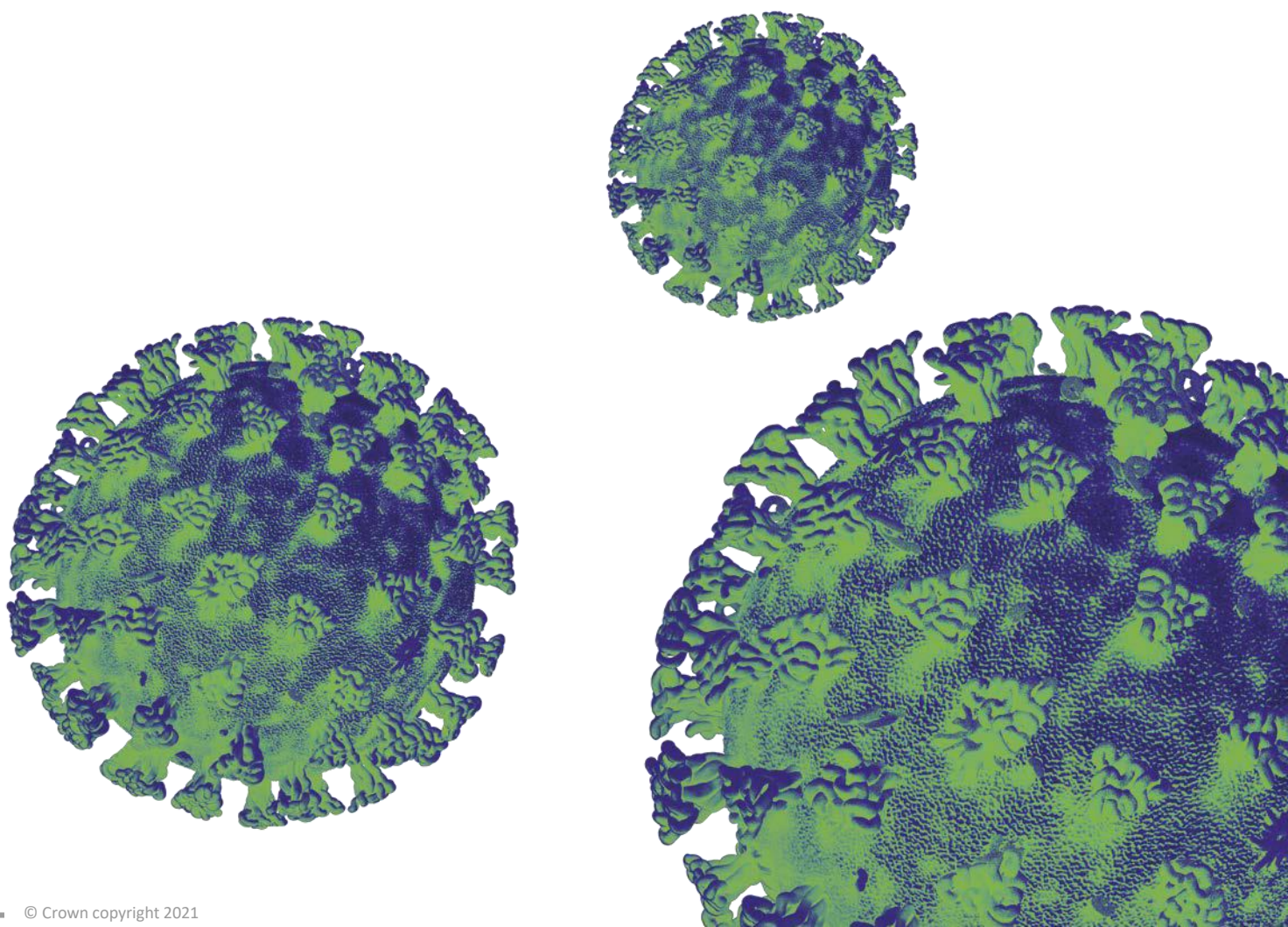


Llywodraeth Cymru
Welsh Government

Technical Advisory Cell

Advice from TAG for the 17 September restriction review

8 September 2021



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This report provides advice on :

1. Commentary on the progress of the current wave of the epidemic and most likely short term scenarios
2. Evidence for benefits and harms associated with vaccine certification and potential effect on the epidemic curve
3. Commentary on wastewater insights
4. Commentary on population level immunity and the implications for the need for protective behaviours.

Advice from previous review cycles is referred to where relevant and is not repeated here.

The question that should be asked is – **what outcome is the government now seeking to achieve?**

The balance of harms has changed and fortunately, the emphasis is now on hospitalisations rather than deaths. At this point, the key question is – **can the NHS cope with the increased demand of COVID alongside every other pressure?**

If the answer is no, there are potentially two solutions. One is to increase the capacity in the NHS and the other is to decrease the cases of COVID-19. Since the first option is operational it will not be considered in this paper. For emergency response planning, we must expect the best but prepare for the worst. In doing so, we must consider the Reasonable Best Case Scenario (RBC) of living with COVID-19, and the Reasonable Worst Case (RWC) of having to react to unmanageable levels of COVID-19.

1. Wales situation update

In general, the ratio of cases to hospitalisations and deaths remains low. This is due in the most part to vaccination and to the continued, although steadily reducing, effect of protective behaviours by the population. However, the growth of cases, hospitalisations and deaths is on an exponential, rather than linear, curve and as with previous waves the potential for direct harm from COVID-19 and indirect harm from loss of NHS services is not insignificant.

The most recent COVID-19 Situational Report (CSR) shows the position of the epidemic for Wales¹. Incidence continues to rise. We are approaching 500 cases per 100,000. Positivity is over 19%, against a background of a high number of testing

¹ [COVID-19 situational reports | GOV.WALES](#)

episodes. The doubling time is estimated to be around 15 days in Wales. There is evidence of a continued steady increase in hospital admissions and ICU admissions. The median age of hospital admissions is increasing, and the balance of COVID-19 related admissions is now made up of vaccinated rather than unvaccinated individuals.

The actual data for cases, hospitalisations and ICU admissions with COVID-19 is now well above the Most Likely Scenario (MLS) that was set in June². COVID-19 patients now take up around 1/3 of beds in intensive care. Currently approximately a third of COVID-19 cases in hospital are hospital acquired (nosocomial)³.

It is important to note that there is not enough information about the purpose of admission for a determination of whether people are being admitted *because of* COVID-19 or *with* COVID-19. PHW are analysing the data available to them on the burden of disease from COVID in hospitals, however this is fraught with difficulty due to insufficient data capture in care settings. Working with the COVID Evidence Centre and SAIL we may be able to commission further analyses.

The most recent short to medium term projections show that cases will continue to rise for some time⁴. This is likely to be driven by the return to work and education of the population, as well as widespread seeding of infection from those who became infected on holiday or at a mass gatherings. The apparent flattening in Scotland offers encouragement that schools may be less of a driving factor.

There is no “one reason” for the increases currently occurring, but the prevalence, lack of restrictions and communications about relaxation and waning immunity all lead to an expected rise in the epidemic.

2. Vaccine certification

Much of the evidence to date refers to ‘immunity passports or certificates’, which provide proof the holder is fully vaccinated, has had a prior COVID-19 infection or a recent negative test result.

SAGE has considered broader immunity certification in a number of previous papers⁵ and concluded that even with careful planning and application there may not be a net benefit to such a move.

² [Technical Advisory Group: policy modelling update 12 July 2021 | GOV.WALES](#)

³ PHW report to COVID-19 Intelligence Cell, reporting date 7 day period ending 3/9/21

⁴ TAG Policy modelling paper September 2021– publication pending

⁵ [NERVTAG: Immunity certification, 9 December 2020](#); [SPI-B: Health status certification in relation to COVID-19, behavioural and social considerations, 9 December 2020](#); [Academics: Ethics of certification – briefing paper, 9 December 2020](#); [SPI-B Policing and Security Subgroup: Health status certification in relation to COVID-19 legitimacy and enforcement considerations, 9 December 2020](#); [SPI-B: Behavioural considerations of health certificates in population mass testing, 26 November 2020](#); [NERVTAG: Certifying COVID-19 immunity, 19 November 2020](#)

Referring to “immunity” certification may give the bearer unreasonable expectations about the level of protection they have. Even in the case of large events and hospitality, holding a certificate should not permit an individual to avoid of self-isolation if symptoms develop, nor be exempt from other measures used to protect high-risk individuals.

The prevalence of infection in the community will have an important impact on the level of risk and any effectiveness of certification (it may be effective when prevalence is low, out with considerations below, but less effective at high prevalence). The reliability of any immunity certificate will be reduced if virus variants with significant antigen escape are circulating. Thus were certification to be used in addition to other measures to control transmission, it will be an imperfect tool and a risk-based approach should be adopted.⁶

Due to the limited evidence and uncertainty around outcomes if certification were to be introduced, SAGE has previously recommended use of pilot studies to understand the impact and practicalities of certification, including consideration of behavioural and ethical issues, particularly concerning equity and fairness, particularly given variable vaccination uptake across groups in the population⁷. TAC do not hold information on any such pilots currently being run. Communication to the public on any certification policy would be important, and attitudes towards certificates can vary between different groups. Certificates should not imply that an individual has no risk rather, that they have a reduced risk.

A recently published review⁸ by a number of academics attending SPI-B (based on earlier work by SPI-B⁹) assessed the evidence related to immunity passports and public attitudes towards certification, and its possible impact on uptake of testing and vaccination, protective behaviours, and crime. The authors concluded that the limited evidence suggests that health certification in relation to COVID-19 – outside of the context of international travel – **has the potential for harm as well as benefit**. Realising the benefits while minimising the harms requires real-time evaluations allowing modifications to maximise the potential contribution of certification to enable safer access to a range of activities- mass events, pubs etc.

Certification requiring vaccination could possibly encourage vaccine uptake although evidence is limited. Several concerns have also been identified, notably the possibility of perverse incentives (e.g. deliberate infection where certification includes proof of prior infection), complacency with regard to other personal protective behaviours (e.g. social distancing or use of face coverings) and the possibility of increased opposition to vaccination among some groups. Higher mistrust in government amongst marginalised communities has affected uptake of vaccination

⁶ [NERVTAG: Immunity certification update, 4 February 2021 \(GOV.UK\)](#)

⁷ [SPI-B: Health status certification in relation to COVID-19, behavioural and social considerations, 9 December 2020 \(GOV.UK\)](#)

⁸ [Behavioural responses to COVID-19 health certification: a rapid review | BMC Public Health | Full Text \(biomedcentral.com\)](#)

⁹ [SPI-B: Health status certification in relation to COVID-19, behavioural and social considerations, 9 December 2020 \(GOV.UK\)](#)

thus far, as well as NHS Test and Trace, and mass (asymptomatic) testing and certification could both mirror, and compound this.

Further, a recent preprint¹⁰ (June 2021) presents UK data from a large scale survey and modelling exercise carried out in April 2021. The findings suggest the introduction of vaccine passports will likely lower the inclination to get vaccinated once baseline vaccine intent has been adjusted for, the decrease being larger if passports were used for domestic purposes (i.e. not for international travel). The authors conclude passports may result in lower vaccine inclination in socio-demographic groups that cluster geographically, possibly contributing to concentrated areas of low uptake and an epidemic risk.

More recently (August 2021) a study¹¹ involving 1300 adults in the UK and Israel explored willingness and motivation to get vaccinated as determined by psychological needs. The authors conclude that vaccine passports may have detrimental effects on people's autonomy, motivation, and willingness to get vaccinated, and affect longer term relationships with local governments and health authorities (that are crucial for public health adherence and behaviour change to occur).

3. Wastewater insights

Since mid-July the mean wastewater signal in Wales has steadily increased, in line with positive cases reported by Public Health Wales. The wastewater signal is broadly comparable to the ONS Covid-19 prevalence in Wales during that same period.

Some specific sites in both North and South Wales have seen trends above the average during this period. Sites of specific concern in the last 14 days are Chester, Bangor and Wrexham in the North and Newport (Cog Moors) in the South.

4. Population level immunity

A useful article from the Atlantic¹² offers this description, likening herd immunity to wet logs in a campfire:

“If there’s enough water in the logs—if there’s enough immunity in a population—you can’t get the fire to start, period... But what if we still can’t get the logs wet

¹⁰ [The potential impact of vaccine passports on inclination to accept COVID-19 vaccinations in the United Kingdom: evidence from a large cross-sectional survey and modelling study \(medRxiv\)](#)

¹¹ [Vaccines | Free Full-Text | “Vaccine Passports” May Backfire: Findings from a Cross-Sectional Study in the UK and Israel on Willingness to Get Vaccinated against COVID-19 | HTML \(mdpi.com\)](#)

¹² [COVID-19 Vaccines Might Never Get Us to Herd Immunity - The Atlantic Waning Immunity Is Not a Crisis, Right Now - The Atlantic](#)

enough? What if they are drying out faster than we can douse them? A number of signs now point to a future in which the transmission of this virus cannot be contained through herd immunity.”

Expanding this analogy further, not all logs will hold water for the same time and not all fires are the same (some rage some smoulder). It may not be possible to have sufficient wet logs at any one time to avoid a raging fire from spreading. But if the intensity of the fire recedes and wet logs exist then it may be less likely to take hold and do as much damage in the future. As it is, we have some drying, but still wet logs in a significant fire.

On protective behaviours, we have sufficient evidence that this has waned more quickly than the protective effects of vaccines. Doing the things that we know work well will help reduce R_t – in particular isolation of symptomatic (and positive) people as quickly as possible for 10 days – supporting people to isolate for the full period (by financial or other support). Educating people why this is important, even when they are vaccinated. Collective action works but everyone has to buy-in.

COVID-19 has existed for over 18 months and natural immunity has built up in the population following infections. On top of that, deployment of vaccines has further increased immunity against COVID-19 infection. It is estimated that over 80% (may be closer to 90%) of the Welsh population, spread evenly across Wales, must be immune to COVID-19 before population immunity effects could be observed.

Despite an average vaccine first dose uptake of 89% in those aged 16 and over in Wales (74% of the total population), it will be extremely difficult, if possible, to reach population immunity. Factors affecting the likelihood of achieving population immunity include: lower vaccine uptake in younger age groups, a significant proportion of those aged under 18 being ineligible for vaccines, a non-uniform distribution across Wales and across age groups, R_0 of the dominant delta variant and other emerging variants, the proportion of individuals immune from natural infection, the possibility of waning immunity and the need for booster vaccines, the possibility of emerging variants with increased transmissibility or mortality risk or ability to escape immune responses, and evidence that vaccines are not 100% effective.

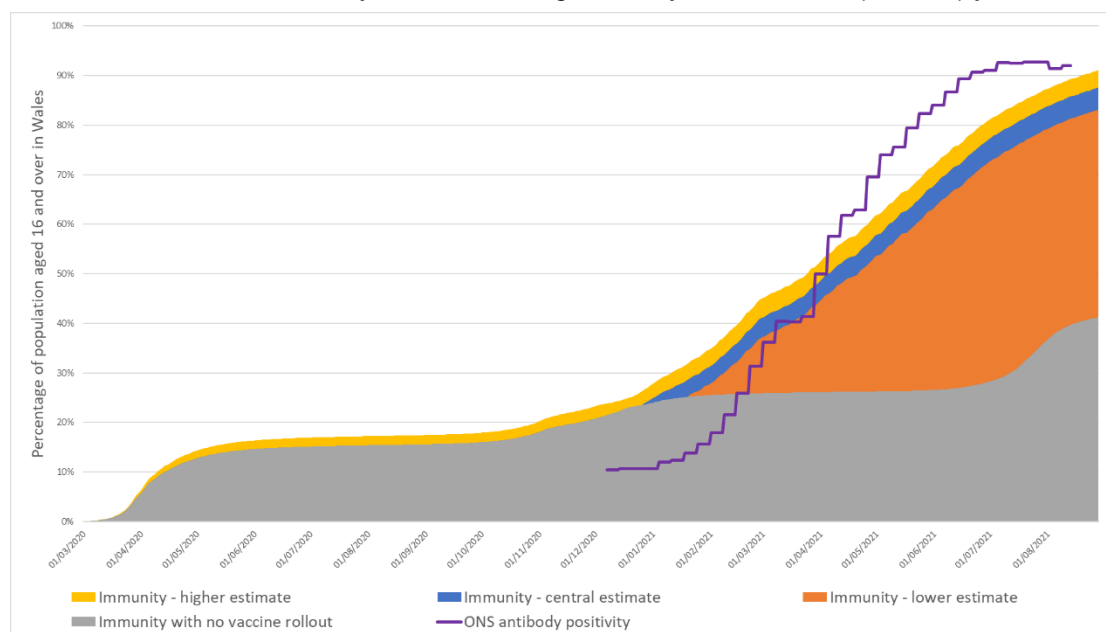
Waning immunity from natural infection and vaccination is a key uncertainty in population immunity estimates and is increasingly important. Of concern, recent studies from Israel have reported higher infection rates in individuals vaccinated earliest compared with those vaccinated later.¹³ Additionally, immunity against COVID-19 infection may wane faster or to a greater degree than immunity against severe illness and death.

¹³ [Elapsed time since BNT162b2 vaccine and risk of SARS-CoV-2 infection in a large cohort \(nih.gov\)](#)

Analysis has been carried out to estimate the percentage of the population of Wales with COVID-19 immunity against infections.¹⁴ The key results (updated using latest available data) obtained from our default scenario are as follows:

- Assuming immunity wanes after 2 (or more) years, 88% [83%, 91%] of people **aged 16 and over** in Wales were estimated to have had some immunity against COVID-19 infection at 28 August 2021.
- Assuming immunity wanes after 2 years, 75% [74%, 78%] of the **total population of Wales** were estimated to have had some immunity against COVID-19 infection at 28 August 2021.
- Immunity levels varied across age groups. Highest immunity was estimated in individuals aged 80 and over at 97% [91%, 100%] at 28 August 2021. Lowest immunity (excluding individuals aged under 16) was estimated in individuals aged 16 to 17 at 53% [48%, 57%] at 28 August 2021.
- Immunity levels in the population have been significantly increased by the vaccine rollout. If no vaccines had been administered, it was estimated that 41% of people aged 16 and over in Wales (39% of the total population) would have had some immunity against COVID-19 infection at 28 August 2021.

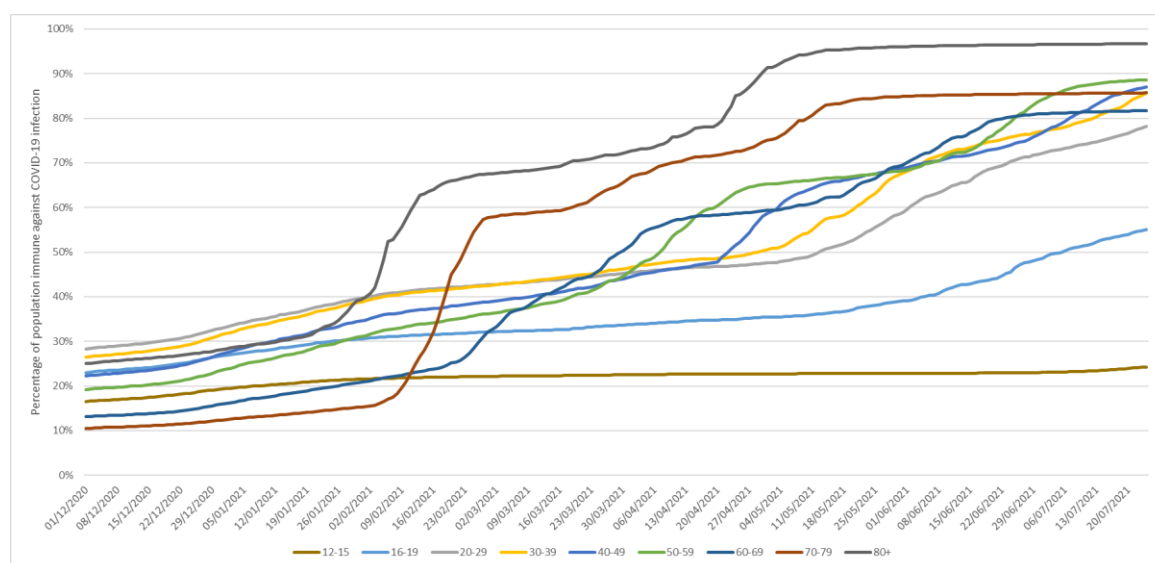
Figure 1: Default Scenario - Immunity estimates and antibody status of individuals aged 16 and over in Wales, to 24 July 2021, assuming immunity wanes after 2 (or more) years



¹⁴ Wales' immunity estimates to the 24 July 2021 published [here](#) on 8 August 2021.

Sources: [ONS COVID-19 Infection Survey](#), [PHW](#), [SPI-M](#), Swansea University modelling

Figure 2: Default Scenario Immunity estimates in Wales, by age group, to 24 July 2021, assuming immunity wanes after 2 years



Sources: [ONS COVID-19 Infection Survey](#), [PHW](#), [SPI-M](#), Swansea University modelling

In the default scenario, immunity was assumed to wane after 2 years. This time period was based on time to waning immunity of other coronaviruses.¹⁵ Since the COVID-19 pandemic started less than 2 years ago, no individuals were modelled to have had their immunity wane up to September 2021 in the default scenario. Studies have reported that antibodies are detectable for at least 6 months and probably 8 months or more.¹⁶ The SIREN study reported that a previous history of SARS-CoV-2 infection was associated with an 84% lower risk of infection, with median protective effect observed 7 months following primary infection.¹⁷ The Vivaldi study reported that natural immunity to COVID-19 substantially reduced the risk of reinfection for approximately 10 months following primary infection.¹⁸ Therefore, scenarios were modelled assuming immunity waned after 7 months and 10 months.

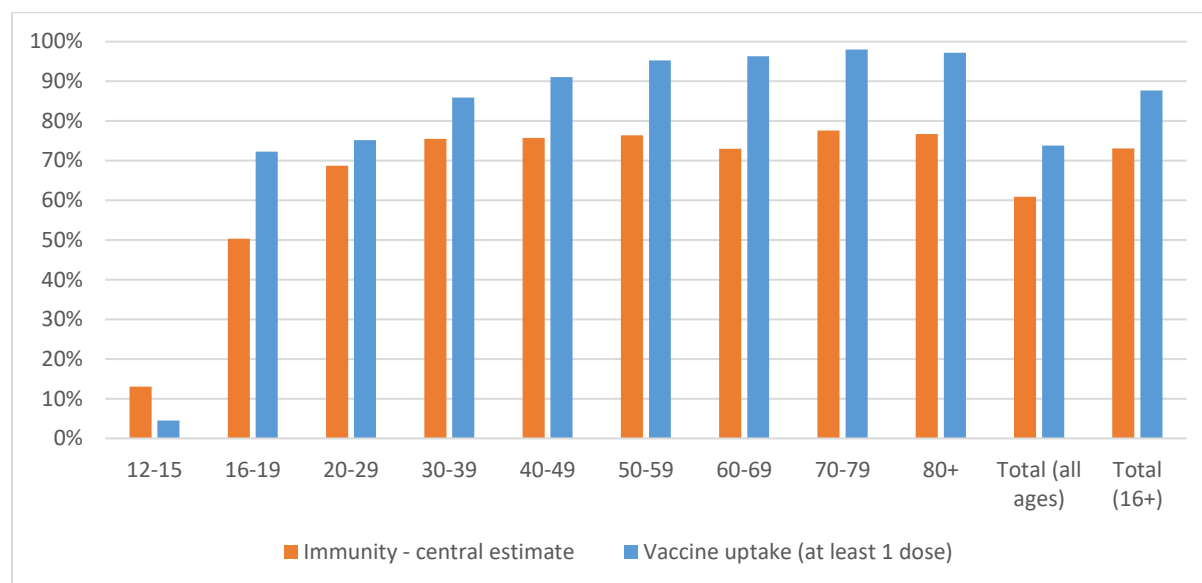
¹⁵ [S907_NERVTAG_certifying_COVID_immunity.pdf \(publishing.service.gov.uk\)](#)

¹⁶ [NERVTAG: Immunity certification update, 4 February 2021 - GOV.UK \(www.gov.uk\)](#)

¹⁷ [SARS-CoV-2 infection rates of antibody-positive compared with antibody-negative health-care workers in England: a large, multicentre, prospective cohort study \(SIREN\) - The Lancet](#)

¹⁸ [Vivaldi 2: COVID-19 reinfection in care homes study report - GOV.UK \(www.gov.uk\)](#)

Figure 3: Default scenario Immunity estimates and vaccine uptake in Wales, by age group, to 28 August 2021, assuming immunity wanes after 2 years



- Assuming immunity wanes after 210 days (roughly 7 months), 64% [62%, 65%] of people **aged 16 and over** in Wales were estimated to have had some immunity against COVID-19 infection at 28 August 2021.
- Assuming immunity wanes after 210 days (roughly 7 months), 53% [51%, 54%] of the **total population of Wales** were estimated to have had some immunity against COVID-19 infection at 28 August 2021.
- Assuming immunity wanes after 300 days (roughly 10 months), 73% [70%, 75%] of people **aged 16 and over** in Wales were estimated to have had some immunity against COVID-19 infection at 28 August 2021.
- Assuming immunity wanes after 300 days (roughly 10 months), 61% [58%, 63%] of the **total population of Wales** were estimated to have had some immunity against COVID-19 infection at 28 August 2021.