

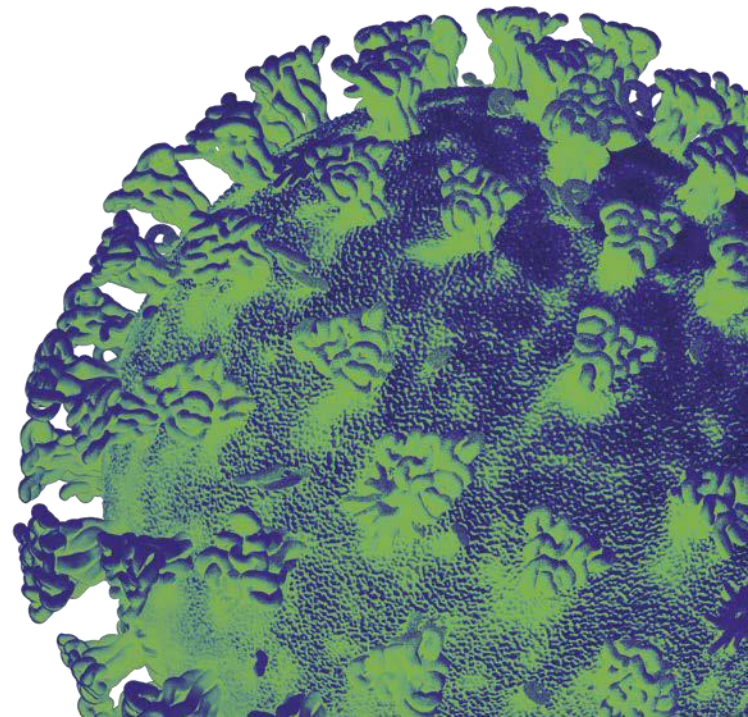
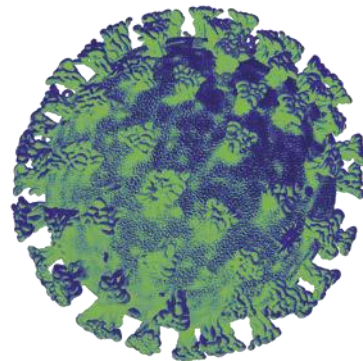
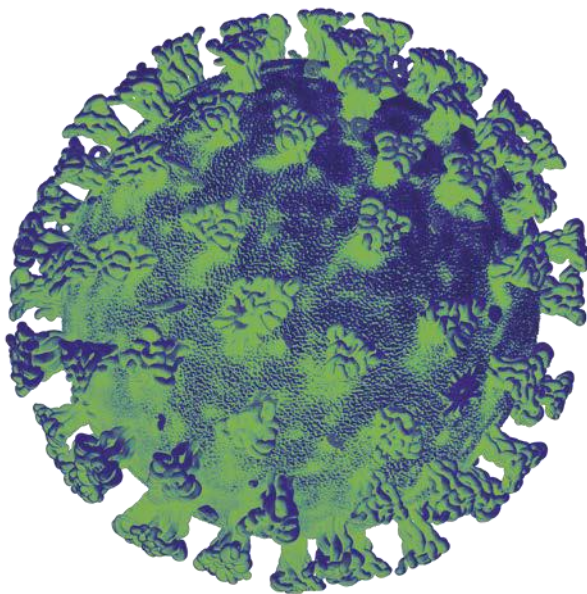


Llywodraeth Cymru
Welsh Government

Technical Advisory Group

Advice for 15th July Restriction Review

2 July 2021



Advice for 15th July Review from the Technical Advisory Group and the Chief Scientific Advisor for Health (2 July 2021)

Contents

1.	Summary of advice	3
2.	Wales Situational Report	4
	6-day predictive waste water levels and observed cases	8
3.	UK Situation Report.....	9
4.	Public Health Wales (Delta Variant Epidemiology)	10
5.	Public Health England Technical Variant Report (25 June).....	11
	Delta +K417N (AY.1)	12
6.	Medium Term Projections (Imperial).....	12
7.	Medium Term Projections (SPI-M modelling)	13
8.	Swansea University Modelling.....	14
9.	Ratios of Cases to Admissions and Deaths, Wales (TAC Analytics)	16
10.	Ratios of Cases to Admissions and Deaths from 1 st March 2021 to 26 th June 2021, by UK nation (Internal only – OFFICIAL SENSITIVE)	18
11.	Comparison of wave one, two and three for Scotland, England and Wales (TAC).....	19
12.	Long Covid	21
13.	Behavioural considerations supporting this advice	21
14.	Baseline measures moving forwards	22
	Adult mixing and home working	24
15.	Conclusions	25
	Annex 1- Public Health Wales COVID-19 briefing to Welsh Government: Spread of SARS-CoV-2 variants in Wales	28
	Annex 2- SPI-M: Transitioning from non-pharmaceutical interventions to vaccination to control COVID-19 transmission OFFICIAL-SENSITIVE (Not for further sharing).....	45

1. Summary of advice

- The advice from TAG should be read in conjunction with [previous regulation review submissions](#) and considered in the context of the current epidemiological situation¹. The most recent situational assessment for Wales is documented in the COVID-19 Situational Report [here](#).
- COVID-19 cases are increasing in Wales, particularly in younger age groups. Cases are doubling approximately every eight days (high confidence).
- Social contact levels have increased in Wales, albeit at lower levels than pre-pandemic. The public perception of risk from COVID-19 has decreased, although adherence to restrictions remains high according to self-reported survey data.
- Comparing the most recent increases with previous waves in the UK nations shows indications of a step change in the case to hospitalisation ratio, which is a result of the impact of vaccination.
- National risk assessment of the delta variant has not changed significantly since previous advice. Estimates of Delta's growth advantage remain between 40 and 80% (PHE/SPI-M) and a higher risk of hospitalisation compared to Alpha. Vaccine Effectiveness remains close to previous estimates with two doses providing similar vaccine effectiveness to Alpha.
- Observed data appears to be diverging from the more pessimistic modelled scenarios for cases and hospitalisations. More observational data will provide greater confidence in estimates of future growth, this is important given the uncertainty over the growth advantage of delta.
- Updated estimates from the ONS² indicate that in the 4-week period ending 6 June 2021, an estimated 1.4% of the Welsh population were experiencing self-reported long COVID.
- If population baseline measures are retained as restrictions are relaxed, it is imperative that practical support to assist risk-based decision making is available and promoted as widely as possible.
- Working from home currently occurs in the context of a wide range of other measures that also reduce the number of effective contacts that allow for viral

¹ This advice is informed by a range of evidence sources, including from the Scientific Advisory Group for Emergencies (SAGE), the Welsh Government Technical Advisory Group (TAG) and subgroups, Public Health Wales, the Wales COVID-19 Evidence Centre, and the wider academic literature and surveillance data. Advice from previous review cycles is referred to where relevant and is not repeated here.

² [Prevalence of ongoing symptoms following coronavirus \(COVID-19\) infection in the UK - Office for National Statistics \(ons.gov.uk\)](https://ons.gov.uk)

transmission. While individually these other measures may not contribute much, together they do add up to a significant impact.

- Relaxations to level one seem counterintuitive given the increase in cases, however this reflects the changing dynamics and balance of harms. Modelling suggests that, even with high levels of a vaccinated adult population, we will continue to need baseline measures like TTP, work place risk assessments, working from home and importantly protective behaviours from the public (e.g. isolation on symptoms, handwashing, reducing social contacts) to keep the epidemic at manageable levels. Importantly there is an increased risk of a resurgence of hospitalisations and deaths if immunity levels drop as a result of waning vaccine-derived or natural infection-derived immunity, or new variants that escape immune responses, or if vaccination uptake is lower than expected in younger adults.
- Additional TAG papers on balancing five harms, indicators and thresholds and venue specific advice will be made available next week.

2. Wales Situational Report

- The most recent Reproduction number (R_t) in Wales is currently estimated as being between 1.1 and 1.5, with a doubling time of between 1 and 7 days by SAGE and 1.8 and 1.9 with a doubling time of 6 to 10 days by PHW. Note that SAGE estimates are lagged by around 2-3 weeks while PHW is lagged by around 1 week and uses a different methodology.

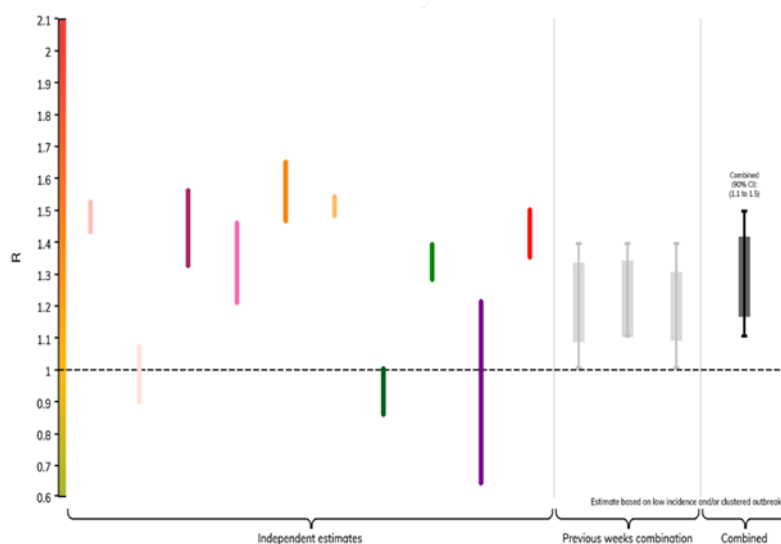


Figure 1. SPI-M-O groups estimates of median R_t in the Wales, including 90% confidence intervals. Bars represent different independent estimates. The grey shaded areas represent the combined numerical range and the black bars are the combined R_t

- Cases at a national level have increased rapidly since the beginning of June, following a six-month sustained reduction in cases, with an 800% increase

from a very low baseline. The number of weekly cases recorded by PHW for the period as at 25 June is 65 per 100,000 people, or 2043 cases in total.

- However, this general summary provides a skewed picture, with the reality being considerable heterogeneity between regions and case numbers dominated by younger, less-vaccinated age groups.

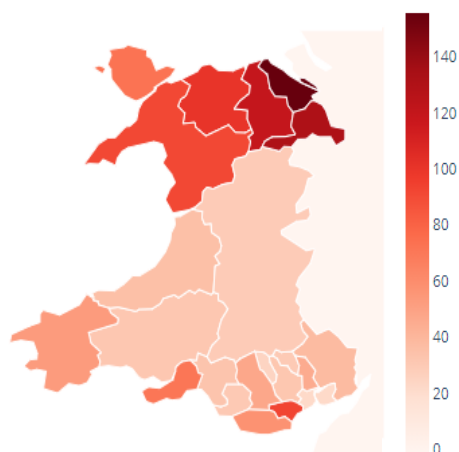


Figure 2. COVID-19 cases in last seven days per 100k population by Local Authority

Local Authority	#	% of All Wales Total	Case Incidence per 100,000	Incidence threshold reached	Change from previous week	Proportion of tests positive (%)	Positivity threshold reached	Test Incidence per 100,000
Blaenau Gwent	21	1.0%	30.06	25 to < 50	200% ↑	2.1%	Under 2.5%	1448.57
Caerphilly	58	2.8%	32.03	25 to < 50	61% ↑	2.6%	2.5 to < 5%	1248.65
Monmouthshire	36	1.8%	38.06	25 to < 50	100% ↑	2.9%	2.5 to < 5%	1313.04
Newport	34	1.7%	21.98	20 to < 25	70% ↑	1.5%	Under 2.5%	1430.09
Torfaen	43	2.1%	45.76	25 to < 50	258% ↑	3.4%	2.5 to < 5%	1329.27
ABUHB	192	9.5%	32.31	25 to < 50	106% ↑	2.4%	Under 2.5%	1342.39
Conwy	118	5.8%	100.68	50 or higher	17% ↑	4.7%	2.5 to < 5%	2143.29
Denbighshire	115	5.6%	120.17	50 or higher	60% ↑	5.7%	5% or higher	2106.67
Flintshire	243	11.9%	155.67	50 or higher	79% ↑	8.4%	5% or higher	1852.02
Gwynedd	114	5.6%	91.52	50 or higher	245% ↑	4.9%	2.5 to < 5%	1873.80
Isle of Anglesey	51	2.5%	72.81	50 or higher	240% ↑	5.1%	5% or higher	1426.27
Wrexham	179	8.8%	131.66	50 or higher	180% ↑	7.6%	5% or higher	1737.31
BCUHB	820	40.6%	117.22	50 or higher	95% ↑	6.3%	5% or higher	1874.61
Bridgend	45	2.2%	30.60	25 to < 50	61% ↑	2.3%	Under 2.5%	1305.69
Merthyr Tydfil	15	0.7%	24.86	20 to < 25	275% ↑	1.7%	Under 2.5%	1475.32
Rhondda Cynon Taf	115	5.6%	47.67	25 to < 50	342% ↑	3.6%	2.5 to < 5%	1341.27
CTMUHB	175	8.7%	39.01	25 to < 50	202% ↑	2.9%	2.5 to < 5%	1347.63
Cardiff	342	16.7%	93.21	50 or higher	144% ↑	6.3%	5% or higher	1476.14
Vale of Glamorgan	77	3.8%	57.64	50 or higher	31% ↑	3.9%	2.5 to < 5%	1479.93
CVUHB	419	20.7%	83.72	50 or higher	111% ↑	5.7%	5% or higher	1477.15
Carmarthenshire	60	2.9%	31.78	25 to < 50	94% ↑	2.1%	Under 2.5%	1497.05
Ceredigion	26	1.3%	35.77	25 to < 50	8% ↑	2.4%	Under 2.5%	1510.42
Pembrokeshire	67	3.3%	53.25	50 or higher	49% ↑	3.2%	2.5 to < 5%	1658.75
HDUHB	153	7.6%	39.51	25 to < 50	53% ↑	2.5%	2.5 to < 5%	1552.09

Local Authority	#	% of All Wales Total	Case Incidence per 100,000	Incidence threshold reached	Change from previous week	Proportion of tests positive (%)	Positivity threshold reached	Test Incidence per 100,000
Powys	39	1.9%	29.45	25 to < 50	44% ↑	2.5%	Under 2.5%	1185.49
PTHB	39	1.9%	29.45	25 to < 50	44% ↑	2.5%	Under 2.5%	1185.49
Neath Port Talbot	48	2.3%	33.49	25 to < 50	33% ↑	2.1%	Under 2.5%	1600.67
Swansea	176	8.6%	71.26	50 or higher	151% ↑	4.8%	2.5 to < 5%	1496.80
SBUHB	224	11.1%	57.39	50 or higher	111% ↑	3.7%	2.5 to < 5%	1534.94
Total	2043	100.0%	64.80	50 or higher	101% ↑	4.2%	2.5 to < 5%	1541.92

Table 1. Cases and Tests - All confirmed episodes - For the 7 day period ending 25-06-2021

- At a national level cases in the 20-29 age group are 148 per 100,000 population, followed by 10-19 at 118, 30-39 at 60 and 40-59 at 49. There is also considerable heterogeneity at a regional level between the North and South of Wales for these groups, with these figures for younger ages being higher again in North Wales (see figures 2a-c).
- For the most recent period cases in the under 60s remains low at an average of 13 cases per week, although this has doubled from an even lower point since the beginning of June. This pattern does not appear to have filtered through to admissions or deaths.

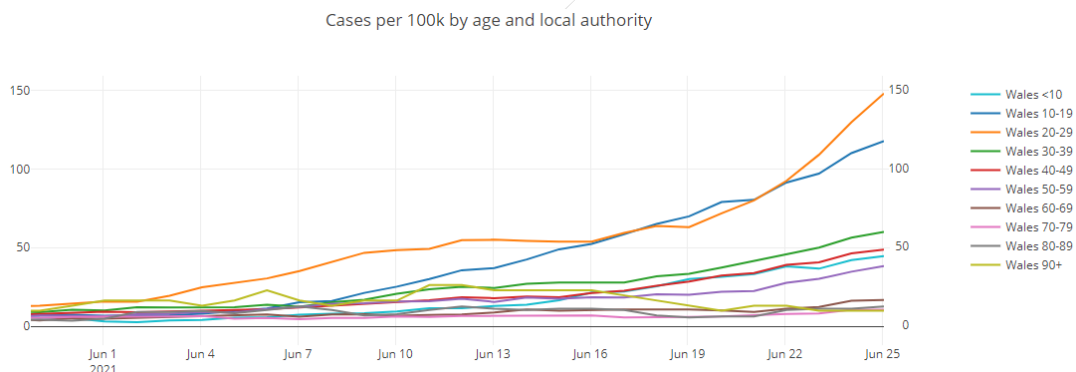


Figure 2a. Cases per 100k population by age group (PHW data, 01 July)

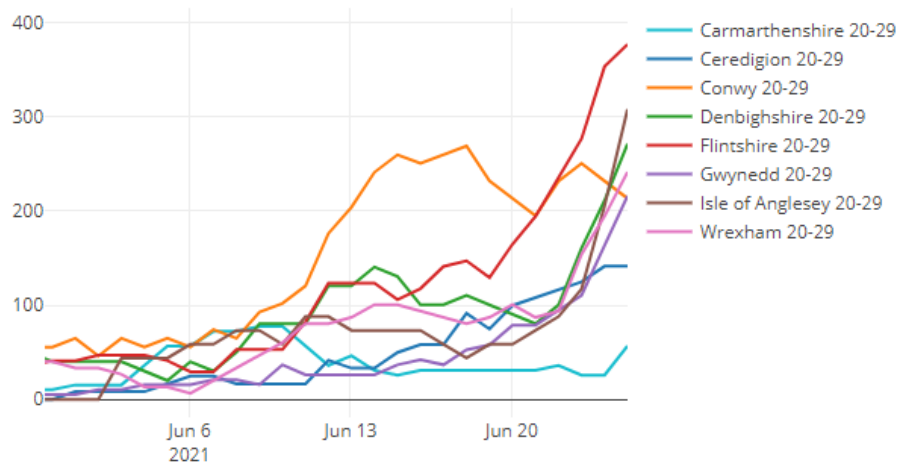


Figure 2b. Cases per 100k population ages 20-29 by Local Authority North Wales, PHW data 01 July

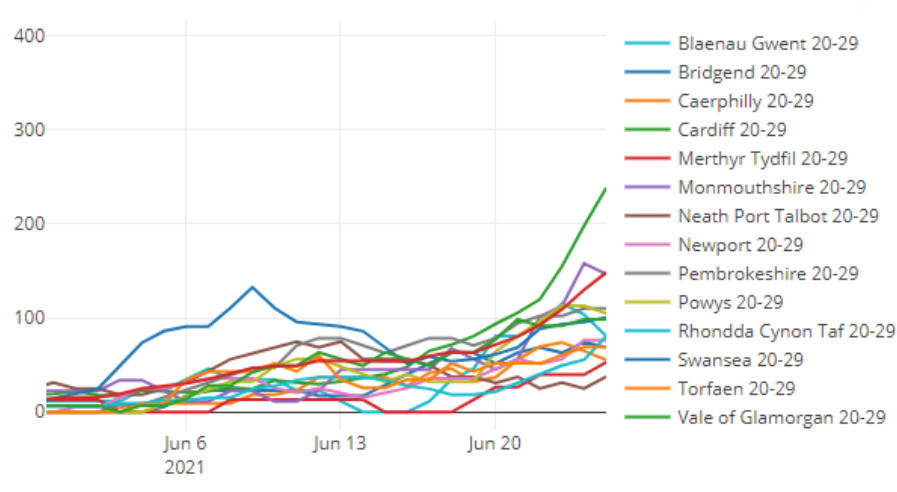


Figure 2c. Cases per 100k population ages 20-29 by Local Authority South Wales, PHW data 01 July

- In the most recent week, cases increased by about 85% and if this trend continues unchanged then daily case numbers could exceed the December peak in four more weeks.
- Since the beginning of May, COVID-19 confirmed hospital occupancy in Wales has been at the lowest levels since the pandemic began and this appears to have increased in June, albeit still at low levels. This is also true for ICU admissions and invasive ventilated bed occupancy.
- COVID-19 deaths are also currently at their lowest level, with around 0-10 COVID-19 deaths per week since the beginning of March (decreasing to 0-5 since and remaining stable).
- According to data from the Welsh Government Survey of public views on the coronavirus perception of the threat posed by COVID-19 have reduced over recent months, with 29% saying they are only leaving the home for essential

trips, 49% believe the virus poses a threat to the country and 23% believing the virus poses a personal threat.

- The number of close contacts contacted through contact tracing relative to index cases has also increased from 1,093 at the beginning of May (365 index cases, average 3 contacts) to 4,459 (1,118 index cases, average 4 contacts)
- Testing waste-water for SARS-CoV-2 RNA has potential to be representative of the true levels of SARS-CoV-2 in the community, less affected by testing policy, behaviour and other service effects.
- Waste Water data has generally been confirmatory of the levels of SARS-CoV-2 observed through traditional community testing regimes.

6-day predictive waste water levels and observed cases

- Recent modelling suggests that the rate of RNA shedding is being reduced following uptake of the vaccine, this has resulted in Waste Water signals being reduced against the observed cases.
- An increased level of SARS-CoV-2 was observed at a Waste Water Treatment Works in Pembrokeshire during the early May bank holiday and again a slight increase during the school half-term week in early June. Observed case data at this time does not indicate the same pattern, suggesting the Waste Water signal has picked up signs of infection from a transient population.
- A new process for identifying variants and their abundance within a sample of Waste Water has been developed by Cardiff University as part of the Waste Water Monitoring Programme. The new process will be introduced into the waste water surveillance reporting over the summer.

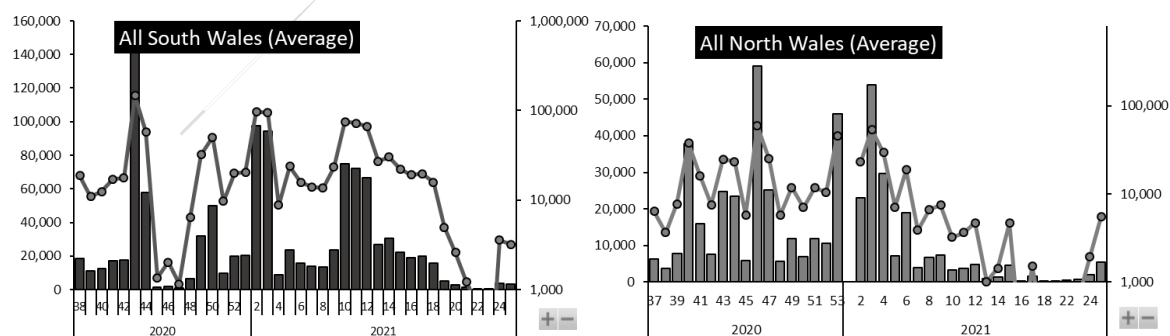


Figure 3: South & North Wales - Waste Water Surveillance Data - SARS-CoV-2 (cp/L)

- Provisional data shows that on 24 June 12,645 pupils were absent from school for at least part of the day for a known COVID-19 related reason. This equates to 3.2% of all pupils being absent due to a known COVID-19 related reason. A COVID-19 related reason includes remote learning due to COVID-19, partial and forced closure of the school due to COVID-19 or school-

directed absence due to COVID-19 such as shielding or self-isolation. It does not include pupils who are absent due to illness with COVID-19.

3. UK Situation Report

- Cases have rapidly increased across the UK as a result of the Delta variant, particularly in Scotland, although cases may have peaked very recently. This rise in cases previously led to many planned easements of restrictions being delayed across the UK nations. Both the English and Scottish government have since signalled that easing of restrictions will resume in the coming weeks despite increasing cases, largely in response to indications that the vaccines have significantly weakened the relationship between cases, hospitalisation and death compared to previous waves.

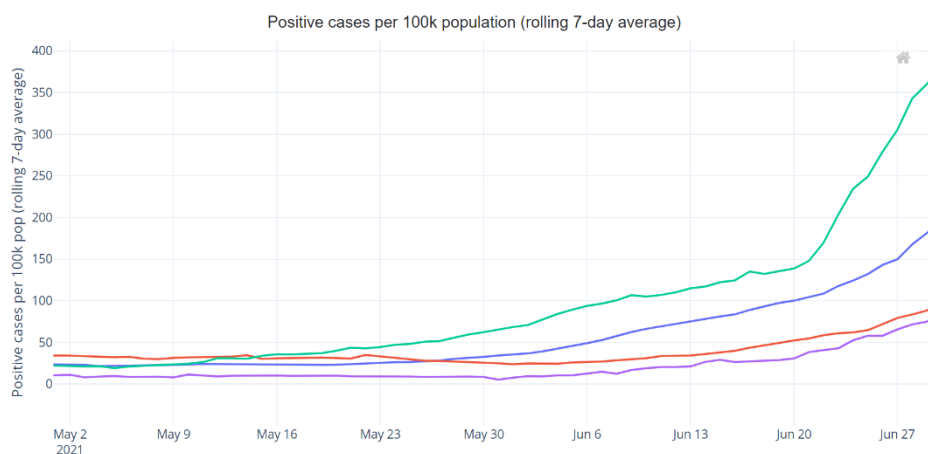


Figure 3. Four nations: Positive cases per 100k population (7 day rolling average) green – Scotland, blue – England, red – Wales, purple – N. Ireland (TAC 01 July)

- While cases continue to rise, contacts of those aged 18 and over remain stable. The documented protective effect of working from home may be partially driving this, alongside a vast range of other smaller measures that combine to have a big impact on reducing transmission. SAGE have stated there is scope for the epidemic to grow considerably more quickly if all these mitigating factors are relaxed over a short period of time.
- During its most recent week (20 to 26 June), the ONS community infection survey estimates that an average of **6,800 people had COVID-19** in the community in Wales (95% credible interval **3,700 to 11,000**). The survey does not include people in care homes, hospitals, or prisons. Estimates from across the four nations of the UK are:

England	211,100 (95% credible interval 185,200 to 239,300)
Scotland	35,900 (95% credible interval 26,500 to 47,200)
Wales	6,800 (95% credible interval 3,700 to 11,000)

N. Ireland 2,800 (95% credible interval 1,000 to 5,500)

- SAGE's most recent estimate of Rt and growth rates for the UK is below; note that R is an indicator that lags by two-to three weeks and therefore does not reflect any significant changes in this time, for example the recent step change in the number of cases observed in Scotland.

SAGE Rt and Doubling time estimates as at 30 June				
Nation	England	Scotland	Wales	Ireland
Daily growth rate	+2% to +5%	+3% to +7%	+1% to +7%	+1% to +5%
Doubling time	16 to 29 days	10 to 22 days	11 days to flat	14 days to flat
Reproduction number	1.1 to 1.3	1.2 to 1.5	1.1 to 1.5	1.1 to 1.4

Table 2: ([SPI-M Consensus 30 June](#))

- In line with last week's SPI-M consensus statement, data from Comix shows that the number of contacts made by adults has remained broadly flat from late April / early May 2021 to date (Figure 3), i.e. taking Step 3 in England on 17 May has led to minimal increases in contacts. This has happened alongside the observed increases in cases. Adults are making contact with slightly fewer people than in August/September 2020 and far fewer than before the pandemic. Pre-pandemic data collected with the same methodology suggested an average of 11 contacts per day. (SPI-M Consensus 30 June)

4. Public Health Wales (Delta Variant Epidemiology)

- As of late May/June the Delta variant has become the dominant variant in Wales, accounting for 94% of cases as at 14 June at a national level. The majority of Delta cases are in people aged under 30, with a lesser proportion being contacts of confirmed cases, suggesting community transmission. Only a small proportion are linked to international travel (<2%) and 48% of Delta cases were unvaccinated, reflecting the rollout of the vaccine by age group.
- Genomic analysis by the Public Health Wales Pathogen Genomics Unit (PenGU) have used sampling to determine that Welsh case clusters fall into a wide range of sizes, ranging from very large groups that encompass significant outbreaks to sporadic cases with only a handful of close contacts. Across most groups identified, Welsh samples crossover with samples from elsewhere in the UK, indicating a pattern of mixing and transmission across the border.

- A conservative estimate of over 100 separate introductions into Wales have been estimated through genomic analysis. There is also considerable evidence of community transmission in most parts of Wales through both single sporadic cases and multi-case clusters. In 31 of 55 Delta variant groups identified in the analysis, cases originated from 2 or more Welsh local authorities, suggesting wider transmission in Wales. 13 of these groups encompass cases in both North and South Wales, suggesting the presence of non-local transmission within Wales in addition to community transmission.
- Full paper available in [Annex 1a and 1b](#)

5. Public Health England Technical Variant Report (25 June)

- Public Health England's most recent weekly [variant technical briefing](#) states that the secondary attack rate of Delta compared to Alpha is around 40% higher and that cases from non-household contacts make up a higher proportion of cases identified. PHE's estimate of vaccine effectiveness has increased slightly but remains at around 15% reduction for the Delta variant compare to Alpha at 35%. Vaccine effectiveness against hospitalisation and severe disease remains high with only a minor reduction in effectiveness for the Delta variant.

Table 8. Vaccine effectiveness against symptomatic disease for Alpha and Delta variants

Vaccination status	Vaccine effectiveness (%)	
	Alpha	Delta
Dose 1	49 (46 to 52)	35 (32 to 38)
Dose 2	89 (87 to 90)	79 (78 to 80)

Table 9. Vaccine effectiveness against hospitalisation for Alpha and Delta variants

Vaccination status	Vaccine Effectiveness (%)	
	Alpha	Delta
Dose 1	78 (64 to 87)	80 (69 to 88)
Dose 2	93 (80 to 97)	96 (91 to 98)

Source: [SARS-CoV-2 variants of concern and variants under investigation Technical Briefing 17 \(publishing.service.gov.uk\)](#)

- Information on hospitalisation by variant shows that Delta case fatality rates are lower for Delta compared to Alpha, as a result of vaccine coverage.
- In England 10% of Delta variant cases were in the over 50 age group, while 24% of hospital inpatients and 92% of deaths were in this age group. Of these, 35% were unvaccinated, 16.5% were partially vaccinated and 45% had received both doses

Table 4. Attendance to emergency care and deaths by vaccination status among Delta confirmed cases (sequencing and genotyping) including all confirmed Delta cases in England, 1 February 2021 to 21 June 2021

	Age group (years)	Total	Cases with specimen date in past 28 days	Unlinked	<21 days post dose 1	≥21 days post dose 1	Received 2 doses	Unvaccinated
Delta cases	All cases	92,029	79,336	11,015	6,242	13,715	7,235	53,822
	<50	82,458	71,311	9,892	6,154	9,850	3,689	52,846
	>50	9,571	8,025	1,123	88	3,865	3,546	976
Cases with an emergency care visit§ (excluding cases with the same specimen and attendance dates)‡	All cases	2,406	N/A	33	186	426	190	1,571
	<50	2,013	N/A	25	183	259	68	1,478
	>50	393	N/A	8	3	167	122	93
Cases with an emergency care visit§ (including cases with the same specimen and attendance dates)	All cases	3,460	N/A	51	249	564	348	2,248
	<50	2,728	N/A	40	238	321	94	2,035
	>50	732	N/A	11	11	243	254	213
Cases where presentation to emergency care resulted in overnight inpatient admission§ (excluding cases with the same specimen and attendance dates)‡	All cases	745	N/A	11	55	115	80	484
	<50	564	N/A	8	52	55	17	432
	>50	181	N/A	3	3	60	63	52
Cases where presentation to emergency care resulted in overnight inpatient admission§ (including cases with the same specimen and attendance dates)	All cases	1,320	N/A	22	88	189	190	831
	<50	902	N/A	16	79	85	27	695
	>50	418	N/A	6	9	104	163	136
Deaths within 28 days of positive specimen date	Total	117	N/A	3	1	19	50	44
	<50	8	N/A	-	-	2	-	6
	>50	109	N/A	3	1	17	50	38

Data sources: Emergency care attendance and admissions from Emergency Care Dataset (ECDS), deaths from PHE daily death data series (deaths within 28 days)
 ¥ Cases without specimen dates and unlinked sequences (sequenced samples that could not be matched to individuals) are excluded from this table.

* Cases are assessed for any Emergency Care attendance within 28 days of their positive specimen date. Cases still undergoing within 28-day period may have an emergency care attendance reported at a later date.

§ At least 1 attendance or admission within 28 days of positive specimen date

‡ Cases where specimen date is the same as date of Emergency Care visit are excluded to help remove cases picked up via routine testing in healthcare settings whose primary cause of attendance is not COVID-19. This underestimates the number of individuals in hospital with COVID-19 but only includes those who tested positive prior to the day of their Emergency Care visit. Some of the cases detected on the day of admission may have attended for a diagnosis unrelated to COVID-19.

^ Total deaths in any setting (regardless of hospitalisation status) within 28 days of positive specimen date.

Source: [SARS-CoV-2 variants of concern and variants under investigation Technical Briefing 17 \(publishing.service.gov.uk\)](#)

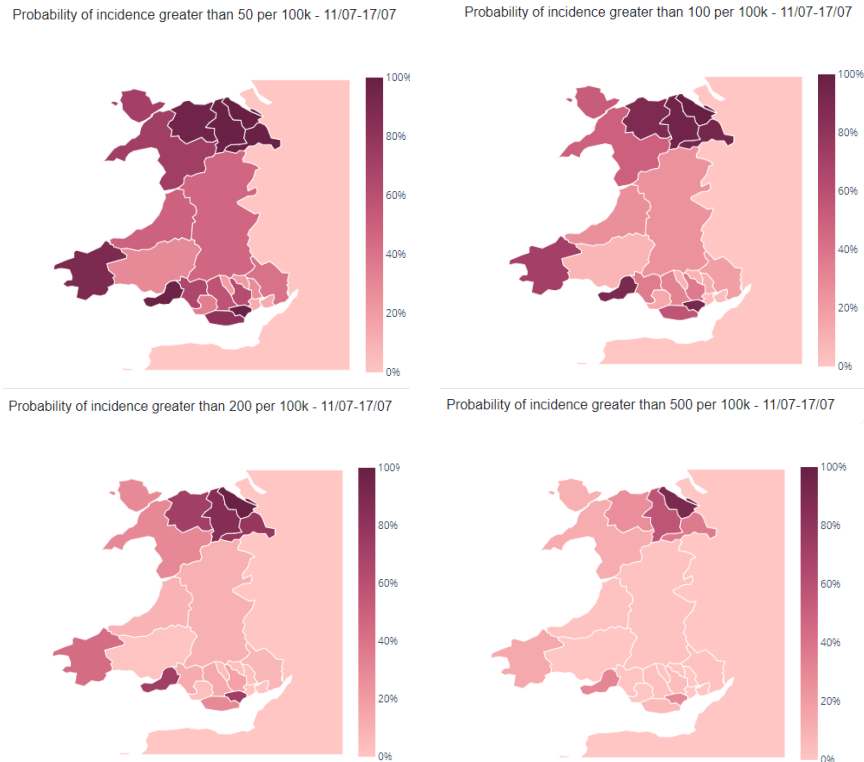
Delta +K417N (AY.1)

- Through routine scanning of Delta cases a small number of sequences have been detected with an additional mutation in the K417N gene, nicknamed 'Delta plus' in the media. It has since been found in several countries but has remained at low levels; to date, only 41 cases have been identified in the UK and 161 strains have been sequenced internationally (note that the high numbers in UK are largely a result of greater sequencing capacity). There is limited evidence on this variant's transmissibility, vaccine evasion or impact on disease severity due to the low number of samples and no indication that this variant has an advantage over the more common Delta variant or is growing in the UK.

6. Medium Term Projections (Imperial)

- Imperial College London uses reported cases and deaths to estimate the probability that regions will have cases over a specific threshold, assuming no

changes in current interventions or testing behaviour. The model does not consider demographic factors such as age structure of the infected population. The model predicts that over the next two weeks several areas of Wales are likely to see an increase in cases.



Source: [COVID-19 UK \(imperialcollegelondon.github.io\)](https://github.com/imperial-college-london/COVID-19-UK)

7. Medium Term Projections (SPI-M modelling)

- SPI-M modelled projections based on trends to 28 June and will not fully reflect the impact of policy or behavioural changes over the past two or three weeks. They are not forecasts or predictions. Lighter shade is 90% credible interval.
- These projections include the potential impact of vaccines to be given over the next four weeks. This has been based on a rollout scenario provided by Cabinet Office for modelling purposes; with uptake in the over 40-year olds based on the number of vaccines given to date and uptake in those aged 40 and under assumed to be 80%. These doses will have limited impact over this timescale, given lags between vaccination and protection, and between infection and hospital admission
- The number of deaths have fallen to very low levels in the Scotland, Wales, Northern Ireland and NHS regions of England. Projecting forwards is difficult when numbers fall to very low levels, therefore SPI-M-O have decided to pause producing medium-term projections where this is the case. SPI-M's

consensus view is that the number of deaths in Scotland, Wales, Northern Ireland and all NHS England regions will remain low over the next four weeks

New Hospitalisations per day

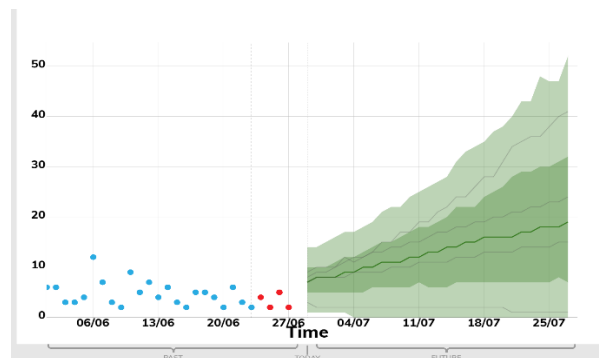


Figure 4. Fan charts show the 90% credible interval and interquartile range. blue real data, red expected increase, Source: [SPI-M-O: Medium-term projections, 30 June 2021 - GOV.UK \(www.gov.uk\)](https://www.gov.uk/government/publications/spi-m-o-medium-term-projections-30-june-2021)

8. Swansea University Modelling

- The most recent TAG policy modelling update, dated 25 June, is available [here](#). The Swansea University epidemiological models have produced estimates of infections and direct COVID-19-related harms until the end of March 2022.
- We can look at the current trajectories of actual data to potentially rule out some of the modelled scenarios as being unlikely to occur.
- Currently only cases and hospitalisation data are reliable to draw conclusions around trends from, as observed deaths/ICU remain too low to evaluate (Figures 10-13).
- Observed 'actual' data appears to be diverging from the worst scenarios. This does not necessarily mean delta is less transmissible than assumed in those trajectories but that the combination of transmission and vaccine assumptions are not likely (i.e. vaccines are performing at the top end of the estimated effectiveness).
- There is early indication of a divergence between the scenario best tracked by the cases and the scenario best tracked by hospitalisation. This is currently not statistically significant, but if it continues would be good news and would signify that the vaccine effectiveness assumptions should possibly be revised upwards in line with the PHE technical reports value of 97% vaccine effectiveness (CI 93-98), further separating cases and hospitalisations. Alternatively it could represent differing age group behaviours, which can be investigated by monitoring age trends in the data.

- By this time next week we would expect considerably more scenario separation and further monitoring will continue. It is expected that updating the vaccine assumptions will push the tracking scenario closer to 'Delta high', although this scenario would be reduced by the altered vaccine effectiveness assumptions.
- Note that the most recent 4 days data are subject to backlog, and will likely increase in subsequent updates- these are highlighted in red.

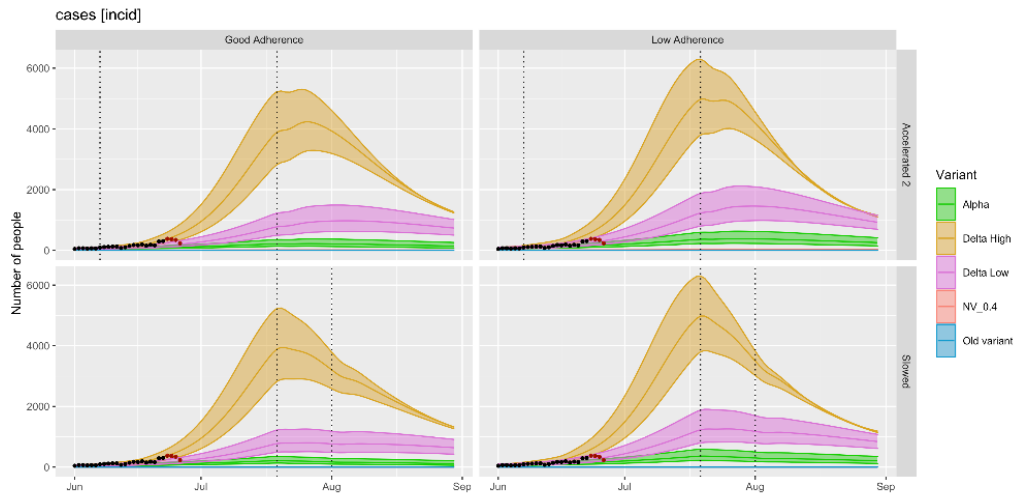


Figure 5. Cases

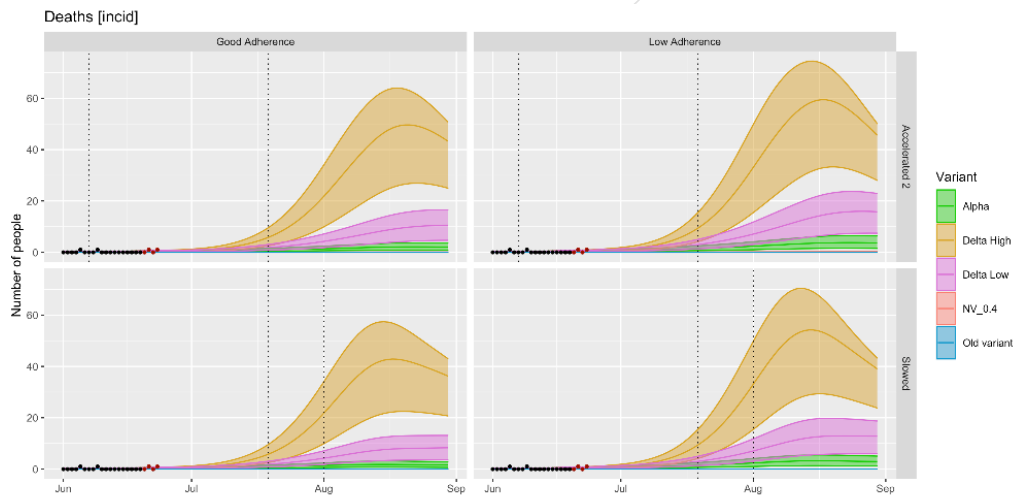


Figure 7. Deaths

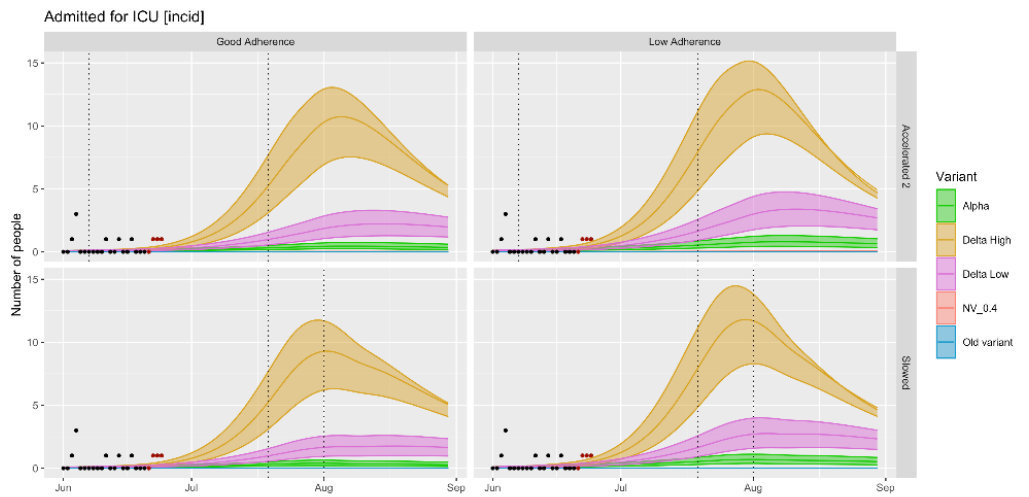


Figure 8.
Admitted to ICU

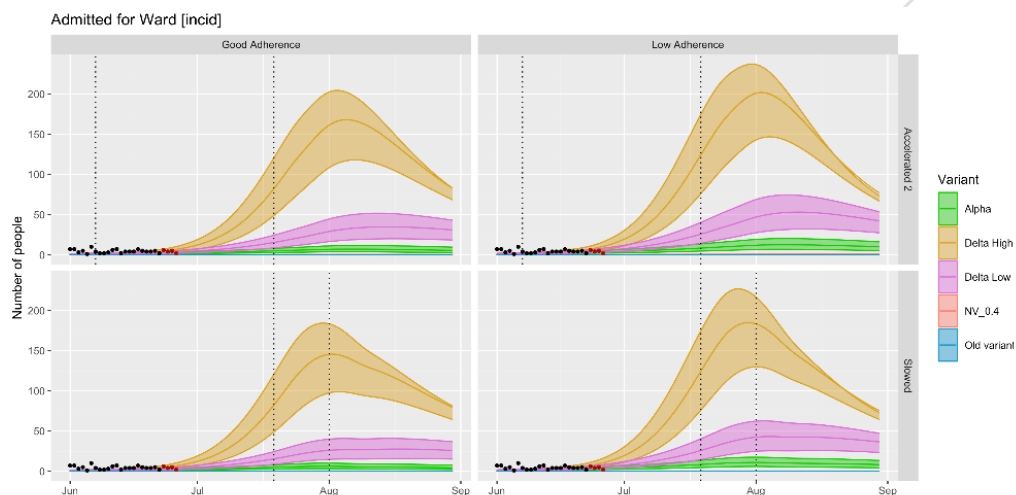


Figure 6.
Hospitalisations

9. Ratios of Cases to Admissions and Deaths, Wales (TAC Analytics)

- The percentage of confirmed COVID-19 cases who end up being hospitalised due to COVID-19 has decreased from around 10% in December 2020, before the introduction of COVID-19 vaccines, to 2.8% on 26 June 2021. This is largely driven by the 25 – 70 year old age group although the under 25s have also shown a decrease in cases to admissions. When looking at the over 70s only, the ratios of ratios of cases to admissions fluctuate but don't show an increase or decrease.

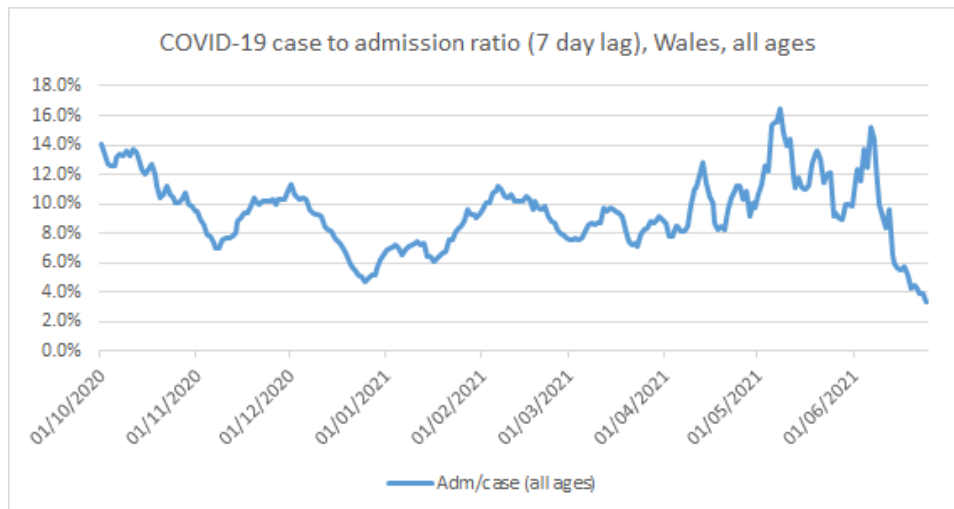


Figure 7. COVID-19 cases to admissions ratio (7 day lag), all Wales, all ages. Source: PHW

- Conversely, the over 70s show a large reduction in the percentage of COVID-19 deaths produced on average from COVID-19 cases. Overall, the ratio of deaths in all ages has decreased following the introduction of COVID-19 vaccines from 3.5% in December 2020 to 0.5% on 26th June 2021. However, this is mostly driven by the over 70s where the ratio of cases to deaths has reduced from 24% in December 2020 to 5% on 26th June 2021.
- Using matched up data may allow us to improve these estimates. There are potential biases with comparing cases to admissions and cases to deaths over time; if vaccines move individuals down a ladder of severity, then some symptomatic cases may move a step down the ladder and become asymptomatic or not detected; so the ratios may not be comparing the same type of cases over time. Using measures like ONS infection survey may negate some of these issues as it picks up all infections, although the numbers of infections in the survey are currently quite low and subject to uncertainties, especially when splitting by age group.

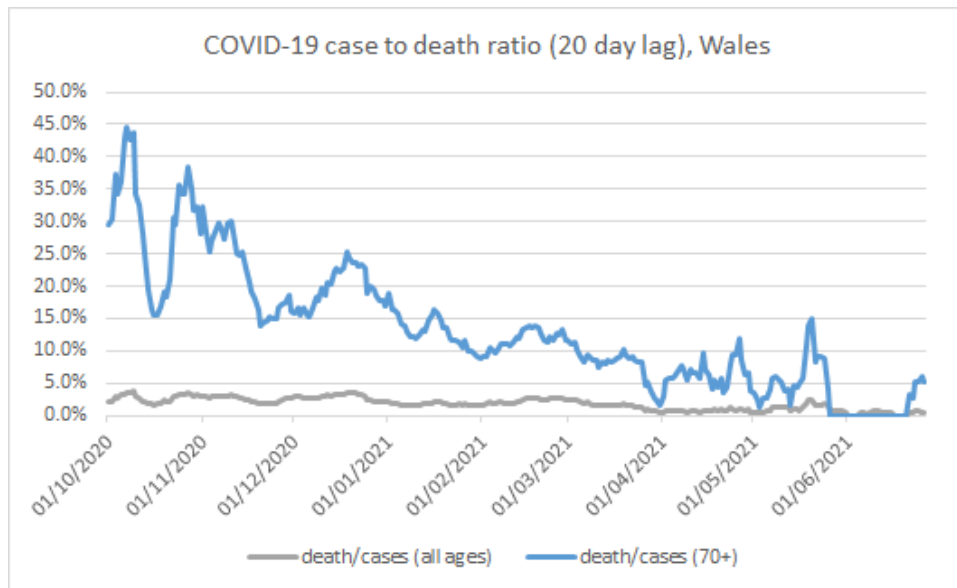


Figure 8. COVID-19 case to death ratio (20 day lag) all Wales. Source: PHW ICNet. Cases by specimen date and deaths by date of death are used. Ratios are calculated using 7 day rolling averages of cases, admissions and deaths and applying lags. Source: PHW

10. Ratios of Cases to Admissions and Deaths from 1st March 2021 to 26th June 2021, by UK nation (Internal only – OFFICIAL SENSITIVE)

- Data currently indicates that Wales has a higher number of hospital admissions per 1,000 confirmed cases than the other home nations. Further work is underway to explore the reasons for this which may be related to data collection and reporting.

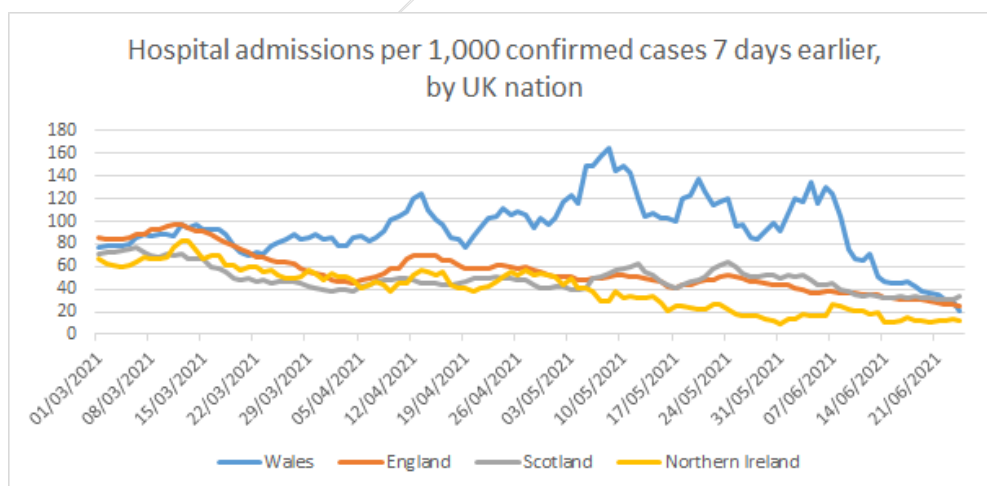


Figure 9. Hospital admissions per 1,000 confirmed cases 7 day earlier, by UK Nation.

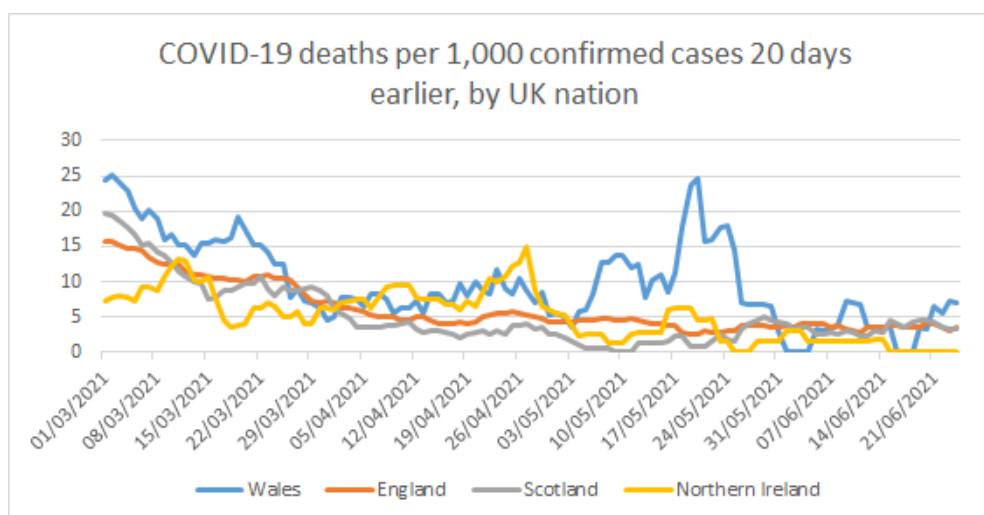


Figure 10. Hospital admissions per 1,000 confirmed cases 20 days earlier, by UK Nation. Sources: [UK dashboard](#) for all chart data (except Wales COVID-19 hospital admissions which comes from PHW ICNet). Cases by specimen date and deaths by date of death are used. Ratios are calculated using 7 day rolling averages of cases, admissions and deaths and applying lags.

11. Comparison of wave one, two and three for Scotland, England and Wales (TAC)

- Comparing the most recent increases with previous waves in the UK nations (Figure 4) shows indications of a step change in the ratio of cases to hospitalisations (even when accounting for time lags of around seven days from onset to admission) as a result of the impact of vaccination. Scotland's recent peak in cases exceeded previous waves. This magnitude of cases is likely to occur in other UK nations following the easing of restrictions and the implications of this, even if deaths and hospitalisations are kept at a relatively low level, should be carefully considered. Wales may fare better because it has a higher vaccination rate, which offers individual protection from severe disease as well as reducing onward transmission when vaccinated individuals are infected. There is also still uncertainty around the duration of effectiveness of vaccines, waning immunity and plans for vaccination of children and booster vaccines.

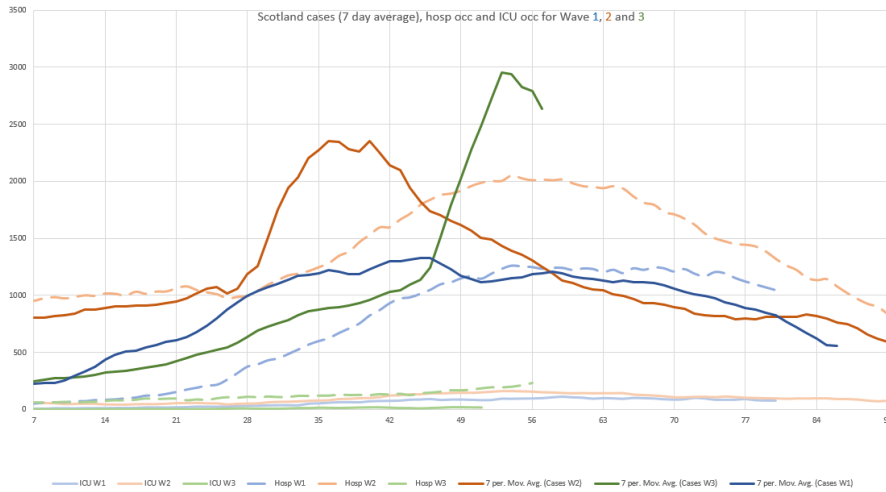


Figure 11. Wave one, two and three analysis of cases, hospitalisations and ICU admissions Scotland. Blue wave 1, Orange wave 2, Green wave 3. Dark colour – cases, Broken line hospitalisations, Pale colour – ICU admissions

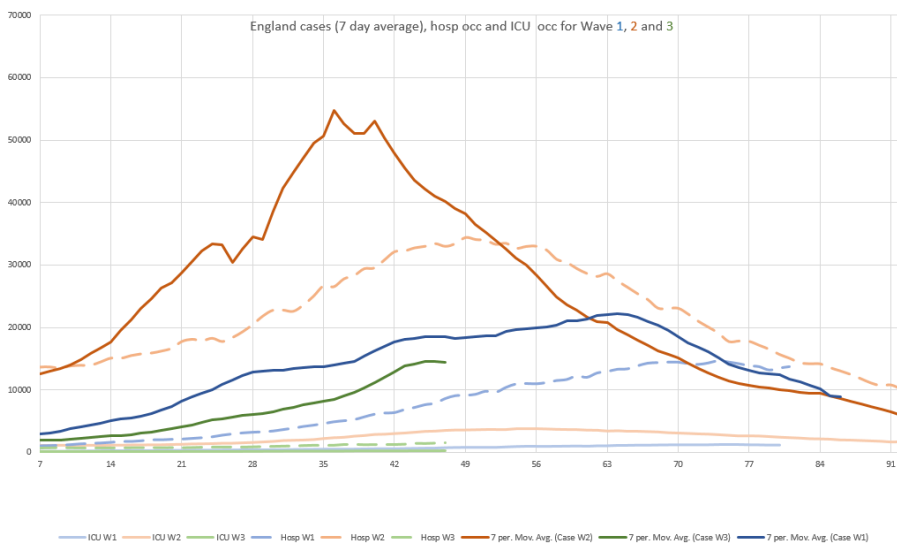


Figure 12. Wave one, two and three analysis of cases, hospitalisations and ICU admissions England. Blue wave 1, Orange wave 2, Green wave 3. Dark colour – cases, Broken line hospitalisations, Pale colour – ICU admissions

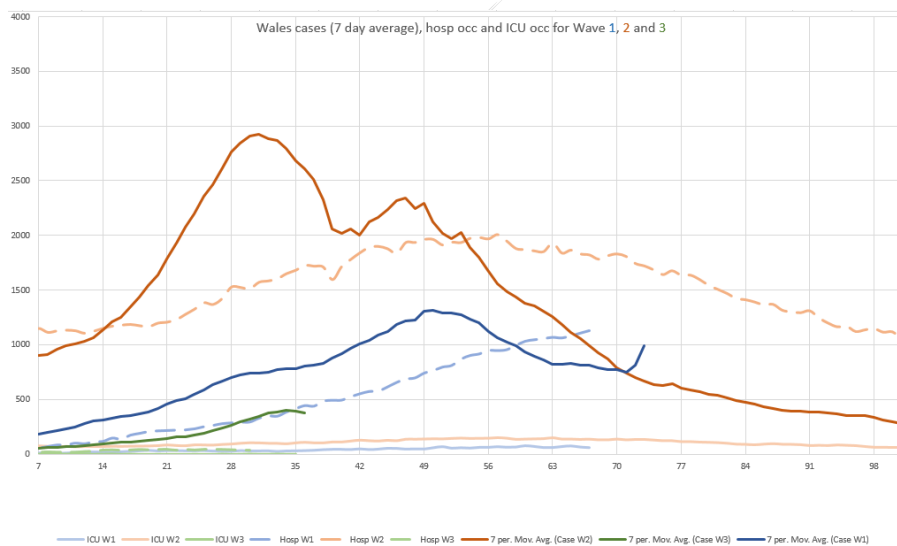


Figure 13. Wave one, two and three analysis of cases, hospitalisations and ICU admissions Wales. Blue wave 1, Orange wave 2, Green wave 3. Dark colour – cases, Broken line - hospitalisations, Pale colour – ICU admissions

12. Long Covid

- Updated estimates from [ONS](#) indicate that as of 6 June 2021, an estimated 1.4% of the Welsh population were experiencing self-reported long COVID (symptoms persisting for more than four weeks after the first suspected COVID-19 infection that were not explained by something else). This has reduced from an estimated 1.7% reported as at 2 May 2021. An estimated 27.9% with self-reported long COVID indicated their ability to undertake day-to-day activities was 'limited a lot'. Fatigue was the most common symptom reported as part of individuals' experience of long COVID, followed by shortness of breath, muscle ache, and difficulty concentrating.
- A recent working paper from the [REACT study](#) of over 0.5 million adults in England shows substantial declines in symptom prevalence over the first 12 weeks following COVID-19, reported by nearly one fifth of respondents. However over a third of these remained symptomatic at 12 weeks and beyond, with little evidence for decline thereafter. Risk factors identified for persistent symptoms (12 weeks or more) suggestive of Long COVID confirm findings from others - an increased risk in women, obese and overweight individuals and those hospitalised for COVID-19, with strong evidence for an increasing risk with age. Additional evidence was found for an increased risk in those with lower income, smoking or vaping and healthcare or care home workers. A lower risk was found in those of Asian ethnicity.
- There remains uncertainty around the characterisation and definition of 'Long COVID' and the extent of the burden for both individuals and services. However as previously advised, the impact of Long COVID and post COVID-19 conditions, which can also affect younger age groups who may not yet be vaccinated, continues to be important to consider when planning relaxations.

13. Behavioural considerations supporting this advice

- The latest available evidence on adherence from various sources suggests the position remains similar to that set out in recent TAG advice³. As noted previously, reported adherence across a range of measures remains high, albeit it has fallen slightly as restrictions have been relaxed. The most recent Ipsos MORI data for Wales for the period 18 to 21 June suggests, for example, that seven in ten continue to report maintaining two metre distancing and four in five report wearing a face covering⁴. Public Health Wales's ongoing survey research indicates that for the period 21 to 27 June, some four in five reported mostly following the restrictions in place (a score of 8 or more

³ <https://gov.wales/technical-advisory-group-advice-tag-and-chief-scientific-advisor-health-delta-variant>

⁴ <https://gov.wales/technical-advisory-cell-summary-advice-22-june-2021>

on a 1 to 10 scale, not at all to completely)⁵. Similarly, UCL COVID-19 Social Study data for Wales for the period up to 13 June show a gradual decline in complete compliance while majority compliance remains high⁶. However, as set out previously, it should also be noted there is evidence of increased social mixing between family and friends in private dwellings in recent weeks, with implications for transmission⁷.

- In light of this evidence and the current epidemiological situation, previous TAG advice remains valid, highlighting a continued role for personal, procedural, engineering and societal mitigations in the short and medium term⁸. While some 2.2 million people in Wales have received a first dose of vaccine and 1.6 million a second dose⁹, a significant minority of the population remain unprotected. The increased transmissibility of the Delta variant reinforces the importance of having both vaccine doses and recognising the post-vaccination period of two weeks before protection is fully active. A focus on reaching the young and most vulnerable groups and deploying behaviourally informed interventions (policy, communications and services) is still necessary to maximise individual and population level protection.
- Other mitigations noted previously to reduce risk of infection include: limiting the number and duration of social contacts; ensuring effective ventilation; continued emphasis on the relatively lower risk in meeting outdoors; and seeking a test when symptomatic and self-isolating when necessary. Furthermore, financial, practical and emotional support for self-isolation remains critical.
- If population baseline measures are retained as restrictions are relaxed, it is imperative that practical support to assist risk-based decision making is available and promoted as widely as possible. Evidence from unpublished Welsh Government focus group analyses indicates that people are already making their own risk-based decisions around adherence to restrictions, such that the provision of evidence informed support providing a pragmatic assessment of risk has the potential to make an important contribution to risk reduction.

14. Baseline measures moving forwards

- As existing restrictions are lifted, cases will almost certainly increase as a result, until wide population immunity is reached. Despite the reduction in the number of cases that lead to hospitalisation and death, there remain many

⁵<https://phw.nhs.wales/topics/latest-information-on-novel-coronavirus-covid-19/how-are-you-doing/how-are-we-doing-in-wales-reports/>

⁶ <https://www.covidsocialstudy.org/results>

⁷ [Ad-hoc statistical requests: 21 June 2021 | GOV.WALES](#)

⁸ [Technical Advisory Group: advice from TAG and the Chief Scientific Advisor for Health on the Delta Variant | GOV.WALES](#)

⁹ [Rapid COVID-19 virology - Public | Tableau Public](#)

advantages from an epidemiological perspective in maintaining low prevalence of COVID-19. Remaining at a low base will reduce the risk of a return to rapid growth and give time to observe outbreaks before they become too large, as well as enabling operational effectiveness of the test and trace system. This will be critical in order to ensure that self-isolation takes place, which SAGE has previously emphasised is a critical component of post-restriction baseline measures.

- Keeping cases at a low level will also reduce the impact of post-COVID syndromes (Long COVID) and prevent indirect harm from COVID.
- SAGE have previously suggested that retaining a baseline set of measures to reduce transmission even after other restrictions have been lifted would reduce the scale of a resurgence (high confidence).¹⁰ The lifting of restrictions in certain settings may also recreate the conditions for super-spreader events in the absence of other baseline measures.
- There is currently considerable variation at a regional level in Wales and this is likely to continue as transmission increases. Areas with higher levels of deprivation or lower vaccine penetration will be disproportionately impacted by this, and assessment should take place at a regional level considering the balance of harms and ensuring a proportionate response.
- Consideration will also need to be given to the possibility of future variants of concern with greater vaccine escape or transmission- if this were to occur the response would likely require significant measures. As a result it is imperative that variant surveillance by public health agencies continues following the lifting of restrictions.
- A paper recently discussed at SPI-M presented a model which found that lifting social distancing restrictions after adults are eligible for two doses leads to an estimated reproduction number of 1.8 (95%CI 1.5, 2.4), and low numbers of deaths. The model evidenced the potential meaningful contribution to reducing cases and deaths offered by COVID-security and contact tracing, as well as retaining some more limited social distancing restriction. With all adults eligible for two doses, retaining some social distancing could bring the reproduction number close to 1 and result in non-linear decreases in cases and deaths. The paper finds that a 10% drop in vaccine uptake increases the number of cases three-fold and the number of deaths ten-fold. When returning to pre-COVID contact patterns, there is an ever-present risk of a new variant transmitting as the reproduction number is still above 1¹¹.

¹⁰ [S1082_SAGE_79_Minutes.pdf \(publishing.service.gov.uk\)](#)

¹¹ [SPI-M Transitioning from non-pharmaceutical interventions to vaccination to control COVID-19 transmission: S1305 JUNIPER Transitioning from nonpharmaceutical interventions to vaccination to control COVID-19 transmission.pdf \(publishing.service.gov.uk\)](#)

Adult mixing and home working

- A large proportion of this reduction in contacts is the result of people working from home. The CoCoNet survey¹² ran in early August 2020 and found that, after adjusting for other factors (demographics, region, COVID-19 circumstance, etc.), those participants who were going to work, self-employed, or healthcare professions had significantly more non-household contacts (3.04-3.68 times higher) than those working from home. (SPI-M Consensus 30 June)

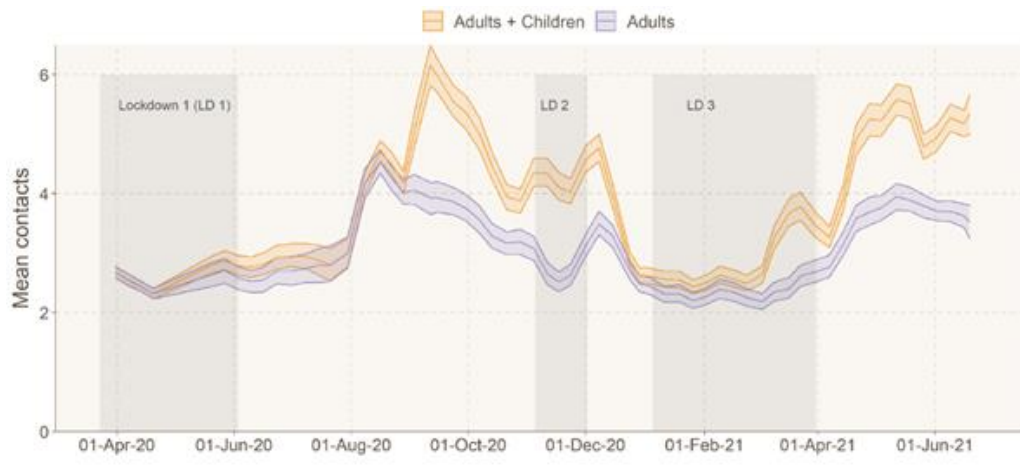


Figure 14. Mean contacts for adults (lower purple line – 18-year olds and over) and adults and children (upper yellow line – all participants) in the UK as estimated through the COMIX study since 23rd March 2020

- The REACT survey¹³ from Imperial College London has also shown working from home reduces the chance of catching COVID-19 with those not currently required to work outside the home are 54% to 76% less likely to test positive for SARS-CoV-2 compared to those that did. Analyses of risk by occupation consistently show a lower risk for those occupations with higher levels of working from home¹⁴. (SPI-M Consensus 30 June)
- Working from home currently occurs in the context of a wide range of other measures that also reduce the number of effective contacts that allow for viral transmission. While individually these other measures may not contribute much, together they do add up to a significant impact. There is scope for the epidemic to grow considerably more quickly if all these mitigating factors are relaxed over a short period of time. (SPI-M Consensus 30 June)

¹² [CoCoNet Survey](#), Lancaster University

¹³ [REACT-1 round 9 final report](#): Continued but slowing decline of prevalence of SARS-CoV-2 during national lockdown in England in February 2021 – tables 3c and 7.

¹⁴ [Coronavirus \(COVID-19\) Infection Survey](#): characteristics of people testing positive for COVID-19 in England, 22nd February 2021; [Environmental Modelling Group: COVID-19 risk by occupation and workplace](#), SAGE 80 11th February 2021

15. Conclusions

- In the coming weeks COVID-19 cases in Wales will continue to rise, but the relationship between cases, hospitalisations and deaths has changed. Relative to cases and epidemic growth, fewer hospitalisations and deaths have so far been observed in wave 3 compared to previous waves – this is directly related to the vaccine deployment. More observational data will provide greater confidence in estimates of future growth, this is important given the uncertainty over the growth advantage of delta.
- Large increases in cases can still cause pressures on the NHS and deaths. Impacts on the NHS and deaths are likely to accrue over the summer. For a number of reasons winter may be challenging and separate advice will be forthcoming on this.
- The balance of the five harms is changing (e.g. reduction in serious illness and deaths), such that relaxations could be made to rebalance them (e.g. to address economic, inequalities and isolation harms). We will need to carefully monitor direct (COVID) and indirect (NHS) harms as backlogs in care, staff fatigue and pressures from increasing cases could prove challenging. Further TAG advice on the balancing of the five harms will be forthcoming next week.
- Infections in children and our response to managing this also requires broader analysis and advice such that vaccination, education and epidemic characteristics are considered together. New advice from JCVI and SAGE will be important.
- Relaxations to level one seem counterintuitive given the increase in cases, however this reflects the changing dynamics and balance of harms. Modelling suggests that, even with high levels of a vaccinated adult population, we will continue to need baseline measures like TTP, work placed risk assessments, working from home and importantly protective behaviours from the public (e.g. isolation on symptoms, handwashing, reducing social contacts) to keep the epidemic at manageable levels. Importantly if vaccination levels in adults drop this could lead to significant levels of hospitalisations and deaths.
- Whilst the relationship between cases and direct harm has changed in Wales, it has changed little in many countries. It will be important that we consider the impact of exporting infections from Wales to other areas as well as the introduction of new variants in Wales. In a world where cases remain high, including Wales, the risk of evolution of new variants with different characteristics increases. Further advice from SAGE and NERVTAG on viral evolution will be important to consider.

- Whilst high levels of vaccination have changed the landscape of COVID-19 in Wales affording us more freedoms and relaxations of regulations, coronavirus has not gone away and we may need to quickly assess and react if conditions change.

Disclaimer

- *It is important to note that due to limited evidence relevant to specific environments, it has been necessary to refer to a smaller numbers of studies conducted outside of the UK and under varying levels of restrictions. Therefore the studies may not be directly comparable to each other, or generalisable to Wales.*
- *Some of these studies may be published 'preprints' from sites such as MedrXiv and therefore have not been subject to the same level of independent peer-review as evidence published in scientific journals. These preprints are identified in the text.*
- *Moreover, outside of controlled laboratory or experimental conditions, it is very difficult to identify exactly how, where and when an individual has been infected and therefore these studies should be treated with caution. However, due to the dynamic nature of the pandemic and timelines involved, evidence is often emerging and is revisited as more substantive peer reviewed scientific papers and studies are published.*

Annex 1a- Public Health Wales COVID-19 briefing to Welsh Government: Spread of SARS-CoV-2 variants in Wales



Public Health Wales COVID-19 briefing to Welsh Government: Spread of SARS-CoV-2 variants in Wales

28 June 2021

Summary of main points

- Data on sequenced cases of SARS-CoV-2 were linked to vaccination, hospitalisation and contact tracing data to describe the spread of variants
- Delta variant is the third most frequently identified (n=1321) after wild-type and alpha, with the earliest cases sampled in 8 April 2021
- The alpha variant was seen from November 2020 and became the dominant strain in Wales in January 2021
- None of the other variants took hold significantly in Wales
- The delta variant became the dominant variant in Wales in late May/June, accounting for 94% of cases in week 24 2021
- The percentage of delta cases in the most recent week ranged from 74 to 98%, being 85% or higher in all health boards except Swansea Bay UHB and Powys THB.
- Only a small proportion (22/1322, 1.7%) of delta cases have been hospitalised; 2 further cases are possible healthcare associated infections
- Only a small proportion of recent delta cases are aged 60 and over –most are under 30
- Delta cases in all age groups have slightly declined in recent days.
- Most cases are now sporadic, with a lesser proportion being contacts of confirmed cases. Few are now linked to international travel
- Cases with a travel link had a higher peak age (around 45) than sporadic cases and those who were contacts of a confirmed variant case (peak around 25)
- The proportion which are sporadic in the most recent week is slightly higher in CVUHB and ABUHB than in BCUHB
- Sporadic cases have increased week on week and now predominate in all areas. A proportion of these have workplaces outside Wales.

- The first 1322 delta cases had a higher proportion of workplaces outside Wales than seen in the earliest 1322 alpha cases (8% vs 2%), with workplaces in NW England, W Midlands and London
- Under half (48%, 630/1322) of delta cases were unvaccinated.
- Vaccination status reflects the underlying uptake by age groups, with 93% of those aged 60 and over having had at least 1 dose of vaccine compared to 50% of cases aged under 60.
- Rt for delta variant rose above 1 around May 24th and was between 2 and 3 until mid-June, when it declined to just above 1.
- Rt for alpha variant rose above 1 in early June and then also declined to below 1 around mid-June

Background

Sequencing of SARS-CoV-2 in Wales started in March 2020, through the Pathogen Genomics Unit (PenGU), and working with colleagues in the UK, a number of variants have been identified. These are detected via a horizon scanning process, then assigned as variants under investigation or concern based on a risk assessment process.

In November 2020, a variant now designated VOC-20DEC-01 or Alpha was detected from samples in Kent, following an increase in growth rates in that area. The first sequenced case was sampled in Wales on 5th November 2020. Monitoring of spread was also possible using some of the routine PCR tests, and this showed a rapid increase in cases of Alpha variant across Wales, resulting in it becoming the dominant variant in January 2021.

Further variants under investigation and of concern have been identified, some with likely origins outside the UK, and enhanced identification and control measures specific for these variants have been adopted, with the aim of containment.

The delta variant (VOC-21APR-02, initially linked to India) is the most frequent recent variant in the UK, and following introduction in spring 2021 it has rapidly become the predominant variant in England. As initial efforts at containment have not been successful, the approach in England has shifted to controlling spread and impact, with health protection resources focusing on clusters and outbreaks rather than individual cases.

This paper describes the identification and spread of delta variant in Wales, with some comparisons with the introduction of alpha variant, in order to draw conclusions to inform the approach to management in the future. A parallel paper describes the genomic evolution and clustering of delta variant in Wales.

Methods

This analysis includes only episodes of infection for which sequencing results are available. Episodes without attempts at sequencing or for which sequencing results were not available are not included, but in the wider dataset, inconclusive or unclassified sequences are included. Cases were labelled “unclassified” where the sample did not fit the definition of a current VOC/VUI, and these were grouped with “wild type” as nearly all were unclassified due to their being wild type (Wuhan) virus.

COG-UK data published in the weekly variant report shows that over 50% of positive cases are sequenced in Wales, with a lag between sample date and availability of full sequence data. In week 19, between 25% and 80% of all cases were sequenced (by Health Board), with most (5/7) Health Boards having between 57 and 80% of cases sequenced. The two lower percentages (25% and 32%) were based on small numbers of cases in two health boards.

The sequenced episodes were deduplicated on a 42 day episode length, meaning that no individual can have more than one positive episode in a 42 day period but can experience reinfection after this. The data was linked to information from the Test, Trace, Protect database (CRM), hospitalisations (via ICNET), travel status (from the ports and borders team), and vaccination (Via the Wales Immunisation System). Geolocation for workplace locations was derived via linkage to the ONS UK postcode lookup file.

Analyses were done in R. Growth rate calculations used the EpiEstim package. The data was taken as that correct on 28/6/2021. Hospitalisations may not be fully up to date as data are not linked daily.

Results

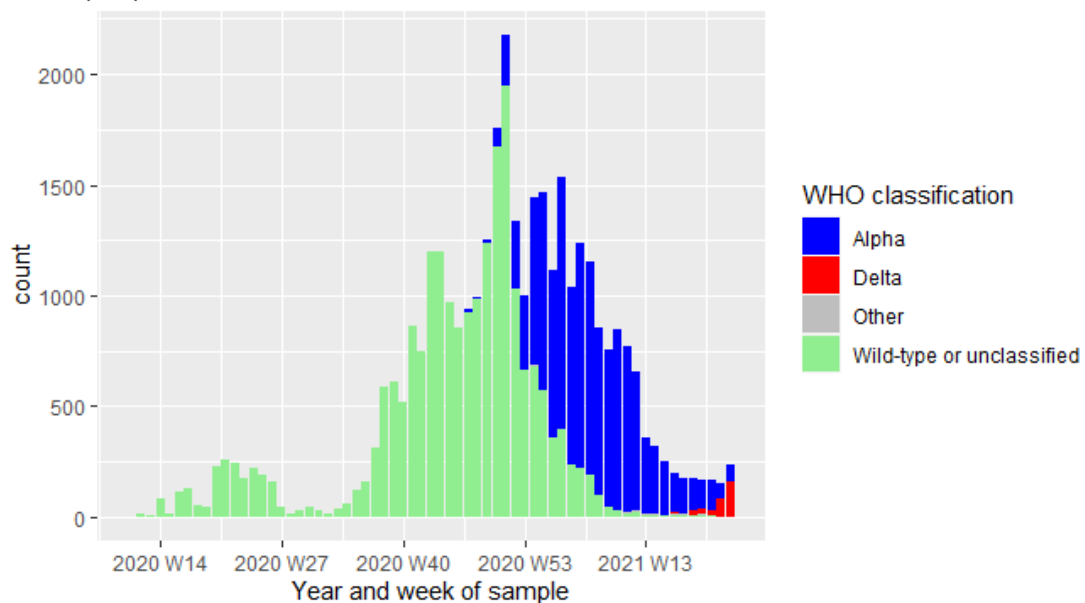
Summary table for all variants (excluding E484K alone, n=2)

variant	pango	greek	Cases	Earliest case	Latest case	Median age	Hospitalised	Community admissions	Possible HCAI
Wild-type or unclassified	Wild-type or unclassified	Wild-type or unclassified	21826	2020-03-12	2021-06-11	50.0	5427	2376	3051
VOC-20DEC-01	B.1.1.7	Alpha	12913	2020-11-05	2021-06-18	39.0	1420	902	518
VOC-21APR-02	B.1.617.2	Delta	1321	2021-04-08	2021-06-20	26.0	24	22	2
VOC-20DEC-02	B.1.351	Other	43	2020-12-26	2021-06-11	32.0	2	1	1
VUI-21APR-01	B.1.617.1	Other	15	2021-03-09	2021-05-02	33.0	0	0	0
VUI-21FEB-03	B.1.525	Other	10	2021-01-21	2021-04-03	29.0	0	0	0
VOC-20DEC-01 + E484K	B.1.1.7 + E484K	Alpha	7	2020-12-29	2021-04-15	35.0	1	1	0
VUI-21MAY-02	C.36.3	Other	4	2021-03-18	2021-05-21	47.5	0	0	0
VOC-21JAN-02	P.1	Other	2	2021-04-18	2021-04-19	35.0	0	0	0
VOC-21APR-02 + K417N	B.1.617.2	Delta	1	2021-05-07	2021-05-07	42.0	0	0	0
VUI-21APR-03	B.1.617.3	Other	1	2021-04-26	2021-04-26	55.0	0	0	0
VUI-21JAN-01	P.2	Other	1	2021-01-22	2021-01-22	38.0	0	0	0
VUI-21MAY-01	AV.1	Other	1	2021-06-09	2021-06-09	38.0	0	0	0

The delta variant is the 3rd most frequent type, with 1322 cases [as of 28/06/2021, note 1 case delta+K417N], of which 24 were hospitalised (22 community admissions and 2 possible HCAI). The earliest case was sampled on 8 April 2021. The overall median age is lower for delta (26 years), than for alpha variant (39 years). No other variants are present in large numbers.

Variant changes over time

Figure 1 - Epidemic curve of sequenced cases by variant name (WHO terms) as of 14/06/2021



The alpha variant is seen from late 2020 and became the dominant type in early 2021. In recent weeks, the delta variant has become the dominant type. The increase in overall case numbers seen in figure 2 is largely associated with new Delta cases.

Figure 2 - Epidemic curve of sequenced cases by variant name (WHO terms) as of 28/06/2021

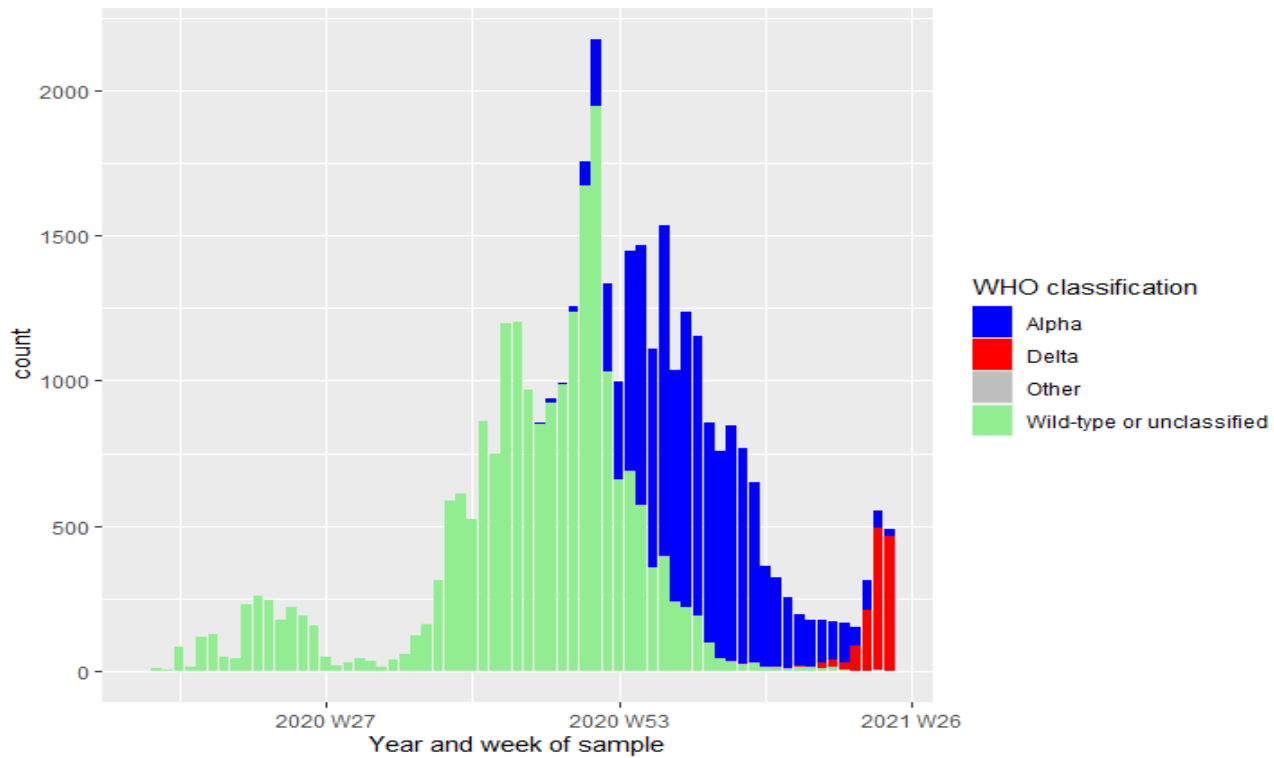


Figure 3: Epidemic curve of cases by WHO classification and Year/week of sample

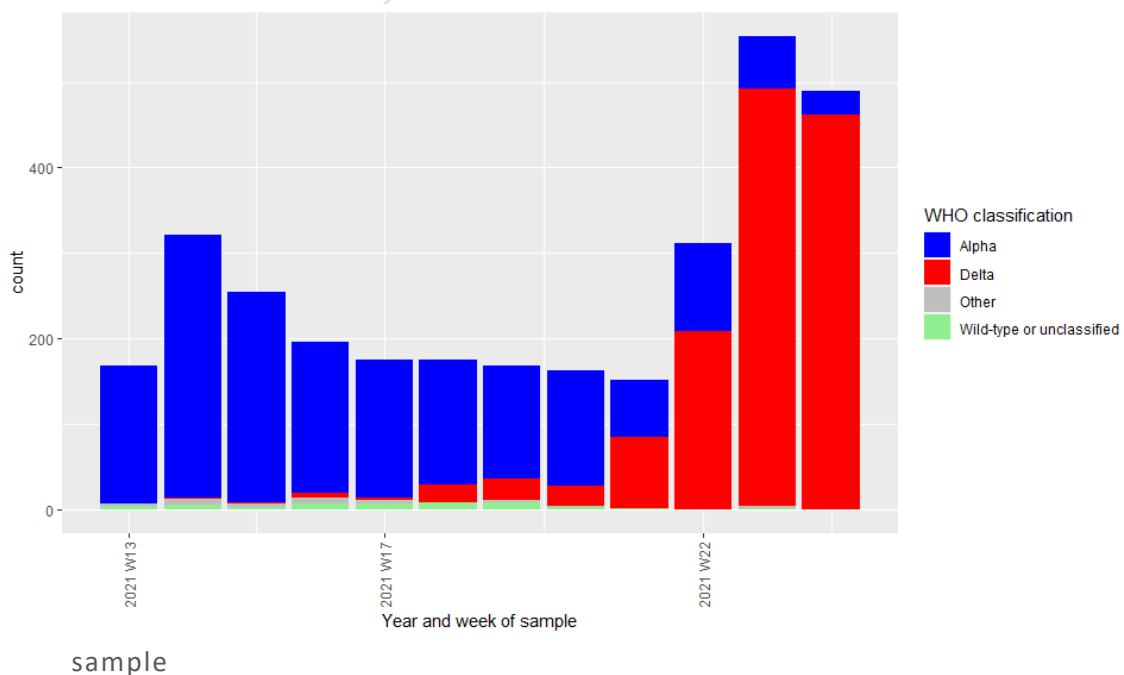


Table 2: Table of cases by WHO classification and Year/week of sample

Year/week	Cases	Alpha cases	Delta cases	Percentage Delta
2021 W13	169	162	0	0
2021 W14	321	307	1	0
2021 W15	255	247	1	0
2021 W16	196	177	5	2
2021 W17	175	161	3	1
2021 W18	175	146	20	11
2021 W19	169	133	25	14
2021 W20	163	135	24	14
2021 W21	151	66	84	55
2021 W22	311	102	209	67
2021 W23	554	62	488	88
2021 W24	490	28	462	94

In the most recent week (**24**), delta cases constituted **94%** of all new cases.

Figure 4 – Epidemic curves of variant cases by Year/week of sample and Health Board

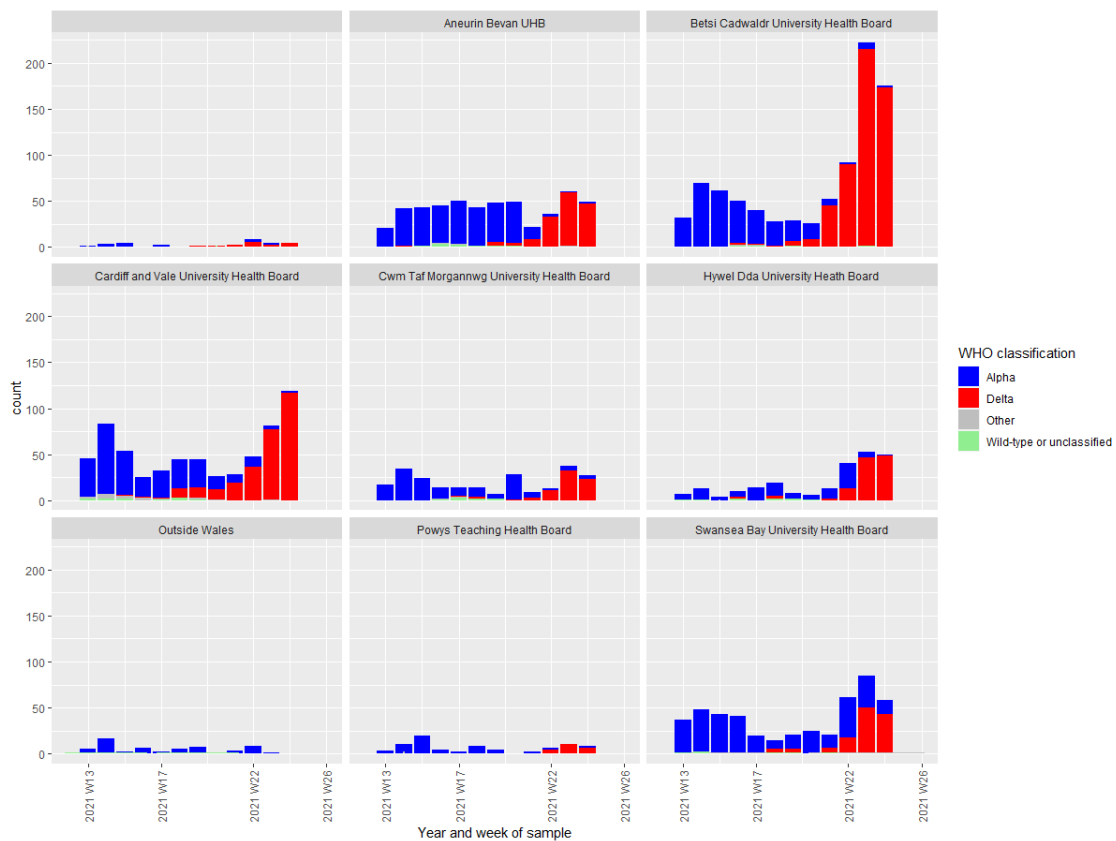


Table – Proportion of delta cases by Year/week of sample and Health Board

Year/week	Health Board	Cases	Alpha cases	Delta cases	Percentage Delta
2021 W24	Aneurin Bevan UHB	49	2	47	95
2021 W24	Betsi Cadwaldr University Health Board	175	2	173	98
2021 W24	Cardiff and Vale University Health Board	119	2	117	98
2021 W24	Cwm Taf Morgannwg University Health Board	27	4	23	85
2021 W24	Hywel Dda University Health Board	50	1	49	98
2021 W24	Powys Teaching Health Board	8	2	6	75
2021 W24	Swansea Bay University Health Board	58	15	43	74

The percentage of delta cases in the most recent week (week 24) ranged from 74% in SBUHB to 98% in BCUHB, C&V UHB and HDUHB.

Figure – Epidemic curves of variant cases by Year/week of sample and Health Board

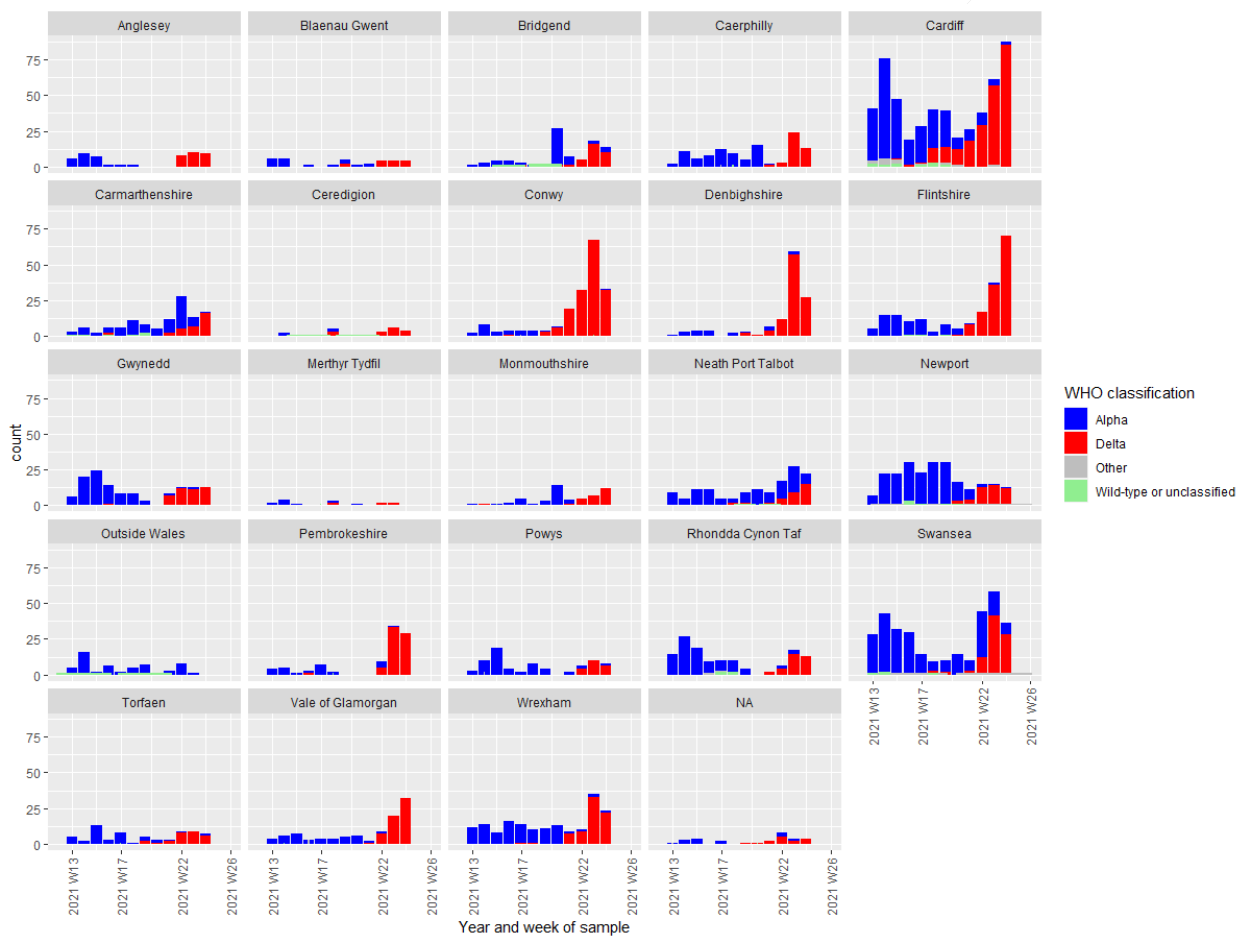


Table – Proportion of delta variant cases in week 24, by local authority of

Year/week	Local Authority	Cases	Alpha cases	Delta cases	Percentage Delta
2021 W24	Anglesey	9	0	9	100
2021 W24	Blaenau Gwent	4	0	4	100
2021 W24	Bridgend	14	4	10	71
2021 W24	Caerphilly	13	0	13	100
2021 W24	Cardiff	87	2	85	97
2021 W24	Carmarthenshire	17	1	16	94
2021 W24	Ceredigion	4	0	4	100
2021 W24	Conwy	33	1	32	96
2021 W24	Denbighshire	27	0	27	100
2021 W24	Flintshire	70	0	70	100
2021 W24	Gwynedd	13	0	13	100
2021 W24	Monmouthshire	12	0	12	100
2021 W24	Neath Port Talbot	22	7	15	68
2021 W24	Newport	13	1	12	92
2021 W24	Pembrokeshire	29	0	29	100
2021 W24	Powys	8	2	6	75
2021 W24	Rhondda Cynon Taf	13	0	13	100
2021 W24	Swansea	36	8	28	77
2021 W24	Torfaen	7	1	6	85
2021 W24	Vale of Glamorgan	32	0	32	100
2021 W24	Wrexham	23	1	22	95

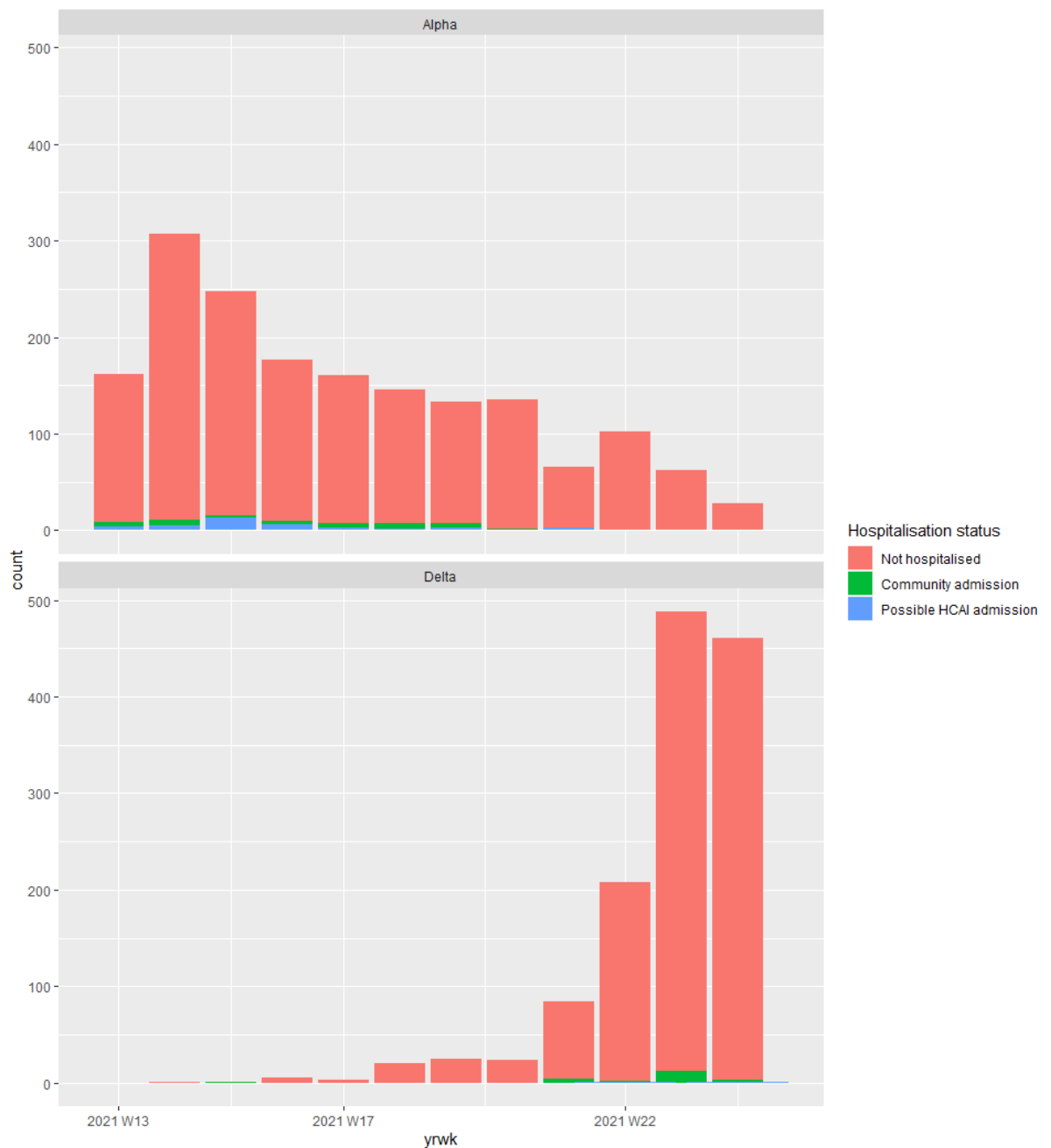
residence

At the local authority level, the proportion of delta cases in the most recent week (week 24) ranged from 68% in Neath Port Talbot to 100% in 11 LAs (Vale of Glamorgan, Rhondda Cynon Taf, Monmouthshire, Pembrokeshire, Gwynedd, Flintshire, Denbighshire, Ceredigion, Caerphilly, Blaenau Gwent and Anglesey).

Some LAs report small numbers of cases, so proportions need to be interpreted with caution.

Hospitalisation status of recent cases by Variant type

Figure: Hospital admissions for variant cases over time (source ICNet)



Very few delta cases have been hospitalised, and none in the most recent week. Updates to the ICnet linkage may identify further recent hospitalisations.

Change in age distribution of recent cases

Figure: Age distribution of recent alpha and delta cases, by year and week

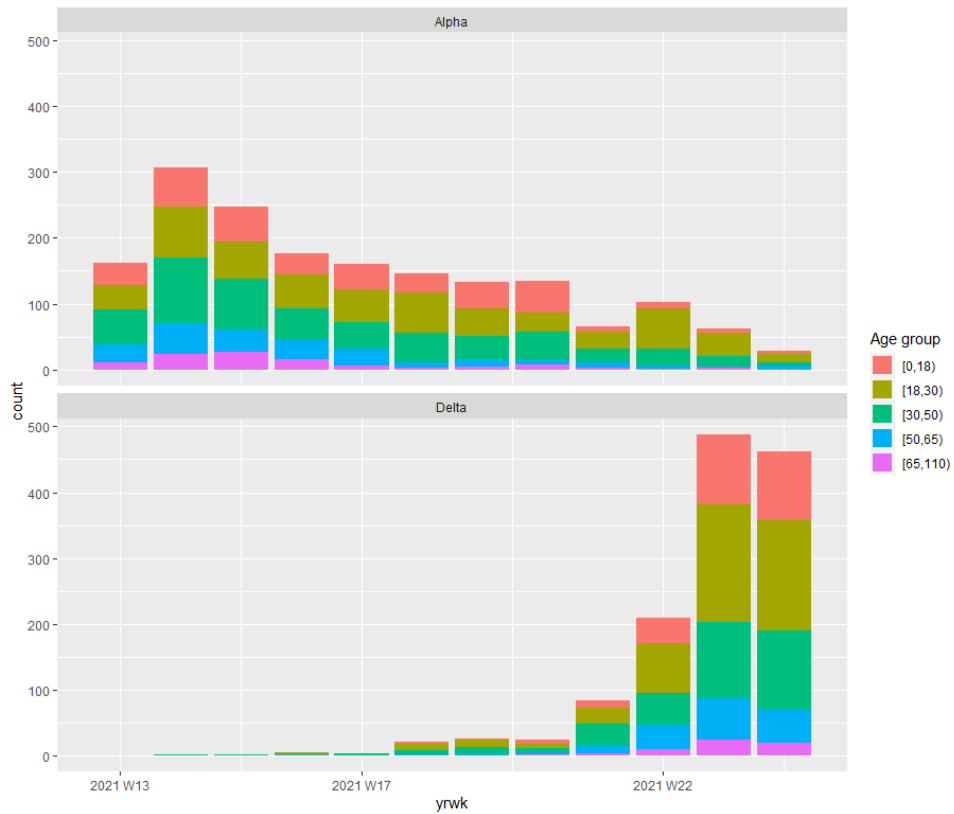
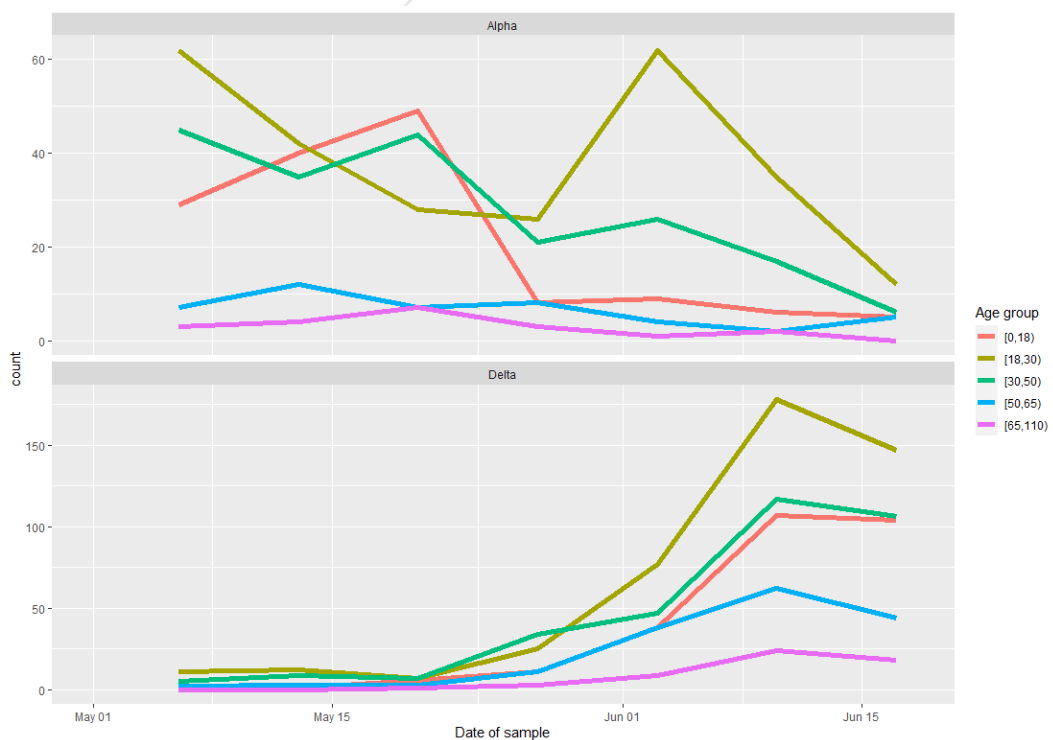
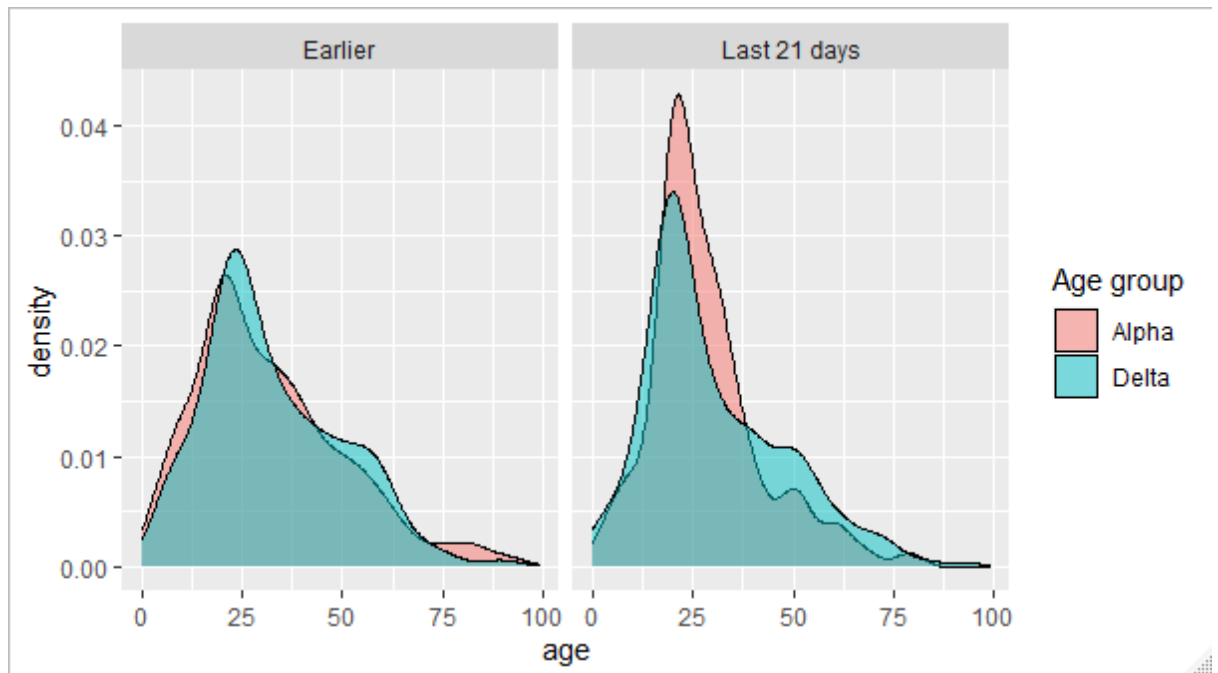


Figure: Age distribution of alpha and delta cases since 1st April, by most recent 21 days





In the most recent 21 days, Delta cases can predominantly be seen in those under 40 years old. However, increases in both alpha and delta cases can be seen in this group, but for alpha, the case numbers in other age groups have declined.

Travel and contact status for delta cases

Figure: Epidemic curve of recent delta cases by travel and contact status

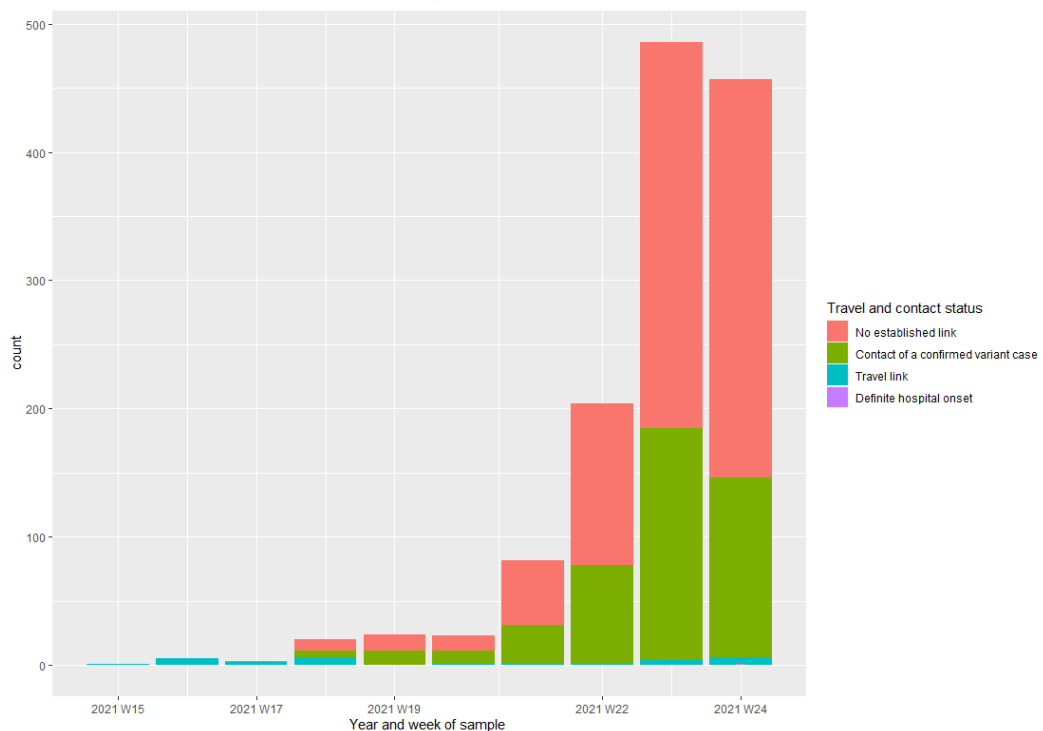
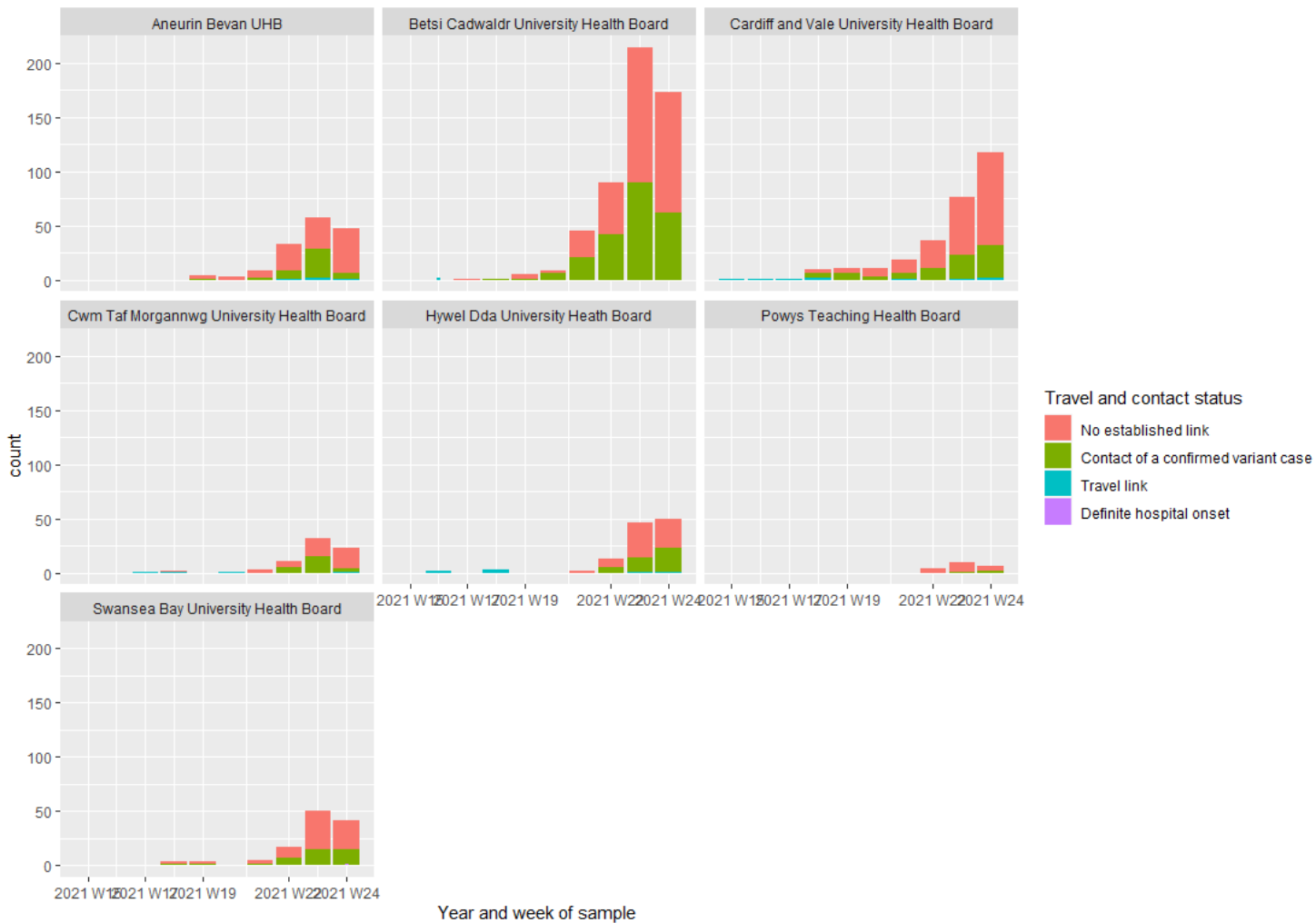


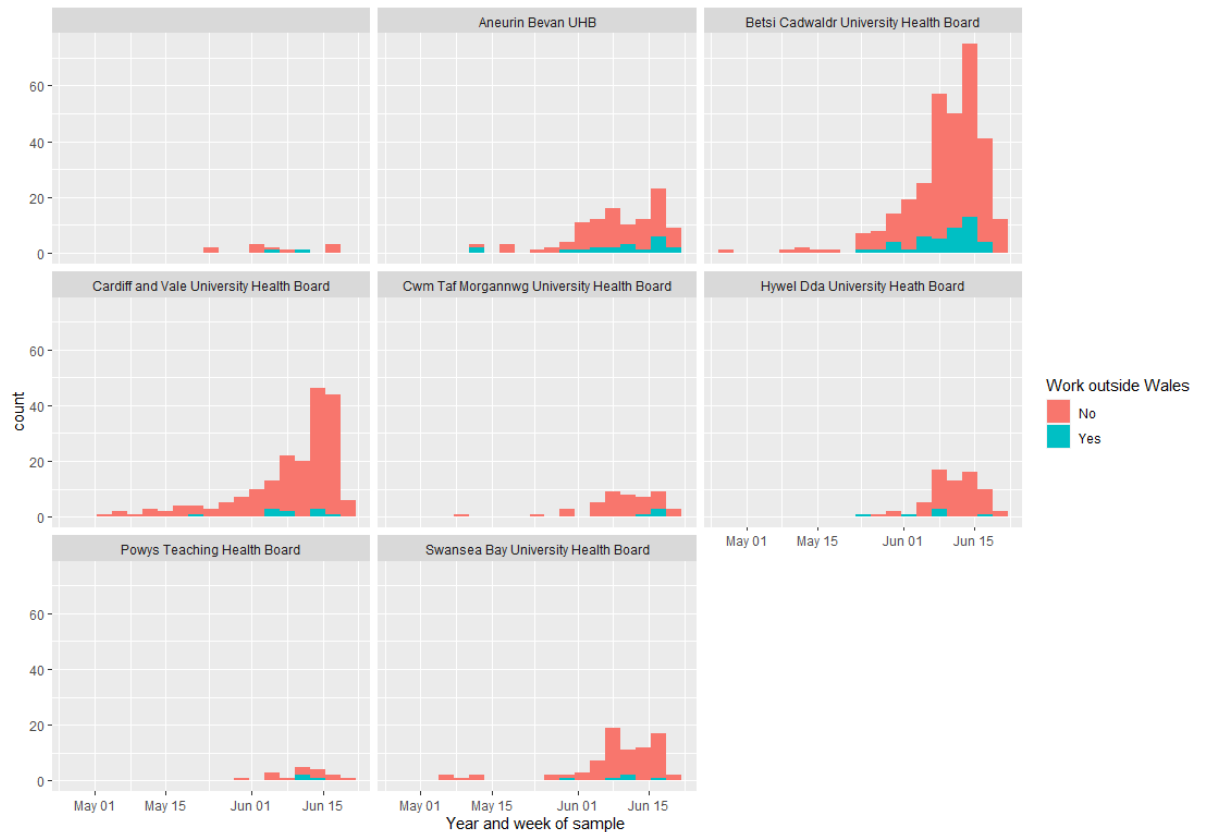
Figure: Epicurve of recent delta cases by travel and contact status, and Health Board



Only a very small proportion (<2%) of recent cases are linked to travel. The majority of cases now have no established link to another case on the CRM. A small number are classed as “definite hospital onset”.

Sporadic delta cases and work location

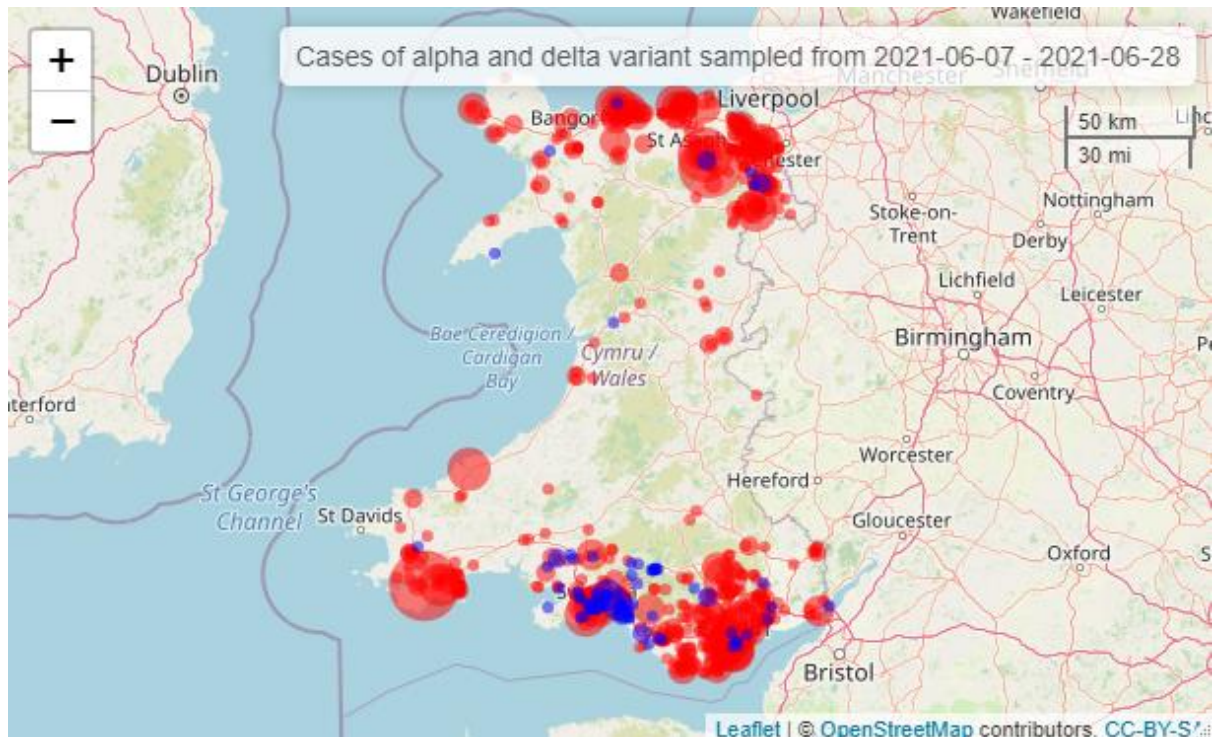
Figure: Epidemic curve of sporadic delta cases by work location outside Wales and Health Board



Sporadic case numbers have increased week on week. In ABUHB several early cases worked outside Wales. In BCUHB the proportion of cases working outside Wales increased, but has dropped off in recent weeks. In CVUHB several cases over the past few weeks have worked outside Wales, but with no upward trend. There has been an increase in the last two week in the proportion of cases who work outside of Wales in CTMUHB.

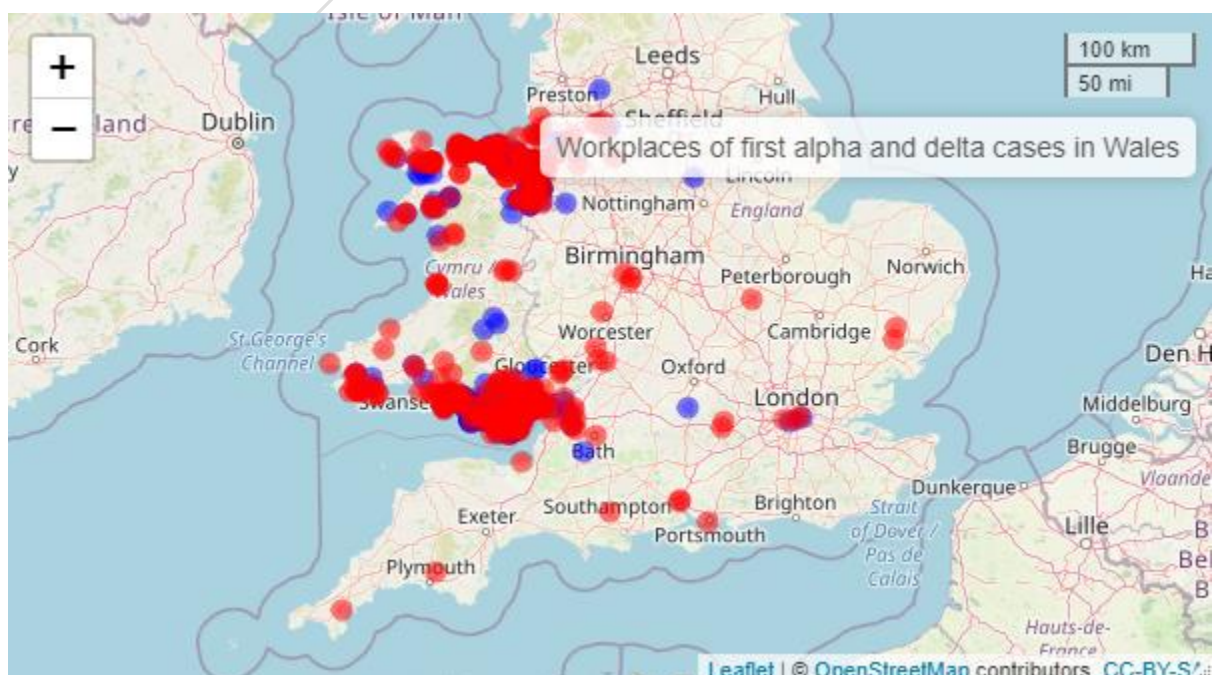
Locations of recent alpha and delta cases

Figure- cases of alpha (blue) and delta (red) variant from 7/6 to 28/6, by postcode of residence (size = number of cases)



In this last 21 day period, delta cases (red) predominate in both north and south Wales, with few alpha cases (blue). Alpha cases are mainly seen in the Swansea Bay area.

Workplaces of the first 1322 alpha (blue) and delta (red) cases, by postcode

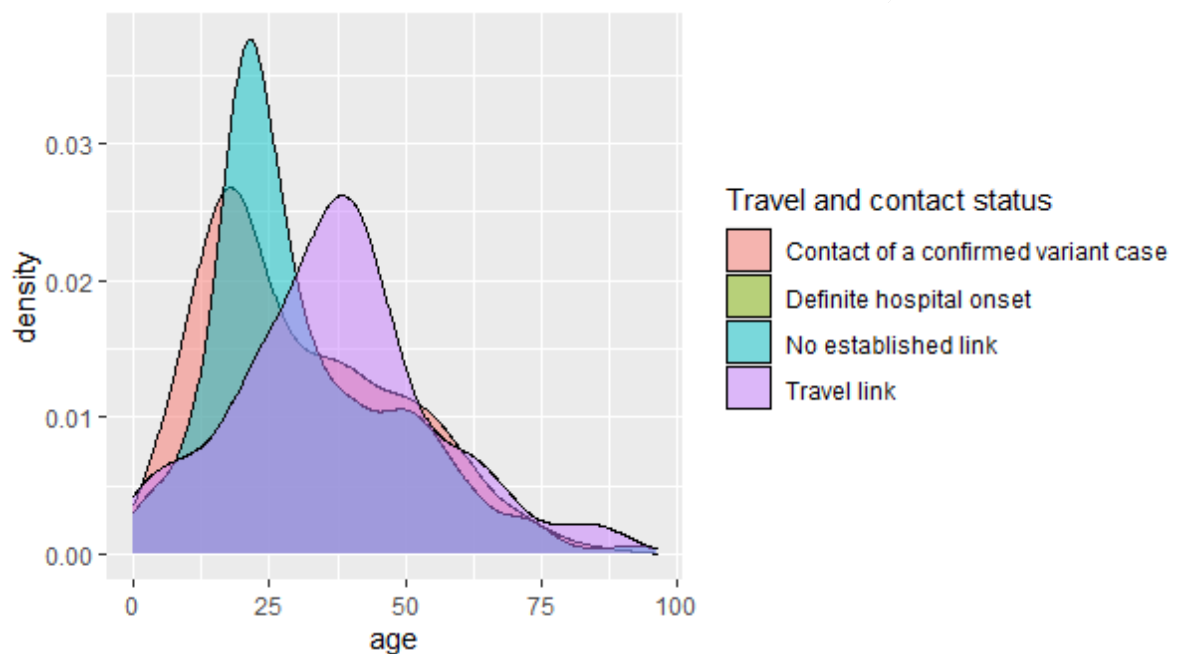


Red circles = workplaces for first 1322 delta cases; Blue circles= workplaces for first 1322 alpha cases

The alpha cases were the earliest 1322 cases, showing possible workplace links for seeding for the initial alpha wave. There are more workplaces in England, particularly in the northwest, West Midlands, and London, for the first delta cases, suggesting possible seeding from these areas for delta more than for alpha. English workplaces for early alpha cases are more prominent in the Bristol/SW area but most are in Wales.

8% (103/1322) of the earliest 315 delta cases had workplaces outside Wales, compared to 29/1322 (2%) of the first 315 alpha cases.

Figure: Age distribution of delta cases by travel/contact status



Cases with a travel link have a higher peak age (around 40) than those without an established link (sporadic, peak around age 20) and those who are contacts of a confirmed variant case (around age 16).

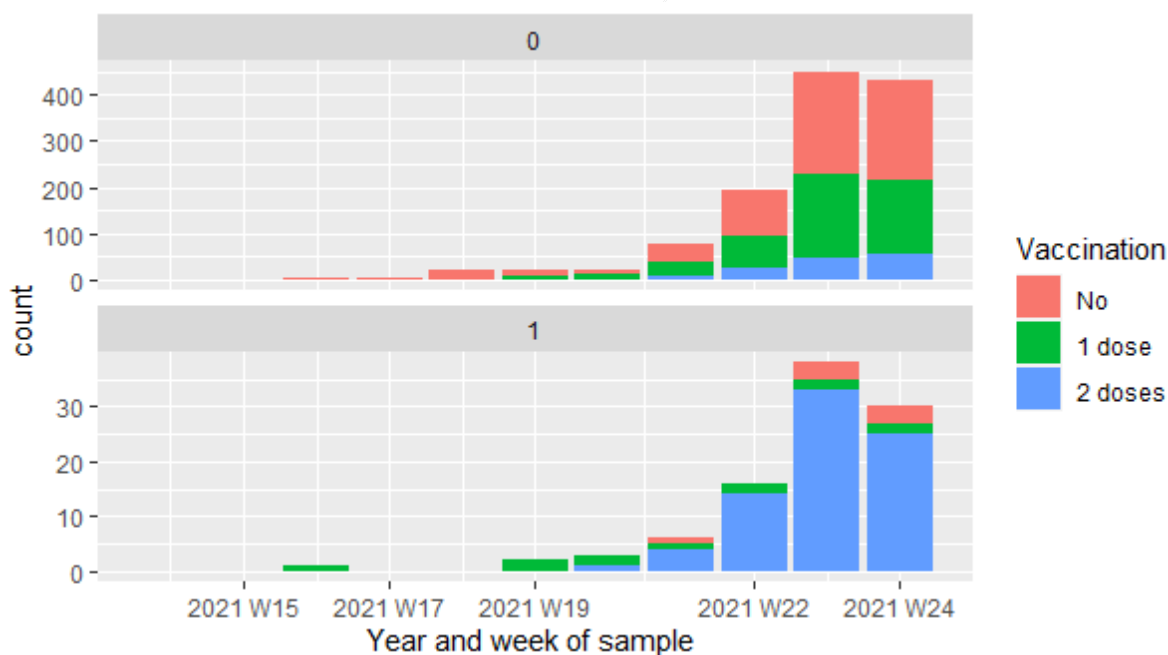
Vaccination status

Table: vaccination status of delta cases, by age group

over60	Cases	Median age	Hospitalised	Community admissions	Possible HCAI	No vaccine	Vaccinated 1 dose	Vaccinated 2 doses	Percentage unvaccinated
60 years and over	88	69	9	8	1	7	11	70	7
Under 60	1234	25	15	14	1	623	465	146	50

Under half (48%, 630/1322) of delta cases were unvaccinated. Vaccination status reflects the underlying uptake by age groups, with 93% of those aged 60 and over having had at least 1 dose of vaccine compared to 50% of cases aged under 60. An assessment of vaccine effectiveness cannot be made from these data alone.

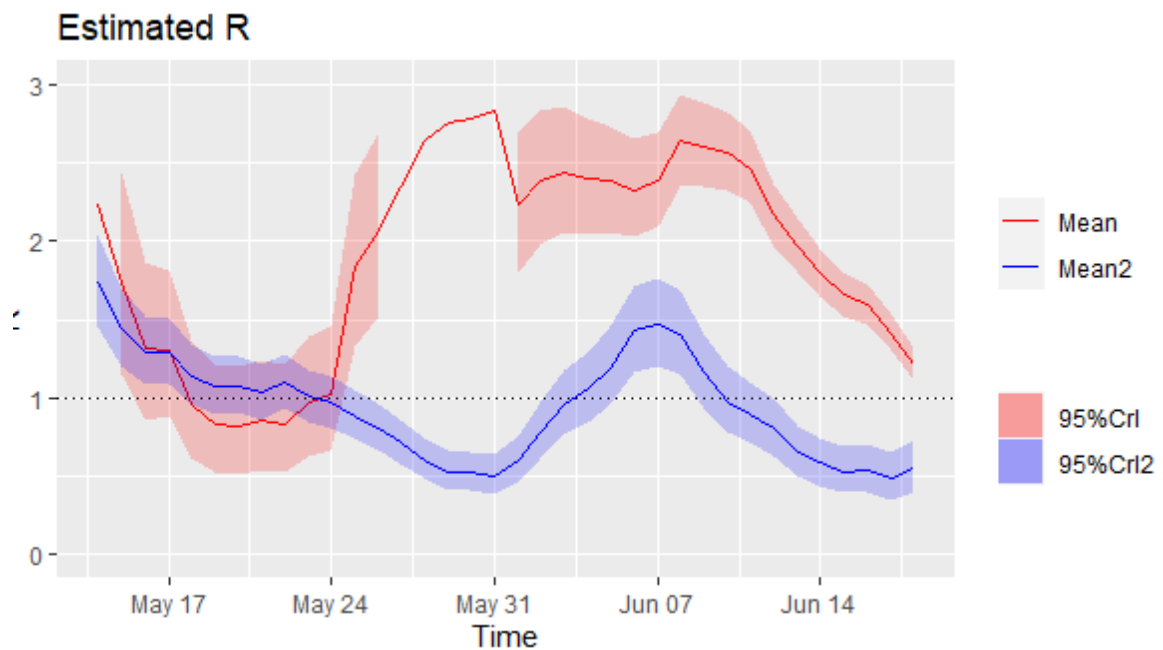
Figure: Epicurve of delta cases by age group and vaccination status



More recent cases in the over 60's have been vaccinated, whereas in the under 60's around half have had 1 or 2 doses. Earlier cases in the under 60's were nearly all unvaccinated.

Reproductive number estimates for alpha and delta variant

Figure: Estimation of R_t using EpiEstim, over time- comparison of delta (red) and alpha (blue)



R_t for delta variant rose above 1 around May 24th and was between 2 and 3 until mid-June, when it declined to just above 1. R_t for alpha variant also rose above 1 in early June and then declined to below 1.

The results should be interpreted with caution due to the small numbers, and recent falls in R_t may be due to reporting lags.

Annex 1b- Public Health Wales Updated Genomic Analysis

The Public Health Wales Pathogen Genomics Unit (PenGU) have been providing real time analysis of genomics data to identify and confirm cases of the delta variant (VOC-21APR-02)

To date (2021-06-27) over 1400 samples identified as Delta have been sequenced from Welsh patients (note: some patients have provided multiple samples). For this analysis, partial deduplication has provided a dataset of 1334 delta samples (VOC-21APR-02) to provide an update on the overview of the current situation in Wales. The analysis below focuses on 837 samples, covering 55 distinct groups of delta samples, determined based upon genetic relatedness. A further 430 samples form another larger group, which had to be processed in two parts, and is included as a separate document. The results from that data are consistent with the summary presented here. 67 samples have been typed by PHW but have not passed through COG-UK phylogenetics processing yet, and so were not covered.

In the last month, PenGU has also identified 4 sequenced cases belonging to VUI-21MAY02, these have also been included to provide an indicative overview of the situation with that variant in Wales.

Overview

The delta variant has been circulating in India since the autumn of 2020. The combination of circulating time and number of cases means that the delta variant is, in fact, a genetic lineage that has accumulated considerable genetic diversity.

This means that imports into Wales are a subsample of that larger cloud of diversity, meaning that it is possible to identify clusters that are genetically distinct from one another, which can be used to identify imports into Wales, and to look at spread within our communities.

By examining Welsh cases in the context of other UK and global cases, we can identify putative groups which may represent transmission networks. We can also use the grouping of Welsh and other cases to exclude the possibility that any pair of cases are a direct transmission. While very powerful, the genomic data only provides one piece of information; for full interpretation and to answer specific questions about clusters of cases, this information must be combined with other epidemiological data.

Contextualising Welsh sequence data with other sequenced samples from the UK also enables us to understand how outbreaks elsewhere in the UK may be affecting Wales.

VUI-21MAY-02 summary

The four Welsh VUI-21MAY-02 samples fall into 2 groups. Two cases fall into a group with other UK cases, are identical to at least one other UK case and one another, and may represent transmission within the UK (tree 2), although this would require epidemiological follow up to establish. Two cases form a group

with a case from the UK and one case from the USA, this group is sparse, and while the result could be consistent with the samples being part of a transmission group, it would also be consistent with a pair of independent introductions into Wales/UK.

Delta summary

Welsh cases fall into a range of group sizes - ranging from two very large groups of closely related samples, that also encompass significant outbreaks in the UK and cases from other parts of the world, down to sporadic cases that have only a handful of close relatives. For example, one cluster (Tree 43) encompasses 381 Welsh cases, including clusters in both North and South Wales, with evidence of both multiple independent introductions and community spread, while the other end of the scale is demonstrated by trees 6, 22 and 34.

Across most groups identified, Welsh samples intermingle with samples from elsewhere in the UK, pointing towards a pattern of mixing (and transmission) across the border.

By examining the phylogenetic trees generated as part of our analysis, we can identify over 100 predicted/estimated introductions into Wales. This estimate is conservative and additional analysis of patient travel history would potentially increase this estimate, as there are multiple larger clusters which include cases from across Wales which would be consistent either with spread within Wales or import into Wales.

Since the last analysis, we also see evidence for an increasing number of cases which, based on location and their genomic relatedness, would be consistent with community transmission. Furthermore, our genomic data indicates that there are clusters of cases that would be consistent with community transmission for most parts of Wales.

It is important to note that while we see large clusters associated with particular locations, consistent with community transmission (e.g. Trees 1,7,16,29,41 for examples in different parts of Wales), we continue to see both single, sporadic cases, and multi-case clusters. In some cases, (e.g. Cardiff, Trees 7, 37, 39, 55) evidence points towards the establishment of multiple transmission groups, overlapping in time, in a local area.

Evidence for origin of imports into Wales

Previously we could identify clear clusters associated with Cardiff (tree 7) and Conwy (tree 43), in our more recent data we see these clusters increasing in size, and beginning to include further cases from outside their immediate geographic vicinity. This could be indicative of either imports into Wales or spread within Wales. Without linked travel history and contact tracing this data is more difficult to make complex inference from using the genomic data alone, however, across our data we see evidence of Welsh cases grouping with cases from elsewhere in the UK on a genomic level, a signature that would be

consistent with community transmission within this wider lineage in other locations across the UK, and imports into Wales. The wider UK perspective is instructive, both from the timescale of observed cases for this lineage and the lineage phylogenetic tree.

Evidence for wider transmission within Wales

In 31 of 55 Delta groups identified in our analysis, cases originated from 2 or more Welsh local authority areas. 13 of those groups encompass cases in both North and South Wales.

Collectively this data may be indicative of the presence of non-local transmission within Wales, in addition to evidence of localised community transmission.

*Please note; one large group of cases encompassing 501 sequenced Welsh samples, was too large to process as a single group once cases from elsewhere in the UK are included. This group was split and processed in parts separately, which splits trees that would have been grouped together following the methodology used for the other trees in this analysis. The split analysis is included as a separate document, but provides effectively the same results as the analysis above. *

Acknowledgements

This report was generated by CIVET, made primarily by Aine O'Toole and Verity Hill, using code from Rambaut Lab members.

The analysis was performed using the CLIMB COVID system, hosted at the University of Birmingham and Cardiff University.

The background data from the UK was generated by the COG consortium (<https://www.cogconsortium.uk/>), a national, multi-centre consortium for the sequencing and analysis of SARS-CoV-2 genomes for Public Health.

We also use some background data from GISAID (<https://www.gisaid.org/>) in the phylogenies. We thank everyone involved in the global sequencing effort for making their data available.

Tree data was visualised using baltic (<https://github.com/evogytis/baltic>)

Mapping data was downloaded from the Global Administrative Database (<https://gadm.org/>) and Natural Earth (<https://www.naturalearthdata.com/>)



Annex 2- SPI-M: Transitioning from non-pharmaceutical interventions to vaccination to control COVID-19 transmission

Available here:

[S1305 JUNIPER Transitioning from nonpharmaceutical interventions to vaccination to control COVID-19 transmission.pdf \(publishing.service.gov.uk\)](#)

Summary

We use social contact data collected in the Social Contact Survey (SCS) in combination with age-specific vaccination rates to construct a framework for estimating the effective COVID-19 reproduction number as a functions of social distancing restrictions, COVID-security, contact tracing and vaccination. We use the effective reproduction number to estimate the attack rate following the lifting of non-pharmaceutical interventions at snapshots in the vaccine rollout programme: at the end of May 2021, end of June 2021, once all adults have been offered a first vaccine dose, once all adults have been offered two vaccine doses and extending the vaccine programme to older teenagers. We model the emergence of new variants by increasing the transmission potential, Infection Fatality Rate and the potential for vaccine escape.

Findings

- Lifting social distancing restrictions after adults are eligible for two doses leads to an estimated reproduction number of 1.8 (95%CI 1.5, 2.4), and low numbers of deaths.
- With average vaccine uptake in adults around 95%, half of all deaths are estimated to be in vaccinated individuals.
- COVID-security and contact tracing and retaining some more limited social distancing restrictions, as implemented in the model, has the potential to make a meaningful contribution to reducing cases and deaths. With all adults eligible for two doses, retaining some social distancing could bring the reproduction number close to 1 and result in non-linear decreases in cases and deaths.
- We find that a 10% drop in vaccine uptake increases the number of cases three-fold and the number of deaths ten-fold.
- When returning to pre-COVID contact patterns, there is an ever-present risk of a new variant transmitting as the reproduction number is still above 1.
- In this framework, vaccinating 15 to 17 year-olds had a minimal impact on case numbers and numbers of deaths.

Conclusions

- All vaccine/restriction lifting scenarios post July 2021 result in lower numbers of deaths than those seen so far in England.
- This is a complementary approach to full dynamic modelling, and lends itself for comparison between strategies.