Witness Name: Professor Sir Ian Diamond
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UK Covid-19 INQUIRY

WITNESS STATEMENT OF PROFESSOR SIR IAN DIAMOND

I, Professor Sir Ian Diamond, Chief Executive of the UK Statistics Authority and National Statistician, will say as follows:

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The UK Statistics Authority's Role and Data Relating to Wales

1. The UK Statistics Authority (the Authority) is an independent body established by the Statistics and Registration Service Act 2007 ('the 2007 Act'). It operates at arm's length from government as a non-ministerial department and reports directly to the UK Parliament, the Scottish Parliament, the Welsh Parliament, and the Northern Ireland Assembly.

2. The Office for National Statistics (ONS) is the Authority's executive office and operates the Authority's statistical production function. The ONS is the UK's internationally recognised National Statistical Institute and largest independent producer of official statistics in the UK. It is responsible for collecting and publishing statistics related to the economy, population, and society at national, regional and local levels for England and Wales. The ONS's headquarters is based in Newport, South Wales.

3. Some statistics that the ONS produces relating to England and Wales are required by legislation. For example, the Registration Service Act 1953 requires that we lay an abstract of births and deaths for England and Wales before Parliament each year. Other data covering the Welsh population is not legally mandated but collected to aid the production of data and insights relating to Wales. For example, the Coronavirus Infection Survey, which during the pandemic provided country specific modelled estimates of prevalence of infections for each UK nation, and until this year the National Survey for Wales (NSW) which the ONS undertook on behalf of the Welsh Government who then provide analytical commentary.

4. I, as the National Statistician (October 2019 – present (November 2023 at the time of writing)), am Chief Executive of the Authority, Head of the Government Statistical Service (GSS) and Analysis Function. I provide overall leadership for the ONS and the statistics profession across government. I advise ministers, the Cabinet Secretary and senior officials on the production, dissemination, and use of statistics across government. I am responsible for the work of our department and provide direction to ensure we deliver on our strategy 'Statistics for the Public Good'.

5. Each of the devolved administrations has its own Chief Statistician. The Concordat on Statistics [INQ000335482] sets out the agreed framework for statistical collaboration between the Authority, UK Government, and the Northern Ireland, Scottish and Welsh Governments. It provides assurance that we will work together to meet public need by producing coherent and comparable statistics at the UK and disaggregated levels while recognising differing policy contexts. This approach works in line with devolution settlements, allowing official statistics to best meet the needs of the public and decision makers within devolved regions and capitalise on data sources in devolved policy areas.

Exhibit ID4/01/INQ000335482

6. As health and social services are devolved matters, we work with statistical producers across the UK to ensure relevant official statistics are high quality, statistically coherent and UK-wide wherever possible. Cross-UK engagement increased during the pandemic through working-level initiatives and groups.

7. High-level formal governance and oversight of cross-UK statistical work is provided by the Authority's Inter-Administration Committee (IAC) that I chair, with membership that includes the Chief Statisticians of the devolved administrations. This Committee

meets quarterly and promotes statistical coherence across the administrations of the UK and resolves inter-administration issues should they arise.

8. The GSS is a community for all civil servants working in the collection, production, and communication of official statistics. Each government department that produces official statistics has a statistical Head of Profession who leads and manages statistical activities. The Heads of Profession are accountable to their departmental management for day-to-day delivery, but also have a professional accountability to the me as the National Statistician. The Chief Statistician and Head of Profession for Statistics for the Welsh Government is Stephanie Howarth whom I and ONS colleagues meet with regularly.

Welsh Population Statistics

9. The following statistics are taken from the UK mid-2020 population estimates and 2021 Census to provide the requested Welsh population at March 2020 and at Census 2021.

10. The statistics relating to 2020 are not directly comparable with the statistics that relate to 2021, from the 2021 Census. This is because the estimates for 2020 have not yet been revised to take account of the higher quality data that Census 2021 has subsequently provided.

11. The estimated usually resident population of Wales for mid-2020 was 3,170,000 [INQ000335483]. The median age of the usually resident population of Wales in mid-2020 was 42.4 years. The population aged between 16 and 64 in Wales was 1,938,000, which is 61.1% of the total population. An estimated 21.1% of the population was aged 65 and over, while 17.8% of the population of Wales was estimated to be aged 0 to 15.

12. On Census Day 2021 [INQ000335484], 21 March, the size of the usual resident population in Wales was 3,107,500; this was the largest population ever recorded through a census in Wales.

13. The population of Wales had grown by 44,000 (1.4%) since the last Census in 2011, when it was 3,063,456. There were 1,586,600 women (51.1% of the population) and 1,521,000 men (48.9%). The estimates for mid-2020 (in paragraph 11) and Census Day 2021 are not directly comparable as the estimates between 2012 and 2020 are yet to be rebased to account for Census 2021.

14. On Census Day 2021, there were more people than ever before in the older age groups; the proportion of the population who were aged 65 years and over was 21.3% (662,000). In comparison, 62.2% (1,931,800) were aged 15 to 64 years, 16.5% of the population (513,800) in Wales were aged under 15 years.

15. In terms of population density, there were 150 residents per square kilometre in Wales on Census Day in 2021. The most densely populated local authority was Cardiff (2,572 residents per square kilometre), which was more than three times as densely populated as the next highest area, Newport (838 residents per square kilometre).

16. In Wales, the percentage of usual residents aged 16 years and over who were in employment was 53.5%. Across local authorities that percentage ranged from 49.1%

in Ceredigion, to 57.9% in Flintshire. In total, 1.1 million usual residents aged 16 years and over in Wales were economically inactive in 2021 (43.5%).

17. A greater percentage of usual residents aged 16 and over were economically inactive in Wales (43.5%) than in England (39.1%). In Wales, larger percentages of usual residents aged 16 years and over were economically inactive because of being retired (24.7%), long-term sick or disabled (5.9%) or studying (5.7%) than in England (21.5%, 4.1% and 5.6% respectively).

Mortality Statistics

18. The ONS regularly publishes mortality data by various characteristics in England and Wales. The *Deaths Registered in England and Wales* release is published annually and laid before Parliament. In my witness statement to the Inquiry dated 11 September 2023, mortality data breakdowns were provided for Wales as well as other UK nations and, the UK as a whole [INQ000271436]. Numbers in this statement will differ to those presented in my previous statement as the time period requested by the Inquiry is different. The summary and methods in my previous statement are valid for this statement also.

19. Mortality analysis was published throughout the pandemic, however we have recalculated some of the analysis based on the most up-to-date data. The majority of trends found at UK level hold true at a Wales level also. Specifically, rates of deaths involving and due to Covid-19 were highest in the eldest age groups and higher in males compared with females. Unlike the UK, Wales saw a larger peak in Covid-19 mortality in the second wave compared to the first.

20. Mortality figures are based on the date a death was registered, rather than date a death occurred, unless otherwise stated. The majority of deaths are registered within one week, with 75.9% of deaths registered in Wales being registered within a week in 2021 [INQ000335485].

21. When compared to the other UK nations, looking at mortality for the period March 2020 to February 2022, Wales had the second highest age-standardised mortality rate (ASMR, see paragraph 27) of deaths involving COVID-19 with 144.6 deaths per 100,000 population. This was lower (but not statistically significantly) than the rate seen in England (145.0 deaths per population) but significantly higher than the rate seen in Northern Ireland (130.7) and Scotland (124.9).

22. The number of deaths involving Covid-19 registered to Welsh residents up to May 2022 was 10,380 of these 8,802 (84.8%) had Covid-19 as the underlying cause of death. Up to June 2022, this increased to 10,446 deaths involving Covid-19, of which 8,843 (84.7%) had Covid-19 as the underlying cause of death. For both time periods, the number of deaths was above the five-year average (the previous five years excluding 2020) by 9.0% (6,773 deaths above average to May 2022 and 7,008 to end June). When looking at the ASMR rather than the number of deaths, both periods report 4.4% mortality above average (46.2 deaths per 100,000 population above average to May 2022 and 45.3 deaths per 100,000 population above average to June 2022).

23. The number of deaths for Wave 1 (19 March 2020 to 11 September 2020 – 25 weeks) and Wave 2 (12 September 2020 to 8 January 2021 – 17 weeks) have also been provided in Table 1. This shows more deaths per week on average in wave 2 (768)

compared with wave 1 (700). Age-standardised mortality rates have not been provided for breakdowns by wave as the weekly populations used for mortality analysis are linearly interpolated populations which differ from monthly populations (which have been annualised).

Table 1: Number of deaths by Month and wave, and age-standardised mortality rates by month, all-cause and Covid related mortality, Wales [1,2]

	Numbers				Age-standardised mortality rates	
	Wave 1 (19 March 2020 to 11 September 2020)	Wave 2 (12 September 2020 to 8 January 2021)	March 2020 to May 2022	March 2020 to June 2022	March 2020 to May 2022	March 2020 to June 2022
All cause	17,501	13,048	82,318	85,058	1,088.1	1,083.5
Deaths involving Covid-19	2,568	2,848	10,380	10,446	136.3	132.1
Deaths due to Covid-19	2,306	2,495	8,802	8,843	115.6	111.9
Five-year average (all-cause)	15,150	10,871	75,545	78,050	1,041.9	1,038.2
Excess deaths	2,351	2,177	6,773	7,008	46.2	45.3
% excess	15.5	20.0	9.0	9.0	4.4	4.4

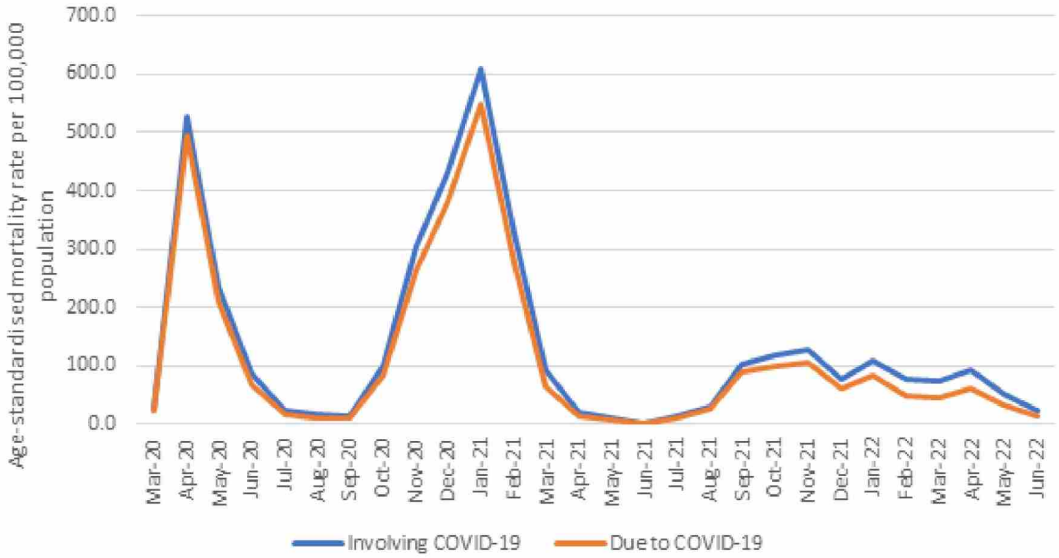
24. Table 2 in statement INQ000271436 Covid-19 across the UK. Below, Figure 1 shows the ASMRs per 100,000 population for deaths involving and due to Covid-19 [INQ000271436].

25. In Wales, the highest peak in the first wave was April 2020 with 525.4 deaths involving Covid-19 per 100,000 population and 494.8 deaths per 100,000 population due to Covid-19.

26. Unlike the UK, where the highest peak was in April 2020 during the first wave, the highest peak in Wales was January 2021 in the second wave. Wales saw rates of 608.6 deaths involving Covid-19 per 100,000 population and 549.4 deaths due to Covid-19 per 100,000 population.

[1] Based on date a death was registered rather than date a death occurred
[2] Based on those resident in Wales

Figure 1: Age-standardised mortality rate of deaths involving and due to Covid-19, Wales, March 2020 to June 2022[3],[4]



Age-Standardised Mortality Rates

27. As age is a key factor in Covid-19 mortality, ASMRs allow comparisons to be made between groups that have differing age structures. Interpreting differences in mortality rates between different groups without accounting for the differing age profiles or population sizes can lead to misleading conclusions. Rates are age-standardised using the 2013 European Standard Population (ESP), an international standard method which reflects a 'typical' population structure of a European country (including the UK). The ESP is a hypothetical population used to weight age-specific mortality rates to produce ASMRs as explained at Page 35 of exhibit [INQ000335486].

Deaths by Region

28. Rhondda Cynon Taf had the highest ASMR across local authorities in Wales for both the period up to May 2022 and June 2022 with 105.8 and 102.6 deaths involving Covid-19 per 100,000 population respectively. This was followed by Merthyr Tydfil with 105.4 deaths involving Covid-19 per 100,000 population and 102.3 per 100,000 population for the period up to May 2022 and June 2022 respectively.

29. The lowest ASMRs were recorded in Ceredigion with 30.9 deaths per 100,000 population for the period up to May 2022 and 30.4 deaths per 100,000 population up to June 2022.

30. Data has also been exhibited for deaths due to Covid-19 as well as for local health boards in Wales [INQ000335487].

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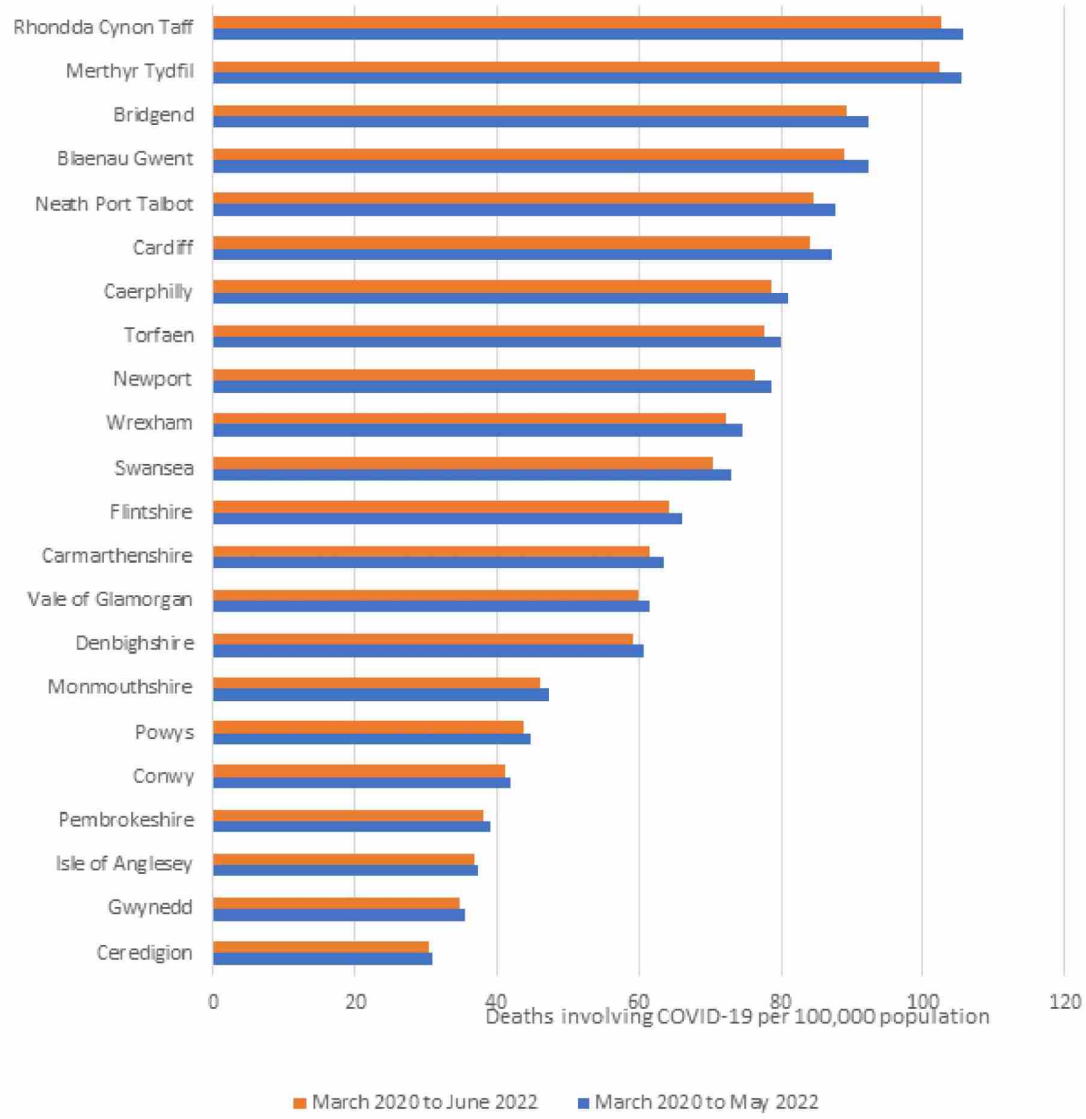
[3] Based on date a death was registered rather than date a death occurred
[4] Based on those resident in Wales

Figure 2: Age-standardised mortality rate of deaths involving Covid-19, Local authorities of Wales, March 2020 to May and June 2022[3,4]



Deaths by characteristic

Age

31. Statistics for the period up to May 2022 and the period up to June 2022 (time points requested by the Inquiry) were very similar. This section focuses on the period up to June 2022. Tables with data up to May 2022 have also been provided at [INQ000335487].

32. For all age groups under 25, a rate was not able to be created for deaths due to Covid-19 because of the low numbers involved.

33. For both deaths involving and due to Covid-19, the ASMR generally increased the older that people were. The highest rate was seen in those aged 90 and over with 2,992.2 deaths per 100,000 population for deaths involving Covid-19 and 2,601.0 deaths per 100,000 population for deaths due to Covid-19.

34. Deaths involving Covid-19 means that Covid-19 was involved in the death as the underlying cause or contributing factor. Deaths due to Covid-19 are those where Covid-19 was the underlying cause of death, in other words the condition that started the causal chain of events that led to the death. Deaths due to COVID-19 are a subset of deaths involving COVID-19.

Table 2: Number of deaths and age-specific rates by five-year age group, Wales, March 2020 to June 2022 [5],[6],[7]

Age group	March 2020 to June 2022			
	Numbers		Age-specific rates	
	Deaths involving Covid-19	Deaths due to Covid-19	Deaths involving Covid-19	Deaths due to Covid-19
Under 1 year	0	0		
1 to 4 years	1	0		
5 to 9 years	1	1		
10 to 14 years	1	1		
15 to 19 years	3	2	0.7	
20 to 24 years	1	1		
25 to 29 years	9	7	2.0	1.5
30 to 34 years	15	13	3.2	2.8
35 to 39 years	27	22	6.2	5.0
40 to 44 years	55	45	13.4	11.0
45 to 49 years	86	68	19.9	15.7
50 to 54 years	193	166	38.4	33.0
55 to 59 years	308	268	59.3	51.6
60 to 64 years	456	391	97.3	83.5
65 to 69 years	687	573	163.9	136.7
70 to 74 years	1055	894	251.0	212.7
75 to 79 years	1502	1249	475.0	395.0
80 to 84 years	1898	1574	898.2	744.9
85 to 89 years	2001	1706	1570.7	1339.1
90 years and over	2147	1862	2999.2	2601.0

[5] Based on date a death was registered rather than date a death occurred
[6] Based on those resident in Wales
[7] Rates have not been calculated for age groups with less than three deaths

Sex

35. For the period to May 2022 and June 2022 the number of deaths involving, and due to Covid-19, was higher in males compared to females. This can be seen in Table 3 below which shows both higher numbers and ASMRs in males.

Table 3 Number of deaths and age-standardised rates by sex, Wales, March 2020 to June 2022[8],[9]

Time period	Numbers		ASMRs	
	Involving COVID-19	Due to COVID-19	Involving COVID-19	Due to COVID-19
Males				
March 2020 to May 2022	5607	4784	171.7	146.9
March 2020 to June 2022	5641	4802	166.4	142.0
Females				
March 2020 to May 2022	4773	4018	109.0	91.7
March 2020 to June 2022	4805	4041	105.8	88.9

Place of Death

36. Findings for the period up to May 2022 and June 2022 were very similar. Therefore, this section focuses on the period up to June 2022, tables with the data up to May 2022 have also been provided at [INQ000335487].

37. The majority of deaths involving and due to Covid-19 occurred in hospital (73.8% and 73.9%, respectively). This was followed by care homes with 18.8% of the deaths involving Covid-19 and 19.8% of deaths due to Covid-19 occurring in care homes. Despite private homes having the second highest percentage of all-cause mortality occurrences (30.0%), there was only a small proportion of deaths involving Covid-19 (6.0%) and deaths due to Covid-19 (5.2%) occurring in private homes.

Table 4: Number and proportion of deaths by place of death, Wales, March 2020 to June 2022[10],[11],[12]

Place of death	Numbers			Proportion of deaths		
	All cause	Involving Covid-19	Due to Covid-19	All cause	Involving Covid-19	Due to Covid-19
Home	25,541	631	464	30.0%	6.0%	5.2%
Hospital	41,649	7,706	6,532	49.0%	73.8%	73.9%
Hospice	1,515	46	17	1.8%	0.4%	0.2%

[8] Based on date a death was registered rather than date a death occurred
[9] Based on those resident in Wales
[10] Based on date a death was registered rather than date a death occurred
[11] Based on those resident in Wales
[12] Home is classed as private homes. Based on place where the death occurred.

Care home	13,907	1,960	1,750	16.4%	18.8%	19.8%
Other communal establishment	265	62	49	0.3%	0.6%	0.6%
Elsewhere	2181	41	31	2.6%	0.4%	0.4%

Socio-Economic Deprivation

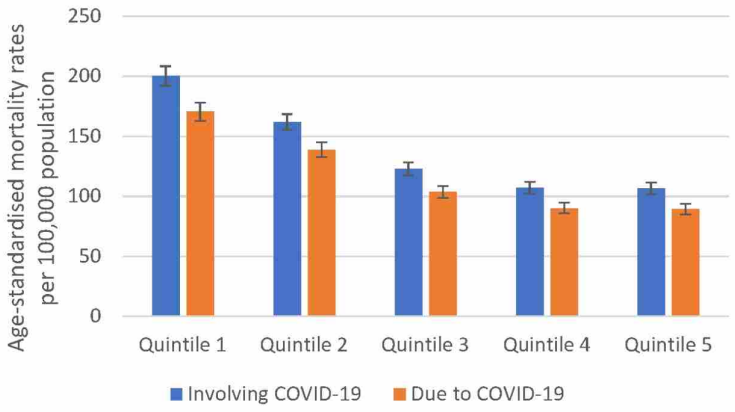
38. Through information available on the death certificate, it is possible to derive some information on socio-economic deprivation, for example, through occupation stated or geography-based variables. Throughout the pandemic and here, the ONS has used the index of multiple deprivation (IMD). This is because it assigns those residents in Wales to a quintile from most deprived (quintile 1) to least deprived (quintile 5).

39. The ASMRs for deaths involving and due to Covid-19 are highest in the most deprived quintile and lowest in the least deprived quintile. This pattern is seen in all-cause mortality as well.

40. The rate of deaths involving Covid-19 was statistically significantly higher in the most deprived quintile (quintile 1) compared to all other quintiles. The rate of deaths in the least deprived quintile was statistically significantly lower than all other quintiles apart from quintile 4, where there was no significant difference.

41. There were 200.1 deaths involving Covid-19 in the most deprived area compared to 106.5 deaths involving Covid-19 in the least deprived area for the period March 2020 to June 2022. The rate for deaths due to Covid-19 for the same period was 170.5 deaths per 100,000 population is the most deprived compared to 89.3 deaths per 100,000 population in the least deprived.

Figure 3: Age-standardised mortality rates per 100,000 population for deaths due to and involving Covid-19 by index of multiple deprivation, Wales, March 2020 to June 2022[13,14]



[13] Based on date a death was registered rather than date a death occurred
[14] Based on those resident in Wales

Pre-existing condition

42. Pre-existing conditions of deaths due to Covid-19 in Wales is available for 2020 and 2021, this is published as part of the ONS Monthly Mortality Analysis. From 2022 onwards data was only available for England and Wales combined, this was due to low numbers of deaths due to Covid-19 in Wales.

43. Table 5 shows the number of deaths due to Covid-19 in Wales with and without pre-existing conditions noted on the death certificate. The tables exhibited alongside the statement also show the top 30 pre-existing causes of death in Wales [ID4/07-INQ000335488]. For 2020, Dementia and Alzheimer's disease was the leading pre-existing cause. For 2021, it was Diabetes.

Table 5: Number and proportion of deaths due to Covid-19 by pre-existing health condition, Wales, 2020 and 2021[15,16,17]

Year		Number of deaths			Proportion of all deaths due to Covid-19		
		All ages	Aged 0 to 64 years	Aged 65 years and over	All ages	Aged 0 to 64 years	Aged 65 years and over
2021	All deaths due to Covid-19	3,650	506	3,144	[z]	[z]	[z]
2021	Covid-19 deaths with no pre-existing conditions	628	151	477	17.2	29.8	15.2
2020	All deaths due to Covid-19	4,382	398	3,984	[z]	[z]	[z]
2020	Covid-19 deaths with no pre-existing conditions	750	108	642	17.1	27.1	16.1

44. As part of my previous statement INQ000271436, breakdowns were provided for Wales as well as the UK and other nations of the UK. We have used the data from this statement to compare mortality in Wales with England, Scotland and Northern Ireland. The period covered between paragraphs 45 and 47 is therefore March 2020 to February 2022 as this is the period requested for the previous statement.

Covid-19

45. The number of death registrations involving Covid-19 between March 2020 and February 2022 by each of the four UK nations was detailed in Table 5 in my previous statement, INQ000271436. It is also included in Table 6 below.

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[15] Based on date a death was registered rather than date a death occurred
[16] Based on those resident in Wales
[17] Cause of death is coding using ICD10 cause of death codes

46. Wales had the second highest ASMR across the four nations with 144.6 deaths per 100,000 population. This was lower (but not statistically significant) than the rate seen in England (145.0 deaths per population) but significantly higher than the rate seen in Northern Ireland (130.7) and Scotland (124.9).

Table 6: Death registrations involving Covid-19, March 2020-February 2022, UK, England, Wales, Scotland, Northern Ireland and region of England[18,19]

Country	Number of deaths involving Covid-19	Age-standardised mortality rates of deaths involving Covid-19 per 100,000 persons	95% Lower confidence interval	95% Upper confidence interval
UK	**186,668**	**143.2**	**142.6**	**143.9**
England	158,964	145.0	144.3	145.7
Wales	9,751	144.6	141.7	147.5
Scotland	13,334	124.9	122.8	127.1
Northern Ireland	4,309	130.7	126.7	134.6

47. The number of death registrations involving Covid-19 between March 2020 and February 2022 by place of death was included in Table 7 in my previous statement, INQ000271436. This information is available for England and Wales only. As can be seen in the table, both showed the majority of Covid-19 deaths occurring in hospitals, followed by care homes and then private homes.

Mortality during October and November 2020

48. The Inquiry requested information on mortality before, during and after the 'Firebreak' lockdown in Wales which took place between 23 October 2020 to 9 November 2020. To provide week by week insight for the period requested, Table 7 refers to data drawn from the weekly published provisional figures for death [INQ000335489]. As these are provisional data and due to the aggregation of data by week rather than month, these cannot be summed to produce the same figures as we report in our monthly published tables. This is because weekly periods span multiple months and do not aggregate neatly to monthly or annual periods. Methodology information for the production of ONS mortality statistics is published in our Quality and Methodology document [INQ000335490].

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[18] Deaths shown as England and Wales occurred and were registered in England or Wales and assigned to either country, and to region within England, based on place of usual residence. Deaths shown as Scotland or Northern Ireland occurred and were registered in those countries, irrespective of place of residence. The UK total includes a small number of deaths of non-residents which occurred and were registered in England and Wales.

[19] Based on date a death was registered rather than occurred.

Table 7: Covid-19 deaths registered in Wales, week ending 2 October to week ending 18 December 2020

Deaths registered for usual residents of Wales, 2020	Total deaths registered by week (Wales)	Average of corresponding week over the previous 5 years (Wales)	Deaths involving Covid-19 (Wales)
Week ending 2 October	671	587	25
Week ending 9 October	638	615	37
Week ending 16 October	688	630	47
Week ending 23 October	661	628	65
Week ending 30 October	712	616	121
Week ending 6 November	832	625	166
Week ending 13 November	742	658	190
Week ending 20 November	848	653	223
Week ending 27 November	797	646	218
Week ending 4 December	836	679	207
Week ending 11 December	814	693	223
Week ending 18 December	882	718	256

Excess deaths

49. Excess deaths are the difference between the observed number of deaths and an expected number of deaths. The expected number of deaths used by ONS is the five-year average.

50. The ONS uses the average of the five previous years (excluding 2020) as its expected number of deaths. We use this method as it ensures comparison with a recent period which was similar in life expectancy, advances in healthcare, population size and shape. Using multiple years removes the fluctuations that can be seen year-on-year when looking at mortality.

51. Some of the benefits of this method are that it is easy to understand and does not rely on different data breakdowns. For instance, it requires only the number of deaths for the period and the five years prior. Some of the limitations are that it does not take into account any trend in the data, nor any other variables than deaths (when looking at numbers of deaths), population, and age-structure (when looking at rates). It can be applied to Wales but care needs to be taken when looking at certain breakdowns as the smaller the number of deaths, the more volatile the method becomes.

52. Excess mortality is useful to look at the direct and indirect impact of the pandemic. For example, during the first wave of the pandemic the number of excess deaths was larger than the number of deaths where Covid-19 was mentioned on the death certificate. This in part can be explained by undiagnosed Covid-19 due to lack of testing at the beginning of the pandemic.

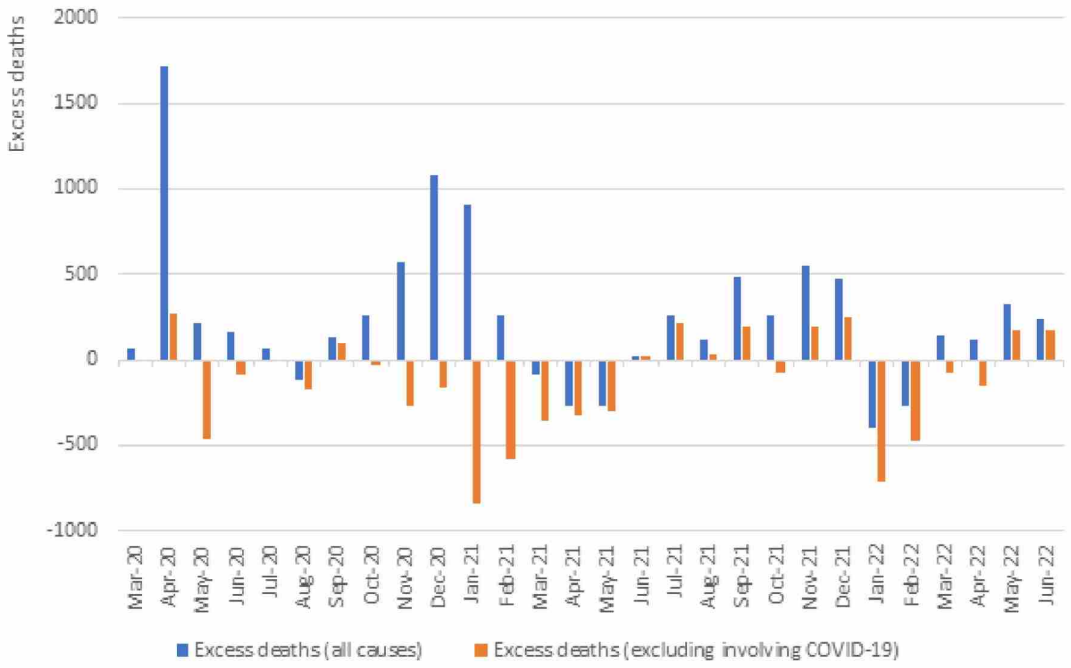
Excess Mortality, January 2020 to May 2022

53. The first death certificate that mentioned Covid-19 was for a death registered in March 2020. Therefore, we have used March 2020 as the starting date.

54. There were only 6 months of the 28 months between March 2020 and June 2022 that did not record excess mortality when looking at all-cause mortality. These were August 2020, March to May 2021, January 2022 and February 2022.

55. However, when removing all deaths involving Covid-19, we only see excess in 9 of the 28 months. These were April 2020, September 2020, June to September 2021, November 2021 and December, May 2022 and June 2022.

Figure 4: Number of excess deaths, all cause and excluding Covid-19, Wales, March 2020 to June 2022[20,21]



Nations and Lockdown Periods

56. The number of excess deaths registered between March 2020 and February 2022 for each of the four nations and lockdown periods is provided in Table 13 in statement INQ000271436 and Table 8 in this statement.

57. England had the highest percentage excess in death registrations when looking at the whole time period and two of the three lockdown periods (March to June 2020 and January to May 2021). This was true when looking at excess using numbers of death registrations or age-standardised mortality rates.

58. During the second lockdown (August to December 2020), Northern Ireland had the highest percentage above average when looking at numbers of death registrations,

[20] Based on date a death was registered rather than date a death occurred
[21] Based on those resident in Wales

but Wales had the highest percentage when looking at age-standardised mortality rates.

59. When looking at age-standardised mortality rates, Wales, Scotland and Northern Ireland all displayed rates below average during the last lockdown period.

Table 8: Excess deaths (deaths above average) for January 2020-February 2022, by nation and lockdown period (February-June 2020; August- December 2020; January-May 2021)[22,23,24]

	UK	England	Wales	Scotland	Northern Ireland
Number of excess deaths					
March 2020 to February 2022	138,909	118,503	6,192	11,017	3,638
March 2020 to June 2020	62,903	55,003	2,150	4,889	908
August 2020 to December 2020	24,668	20,009	1,925	1,871	1,031
January 2021 to May 2021	22,423	20,962	539	770	265
Percentage above average (numbers)					
March 2020 to February 2022	11.4%	11.9%	9.2%	9.5%	11.5%
March 2020 to June 2020	31.5%	33.5%	19.3%	26.0%	17.6%
August 2020 to December 2020	10.2%	10.1%	14.4%	8.0%	16.3%
January 2021 to May 2021	8.3%	9.4%	3.6%	3.0%	3.8%
Percentage above average (ASMRs)					
March 2020 to February 2022	6.1%	6.5%	4.9%	3.9%	4.0%
March 2020 to June 2020	25.5%	27.3%	14.3%	21.3%	11.1%
August 2020 to December 2020	5.8%	5.8%	10.5%	3.5%	10.1%

[22] Figures exclude deaths of non-residents.

[23] Based on date a death was registered rather than occurred.

[24] Figures for the four countries individually exclude deaths of non-residents, as place of residence is used to assign to a country. A small difference to the UK total will therefore be observed as the UK figure also includes deaths of non-residents.

January 2021 to May 2021	2.8%	4.0%	-0.6%	-4.1%	-4.6%

60. As requested by the Inquiry I have provided ASMRs for the five local authorities of 'County of Herefordshire', 'Cheshire West and Chester', 'Shropshire', 'Gloucester' and 'South Gloucestershire' which are on the England, Wales land border.

61. For the period March 2020 to June 2022, the ASMRs in the local authorities on the England/Wales border ranged from 77.7 to 133.2 for deaths involving Covid-19 per 100,000 population and 63.5 to 110.8 for deaths due to Covid-19 per 100,000 population. The range for Welsh local authorities were 30.4 to 102.6 deaths involving Covid-19 per 100,000 population and 24.5 to 89.7 deaths due to Covid-19 per 100,000 population.

Table 9: Number and age-standardised rate of deaths involving and due to Covid-19, English/Welsh land border local authorities, March 2020 to June 2022[25,26]

Local Authority	Deaths due to Covid-19	ASMR due to Covid-19	Deaths involving Covid-19	ASMR involving Covid-19
Herefordshire, County of	374	63.5	457	77.7
Cheshire West and Chester	507	73.9	565	82.3
Shropshire	1,018	110.8	1,224	133.2
Gloucester	708	71.1	890	89.5
South Gloucestershire	308	110.8	369	132.5

62. To calculate excess mortality at local authority level we take the observed ASMR in a local authority and compare it to the average of the previous five-years (excluding 2020) in that local authority. Of the five English/Wales land border local authorities noted, the proportion of excess mortality ranged from 0.1% above the local authorities average to 6.8% above the local authorities average. There were two local authorities in Wales that displayed a larger proportion of excess mortality, these were Pembrokeshire and Gwynedd with 0.8% and 1.7% below average. There were six local authorities that displayed a larger proportion of excess mortality in Wales, these ranged from 6.9% to 12.5% above average.

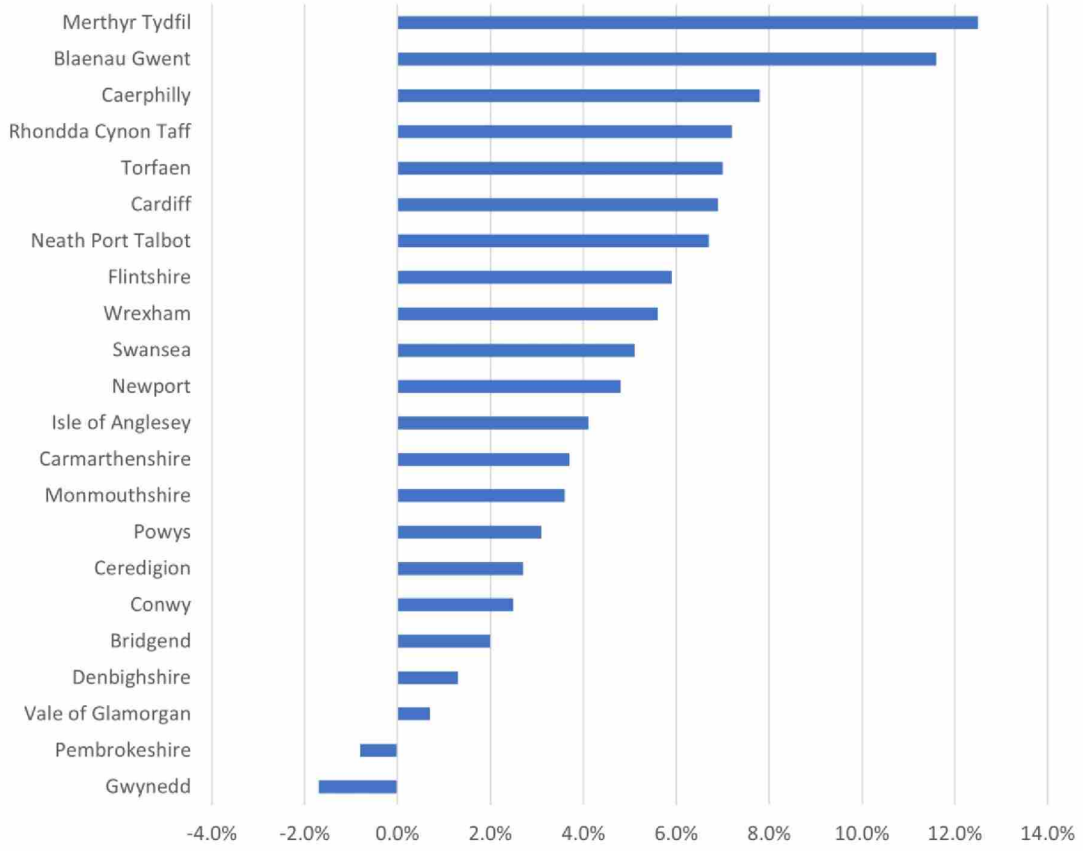
Region/Local Authority in Wales

63. The local authorities with the highest proportional excess were the areas with the highest ASMRs of deaths involving and due to Covid-19. Merthyr Tydfil had the highest excess with ASMRs for the period March 2020 to June 2022 compared to the five-year average. This was followed by Blaenau Gwent and Caerphilly with 11.6% and 7.8% above average, respectively.

[25] Figures exclude deaths of non-residents.

[26] Based on date a death was registered rather than occurred.

Figure 5: proportion of excess deaths by local authority, Wales, March 2020 to June 2022[27,28]

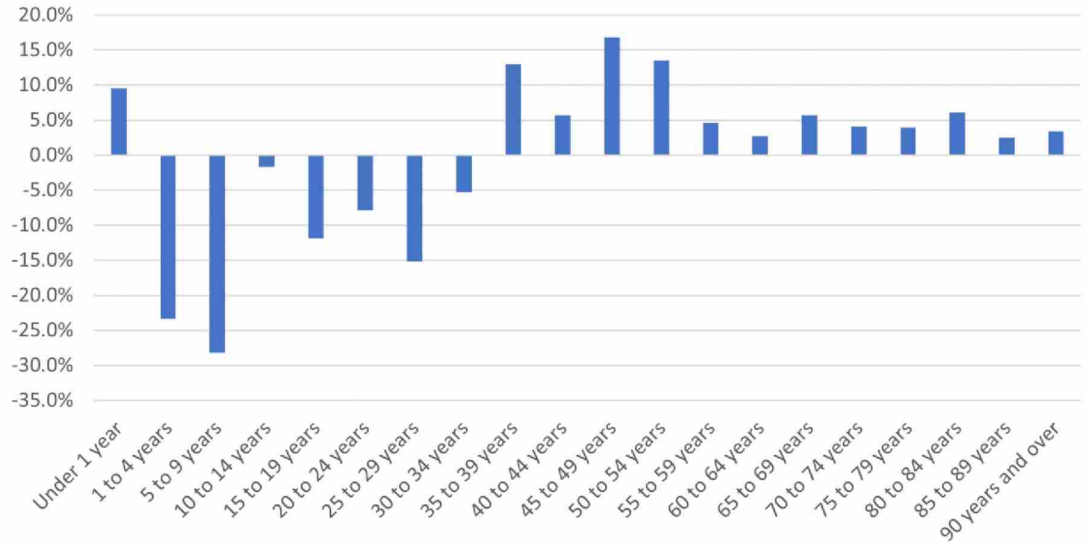


Age

64. The highest excess mortality was observed in those aged 45 to 49 years old with the age-specific rates between March 2020 and June 2022 being recorded as 16.8% above the five-year average. This equated to an extra 41.4 deaths per 100,000 amongst 45 to 49 year olds. The largest decrease was seen in those aged 5 to 9 with observed rates being 28.2% lower than average. Results for the period March 2020 to June 2022 were similar and have been exhibited in Figure 6 below. Please note, in each age group between 1 and 19 there are 100 deaths or fewer for the whole period. Care should be taken when looking at proportions based on these numbers.

[27] Based on date a death was registered rather than date a death occurred
[28] Based on those resident in Wales

Figure 6: proportion of all-cause excess deaths by five-year age-group, Wales, March 2020 to June 2022[29,30]



Sex

65. Excess deaths for males and females were similar, with males showing ASMRs 4.4% and 4.3% above average for the period up to May 2022 and June 2022, respectively. For females, ASMRs were 4.3% and 4.2% above average for the period up to May 2022 and June 2022, respectively.

Place of Death

66. The highest number of excess deaths was seen in private homes with 6,150 excess deaths (33.1% above average) in the period to May 2022 and 6,262 excess deaths (32.5% above average) in the period to June 2022. The highest proportion of excess deaths was seen in other communal establishment with 36.4% (68 excess deaths) and 38.0% (73 excess deaths) above average for the periods to May 2022 and June 2022, respectively.

Table 10: Number and proportion of excess deaths by place of death, Wales, March 2020 to June 2022[31,32,33]

	March 2020 to May 2022		March 2020 to June 2022	
	Numbers	Proportion	Numbers	Proportion
Home	6150	33.1%	6262.2	32.5%
Hospital	-466	-1.1%	-384.4	-0.9%
Hospice	-483	-24.8%	-501.4	-24.9%
Care home	1041.6	8.4%	1082.2	8.4%

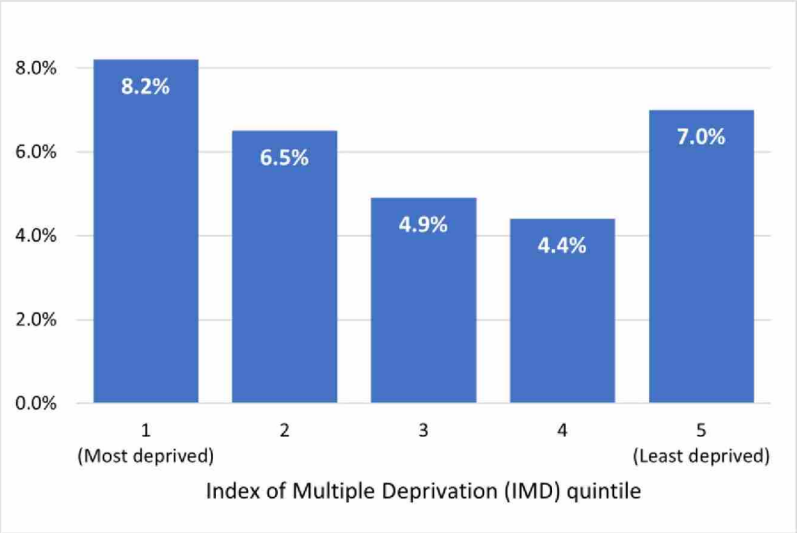
[29] Based on date a death was registered rather than date a death occurred
[30] Based on those resident in Wales
[31] Based on date a death was registered rather than date a death occurred
[32] Based on those resident in Wales
[33] Home is classed as private homes. Based on place where the death occurred.

Other communal establishment	67.8	36.4%	73	38.0%
Elsewhere	463	28.2%	476.4	27.9%

Socio-economic deprivation

67. When comparing the ASMR for the period March 2020 to June 2022 compared to the five-year average, the highest percent excess was seen in the most deprived quintile (Quintile 1) with 8.2%. This was followed by the least deprived quintile with 7.0% above average. Although the least deprived quintile had the second highest proportional excess, it had the lowest age-standardised rate of deaths due to and involving Covid-19.

Figure 7: Age-standardised mortality rates, percentage above five-year average by index of multiple deprivation, Wales, March 2020 to June 2022[34,35]



Ethnicity and occupation

68. In 2020 the ONS published some early data relating to deaths involving Covid-19 by ethnicity in Wales for the period 2 March 2020 to 28 July 2020 shown in Table 11 [INQ000335491]. This publication was last updated on 16 October 2020 and was produced by linking the 2011 Census to death registrations.. These counts should not be used to compare mortality risk between groups because they do not take into consideration the population size in each group.

69. Figures include deaths where Covid-19 was the underlying cause or was mentioned anywhere on the death certificate. Usual residency in Wales was identified from the 2011 Census.

Table 11: Counts of deaths involving Covid-19 by broad age group, Wales: 2 March 2020 to 28 July 2020

Ethnic group	9 to 64 years	65 to 110 years

[34] Based on date a death was registered rather than date a death occurred
[35] Based on those resident in Wales

White	193	2,083
Mixed/Multiple	x	13
Indian	x	3
Bangladeshi or Pakistani	8	4
Chinese	0	x
Black	4	6
Other	8	4

Note: 'x' indicates cells that have been supressed due to disclosure limits for low counts.

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70. The ONS produced deaths involving COVID-19 by occupation noted on the death certificate early in the pandemic, however this was available for England and Wales combined rather than by individual country [INQ000335492].

71. Table 12 shows that for both males and females 'Elementary trades and related occupations' sub-major occupation had the highest rate of deaths involving COVID-19 for those aged 20 to 64 in England and Wales. A breakdown by individual occupations is also exhibited.

Table 12: Deaths involving COVID-19 and all causes among sub-major occupation groups by sex (those aged 20 to 64 years), England and Wales, deaths registered between 9th March and 28th December 2020.[36,37,38,39,40]

Sex	SOC Sub-Major Group	Description	Deaths	Rate
Males	11	Corporate managers and directors	267	18.3
	12	Other managers and proprietors	205	45.8
	21	Science, research, engineering and technology professionals	126	13.5
	22	Health professionals	90	34.2
	23	Teaching and educational professionals	66	18.4

[36] Figures are for residents of England and Wales aged 20 to 64 years.
[37] Age-standardised rates per 100,000 population, standardised to the 2013 European Standard Population. Age-standardised rates are used to allow comparison between populations which may contain different proportions of people of different ages.
[38] Statistics based on a small number of deaths (10 to 19) may not be reliable and are therefore marked by 'u'. Analysis is not provided when numbers of deaths are below 10 and have been marked ':'.
[39] Deaths were defined using the International Classification of Diseases, 10th Revision (ICD-10). Deaths involving COVID-19 include those with an underlying cause, or any mention, of ICD-10 codes U07.1 (COVID-19, virus identified) or U07.2 (COVID-19, virus not identified). All causes of death is the total number of deaths registered during the same time period, including those that involved COVID-19.
[40] Occupations defined using the Standard Occupation Classification (SOC 2010). Definitions of all groups and individual occupations can be found here: https://www.ons.gov.uk/methodology/classificationsandstandards/standardoccupationalclassificationsoc/soc2010/soc2010volume1structureanddescriptionsofunitgroups

	24	Business, media and public service professionals	137	16.6	
	31	Science, Engineering and technology associate professionals	45	15.7	
	32	Health and social care associate professionals	35	34.3	
	33	Protective service occupations	67	71.2	
	34	Culture, media and sports occupations	56	20.3	
	35	Business and public service associate professionals	157	18.2	
	41	Administrative occupations:	178	39.5	
	42	Secretarial and related occupations	8	:	
	51	Skilled agricultural and related trades	52	21.1	
	52	Skilled metal, electrical and electronic trades	309	39.3	
	53	Skilled construction and building trades	305	36.7	
	54	Textiles, printing and other skilled trades	182	83.2	
	61	Caring personal service occupations	194	77.9	
	62	Leisure, travel and related personal service occupations	64	41.3	
	71	Sales occupations	126	46.2	
	72	Customer service occupations	30	26.9	
	81	Process, plant and machine operatives	230	50.4	
	82	Transport and mobile machine drivers and operatives	597	54.1	
	91	Elementary trades and related occupations	200	96.5	
	92	Elementary administration and service occupations	499	58.9	
Females	11	Corporate managers and directors	64	9.5	
	12	Other managers and proprietors	75	19.7	
	21	Science, research, engineering and technology professionals	10	7.3	u
	22	Health professionals	138	18.1	
	23	Teaching and educational professionals	73	9.8	
	24	Business, media and public service professionals	58	11.3	
	31	Science, Engineering and technology associate professionals	8	:	
	32	Health and social care associate professionals	29	9.3	
	33	Protective service occupations	4	:	
	34	Culture, media and sports occupations	13	8.8	u
	35	Business and public service associate professionals	49	7.2	
	41	Administrative occupations:	186	12.9	
	42	Secretarial and related occupations	64	10.6	
	51	Skilled agricultural and related trades	2	:	
	52	Skilled metal, electrical and electronic trades	7	:	
	53	Skilled construction and building trades	0	:	
	54	Textiles, printing and other skilled trades	45	23.3	
	61	Caring personal service occupations	400	27.8	
	62	Leisure, travel and related personal service occupations	60	24.5	
	71	Sales occupations	143	20.9	
	72	Customer service occupations	30	11.8	
	81	Process, plant and machine operatives	46	39.6	
	82	Transport and mobile machine drivers and operatives	11	19.2	u

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91	Elementary trades and related occupations	34	40.5
92	Elementary administration and service occupations	193	19.4

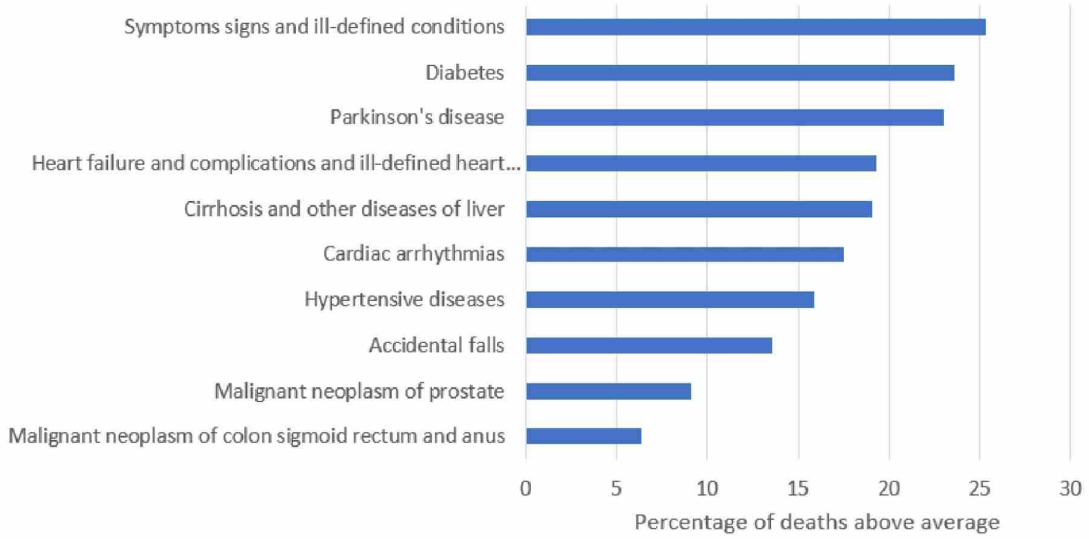
72. For subsequent Covid-19 analysis that included ethnicity and occupation, we developed and updated our Public Health Data Asset which included linked Census data, mortality data and NHS primary care data for England.

73. ONS was not able to estimate mortality rates across socio-demographic groups such as ethnicity and occupation for Wales because an analogous NHS primary care dataset was not available to us to accurately estimate population denominators.

Leading causes of non-covid excess deaths in Wales

74. The non-Covid-19 leading cause of excess deaths was 'Symptoms, signs and ill-defined conditions' with 25.3% deaths above average for the period March 2020 to June 2022. This was followed by Diabetes and Parkinson's disease with 23.6% and 23.0% above average.

Figure 8: proportion of excess deaths by cause of death, Wales, March 2020 to June 2022[41,42]



Infection Statistics

Covid-19 Infection Survey

75. The Coronavirus Infection Survey (CIS) was a gold standard survey set up in rapid time to measure Covid-19 infections and antibodies in partnership with the University of Oxford and others. The survey was the largest of its kind across the UK, collecting at its peak some 400,000 samples each month. It formed a critical evidence base for the government's ongoing surveillance of the prevalence of Covid-19 across the UK, delivering data breakdowns by age and region across all four nations. These breakdowns were fundamental in many of the policy decisions made to contain the pandemic and save lives. CIS was commissioned to discover how many people in private households:
    - had Covid-19, with or without symptoms;
    - had previously caught Covid-19, with or without symptoms; and
    - had a strong response to a Covid-19 vaccination.

76. CIS used a random sample of private households where all residents aged over two years were invited to join the study. Whether or not they had symptoms, participants were regularly asked to:
    - provide nose and throat swabs;
    - answer a questionnaire; and
    - for some participants, provide a blood sample.

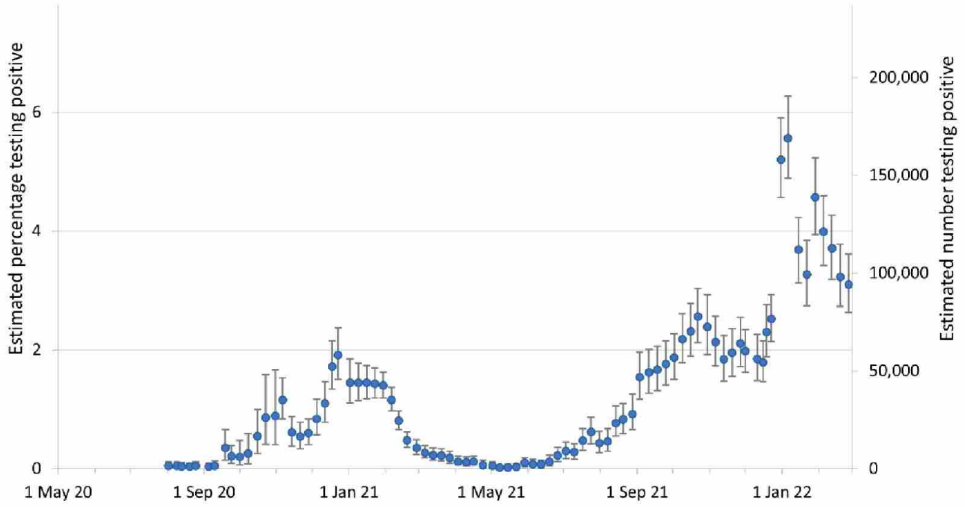
[41] Based on date a death was registered rather than date a death occurred
[42] Based on those resident in Wales

77. Working with academic partners including the University of Oxford, the data from this sample of households were then modelled to ensure the results provided the questionnaire provided more insights into where, and in which types of people, Covid-19 infection was changing.

78. Fieldwork for the Covid Infection Study in Wales began on 29 June 2020, with 7,031 households (13,820 individuals) providing at least one swab test. The ONS is not able to provide data on positivity before this date.

79. The ONS has published complete datasets for all periods from the start of fieldwork in Wales to March 2023 from which the following data are drawn [INQ000335493]. Full quality and methodology information for the study is also published [INQ000335494]. Weekly reports on results from CIS were also published by the Welsh Government on their website at the same time as the ONS publications.

Figure 9: Official reported estimates of the percentage and number of the population in Wales testing positive for Covid-19, week ending 10 May 2020 to week ending 26 February 2022, Covid Infection Survey



80. As noted in paragraph 78, CIS fieldwork began in Wales on 29 June 2020, and we first had enough data to produce official estimates of positivity in Wales for our publication on 7 August [INQ000335495]. We continued to publish positivity figures for the population in Wales at least weekly via bulletins on the ONS website from that point until survey fieldwork ended in March 2023 [INQ000335496].

81. It is not possible to account for infections resolved before start of fieldwork. The following paragraphs summarise the ONS' officially reported estimates of positivity in Wales for the five periods requested.

Wave 1 (to September 2020)

82. During the period from the start of fieldwork in Wales (29 June) to 10 September 2020, the estimated percentage of the population of Wales testing positive for Covid-19 remained broadly level week on week, varying between 0.04 per cent (95% confidence interval: 0.01 to 0.09) and 0.05 per cent (95% confidence interval: 0.01 to 0.11).

Wave 2 (September 2020 to January 2021)

83. During the period 13 September 2020 to 8 January 2021 the estimated percentage of the population of Wales testing positive for Covid-19 rose and fell, increasing from 0.35 per cent (95% confidence interval: 0.14 to 0.66) at the beginning of the period to an interim high of 1.16 per cent (95% confidence interval: 0.84 to 1.53) in the week 31 October to 6 November. Positivity fell back to an interim low of 0.54 (95% confidence interval: 0.34 to 0.78) in the week 15 to 21 November before rising again to a peak in the period of 1.91 (95% confidence interval: 1.50 to 2.37) during the week 17 to 23 December. By the end of this period, the week 3 to 9 January, positivity had levelled off to 1.45 per cent (95% confidence interval:1.15 to 1.78)

Alpha (January 2021 to June 2021)

84. During the period 9 January 2021 to 12 June 2021, the estimated percentage of the population in Wales testing positive for Covid-19 fell over time to a low of 0.02 (95% confidence interval 0.00 to 0.06) during the week 2 to 8 May 2021. By the end of the period, positivity had begun to rise again, at 0.07 per cent (95% confidence interval 0.02 to 0.14) during the week 6 to 12 June 2021.

Delta (June 2021 to January 2022)

85. During the period 13 June 2021 to 9 January 2022 the estimated percentage of the population in Wales testing positive for Covid-19 increased, reaching a peak of 5.56 per cent (95% confidence interval 4.89 to 6.27) during the week 31 December 2021 to 6 January 2022.

Omicron (January 2022 onwards)

86. During the period 10 January to 30 May 2022 the estimated percentage of the population in Wales testing positive for Covid-19 fell and rose, decreasing to an interim low of 3.10 per cent (95% confidence interval: 2.63 to 3.61) during the week 20 to 26 February 2022, before increasing to a peak of 7.63 per cent (95% confidence interval 6.79 to 8.55) during the week 3 to 9 April 2022. By the end of the period, during the week 22 to 28 May 2022, positivity in Wales had decreased to 1.30 per cent (95% confidence interval: 0.97 to 1.71).

'Firebreak' Lockdown, 23 October 2020 to 9 November 2020

87. From 23 October 2020 to 9 November 2020, the Welsh Government imposed lockdown restrictions to try and reduce rates of Covid-19 infection. People in Wales were required to 'stay at home, except for very limited purposes'. Meeting people from other households was banned and non-food retail, hospitality, entertainment, and tourism businesses were required to close [INQ000335497].

Infections during October and November 2020

88. The following positivity data are drawn from our published tables for Wales [INQ000335493]. This source is also used in Figure 9 and uses the same methodology described in [INQ000335494].

89. In the weeks leading up to 23 October 2020, Covid positivity rates from the CIS for the population in Wales had increased from a low of 0.20 per cent (95% confidence interval: 0.06 to 0.48) in the week 25 September to 1 October 2020, to 0.86 per cent (95% confidence interval: 0.41 to 1.58) in the week before the 'firebreak' lockdown, that is during the week 17 to 23 October 2020. Positivity reached a high of 1.16 per cent (95% confidence interval: 0.84 to 1.53) two weeks after the start of the lockdown, that is during the week 31 October to 6 November.

90. Positivity then decreased among the population in Wales, falling to 0.54 per cent (95% confidence interval: 0.34 to 0.78) by the week 15 to 21 November. Following this, positivity increased once again, surpassing the previous November peak by the week 12 to 18 December, when positivity reached 1.72 per cent (95% confidence interval: 1.34 to 2.15).

Table 13: Covid-19 positivity in Wales, 25 September 2020 to 18 December 2020

Official reported estimates of the percentage of the population testing positive for Covid-19, Wales	Wales estimated % average of the population testing positive for Covid-19	95% lower confidence interval	95% upper confidence interval
25 September 2020 to 1 October 2020	0.20	0.06	0.48
2 October 2020 to 8 October 2020	0.26	0.08	0.59
10 October 2020 to 16 October 2020	0.55	0.25	1.00
17 October 2020 to 23 October 2020	0.86	0.41	1.58
25 October 2020 to 31 October 2020	0.89	0.40	1.66
31 October 2020 to 6 November 2020	1.16	0.84	1.53
8 November 2020 to 14 November 2020	0.61	0.38	0.88
15 November 2020 to 21 November 2020	0.54	0.34	0.78
22 November 2020 to 28 November 2020	0.60	0.40	0.84
29 November 2020 to 05 December 2020	0.84	0.57	1.17
6 December 2020 to 12 December 2020	1.10	0.78	1.46
12 December 2020 to 18 December 2020	1.72	1.34	2.15

Infection by age group in Wales

91. The ONS has published modelled daily estimates for the percentage of the population testing positive for Covid-19 in Wales by single year of age from 27 December 2020 onwards. These estimates were modelled using data for a six-week time period and were produced using a different method to the grouped age analysis used in England and were designed specifically to enable age-based outputs for Wales, Scotland and Northern Ireland. This difference in modelling was necessary due to the smaller sample size available when considering only positive cases within the Wales study cohort and reflects the ONS' commitment to developing meaningful analysis tools for each country in the UK.

92. Since these modelled estimates were based on smaller sample sizes within each age group in comparison to the total sample size for the country, there is a higher degree of uncertainty for infection by age group in Wales than for the comparable England models, as indicated by larger confidence intervals. Confidence intervals give an indication of the degree of uncertainty of an estimate and help decide how precise a sample estimate is. It specifies a range of values in which we think the true value is likely to lie, defined by lower and upper limits.

93. Each week ONS took the latest six weeks of positivity data for Wales as input for these models. Due to natural variation in the sample population this meant a different pattern of testing data by age was used for modelling each week. As a result of this

variation week to week, the central estimate for infection by year of age also varied. Nevertheless, the confidence intervals resulting from this modelling work were narrower than would have been possible using weighted data counts alone, and despite these small variations the models allowed meaningful trends in rate of infection to be identified from background chance more readily.

94. Our first published visualisation of these data for Wales was via our regular statistical bulletin on 5 March 2021 [INQ000335498] (Figure 5), although the underlying data tables for modelled single year of age were included in published datasets from 12 February 2021 [INQ000335499]. The time between these two dates was used to develop visualisations that would make the data easier to interpret for non-statisticians. These data continued to form part of our main published datasets from that point on. At Exhibit [INQ000335500] are sequential six-week data series visualisations drawn from these published data to show the trend in positivity by age over time in Wales from February 2021 to June 2022.

95. Prior to developing these outputs for publication, from 2 December 2020 onwards, ONS shared a series of experimental outputs showing age modelling for the Welsh cohort in early statistical development. These outputs, at Exhibits [INQ000335501], [INQ000335502], [INQ000335503], [INQ000335504], [INQ000335505], were shared as Management Information with stakeholders including the Welsh Government. The ONS welcomed feedback on their usability and relevance to user needs. As the models were still in development, the underlying methods were subject to change week to week. They are therefore not comparable with later published series.

96. When infection rates were low, it was not possible to produce age over time analysis by single year of age because the numbers of positive test results were too small for any estimate to be robust. For this reason, no modelled estimates can be provided for the period 17 April to 8 May 2021 inclusive.

Infection by other protected characteristics

97. ONS produced only one breakdown of Covid-19 infection by sex in isolation, regardless of the effect of other characteristics. This analysis was carried out in June 2020, using the first three months of CIS data. These data were from England only, as the analysis was undertaken before CIS fieldwork began in Wales. Statistical testing of these early data showed no evidence of differences in the proportions of males or females testing positive for Covid-19 at that time, however we recognised the risk that this was due to multiple confounding factors affecting risk of infection, such as age, occupation type, household size and others.

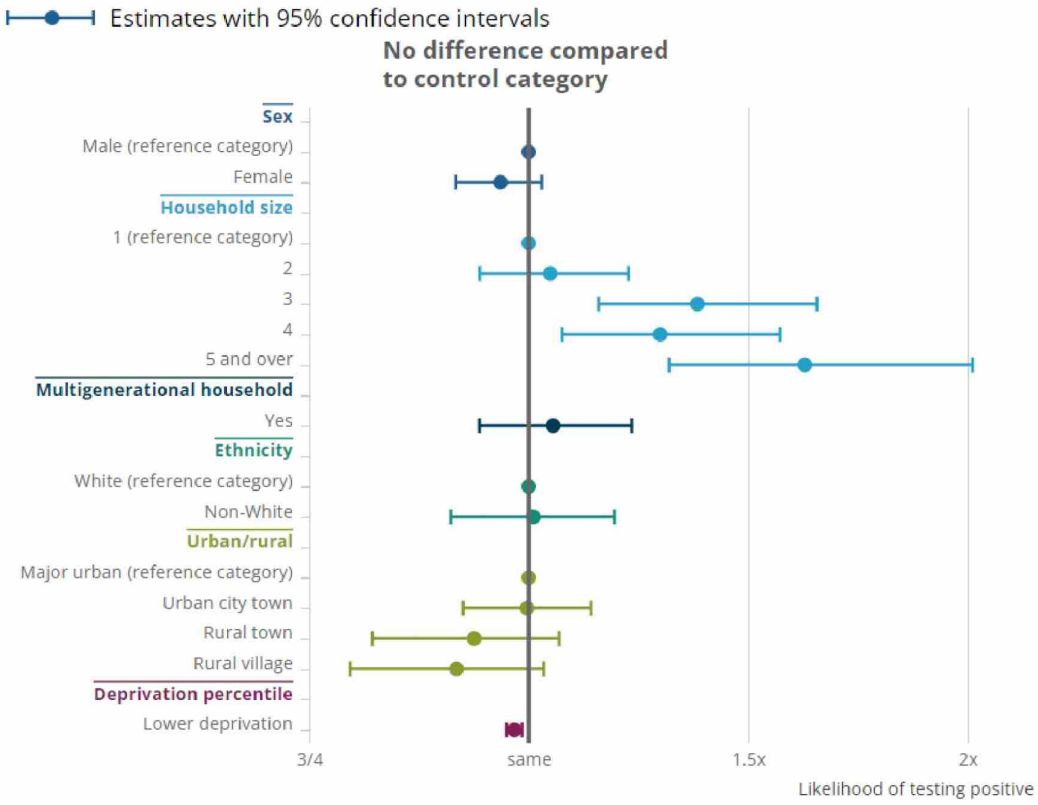
98. Subsequently therefore, ONS developed models to estimate the risk associated with a variety of core demographic and behavioural characteristics, while controlling for the effects of other characteristics. This provided a better reflection of the true risk associated with each characteristic and sought to reduce the risk of data confounds. For example, where occupation is strongly associated with gender, analysis of the risk by either gender or occupation without accounting for the risk associated with the other factor, would provide incomplete information.

99. The characteristic screening models are mixed-effect multivariable logistic regression models, which simultaneously estimate the effect of different factors that impact on the odds of testing positive for Covid-19. The models include various fixed effects and a random effect for region which allows for the variation at region and country level to be accounted for in the calculations. In this way, place of residence with the

UK could be modelled as one among many individual characteristics in terms of its potential to be associated with increased or decreased risk of infection. Further explanation on the way these models incorporated different characteristics can be found in our technical article [INQ000335506]. These models used data for the whole UK in order to provide statistical power and there is insufficient sample size to run these models for Wales excluding other UK nations.

100. The following visualisation shows the association between various characteristics and risk of infection after controlling for the confounding effects of other characteristics. This plot provides the comparative risk associated with a range of characteristics in the fortnight ending 11 September 2021 [INQ000335506] [INQ000335507].

Figure 10: Likelihood of testing positive for Covid-19 by core demographic characteristic, UK, 29 August to 11 September 2021



101. In our accompanying data release we also provided breakdowns of how this risk of infection varied over time in the UK by sex, household size, multigenerational household status, ethnicity, deprivation, work sector, disability status and other factors, over the period March to September 2021 [INQ000335507]. Over that six month period across the UK, we found that:

- People living in households with three or more occupants were more likely to test positive for COVID-19 than single occupancy households in most of the 14-day or 28-day periods from 14 March to 22 May 2021 and from 18 July to 11 September 2021.
- Females were less likely to test positive for COVID-19 than males in four out of five 14-day periods between 20 June and 28 August 2021.

- People living in less deprived areas were less likely to test positive for COVID-19 than those in more deprived areas from 14 March to 22 May 2021 and in four out of five periods from 4 July to 11 September 2021.

102. As the Covid-19 pandemic progressed, we further adapted these models to address different questions such as characteristics associated with infection by a new variant of Covid-19 compared to a previous dominant variant, and characteristics associated with greater risk of reinfection (as opposed to first infection). Our findings were published via our regular characteristics series [INQ000335508].

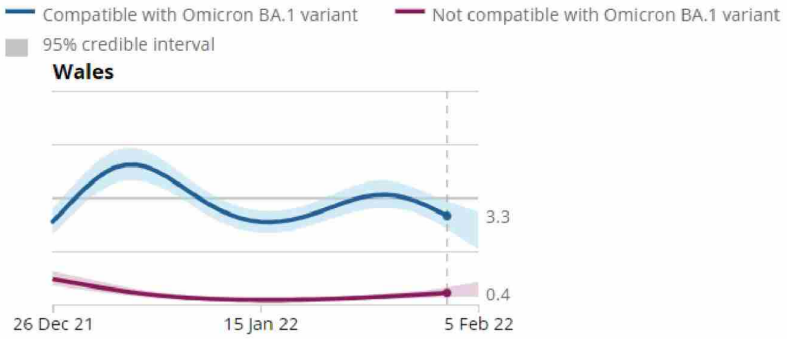
Infection by variant

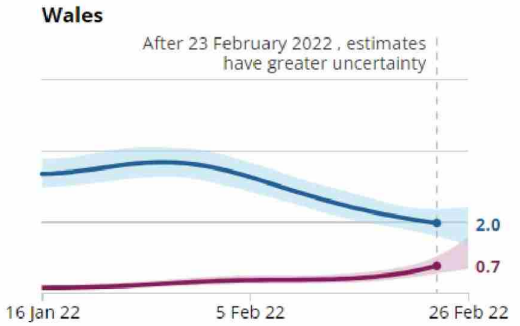
103. At different times during the pandemic, new variants of the SARS-CoV-2 (the virus causing Covid-19) became dominant in the population. ONS published regular analysis produced by our research partners at the University of Oxford, particularly Professor Sarah Walker, Dr Katrina Lythgoe, Dr Tanya Golubchik and Dr Helen Fryer, to track these patterns of positivity by country. These analyses drew on the fact that the Alpha, Delta and Omicron BA.1 variants had opposing changes in the S-gene, one of the three genes that the coronavirus swab test used in the survey tested. These genetic changes meant that by variant, the S-gene was either detectable, or not detectable, by our positivity testing assays. Data tables showing the percentage of positive Covid-19 tests by country and gene pattern are provided in our technical datasets [INQ000335509].

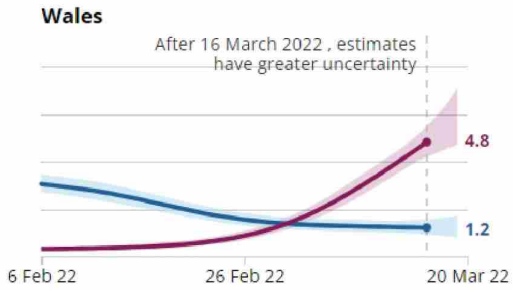
104. In December 2020 our partners at Oxford University used this insight to model the growth rate by variant gene pattern in Wales and other geographies, in order to understand the spread of the new Delta variant within the UK [INQ000335510].

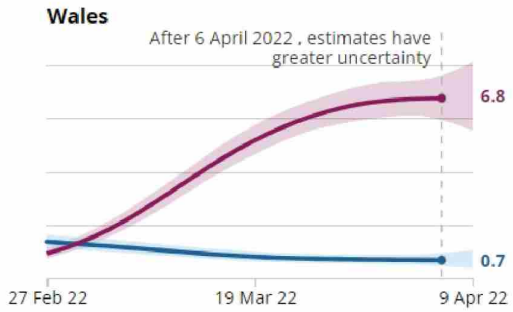
105. In late 2021 and early 2022 during the emergence of the Omicron BA.1 variant and decline of the Delta variant, the ONS regular positivity reporting for Wales was supplemented by new outputs showing how infection patterns differed by variant. The following provides a series of our published visualisations showing how the Omicron BA.1 variant gained dominance over this period in Wales. When nearly all infections were compatible with the new dominant variant, we no longer produced these breakdowns.

Figure 11: Modelled percentage of the population testing positive for cases compatible with the Omicron BA.1 variant and not compatible with the Omicron BA.1 variant, based on nose and throat swabs, daily, December 2021 to April 2022



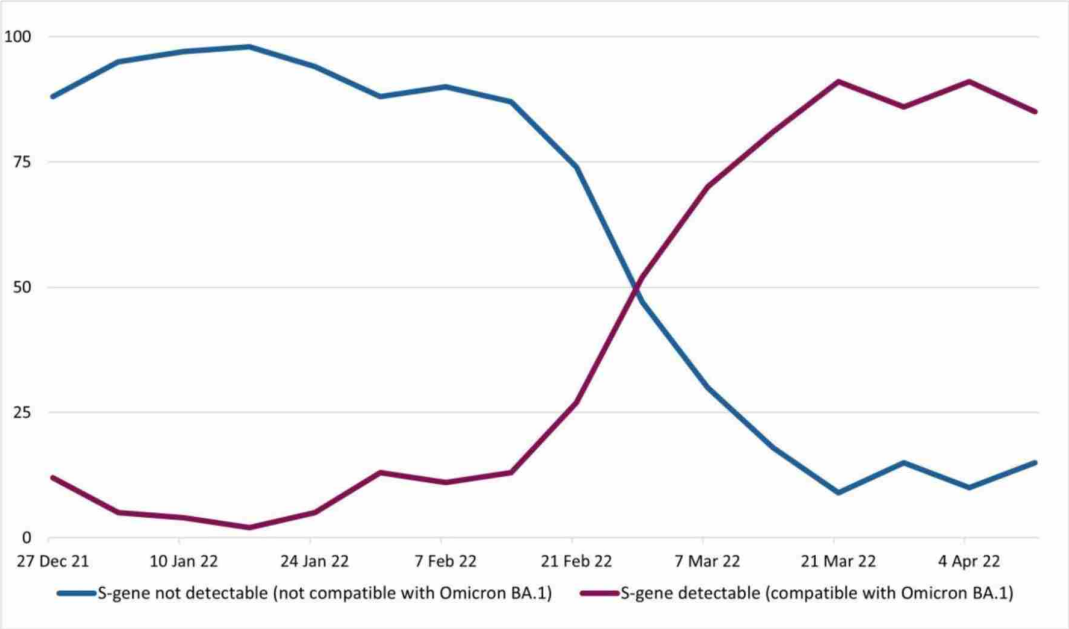






106. As well as the variant model shown in Figure 11 (which was based on results from the initial swab test and therefore was available rapidly) the spread of the Omicron BA.1 variant in Wales can be seen from the proportion of positive tests with different gene patterns. This came from whole genome sequencing of all positive nose and throat swabs with sufficient virus (Ct value less than 30). Sequencing the virus involves trying to read all the letters of the virus' genetic material. This was not possible to complete successfully on all samples that we collected, but where over half of the genome was successfully sequenced, we used these data to work out which variant was compatible with the gene sequence identified. [INQ000335509].

Figure 12: Percentage of Covid-19 positive cases in Wales by detection of S-gene, week starting 27 December 2021 to week starting 11 April 2022



Population prevalence of self-reported Long Covid in Wales

107. The long-term health effects of Covid-19 are still unclear, but many people have reported ongoing symptoms after infection, known as Long Covid.

108. The ONS published a regular 'prevalence of ongoing symptoms' bulletin which estimated the number of people in Wales that had self-reported Long Covid [INQ000335511]. Self-reported Long Covid is defined as symptoms persisting for more than four weeks after a first Covid-19 infection, that were not explained by something else.

109. The prevalence of self-reported Long Covid lasting at least four weeks from a previous SARS-CoV-2 infection among people in private households in Wales peaked at 120,000 people (4.0% of the population) during the four weeks to 3 September 2022, before steadily falling over the next six months. It should be noted that these time series comparisons should be treated with caution because different data collection methods were in place throughout the period.

110. In the ONS's final publication of the prevalence of ongoing symptoms following coronavirus release covering the four weeks to 5 March 2023, we estimated that 94,000 people in Wales (3.1% of the population) were experiencing self-reported Long Covid.

111. Of people in Wales with self-reported Long Covid during the four weeks to 5 March 2023, 89% first had (or suspected they had) Covid-19 at least 12 weeks previously, and 61% at least one year previously.

112. Long Covid symptoms adversely affected the day-to-day activities of 81% of those with self-reported Long Covid in Wales, with 26% reporting that their ability to undertake their day-to-day activities had been "limited a lot".

113. Throughout the pandemic, ONS contributed to a Long Covid Research Working Group, comprising lead investigators from all the major UK Long Covid epidemiological studies: the CIS (ONS), REACT (Imperial College London), PHOSP-COVID (University of Leicester), CLoCk (UCL Great Ormond Street), CONVALESCENCE (UCL and University of Bristol), TLC (University of Birmingham), STIMULATE-ICP (UCL), and OpenPROMPT (LSHTM). The group currently meets on a monthly basis, but met on a fortnightly basis for much of the pandemic. The group is chaired by Professor Kamlesh Khunti (University of Leicester and member of SAGE) and reports to the Chief Medical Officer for England.

Coronavirus and Social Impacts

114. During the pandemic, the ONS's Opinions and Lifestyle Survey (OPN) collected information on the views of adults in Great Britain (GB). As part of this data collection, estimates were also presented from constituent parts of GB where available.

115. Due to sample sizes, estimates produced for Wales using the OPN were subject to some caution. For example, the release on the 7 May 2020 had an achieved sample of 1,327 GB adults (which comprised of around 1,020 adults from England, 140 adults from Wales and 160 adults from Scotland) [INQ000335512]. This broadly followed population totals in each region of GB, although sometimes differed due to sample availability. The sample in England was temporarily boosted to achieve a larger response from October 2020.

116. Due to sample sizes, it was not possible to present estimates for different demographic groups at a Wales level. Other similar surveys were carried out by the Welsh Government and Public Health Wales which provided more granular data on issues. For example, the 'Survey of public views on the coronavirus (COVID-19)'.

Non-Pharmaceutical Interventions

117. The OPN published regular data regarding respondents' views on a range of non-pharmaceutical interventions. For example, views on wearing a face covering in public, hand washing, social distancing and staying at home when asked. These data were then presented at Great Britain level in our releases, with estimates for Wales also published in our data tables.

118. For measures where Government advice was universal across GB, we saw similar levels of self-reported behaviour. For example, the proportion of adults who reported to always wash their hands when returning home from public was at 68% in GB between 11 to 15 November 2020, and similar in Wales (68%), Scotland (72%) and England (68%) [INQ000335513].

119. For measures where there were differences in advice between Wales, Scotland and England, data from the OPN presented these differences. For example, when asked about wearing a face covering in public in the past 7 days, uptake in Wales was lower during the early stages of this advice compared to Scotland and England. Between 15 to 19 July 2020, 71% of adults in GB reported to have worn a face covering outside in the past seven days compared with 47% in Wales, 70% in England and 96% in Scotland [INQ000335514].

120. Self-reported compliance was similar when advice was aligned across each country. With the launch of the National 'Hands, Face, Space' campaign from 9 September 2020, a similar proportion of adults reported wearing face coverings between 16 to 20 September 2020 in Wales (94%), England (96%) and Scotland (98%) [INQ000335515]. Information was included in the OPN publications and data tables to explain differences in rules and guidelines in Wales, Scotland and England at the time.

Regional Lockdowns / Tiers

121. During the pandemic, the OPN survey asked adults "In the past seven days, have you left your home for any reason?". These data were presented in data tables by different countries across GB.

122. Due to differences between restrictions in Wales, Scotland and England, differences appeared to be found (although not always significantly different) in the rates of adults reporting not leaving home in the past 7 days.

123. For example, from the 23 October 2020, Wales entered a three-week firebreak, England had entered local restrictions by tiers and Scotland a 5 tier system. Between 28 October to 1 November 2020, 10% of adults in Wales said they did not leave their house in the last 7 days. This was 5% for adults in England, 6% in Scotland and 6% in GB [INQ000335516].

124. On 13 March 2021, rules in Wales changed from 'stay home' to 'stay local'. This was before changes in Scotland and England were introduced. Between 24 and 28 March 2021, 2% of adults in Wales reported not leaving their house in the last 7 days (6% England, 10% Scotland, 6% GB) [INQ000335517].

125. Due to sample sizes, it was not possible to track the impact of local area restrictions such as those affecting local authorities.

Mental Health and Well-being

126. Data on the mental health of adults during the pandemic were also published at a GB level using Annual Population Survey data, with differences presented for Wales, Scotland and England.

127. For example, pre-pandemic (July 2019 to March 2020), 9.7% of adults in Great Britain reported moderate to severe depressive symptoms (16.8% of adults in Wales, England 8.7%; Scotland 15.1%). This increased to 19.2% in June 2020 (24.2% in Wales, England 18.3%, Scotland 25.1%. However due to sample sizes, statistical differences between countries could not be found [INQ000335518].

128. Rates of anxiety in Wales appeared to increase during the early stages of the pandemic. Pre-pandemic (April 2019 to March 2020), the mean score for anxiety in Wales was 3.08 (on a scale of 0 to 10, where 0 is not at all anxious and 10 is completely anxious). Similar scores were found in England (3.04) and Scotland (3.12) [INQ000335519]. During the first year of the pandemic (April 2020 to March 2021), this increased to 3.41 (Wales), 3.31 (England) and 3.31 (Scotland) [INQ000335519]. In April 2021 to March 2022, mean anxiety scores reduced to 3.17 in Wales, 3.13 in England and 3.09 in Scotland [INQ000335519].

Vaccine Attitudes

129. The OPN also collected data on attitudes towards vaccination at a GB level. 82% of adults in Wales said they would be very or fairly likely to have the Covid-19 vaccine if offered (during period 16 to 20 December 2020, the first time point these data was collected on the OPN). Rates were similar in England (82%), Scotland (81%) and GB (82%).

130. This increased to 91% in Wales who had said they had received at least one dose in August 2021, with similar increases in England (92%), Scotland (96%) and GB (92%) [INQ000335520].

Data Sharing

131. The ONS worked with the Welsh Government and NHS Wales among others to produce health statistics and analysis.

132. The powers and responsibilities set out in the Statistics and Registration Service Act 2007 form the legal framework for data shared with the ONS. As discussed in my first witness statement for Module 2 [INQ000268012], the use during the pandemic of Control of Patient Information (COPI) notices as authorised by the relevant health authorities made obtaining data from relevant health bodies easier however data sharing often took time.

133. With regard to Wales, agreement on the sharing of Welsh health datasets with ONS was reached in November 2021 with Digital Health and Care Wales, (DHCW) who provide digital services and systems for NHS Wales, once their data sharing capabilities were established.

134. DHCW provided ONS with data from records of Covid-19 vaccinations; data on hospital episodes from the Admitted Patient Care Dataset, the Outpatient Dataset and the Critical Care Dataset; and data on accident and emergency treatment from the Emergency Department Data Set. These data were disaggregated similarly to equivalent datasets from the health authorities in England, including data by age, sex, ethnicity, care needs, and clinical information on diagnoses and treatments.

Lessons Learned and Recommendations

135. We worked constructively with Welsh Government and other Devolved Administrations to understand data requirements and shape analytical plans during the pandemic. This included taking a UK wide approach to our work, for example, with the development of the CIS.

136. Throughout the duration of the CIS we met with the Devolved Administrations regularly to discuss operational and analytical elements of the survey and ensure they were part of decision making. We also sought to deliver harmonised data as much as possible to produce comparable insights.

137. As I noted in my evidence to the Inquiry as part of Module 2 in October 2023, I believe it is incredibly important that the National Statistician and wider ONS are involved at the earliest opportunity in any future crisis. As part of this, particularly in relation to the Devolved Administrations, the National Statistician should be able to mandate where, mindful of the different policy contexts, harmonised data should be produced. Producing coherent and comparable statistics across the UK has great value,

especially in a crisis scenario.

138. I do not at this time have further reflections from the pandemic period than those stated in my previous statements to the Inquiry and whilst giving evidence on 10 October 2023.

Statement of Truth

I believe that the facts stated in this witness statement are true. I understand that proceedings may be brought against anyone who makes, or causes to be made, a false statement in a document verified by a statement of truth without an honest belief of its truth.

Signed: Personal Data

Dated: 12 January 2024