

# Inequalities data in Health

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# Our approach to tackling the issue of lack of equalities data

1. Background

2. Short-term work

1. Cancer
2. Vaccinations

1. Longer-term approach

2. Summary

# Aim

Identify inequalities in cancer incidence rates in Wales by socio-demographic factors at the individual level.

# Method

Anonymous linkage of the **WCISU population-based cancer registry data** to individual level **ONS Census 2011 data** within the SAIL Databank.



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# Ethnicity Results

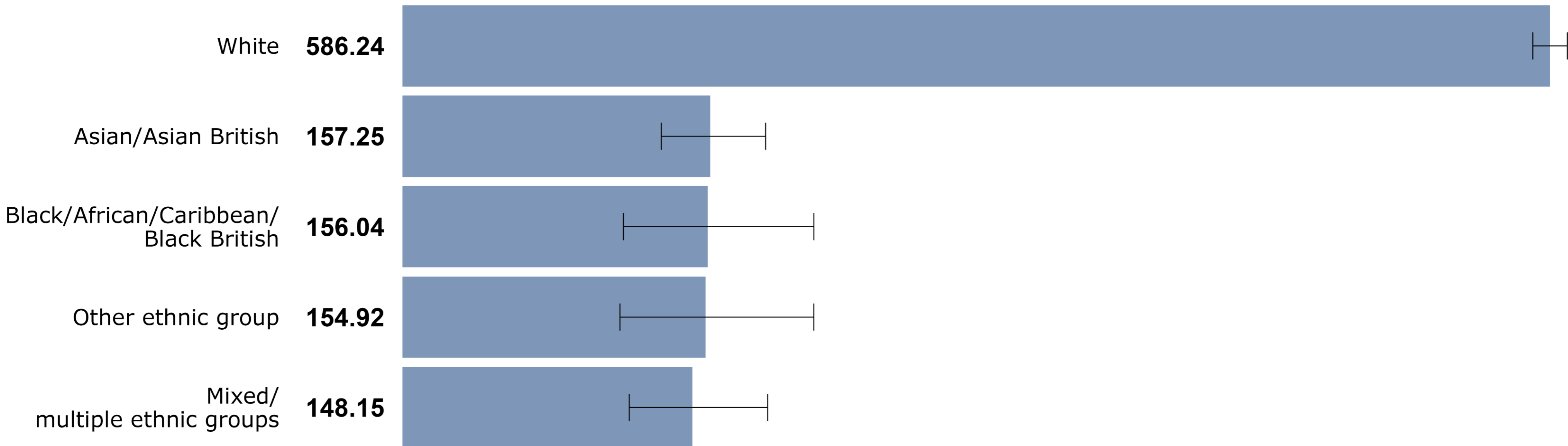


# Crude rates

Before accounting for age, rates in the **white ethnic group** are significantly **higher** than any other ethnic group.

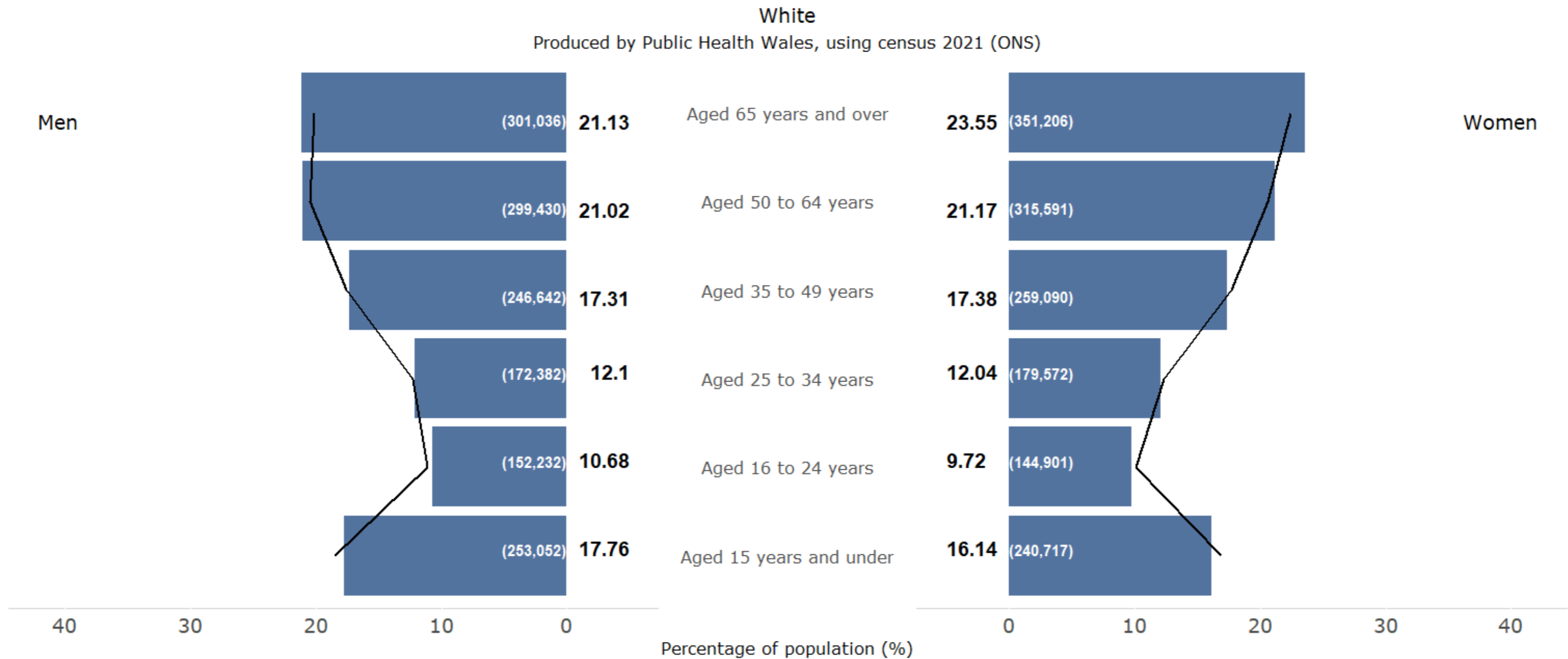
## Cancer incidence, All malignancies excluding NMSC, crude rate per 100,000, Persons, 2020, by ethnic group

Produced by Public Health Wales, using cancer registration data (WCISU), PHM & MYE (ONS), census11 (ONS, access via SAIL) & census21 (ONS)



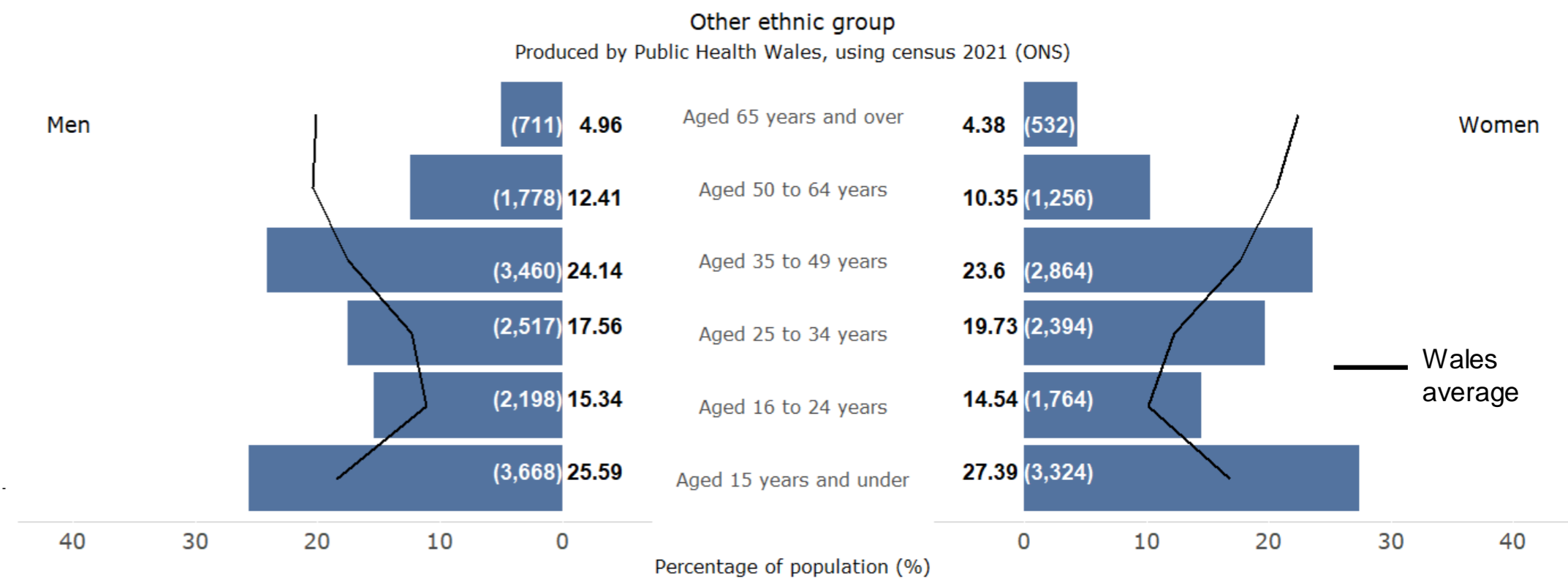
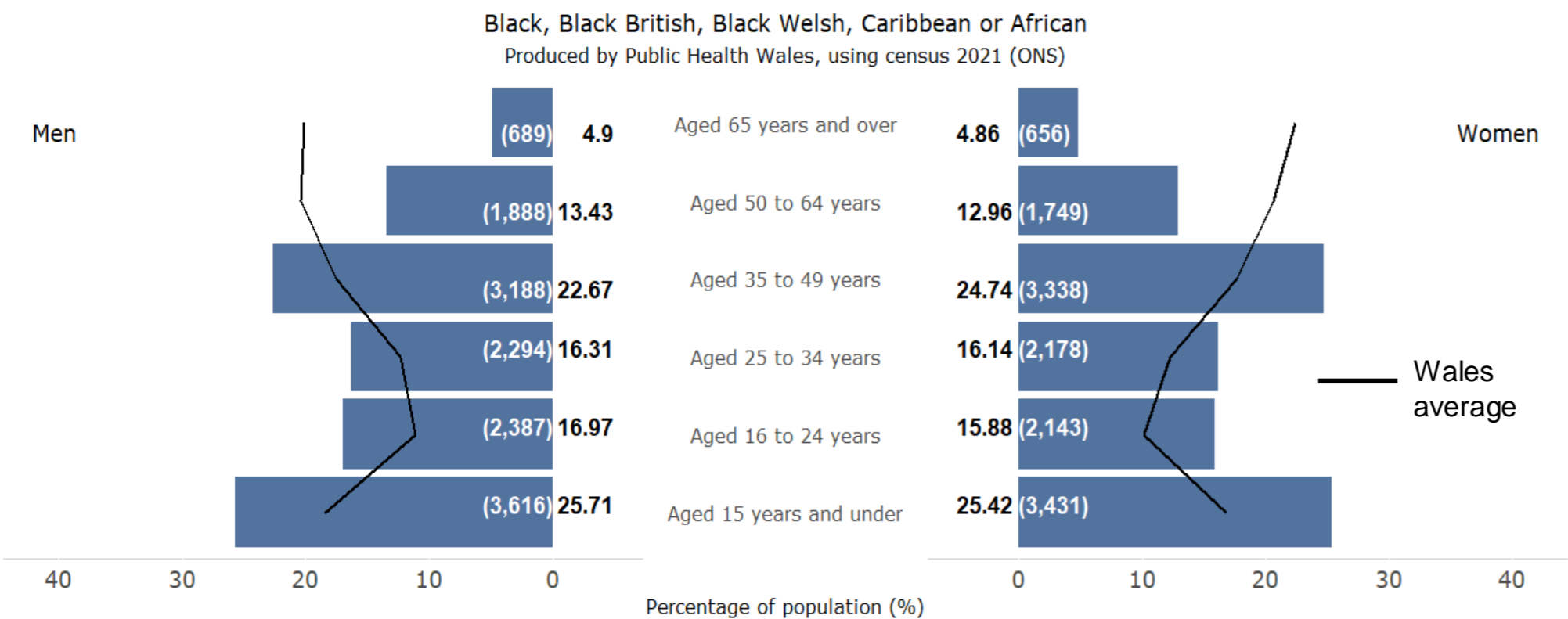
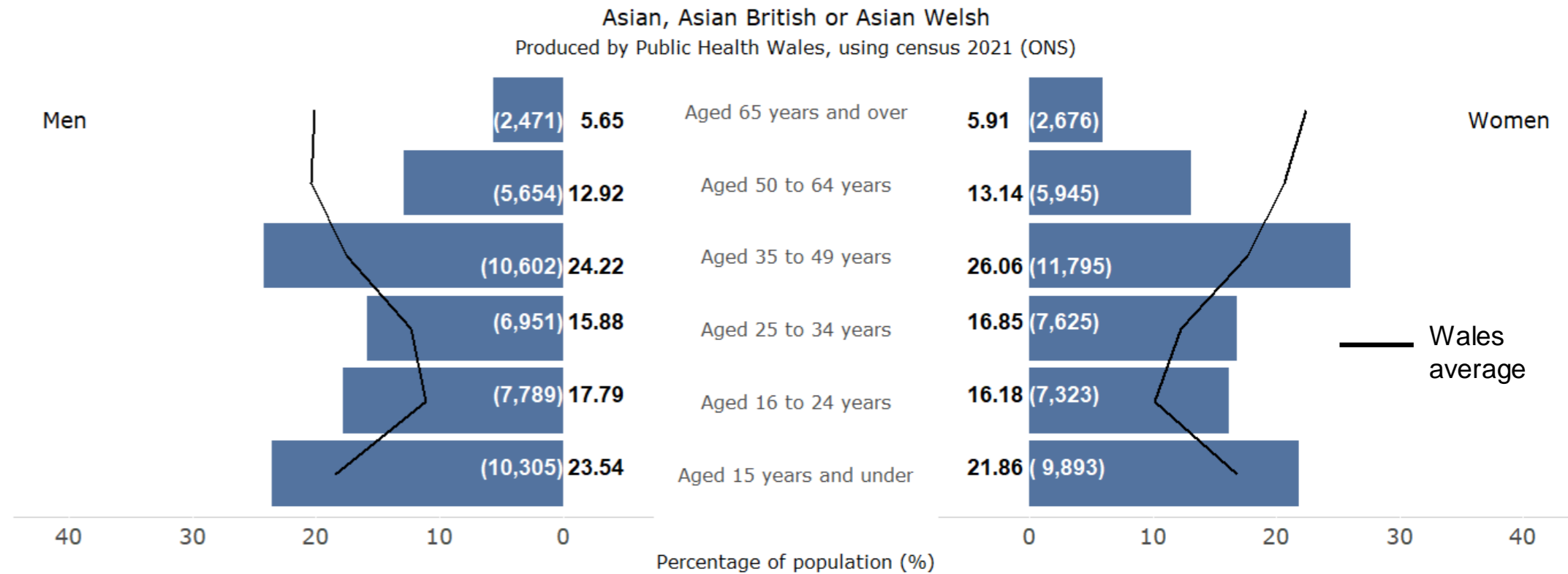
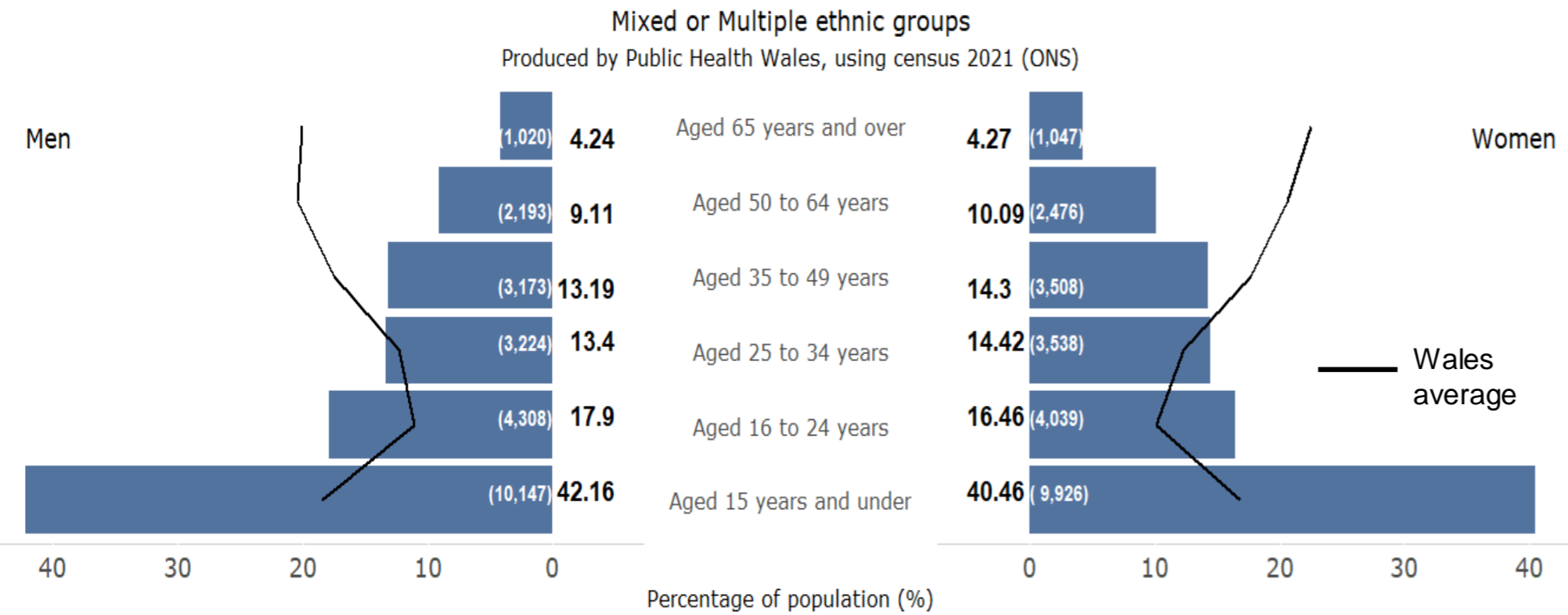
# Percentage population by ethnic group and age-group, 2021

The **white ethnic group** is the largest population and has the **highest percentage of people in the older age categories.**



# Percentage population by ethnic group and age-group, 2021

All other ethnic groups have much younger age-structure.

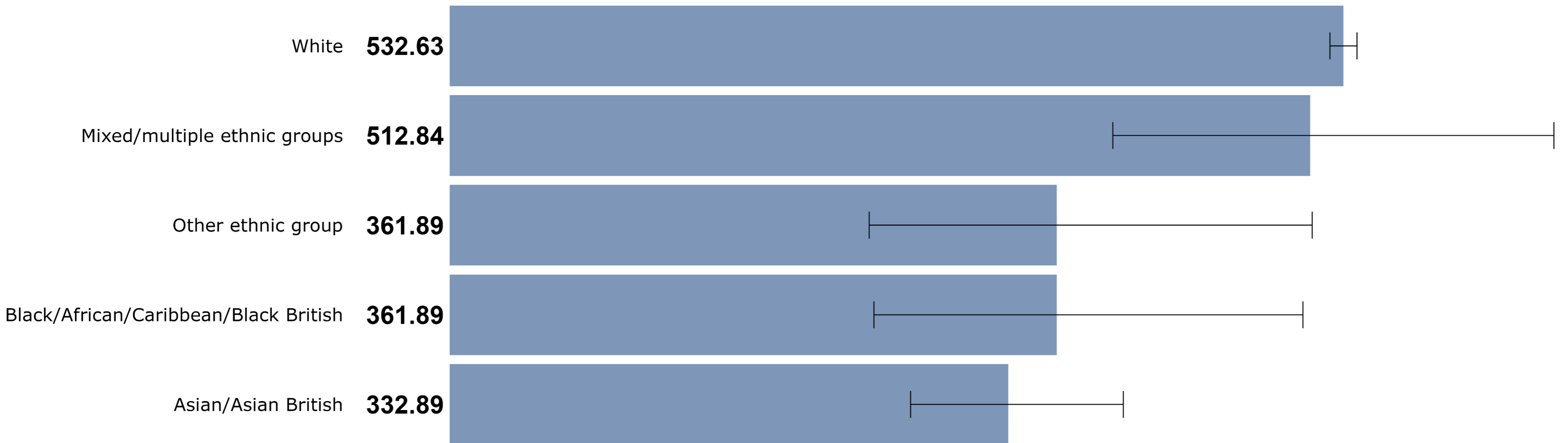


# Age-standardised rates

Even after adjusting for age, rates remain **highest** in the **white ethnic group**, followed closely by mixed/multiple.

## Cancer incidence, All malignancies excluding NMSC, EASR per 100,000, Persons, 2020, by ethnic group

Produced by Public Health Wales, using cancer registration data (WCISU), PHM & MYE (ONS), census11 (ONS, access via SAIL) & census21 (ONS)



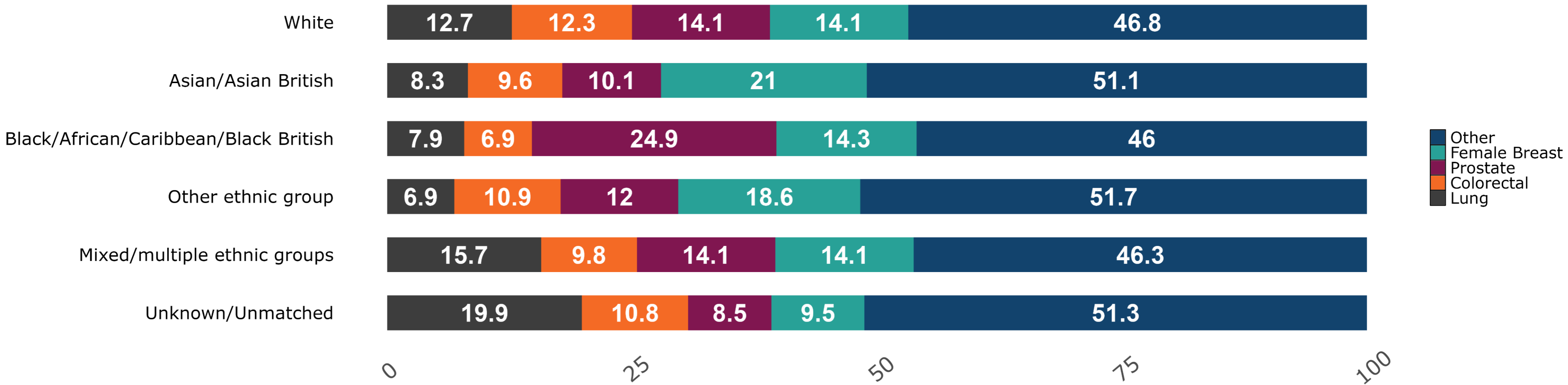
# Cancer type by ethnic group

Mixed/Multiple ethnic group - lung cancer is more common\*

Black/African/Caribbean/Black British - prostate cancer is more common\*

## All malignancies excluding NMSC, proportion of each cancer type by ethnicity, persons, all ages, Wales, 2011-2020

Produced by Public Health Wales, using cancer registration data (WCISU) and census data (ONS, access via SAIL)

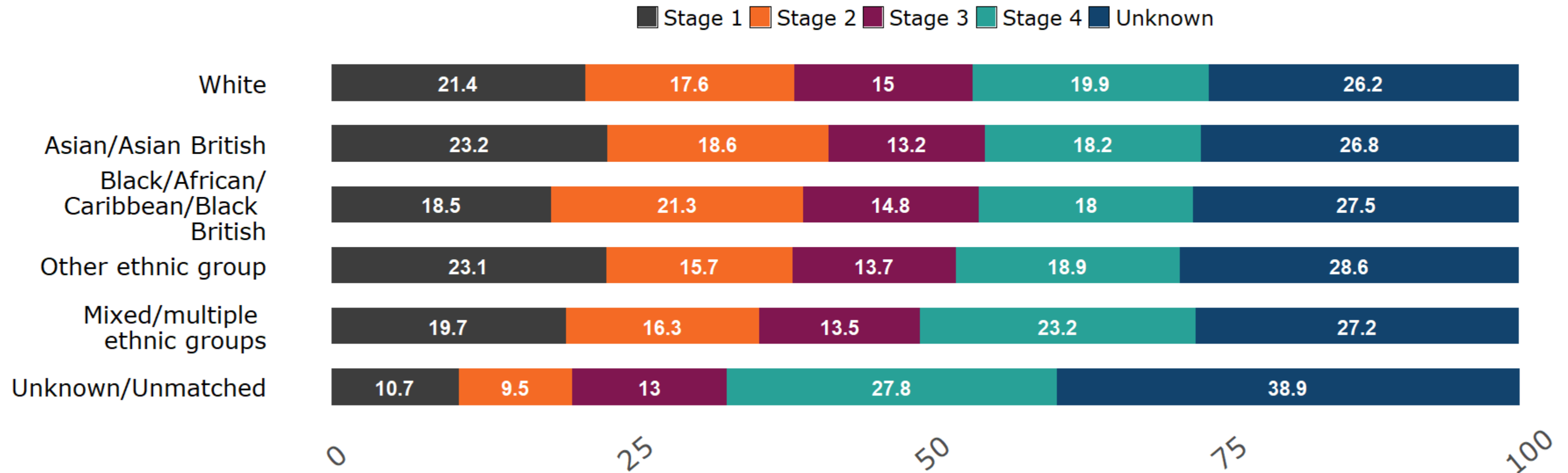


\*than other types of cancer

# Stage by ethnic group

## All malignancies excluding NMSC, Persons, all ages, Wales, 2011-2020

Produced by Public Health Wales, using cancer registration data (WCISU) and census data (ONS, access via SAIL)



# Conclusion: Ethnicity

The **white** ethnic group has **highest incidence** after adjusting for age.

In the distribution of cancers within ethnic group:

**Mixed/Multiple ethnic group** - **lung** cancer is more common than other cancer types

**Black/African/Caribbean/Black British** - **prostate** cancer is more common than other cancer types

Some evidence to suggest the percentage of **early diagnosis** is **slightly better** for the **Asian/Asian British** group and **slightly worse** for the **Mixed/multiple** group, further analysis is required.



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# Overcrowding Results



# Conclusion: Overcrowding

Crude rates are significantly **higher** in those with **1 spare room**, likely reflecting the impact of age.

After adjusting for age, rates are **highest** in those with **fewer rooms than required**, likely reflecting the impact of deprivation.



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# Occupation Results



# Conclusion: Occupation

Generally, rates are significantly **higher** in those with jobs requiring **lower-standards of education**.

**Process, plant and machine operatives** have **lowest** proportions of diagnoses at **early stage**.

**Administrative and secretarial** and **Professional** occupations have **highest** proportions of diagnoses at **early stage**.

# Next steps: Phase 2

- Use Census 2021 data for proportions
- Multivariate analysis to consider confounders
- Assess more protected characteristics
- Link to screening data and mortality data to understand outcomes by protected characteristic



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# VPDP update on inequalities

18/07/2024

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Surveillance and Epidemiology

# COVID-19 vaccine equality surveillance

## Spring booster 2024

- Two reports – mid-program, end of program
- Summarises equality of vaccination coverage for the 3 eligible groups, according to:
  - Sex
  - Rurality/ urbanicity
  - Deprivation
  - Ethnic group
- National report and a break down for each health board
- Analyses conducted in VPDP SAIL project area, due to insufficient of ethnic group data in WIS

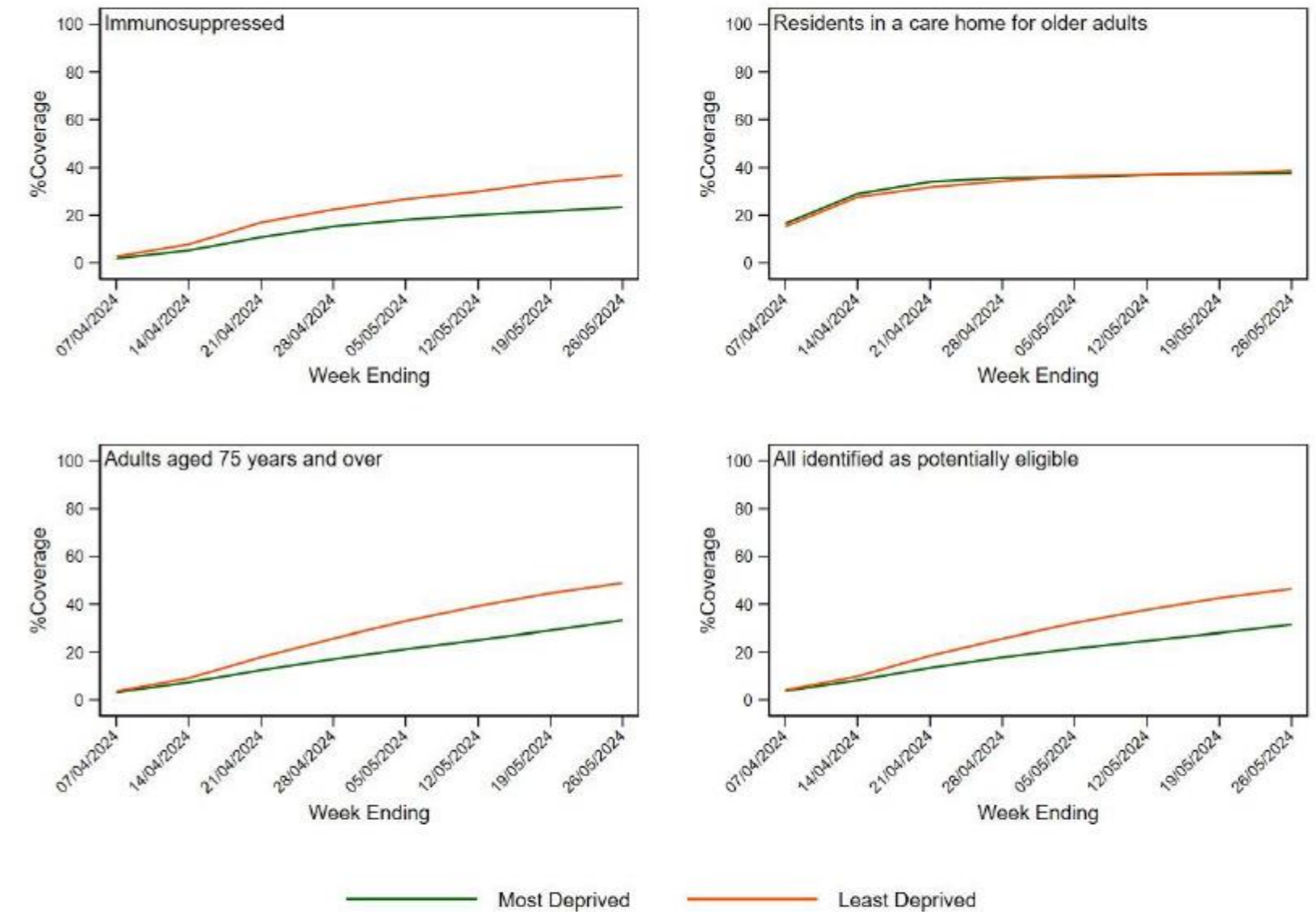
COVID-19 vaccine equality

# Latest spring booster report

**Table 1.3:** Coverage of 2024 Spring COVID-19 vaccination in eligible groups by deprivation quintile (eligibility groups are not mutually exclusive)

Eligible Group	Quintile of deprivation of area of residence (WIMD)	Denominator	Vaccinated (n)	Uptake (%)	95% CI
Individuals aged 6 months and over who are immunosuppressed	1- Most deprived	16,299	4,811	29.5	(29.3-30.2)
	2	17,514	6,138	35.0	(34.8-35.8)
	3	19,406	6,996	36.1	(35.8-36.7)
	4	19,749	7,955	40.3	(40-41)
	5 -Least deprived	18,725	8,516	45.5	(45.2-46.2)
Residents in a care home for older adults	1- Most deprived	2,599	2,034	78.3	(77.7-79.8)
	2	3,725	2,945	79.1	(78.6-80.4)
	3	3,506	2,743	78.2	(77.7-79.6)
	4	3,567	2,777	77.9	(77.4-79.2)
	5 -Least deprived	3,286	2,681	81.6	(81.1-82.9)
Adults aged 75 years and over	1- Most deprived	48,597	24,069	49.5	(49.4-50)
	2	63,009	33,613	53.3	(53.2-53.7)
	3	74,881	41,070	54.8	(54.7-55.2)
	4	83,047	48,462	58.4	(58.2-58.7)
	5 -Least deprived	84,813	56,211	66.3	(66.2-66.6)
All identified as potentially eligible	1- Most deprived	62,240	27,515	44.2	(44.1-44.6)
	2	77,063	37,780	49.0	(48.9-49.4)
	3	89,789	45,469	50.6	(50.5-51)
	4	97,943	53,333	54.5	(54.3-54.8)
	5 -Least deprived	98,532	61,272	62.2	(62.1-62.5)

**Figure 1.3** Trends in weekly coverage of the COVID-19 2024 Spring COVID-19 vaccine eligible groups in Wales: most deprived quintile of LSOAs vs. least deprived quintile of LSOAs



NB: Percentage coverage per week is calculated out of the living population as at the end of each week

COVID-19 vaccine equality

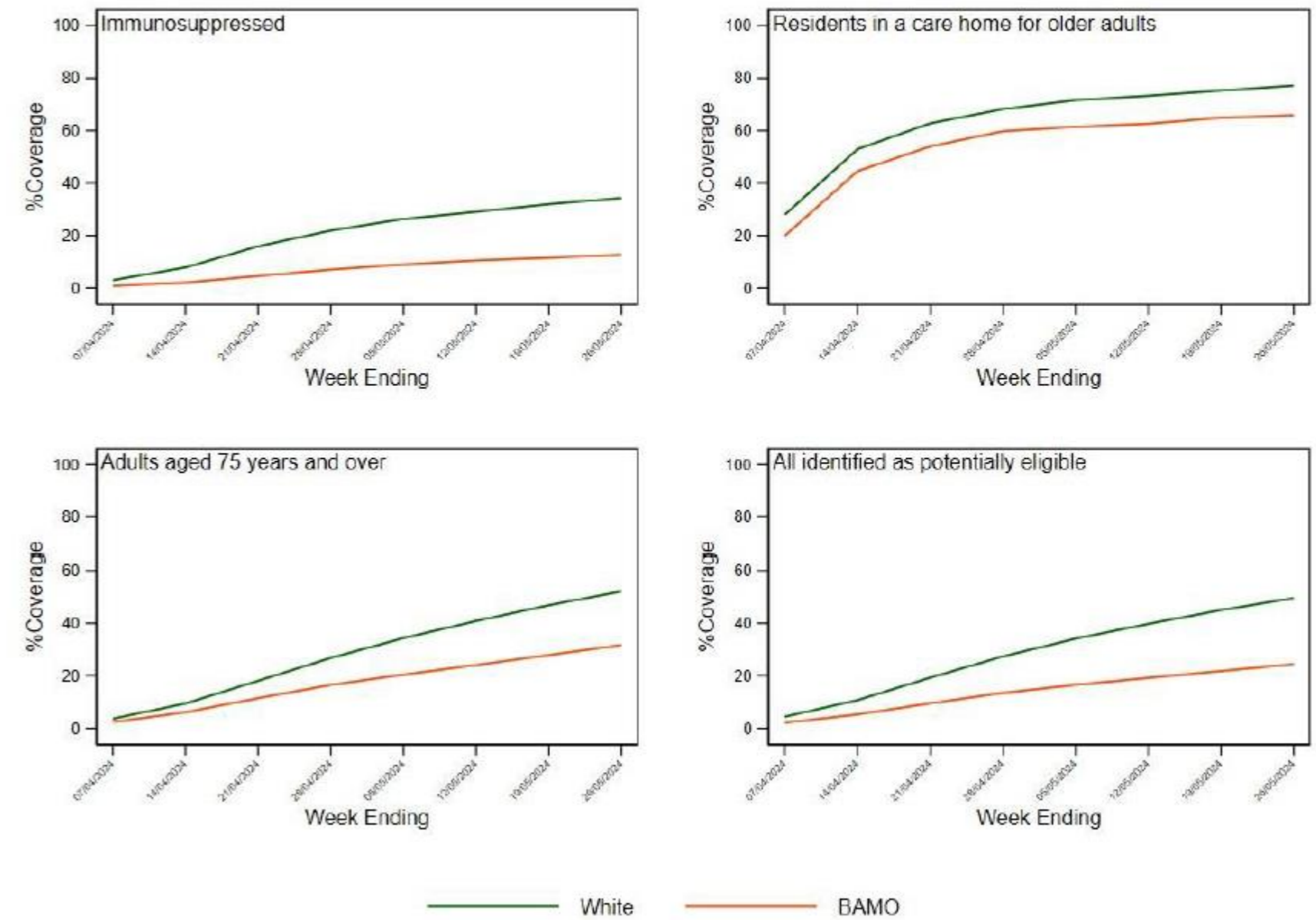
# Latest spring booster report

**Table 1.4:** Coverage of 2024 Spring COVID-19 vaccination in eligible groups by ethnic group (eligibility groups are not mutually exclusive)

Eligible groups	Ethnic Group	Denominator	Uptake (%)	95% CI
Individuals aged 6 months and over who are immunosuppressed	White	81,900	38.8	(38.7-39.1)
	Black	700	12.0	(11.1-14.9)
	Asian	1,400	16.8	(16.2-19)
	Mixed	1,100	18.5	(17.7-21.1)
	Other	300	11.7	(10.4-16.1)
	Unknown	7,900	32.1	(31.8-33.2)
Residents in a care home for older adults	White	15,200	79.1	(78.9-79.8)
	Black	100	66.6	(55.9-86.7)
	Asian	100	65.2	(59.2-78.6)
	Mixed	200	67.3	(63.6-76.3)
	Other	100	66.6	(44.7-95.7)
	Unknown	1,400	75.3	(74.5-77.6)
Adults aged 75 years and over	White	327,200	58.5	(58.5-58.7)
	Black	600	26.7	(25.3-30.7)
	Asian	2,100	38.5	(37.8-40.7)
	Mixed	1,200	43.3	(42.4-46.2)
	Other	500	32.3	(30.7-37.1)
	Unknown	29,200	43.4	(43.3-44)
All identified as potentially eligible	White	389,500	54.2	(54.2-54.4)
	Black	1,100	18.8	(18-21.3)
	Asian	3,400	29.9	(29.4-31.5)
	Mixed	2,200	31.4	(30.8-33.5)
	Other	700	23.7	(22.6-27.1)
	Unknown	35,900	40.5	(40.4-41.1)

NB: Denominators were rounded up to the nearest 100 whilst percentages were rounded up to the nearest whole numbers to with SAIL statistical disclosure control requirements

**Figure 1.4:** Trends in weekly coverage of the COVID-19 2024 Spring vaccination in eligible groups in Wales: combined White ethnic groups (White) vs combined Black, Asian, Mixed and Other ethnic groups (BAMO)



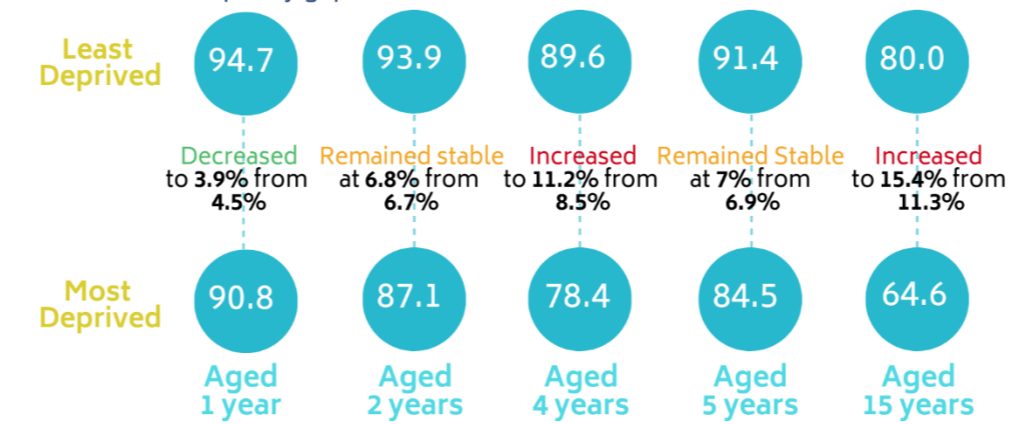
# Surveillance of equality in childhood vaccination uptake

- Annual report on disparities in uptake by HB, geography and deprivation quintile in preparation

## Inequalities in Childhood Immunisations 2022-23

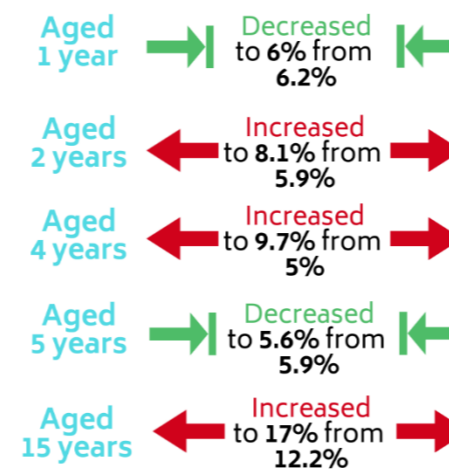
### Socio-Economic Inequalities

The percentage of children up to date with routine immunisations varies between the most-deprived and least-deprived areas in Wales and compared to 2021-22 the inequality gap has:

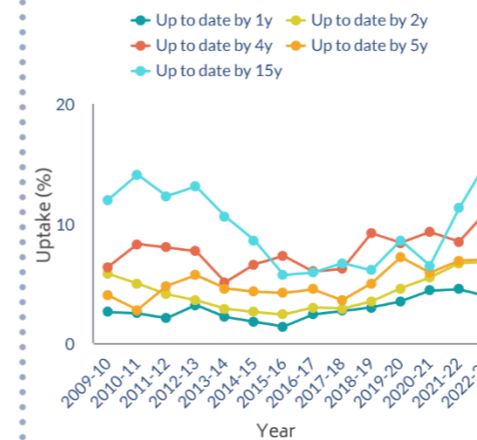


### Health Board Variation

Compared to 2021-22:



The inequality gap between quintiles of highest and lowest deprivation percentages



Routine catch-up activities play an important role in increasing vaccine uptake and reducing inequalities

## In development

- Analysis of multiple dimensions of inequalities in vaccination uptake data
- Building on developments for COVID-19 and MMR, shingles analysis in draft, HPV in development



Article

### Determinants of Equity in Coverage of Measles-Containing Vaccines in Wales, UK, during the Elimination Era

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**Abstract:** In the context of the WHO's measles and rubella elimination targets and European Immunization Agenda 2030, this large cross-sectional study aimed to identify inequalities in measles vaccination coverage in Wales, UK. The vaccination status of individuals aged 2 to 25 years of age, alive and resident in Wales as of 31 August 2021, was ascertained through linkage of the National Community Child Health Database and primary care data. A series of predictor variables were derived from five national datasets and all analysis was carried out in the Secure Anonymised Information Linkage Databank at Swansea University. In these 648,895 individuals, coverage of the first dose of measles-containing vaccine (due at 12–13 months of age) was 97.1%, and coverage of the second dose (due at 3 years and 4 months) in 4 to 25-year-olds was 93.8%. In multivariable analysis, excluding 0.7% with known refusal, the strongest association with being unvaccinated was birth order (families with six or more children) and being born outside of the UK. Living in a deprived area, being eligible for free school meals, a lower level of maternal education, and having a recorded language other than English or Welsh were also associated with lower coverage. Some of these factors may also be associated with refusal. This knowledge can be used to target future interventions and prioritise areas for catch up in a time of limited resource.

**Keywords:** vaccination; immunisation; socioeconomic factors; measles; MMR; measles, mumps and rubella vaccine



**Citation:** Perry, M.; Cottrell, S.; Gravenor, M.B.; Griffiths, L. Determinants of Equity in Coverage of Measles-Containing Vaccines in Wales, UK, during the Elimination Era. *Vaccines* **2023**, *11*, 680. <https://doi.org/10.3390/vaccines11030680>

MMR analysis: <https://www.mdpi.com/2076-393X/11/3/680>

Characteristic	Category	One Dose of Measles-Containing Vaccine (4–25 Year Olds)					Two Doses of Measles-Containing Vaccine (4–25 Year Olds)				
		Vaccinated (n)	Population (n)	Uptake (%)	OR (95% CI)	aOR (95% CI)	Vaccinated (n)	Population (n)	Uptake (%)	OR (95% CI)	aOR (95% CI)
Gender	Male	213,518	215,626	99.0	Baseline	Baseline	208,567	215,626	96.7	Baseline	Baseline
	Female	202,068	203,779	99.2	1.17 (1.09–1.24)	1.11 (1.03–1.18)	197,973	203,779	97.2	1.15 (1.11–1.20)	1.11 (1.07–1.15)
Age cohort	Primary school (4–11)	132,916	133,857	99.3	Baseline	Baseline	130,258	133,857	97.3	Baseline	Baseline
	Secondary school (12–16)	109,335	110,028	99.4	1.12 (1.01–1.23)	1.38 (1.24–1.52)	107,809	110,028	98.0	1.34 (1.27–1.42)	1.60 (1.51–1.69)
	College (17–18)	40,779	41,175	99.0	0.73 (0.65–0.82)	0.90 (0.80–1.02)	39,946	41,175	97.0	0.90 (0.84–0.96)	1.08 (1.01–1.16)
	University (19–21)	54,384	55,079	98.7	0.55 (0.50–0.61)	0.70 (0.63–0.78)	52,902	55,079	96.0	0.67 (0.64–0.71)	0.83 (0.78–0.88)
	Young adults (22–25)	78,172	79,266	98.6	0.51 (0.46–0.55)	0.66 (0.60–0.73)	75,625	79,266	95.4	0.57 (0.55–0.60)	0.73 (0.69–0.77)
Health board of residence	HB1	81,805	82,299	99.4	Baseline	Baseline	80,763	82,299	98.1	Baseline	Baseline
	HB2	57,912	58,599	98.8	0.51 (0.45–0.57)	0.51 (0.45–0.57)	56,282	58,599	96.0	0.46 (0.43–0.49)	0.46 (0.43–0.49)
	HB3	43,403	44,002	98.6	0.44 (0.39–0.49)	0.44 (0.39–0.49)	42,355	44,002	96.3	0.49 (0.46–0.52)	0.47 (0.44–0.50)
	HB4	6801	6902	98.5	0.41 (0.33–0.51)	0.38 (0.31–0.48)	6636	6902	96.1	0.47 (0.42–0.54)	0.45 (0.39–0.51)
	HB5	76,485	77,197	99.1	0.65 (0.58–0.73)	0.62 (0.55–0.69)	74,573	77,197	96.6	0.54 (0.51–0.58)	0.54 (0.51–0.58)
	HB6	79,422	80,048	99.2	0.77 (0.68–0.86)	0.76 (0.68–0.86)	77,768	80,048	97.2	0.65 (0.61–0.69)	0.66 (0.62–0.71)
	HB7	69,758	70,358	99.1	0.70 (0.62–0.79)	0.80 (0.71–0.91)	68,163	70,358	96.9	0.59 (0.55–0.63)	0.64 (0.60–0.68)
Deprivation quintile of residence	Most deprived	97,159	98,266	98.9	Baseline	Baseline	94,183	98,266	95.8	Baseline	Baseline
	2	87,377	88,209	99.1	1.20 (1.09–1.31)	1.06 (0.97–1.17)	85,432	88,209	96.9	1.33 (1.27–1.40)	1.15 (1.09–1.21)
	3	75,674	76,343	99.1	1.29 (1.17–1.42)	1.10 (1.00–1.23)	74,185	76,343	97.2	1.49 (1.41–1.57)	1.16 (1.10–1.23)
	4	72,632	73,239	99.2	1.36 (1.23–1.51)	1.11 (0.99–1.23)	71,339	73,239	97.4	1.63 (1.54–1.72)	1.18 (1.11–1.26)
	Least deprived	82,744	83,348	99.3	1.56 (1.41–1.73)	1.13 (1.01–1.26)	81,401	83,348	97.7	1.81 (1.72–1.91)	1.22 (1.15–1.30)
Ethnic group	White	392,908	396,329	99.1	Baseline	Baseline	384,621	396,329	97.0	Baseline	Baseline
	Other	1817	1868	97.3	0.31 (0.24–0.42)	1.08 (0.77–1.54)	1745	1868	93.4	0.43 (0.36–0.52)	1.08 (0.86–1.36)
	Asian	9762	9900	98.6	0.62 (0.52–0.73)	1.58 (1.27–1.97)	9473	9900	95.7	0.68 (0.61–0.75)	1.31 (1.14–1.50)
	Mixed	9201	9338	98.5	0.58 (0.49–0.70)	0.76 (0.64–0.92)	8920	9338	95.5	0.65 (0.59–0.72)	0.78 (0.71–0.87)
	Black	1898	1970	96.3	0.23 (0.18–0.29)	0.99 (0.75–1.33)	1781	1970	90.4	0.29 (0.25–0.33)	0.92 (0.77–1.11)
Comorbidity score	0	328,434	331,538	99.1	Baseline	Baseline	32,1268	331,538	96.9	Baseline	Baseline
	1	79,664	80,288	99.2	1.21 (1.11–1.32)	1.17 (1.07–1.28)	77,985	80,288	97.1	1.08 (1.03–1.13)	1.10 (1.05–1.16)
	2	5353	5404	99.1	0.99 (0.76–1.33)	1.03 (0.78–1.39)	5209	5404	96.4	0.85 (0.74–0.99)	0.95 (0.82–1.10)
	3+	2135	2175	98.2	0.50 (0.37–0.70)	0.58 (0.42–0.81)	2078	2175	95.5	0.68 (0.56–0.85)	0.87 (0.71–1.09)
Age first registered with primary care GP in Wales	At birth	358,121	360,620	99.3	Baseline	Baseline	351,458	360,620	97.5	Baseline	Baseline
	Young child (2–3)	33,881	34,335	98.7	0.52 (0.47–0.58)	0.70 (0.63–0.78)	32,798	34,335	95.5	0.56 (0.53–0.59)	0.69 (0.65–0.73)
	Primary school (4–11)	11,535	12,120	95.2	0.14 (0.13–0.15)	0.31 (0.27–0.35)	10,663	12,120	88.0	0.19 (0.18–0.20)	0.36 (0.33–0.39)
	Secondary school (12–16)	1609	1761	91.4	0.07 (0.06–0.09)	0.16 (0.13–0.20)	1472	1761	83.6	0.13 (0.12–0.15)	0.25 (0.22–0.29)
	College (17–18)	672	691	97.3	0.25 (0.16–0.40)	0.37 (0.24–0.61)	645	691	93.3	0.37 (0.27–0.50)	0.53 (0.39–0.73)
	University (19–21)	5266	5330	98.8	0.57 (0.45–0.74)	0.70 (0.54–0.91)	5133	5330	96.3	0.68 (0.59–0.79)	0.78 (0.68–0.91)
Young adult (22–25)	4502	4548	99.0	0.68 (0.52–0.93)	0.84 (0.63–1.15)	4371	4548	96.1	0.64 (0.55–0.75)	0.77 (0.66–0.90)	

Characteristic	Category	One Dose of Measles-Containing Vaccine (4–25 Year Olds)					Two Doses of Measles-Containing Vaccine (4–25 Year Olds)				
		Vaccinated (n)	Population (n)	Uptake (%)	OR (95% CI)	aOR (95% CI)	Vaccinated (n)	Population (n)	Uptake (%)	OR (95% CI)	aOR (95% CI)
Mother's age at delivery	Under 17	2987	3002	99.5	1.69 (1.05–2.95)	1.91 (1.18–3.37)	2905	3002	96.8	0.90 (0.74–1.11)	0.97 (0.79–1.20)
	17–18	14,508	14,610	99.3	1.21 (0.99–1.49)	1.30 (1.05–1.62)	14,143	14,610	96.8	0.91 (0.83–1.01)	0.92 (0.83–1.02)
	19–20	26,875	27,051	99.3	1.30 (1.11–1.53)	1.33 (1.13–1.58)	26,293	27,051	97.2	1.04 (0.97–1.13)	1.03 (0.95–1.13)
	21–25	95,435	96,284	99.1	0.95 (0.87–1.05)	1.02 (0.93–1.12)	93,125	96,284	96.7	0.89 (0.85–0.93)	0.92 (0.88–0.97)
	26–30	125,482	126,548	99.2	Baseline	Baseline	122,849	126,548	97.1	Baseline	Baseline
	31–35	102,444	103,414	99.1	0.90 (0.82–0.98)	0.88 (0.80–0.96)	100,419	103,414	97.1	1.01 (0.96–1.06)	0.99 (0.94–1.04)
	36–40	41,039	41,555	98.8	0.68 (0.61–0.75)	0.70 (0.63–0.78)	40,176	41,555	96.7	0.88 (0.82–0.93)	0.91 (0.85–0.97)
	Over 40	6816	6941	98.2	0.46 (0.39–0.56)	0.60 (0.49–0.73)	6630	6941	95.5	0.64 (0.57–0.72)	0.79 (0.70–0.90)
Birth order	First born	160,101	160,931	99.5	Baseline	Baseline	157,847	160,931	98.1	Baseline	Baseline
	Second born	182,014	183,880	99.0	0.51 (0.47–0.55)	0.74 (0.68–0.81)	177,856	183,880	96.7	0.58 (0.55–0.60)	0.70 (0.66–0.73)
	Third born	48,304	48,845	98.9	0.46 (0.42–0.52)	0.54 (0.49–0.61)	46,895	48,845	96.0	0.47 (0.44–0.50)	0.50 (0.47–0.53)
	Forth born	16,425	16,726	98.2	0.28 (0.25–0.32)	0.37 (0.32–0.43)	15,713	16,726	93.9	0.30 (0.28–0.33)	0.35 (0.33–0.38)
	Fifth born	5506	5658	97.3	0.19 (0.16–0.22)	0.27 (0.23–0.33)	5209	5658	92.1	0.23 (0.20–0.25)	0.29 (0.26–0.32)
	Sixth or more	3236	3365	96.2	0.13 (0.11–0.16)	0.21 (0.17–0.26)	3020	3365	89.7	0.17 (0.15–0.19)	0.23 (0.20–0.26)
Total primary care GP visits 1 September 2020 to 31 August 2021	None	38,114	38,843	98.1	Baseline	Baseline	36,931	38,843	95.1	Baseline	Baseline
	1–2	114,209	115,168	99.2	2.28 (2.07–2.51)	2.18 (1.97–2.41)	111,863	115,168	97.1	1.75 (1.65–1.86)	1.72 (1.62–1.83)
	3–4	72,737	73,290	99.2	2.52 (2.25–2.81)	2.53 (2.25–2.84)	71,298	73,290	97.3	1.85 (1.74–1.98)	1.92 (1.80–2.05)
	5–9	90,044	90,745	99.2	2.46 (2.21–2.73)	2.52 (2.26–2.81)	88,290	90,745	97.3	1.86 (1.75–1.98)	1.98 (1.86–2.11)
	10–14	40,422	40,743	99.2	2.41 (2.11–2.75)	2.64 (2.30–3.04)	39,565	40,743	97.1	1.74 (1.62–1.87)	1.97 (1.82–2.13)
	15–19	23,819	23,992	99.3	2.63 (2.24–3.12)	3.06 (2.57–3.65)	23,298	23,992	97.1	1.74 (1.59–1.90)	2.09 (1.91–2.30)
	20–24	13,989	14,122	99.1	2.01 (1.68–2.43)	2.43 (2.01–2.97)	13,632	14,122	96.5	1.44 (1.30–1.60)	1.82 (1.64–2.03)
	25–49	19,737	19,952	98.9	1.76 (1.51–2.05)	2.31 (1.96–2.74)	19,222	19,952	96.3	1.36 (1.25–1.49)	1.88 (1.71–2.07)
50+	2515	2550	98.6	1.37 (0.99–1.97)	2.12 (1.51–3.09)	2441	2550	95.7	1.16 (0.96–1.42)	1.90 (1.55–2.35)	
Recorded language English or Welsh	No	5525	5863	94.2	Baseline	Baseline	5170	5863	88.2	Baseline	Baseline
	Yes	410,061	413,542	99.2	7.21 (6.41–8.07)	1.71 (1.44–2.03)	401,370	413,542	97.1	4.42 (4.07–4.79)	1.33 (1.18–1.49)
Ever eligible for free school meals	No	296,942	299,262	99.2	Baseline	Baseline	291,750	299,262	97.5	Baseline	Baseline
	Yes	118,644	120,143	98.8	0.62 (0.58–0.66)	0.73 (0.68–0.79)	114,790	120,143	95.5	0.55 (0.53–0.57)	0.73 (0.70–0.76)
Ever attended a special school	No	410,837	414,573	99.1	Baseline	Baseline	402,105	414,573	97.0	Baseline	Baseline
	Yes	4749	4832	98.3	0.52 (0.42–0.65)	0.67 (0.53–0.85)	4435	4832	91.8	0.35 (0.31–0.38)	0.43 (0.39–0.48)
Mother's highest qualification	None	59,223	60,034	98.6	Baseline	Baseline	57,107	60,034	95.1	Baseline	Baseline
	A-levels	63,435	63,907	99.3	1.84 (1.64–2.06)	1.12 (0.99–1.27)	62,375	63,907	97.6	2.09 (1.96–2.22)	1.25 (1.17–1.34)
	GCSE/O-Level high grades	85,168	85,779	99.3	1.91 (1.72–2.12)	1.25 (1.12–1.40)	83,527	85,779	97.4	1.90 (1.80–2.01)	1.25 (1.17–1.32)
	GCSE/O-Level any grades	74,792	75,459	99.1	1.54 (1.39–1.70)	1.10 (0.99–1.22)	72,997	75,459	96.7	1.52 (1.44–1.61)	1.11 (1.04–1.17)
	Degree	120,598	121,585	99.2	1.67 (1.52–1.84)	1.10 (0.98–1.23)	118,564	121,585	97.5	2.01 (1.91–2.12)	1.18 (1.11–1.26)
	Apprenticeship	2965	2999	98.9	1.19 (0.86–1.72)	0.83 (0.59–1.20)	2910	2999	97.0	1.68 (1.36–2.09)	1.12 (0.91–1.40)
	Other	9405	9642	97.5	0.54 (0.47–0.63)	0.97 (0.82–1.16)	9060	9642	94.0	0.80 (0.73–0.88)	1.06 (0.95–1.17)

## Staff engagement

- Survey of GPs on shingles invitation methods
- Survey of School Nursing teams on perceived barriers to HPV
- Working with health boards on targeted MMR catch-up in underserved groups
- Working with health boards to assess the impact of forthcoming vaccination changes
  - E.g. 2025 changes to childhood schedule

## Public engagement/ resource

- BSL videos on COVID-19 spring booster
- Coproduced video resources on teenage vaccinations and information for [people with learning disabilities](#)
- Attitudinal surveys on vaccine confidence

## Working with the service

- Vaccine Equity Network workshop on coproduction of interventions to improve uptake in poorly served groups
- Wales Vaccine Equity Group (National steering committee)
- Workshops on childhood vaccination schedule changes
- Vaccine literacy project of the National Immunisation Framework
- Work with health boards on local engagement work, developing and evaluating interventions to improve uptake and reduce inequalities
- Encouraging local teams to share good practice, including around intervention development, through the Wales vaccine evidence repository

## Policy

- Winter Respiratory Virus Welsh Health Circulars
  - People experiencing homelessness
- Measles Elimination current catch-up
- Measles Elimination next step WHC

# Longer-term – make this routine

1. NHS Wales App for data collection
2. Flow of data from GP registration and NHS Wales App
3. Mandate usage of NHS number on all systems, everywhere
4. Get into NDR and make analysis routine

# Annex – detailed charts on rooms and occupation for cancer analysis

# Caveats

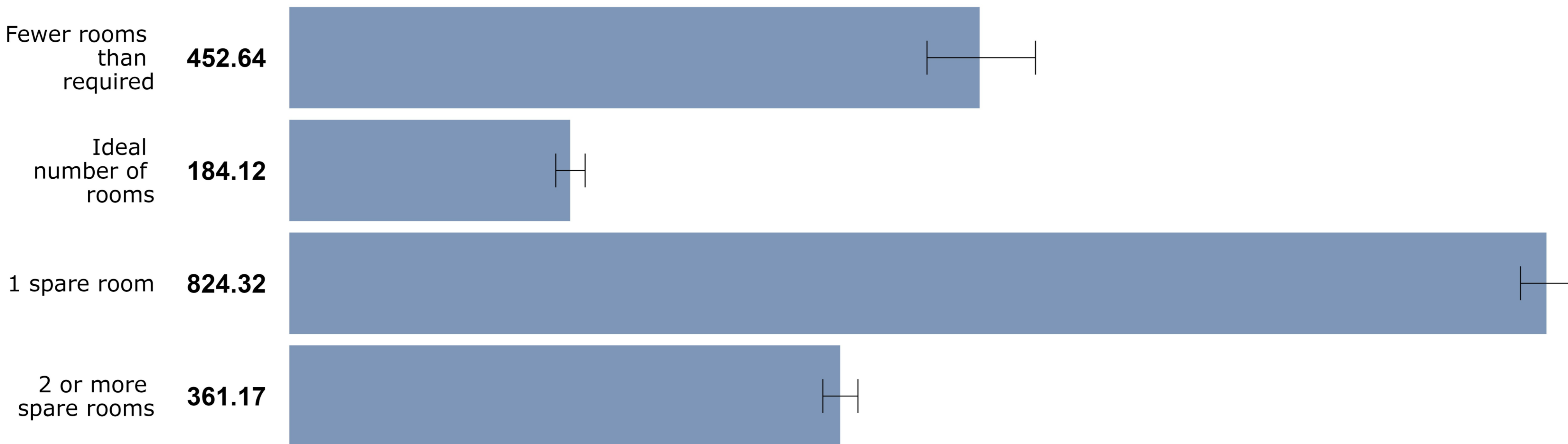
- SAIL's ethnicity spine table was used to identify ethnicity for 12.4% of cases where there was no ethnicity recorded in the Census11 data or where cancer cases didn't map to a Census11 record.
- The cancer diagnosis data covers 2011-2020, with cases being assigned variables based on the 2011 census. For the calculation of crude and age-standardised rates, the numerator counts were based on the 2011 census or ethnicity spine, and denominator counts based on the 2021 census results as it was the only available data. As some demographic characteristics can change over a 10-year period, the different timeframes for each dataset should be considered when interpreting the results.
- Some outputs are suppressed for privacy disclosure control.
- Rates are calculated for 2020, because this was closest year of cancer data to the 2021 census data. 2020 had fewer diagnoses than usual due to the COVID pandemic and was an unprecedentedly atypical year. This should be considered when interpreting the results.

# Crude rates

Before accounting for age, rates in the those with **1 spare room** are significantly **higher** than any other group.

## Cancer incidence, All malignancies excluding NMSC, crude rate per 100,000, Persons, 2020, by number of bedrooms

Produced by Public Health Wales, using cancer registration data (WCISU), PHM & MYE (ONS), census11 (ONS, access via SAIL) & census21 (ONS)

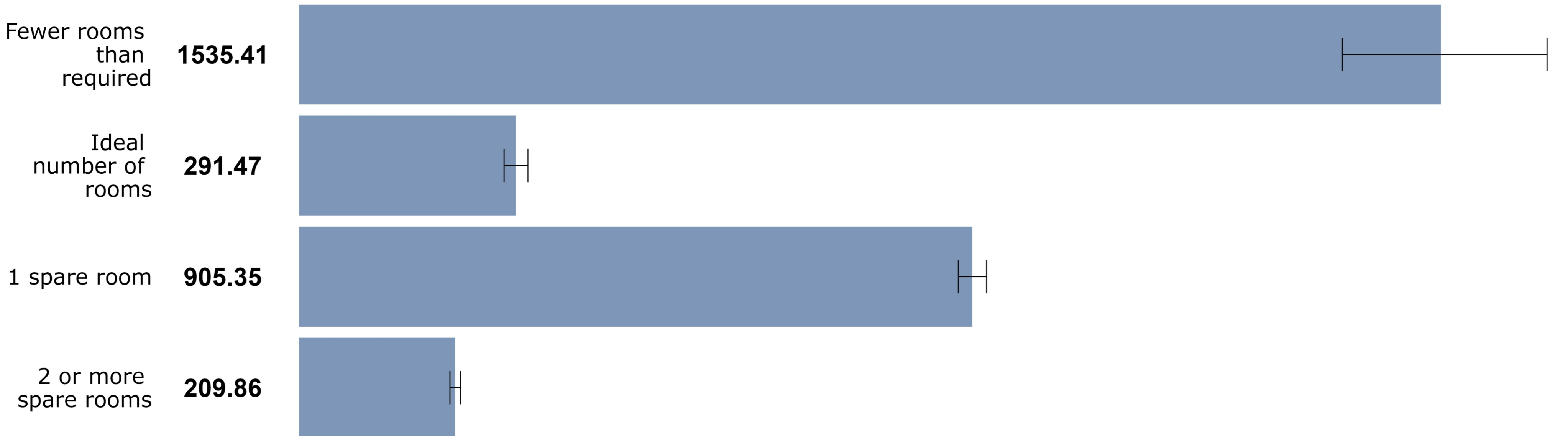


# Age-standardised rates

Rates for those with **fewer rooms than required** is considerably **higher** than the other groups, and **lowest** in those with **2 or more spare rooms**

## Cancer incidence, All malignancies excluding NMSC, EASR per 100,000, Persons, 2020, by number of bedrooms

Produced by Public Health Wales, using cancer registration data (WCISU), PHM & MYE (ONS), census11 (ONS, access via SAIL) & census21 (ONS)



# Stage by number of bedrooms

Fewer unknown stages in those with ideal number of rooms.

## All malignancies excluding NMSC, Persons, all ages, Wales, 2011-2020

Produced by Public Health Wales, using cancer registration data (WCISU) and census data (ONS, access via SAIL)



**Table 2: General nature of qualifications, training and experience for occupations in SOC2010 major groups**

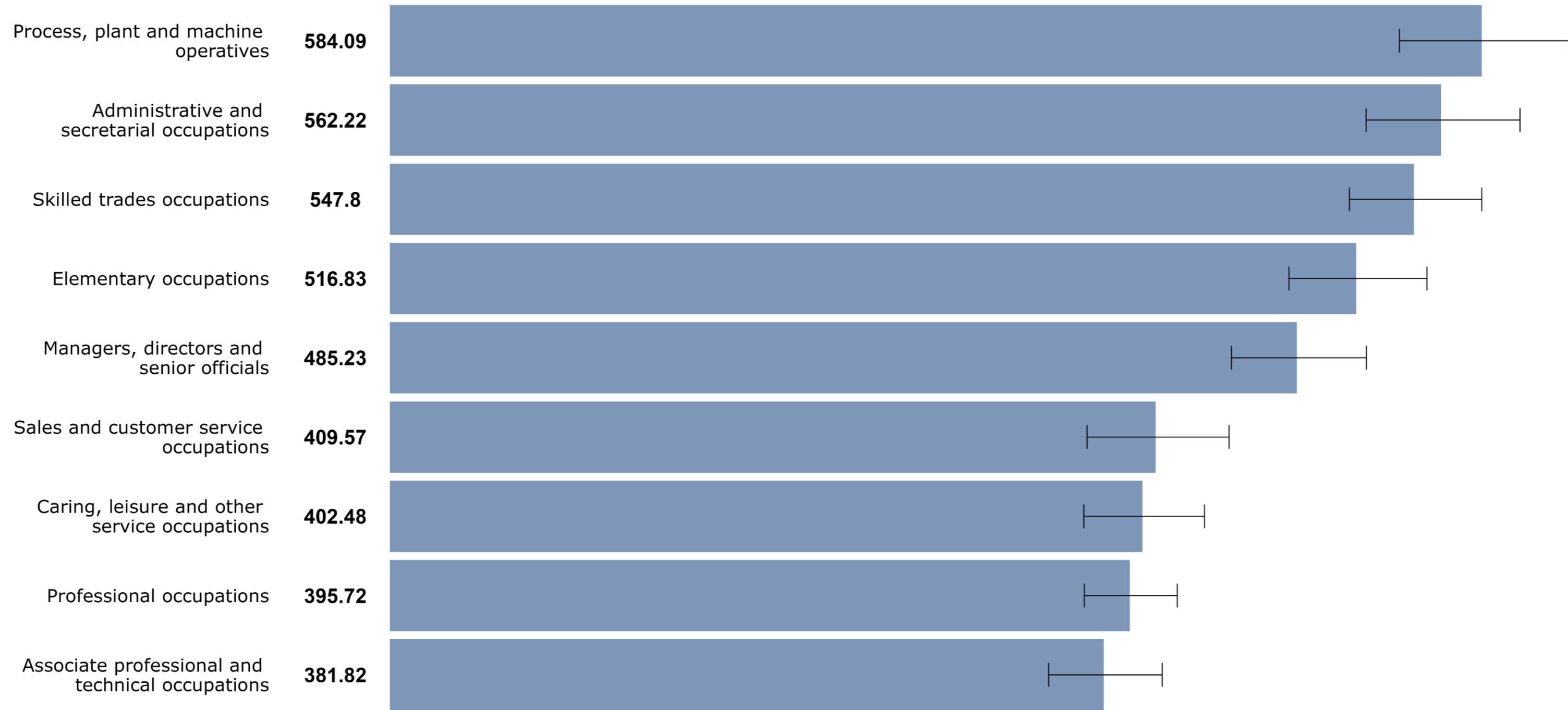
Major group	General nature of qualifications, training and experience for occupations in the major group
Managers, directors and senior officials	A significant amount of knowledge and experience of the production processes and service requirements associated with the efficient functioning of organisations and businesses.
Professional occupations	A degree or equivalent qualification, with some occupations requiring postgraduate qualifications and/or a formal period of experience-related training.
Associate professional and technical occupations	An associated high-level vocational qualification, often involving a substantial period of full-time training or further study. Some additional task-related training is usually provided through a formal period of induction.
Administrative and secretarial occupations	A good standard of general education. Certain occupations will require further additional vocational training to a well-defined standard (e.g. office skills).
Skilled trades occupations	A substantial period of training, often provided by means of a work based training programme.
Caring, leisure and other service occupations	A good standard of general education. Certain occupations will require further additional vocational training, often provided by means of a work-based training programme.
Sales and customer service occupations	A general education and a programme of work-based training related to Sales procedures. Some occupations require additional specific technical knowledge but are included in this major group because the primary task involves selling.
Process, plant and machine operatives	The knowledge and experience necessary to operate vehicles and other mobile and stationary machinery, to operate and monitor industrial plant and equipment, to assemble products from component parts according to strict rules and procedures and subject assembled parts to routine tests. Most occupations in this major group will specify a minimum standard of competence for associated tasks and will have a related period of formal training.
Elementary occupations	Occupations classified at this level will usually require a minimum general level of education (that is, that which is acquired by the end of the period of compulsory education). Some occupations at this level will also have short periods of work-related training in areas such as health and safety, food hygiene, and customer service requirements.

# Crude rates: active occupation

Generally, rates are significantly **higher** in those with jobs requiring **lower-standards of education**.

**Cancer incidence, All malignancies excluding NMSC, crude rate per 100,000, Persons, 2020, by active occupation**

Produced by Public Health Wales, using cancer registration data (WCISU), PHM & MYE (ONS), census11 (ONS, access via SAIL) & census21 (ONS)

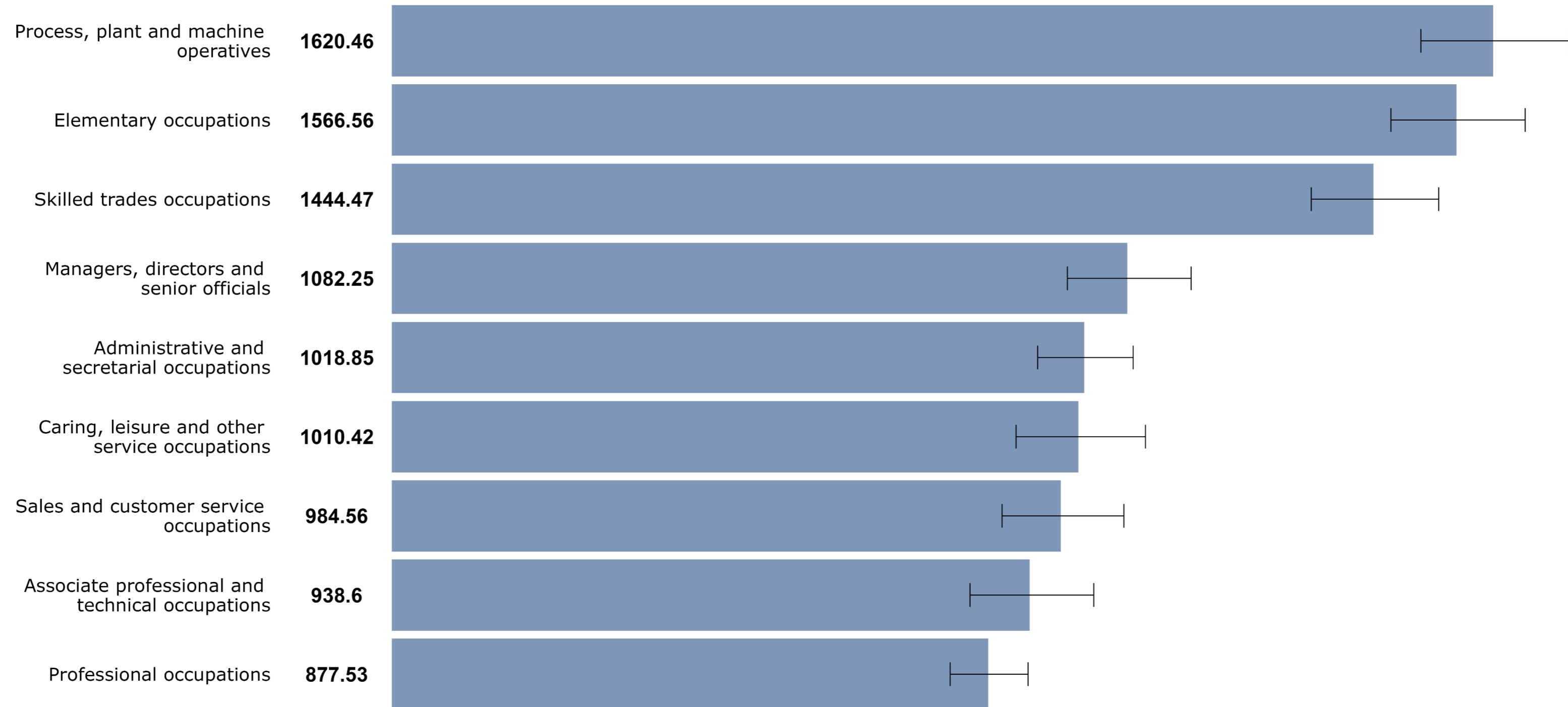


# Crude rates: retired occupation

Generally, rates are significantly **higher** in those with jobs requiring **lower-standards of education**.

**Cancer incidence, All malignancies excluding NMSC, crude rate per 100,000, Persons, 2020, by retired occupation**

Produced by Public Health Wales, using cancer registration data (WCISU), PHM & MYE (ONS), census11 (ONS, access via SAIL) & census21 (ONS)

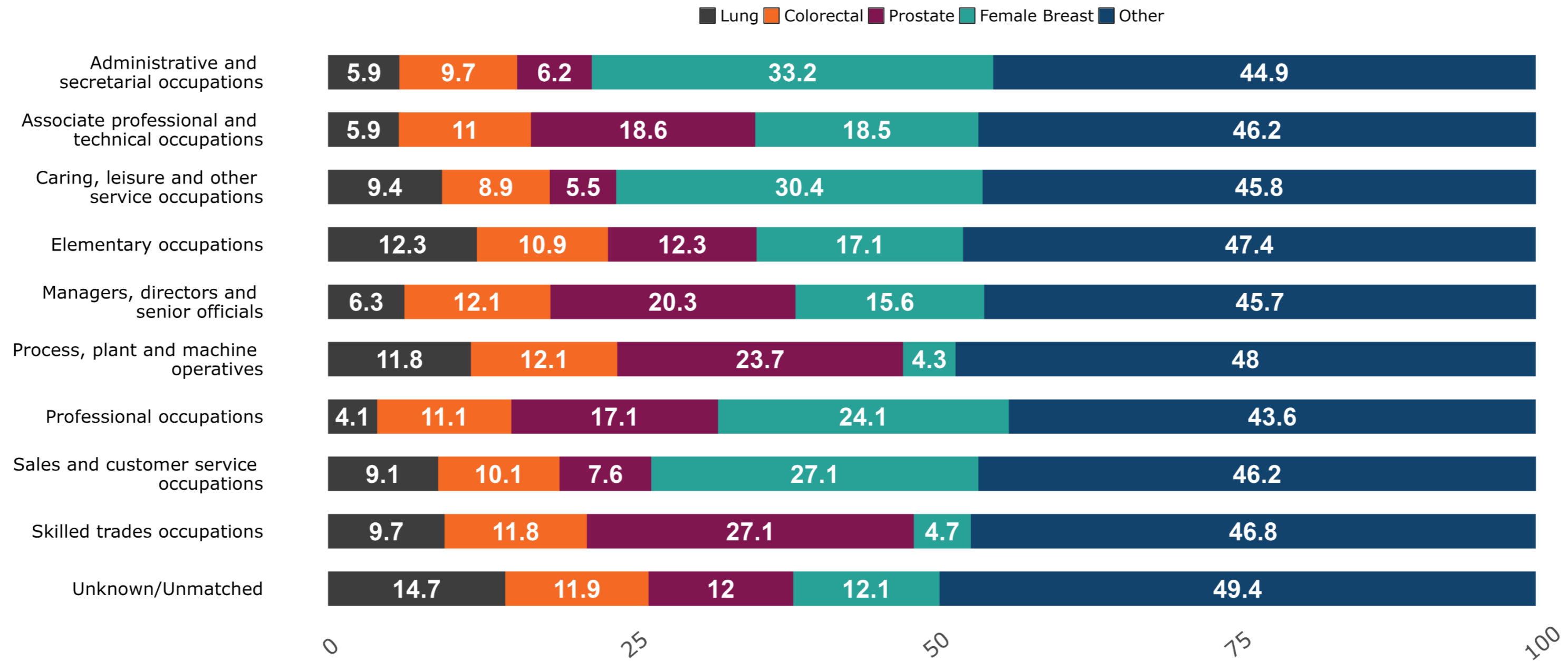


# Cancer type by active occupation

Female breast cancer is more common than other cancer types in occupation groups that are female dominant. Prostate cancer is more common than other cancer types in occupation groups that are male dominant.

**All malignancies excluding NMSC, proportion of each cancer type by active occupation, persons, all ages, Wales, 2011-2020**

Produced by Public Health Wales, using cancer registration data (WCISU) and census data (ONS, access via SAIL)



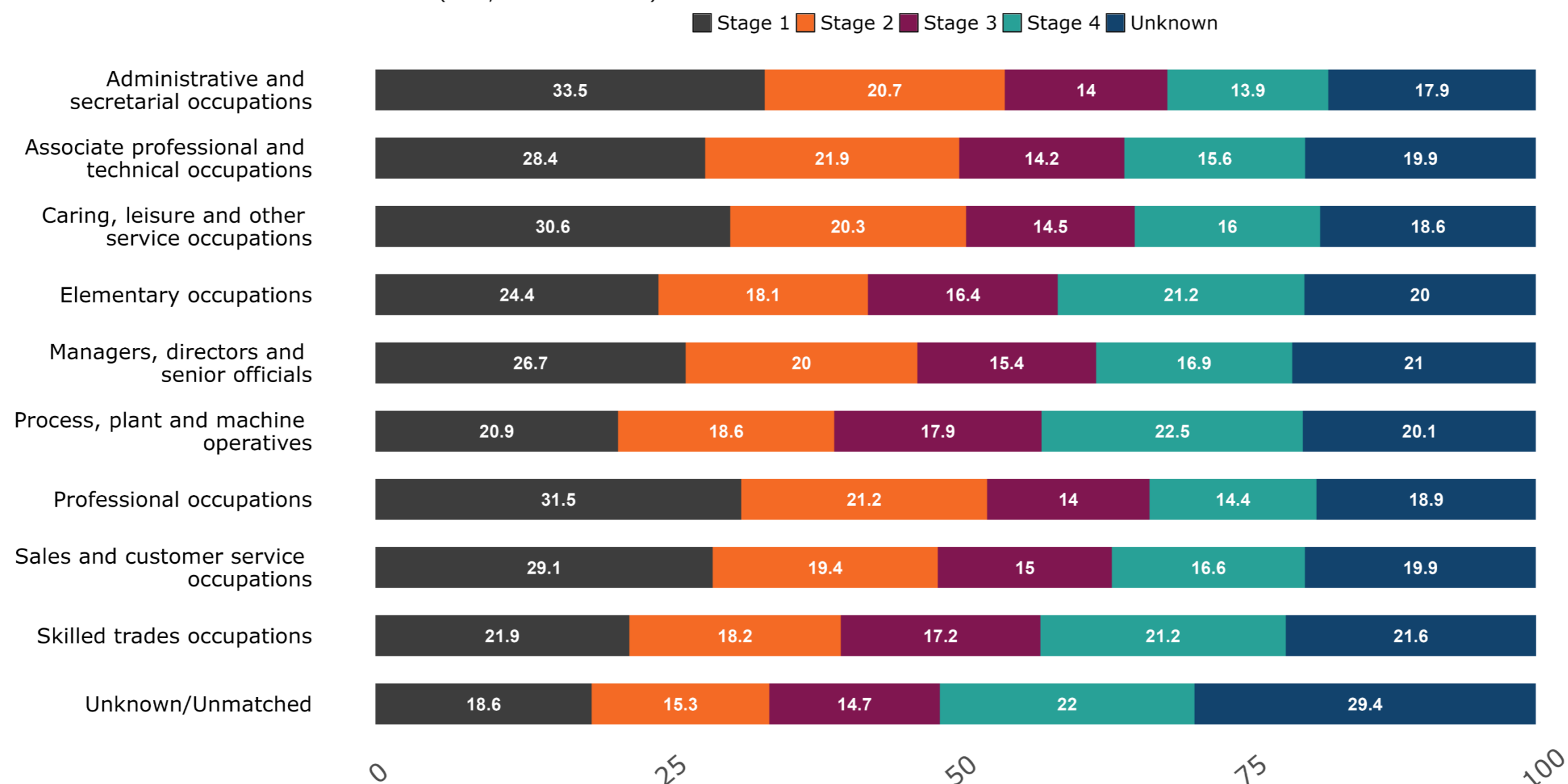
# Stage by active occupation

Process, plant and machine operatives have **lowest** proportions of diagnoses at **early stage\***

Administrative and secretarial and Professional occupations have **highest** proportions of diagnoses at **early stage\***

## All malignancies excluding NMSC, Persons, active occupation, all ages, Wales, 2011-2020

Produced by Public Health Wales, using cancer registration data (WCISU) and census data (ONS, access via SAIL)



\*stage1 and stage2