

Executive Summary

Objective

To investigate the distribution of the ABO RhD blood groups within the hospital populations of England, Wales and Northern Ireland.

Methods

Hospitals in England, Wales and Northern Ireland were asked to provide the numbers, by means of a paper survey, of ABO and RhD types performed in a single year from 1st October 2007 to 30th September 2008. The survey requested that hospitals ignore repeat types, to avoid a potential source of bias. Of the 284 surveys sent, 112 were returned, detailing type data for 117 hospitals; providing a total sample in excess of 1.4 million blood types across England, Wales and Northern Ireland.

Results

Table 1 provides a summary of the mean distributions of ABO and RhD types across England, Northern Ireland and Wales. Table 2 further breaks the distribution of ABO and RhD types by regional transfusion committees (RTCs) in England and North Wales.

Table 1: Blood group distributions within national regions

	O+	O-	A+	A-	B+	B-	AB+	AB-	Sample size	Responses
England All	37.66	7.81	32.90	6.94	9.32	1.68	3.04	0.64	1339911	101
England (Excl. London)	37.48	8.09	33.26	7.21	8.71	1.69	2.92	0.65	1171045	90
Wales	38.19	8.20	33.05	6.76	7.94	1.54	2.81	0.51	60308	9
NI*	36.96	14.62	25.65	9.13	8.00	2.83	2.05	0.75	10809	2

Table 2: Blood group distributions within RTC regions

	O+	O-	A+	A-	B+	B-	AB+	AB-	Sample size	Responses
East Midlands	35.35	8.83	34.90	8.33	7.54	1.70	2.68	0.67	40607	5
East of England	35.59	8.67	34.14	8.50	7.80	1.78	2.85	0.67	116116	8
London	39.01	5.90	30.52	5.05	13.53	1.60	3.88	0.51	168866	11
North East	39.17	9.04	31.30	6.96	8.40	1.90	2.39	0.83	169274	4
North West (Inc. N Wales)	39.12	7.90	31.81	6.36	9.64	1.64	2.99	0.54	219455	19 ¹
South Central	37.14	7.49	33.48	7.03	9.34	1.65	3.27	0.61	133418	13
South East Coast	36.57	7.70	34.87	7.26	8.08	1.73	3.01	0.77	124931	10
South West	36.91	7.89	34.83	7.74	7.69	1.49	2.84	0.61	159057	11
West Midlands	37.41	7.86	33.11	7.08	9.26	1.64	3.04	0.59	130693	12
Yorkshire & The Humber	37.47	7.92	32.83	6.89	9.42	1.69	3.19	0.60	107256	10

¹ Of which, 3 were from North Wales

Key results:

- The area covered by the London RTC contains the lowest levels of RhD- types when compared to other RTCs (see *table 2*).
- The hospital population mean of B RhD+ 13.53% (*table 2*) in the London RTC is substantially higher than any of the other RTC areas, and the level of O RhD- of 5.90% (*table 2*) is substantially lower. Hospital population percentages range from as high as 18% for B RhD+, and as low as 4.7% for O RhD- in the London RTC; these results seem to reflect the ethnic diversity of the London area².
- The highest levels of B RhD+ appear to be associated with proximity to urban areas (*figure 10*). This is perhaps the result of the economic migration that is peculiar to larger cities.
- The North East and North West RTCs present the highest levels of O RhD+ and lower levels of A RhD+. This appears to be consistent with older studies that show a general increase in rates of O blood and a decrease in A as latitude increases in the UK. Interest in whether or not this relationship still holds is a motive for further work.

*Data for Northern Ireland should be treated with caution, where one of the two responses reported unusually high levels of O RhD- and low levels of A RhD+ for which there is no precedent in studies past or present.

Further work to be undertaken:

- Evaluation of geographical areas - RTCs may not be appropriate divisions for spotting spatial patterns, particularly for 'West-to-East' trends and interpreting data for Wales and the South West.
- Determine how significant the trend in blood grouping is across the UK (if it exists) - can we identify any 'hotspots'?

² Ethnic breakdown from the ONS can be accessed here <http://tinyurl.com/bmnjk3>