

HEALTH EQUITY AUDIT:

**AN ANALYSIS OF THE
NHS HEALTH CHECKS PROGRAMME
IN WAKEFIELD DISTRICT**

DISCLOSURE NOTICE

Specific analyses within this document produces low numbers where age is being reported across gender. These numbers are suppressed for non-disclosure purposes.

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NOTES AND ACKNOWLEDGEMENTS

SystmOne searches created in collaboration between Chris Jackson and Anne-Marie Johnson. Extraction performed by Clive Johnson. Analysis was performed by Warren Holroyd.

Additional comments and suggestions were provided by Dr Rory O'Connor.

EXECUTIVE SUMMARY

- Almost 23,000 NHS Health Checks have been performed on patients within the district. Almost 25,000 on all patients.
- This represents about 18% of the eligible population.
- Uptake amongst the eligible population are reasonably flat across deprivation deciles.
- 17.3% of eligible population in the most deprived decile have had a health check, compared to 19.9% of eligible population in the most affluent decile.
- Male uptake is quite different to that of female uptake. Uptake has been slightly biased towards the more affluent of males, yet broadly equitable amongst females.
- The west of the district appears to have lower rates of uptake. This will be relevant to those operating in the Wakefield Rural NPT boundary.
- Mosaic analysis suggests that specific types of older persons also have significantly lower uptake rates, along with specific vulnerable groups such as transient singles and childless persons living in social housing.
- A quarter of SystemOne practices have checked less than 13% of the eligible population, whereas a quarter of practices have checked more than 26% of the eligible population. The wide variation between practices can be addressed by Clinical Consortia.
- Over 2000 new diagnoses of hypertension, over 400 of diabetes, and over 100 of atrial fibrillation were made in individuals *subsequent* to their NHS Health Check. The early treatment of these chronic conditions will significantly improve the long term health potential for the affected individuals.
- Additional analyses could, with the correct permissions, attempt to monitor how this cohort of individuals interacts with secondary care. It could seek to assess what impact the NHS Health Check has on admission rates, or quantify the leverage of other factors in primary care that affect the likelihood of admission.

INTRODUCTION

Wakefield District Primary Care Trust developed a Local Enhanced Service in January 2009 to deliver cardiovascular risk assessment and management. This service contract is a continuation of the previous 2008/10 Cardiovascular Risk Assessment and Management Local Enhanced Service.

The “NHS Health Check” was announced by the Department of Health in April 2009 (DH, 2009). Prior to this, it was called “Vascular checks: risk assessment and management”. The aim is to deliver the Department of Health National Programme of ‘NHS Health Checks’ over a minimum period of five years.

The National programme aims to identify people between the ages of 40 – 74 years who are at risk of developing cardiovascular disease and offer lifestyle interventions and treatment to reduce their overall cardiovascular risk.

The National Programme is developing a national call and recall system. However, until this materialises, practices have been expected to maintain a register of all eligible patients, including dates of attendance and review date. This analysis attempts to examine this programme’s equity of uptake.

METHOD

Query Structure

Two primary sets of searches were constructed in the SystmOne PCT Reporting Module. The first defined the ‘eligible population’ – persons between the ages of 40 and 74, had no pre-existing diagnoses of diabetes, chronic kidney disease (CKD), chronic heart disease (CHD), nor episodes of stroke or transient ischaemic attack (TIA). The second search defined the ‘observed population’ – those people who attended a Health Check between the two-year period of FY 2008/09 and 2009/10.

Over that two-year period, there have been different coding methods used to record such Health Checks. The searches therefore included a wide range of codes to capture activity. See Appendix for details.

Automated batch QRISK assessments were subtracted from the searches by excluding assessments performed on specific dates when batches had occurred. This is not an exact science. There may be genuine Health Checks that occurred on those dates, but the error is likely to be small.

Further searches were defined for subsequent diagnoses of particular relevant conditions.

Extraction

Data was extracted from the SystmOne PCT Reporting Module, reporting on gender, quinary age-band, GP Practice ID and patient postcode. Postcode was converted to Lower Super Output Area (LSOA) against the Information Centre’s Gridall system. Lookups against postcode were performed for Output Area Classification (OAC) and Mosaic geodemographic typologies. LSOA codes were used to assign relative local IMD deciles.

Postcodes were then removed from the dataset used for analysis. Some extracts exceeded to 30,000 CSV row limit within SystmOne. Where this was the case, the search was broken into chunks that remained below this limit.

Analysis

The individual CSVs were imported into an Excel binary format. Where a search had to be broken up, data was recompiled into a single worksheet.

Additional variables were created that flagged where an LSOA lay within the Wakefield District border and where a GP Practice ID was amongst the practices the PCT is responsible for. Much of the analysis excludes records where none of these variables is positive (essentially excluding persons who may live in Wakefield but attend a non-Wakefield GP, or persons who attend a Wakefield GP, but live outside of the District). This is particularly the case with equity and IMD decile analysis. A third variable was created to flag SystmOne practices.

All analyses exclude non-SystmOne practices (despite EMIS practice patients being reported on within the SystmOne environment). Crude rates of uptake were performed using eligible population as a denominator and observed attendance as a numerator. Standardised rates were performed using Byar’s method.

Slope Index Methods

The Slope Index of Inequality (SII) can be used to reflect the socioeconomic dimension to inequalities in health. The approach involves calculating the mean health status of each socioeconomic group and then ranking classes by their socioeconomic status (not by their health). The slope index of inequality (SII) is the linear regression coefficient that shows the relation between the level of health or the frequency of a health problem in each socioeconomic category and the hierarchical ranking of each socioeconomic category on the social scale.

For this purpose, a variable is created from a series of values assigned to the different socioeconomic categories with reference to a range. For example, if the socioeconomic variable is deprivation level, and the category with the highest educational level includes 10% of the population, the range of the individuals in this category would be from 0 to 0.10, giving a mid point of 0.05, which would be the value assigned to this category; if the next highest deprivation level category includes 20% of the population, its range is from 10% to 30%, thus it would be assigned a value of 0.20, and so on. When deprivation deciles are used the method is much simpler as all the categories contain 10% of the population (and the values would be 0.5, 1.5, 2.5... 9.5). The SII can be interpreted as the absolute effect on health of moving from the lowest socioeconomic level through to the highest.

When working with grouped data the regression equation has to be transformed to avoid heteroskedasticity of the error term. The Weighted Least Squares (WLS) estimate of the SII can be obtained by using the following formula:

$$Y \times \sqrt{a} = 0 + \sqrt{a} + b \times \sqrt{a}$$

...where a is the proportion of people in each group, Y is the health score and b is the relative rank variable. This transformed equation is estimated using the Excel regression function.

The SII is sensitive to the mean health status of the population. Suppose that everyone's health doubled then the SII would double (absolute differences have widened but relative differences have remained the same). If we are interested in relative differences then the SII can be divided by the mean level of health. This index is called the Relative Index of Inequality

LIMITATIONS

There are numerous reporting limitations in SystmOne, nonetheless, this analysis is limited to the 30 SystmOne practices (approximately 75% of the Wakefield population) we are able to report on. EMIS practices are currently not covered by the analysis.

For reporting purposes, we restricted ourselves to a single two-year cohort (01 April 08 – 31 April 10). Temporal (monthly/yearly) analysis is not possible due to complexity of extraction and low activity in the first year.

Automated batch-coding of QRISK bloated the initial figures. Although this has been adjusted for within the search criteria, the analysis may 'miss' a small number of genuine, manual assessments.

We presently cannot look at attrition rates (ie: who was invited, but didn't attend) due to variation in how practices use this code this and its late deployment.

Denominator values may fluctuate across different analyses. Where gender is reported on, approximately 25 persons had an indeterminate or unknown gender. Certain analyses exclude these cases, so totals may not sum.

There is no current 'gold standard' of quantifying local NHS Health Checks, leaving little validation options.

RESULTS

Overall Figures – Eligible Population

The following table summarises the structure of the eligible population, *within* Wakefield district, for an NHS Health Check. You will note that the tables below show persons in the 75-79 range. This is due to the age drift in the cohort over the two year period. The total for all patients (including those outside the district) is closer to 136,000.

Row Labels	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Grand Total
Female	10398	10805	9098	8050	8647	6770	6190	3252	63210
Male	10136	10872	9255	7971	8429	6643	5761	2955	62022
All	20536	21680	18353	16021	17078	13415	11951	6208	125242

Table 1: Counts of eligible registered SystmOne patients within Wakefield District borders by quinary age band.

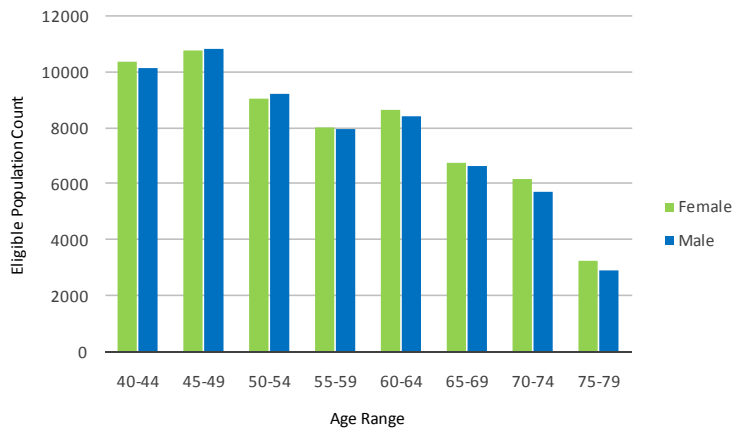


Figure 1: Counts of eligible registered SystmOne patients within Wakefield District borders by quinary age band.

Overall Figures – Observed Attendance

The following table summarises the structure of the population that attended for health checks. In total 24,725 health checks were performed on all patients, 22,828 of which were performed on patients living within the district.

Row Labels	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Grand Total
Female	1285	1590	1659	1758	2209	1760	1475	424	12160
Male	1171	1571	1636	1625	1953	1450	978	284	10668
All	2456	3161	3295	3383	4162	3210	2453	708	22828

Table 2: Counts of health checks attended by registered SystmOne patients within Wakefield District borders by quinary age band.

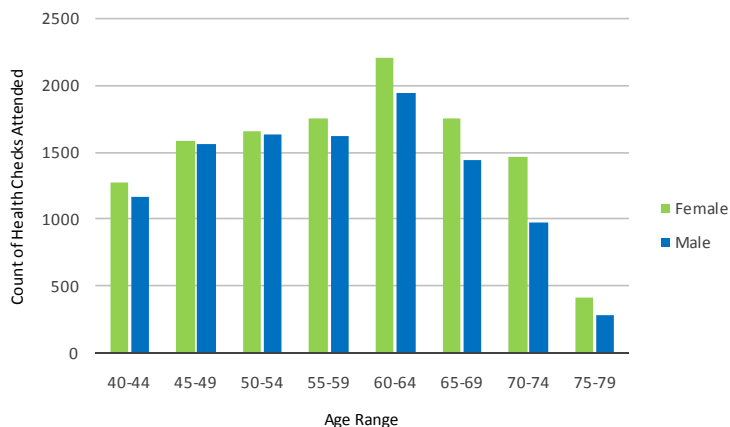


Figure 2: Counts of health checks attended by registered SystmOne patients within Wakefield District borders by quinary age band.

Overall Figures – Crude Rates of Attendance

The following table summarises the structure of the population that attended for health checks, expressed as a percentage of the eligible population.

Row Labels	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Grand Total
Female	12.4%	14.7%	18.2%	21.8%	25.5%	26.0%	23.8%	13.0%	19.2%
Male	11.6%	14.4%	17.7%	20.4%	23.2%	21.8%	17.0%	9.6%	17.2%
All	12.0%	14.6%	18.0%	21.1%	24.4%	23.9%	20.5%	11.4%	18.2%

Table 3: Crude rates of health checks attended by registered SystmOne patients within Wakefield District borders by quinary age band.

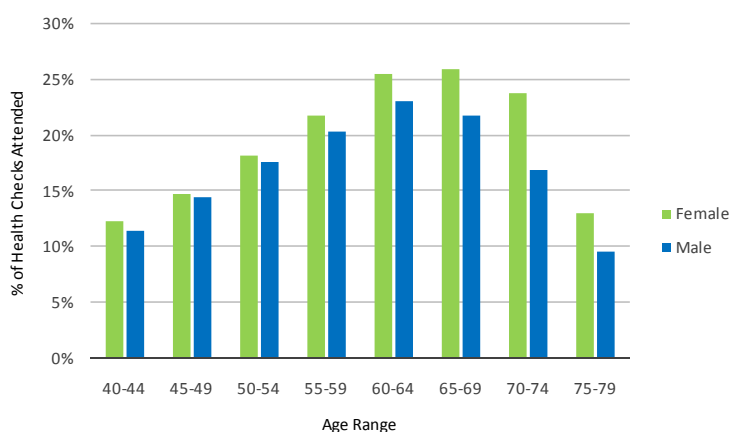


Figure 3: Crude rates of health checks attended by registered SystmOne patients within Wakefield District borders by quinary age band.

Eligible Population – IMD Deciles

Overall eligible population is broadly stable across each of the deciles. Underlying age structures of the eligible population between deciles remain reasonably comparable. When each quinary age band is expressed as a percentage of their respective decile eligible population, there is no greater difference within quinary bands than 3% across all deciles (see Figure 11 in the Appendix).

Decile	S1 Eligible Population	% of S1 Eligible Population Total	WYCSA Population	WYCSA Population Aged: 40-74	% of WYCSA Population Aged: 40-74
DD 1 Affluent	13857	11.1%	30610	16771	82.6%
DD 2	12835	10.2%	34264	18484	69.4%
DD 3	11998	9.6%	32345	17136	70.0%
DD 4	12656	10.1%	33385	16992	74.5%
DD 5	11847	9.5%	34395	17324	68.4%
DD 6	11616	9.3%	32491	15943	72.9%
DD 7	11851	9.5%	35727	16256	72.9%
DD 8	12813	10.2%	34795	16340	78.4%
DD 9	11377	9.1%	34498	15786	72.1%
DD 10 Deprived	14392	11.5%	35370	15501	92.8%
Grand Total	125242	-	337880	166533	75.2%

Table 4: Counts of eligible registered SystmOne patients within Wakefield District borders split by deprivation decile. Source: SystmOne

The table above gives data from the West Yorkshire Central Services Authority (WYCSA) on the total number of registered patients across the district and how many of those which fall within the specified age range. The two sets of figures (“WYCSA Population 40-74” and “S1 Eligible Population”) cannot be reasonably compared or used to calculate the remainder EMIS patient numbers, as the health check exclusion criteria cannot be applied to those EMIS patients. The information above is provided to give a rough estimate of how many additional patients have not been covered by this analysis.

Health Checks by IMD Decile

Crude rates of attendance amongst the eligible population are reasonably flat across deprivation deciles. 17.3% of eligible population in the most deprived decile have had a health check, compared to 19.9% of eligible population in the most affluent decile, as shown in Table 5.

	Female Health Checks	Female Health Checks % Uptake	Male Health Checks	Male % Health Checks % Uptake	All Health Checks	All % Health Checks % Uptake
DD 1 Affluent	1413	19.7%	1350	20.1%	2763	19.9%
DD 2	1109	16.9%	1088	17.4%	2197	17.1%
DD 3	1263	20.6%	1131	19.3%	2394	20.0%
DD 4	1149	17.7%	982	16.0%	2131	16.8%
DD 5	1290	21.7%	1033	17.5%	2323	19.6%
DD 6	1203	20.4%	997	17.4%	2200	18.9%
DD 7	1096	18.6%	972	16.3%	2068	17.5%
DD 8	1199	18.7%	1035	16.2%	2234	17.4%
DD 9	1102	19.5%	928	16.2%	2030	17.8%
DD 10 Deprived	1336	19.0%	1152	15.7%	2488	17.3%
Grand Total	12160	19.2%	10668	17.2%	22828	18.2%

Table 5: Service uptake in absolute counts and crude rates between genders across deprivation deciles.

When measuring all persons, the Slope Index of Inequality (SII) is approximately -1.9%, based on a regression of the ten data points. This basically means that there's a small bias in uptake towards the more affluent decile, but the overall slope is quite flat. Relative Slope Index (RII) was equal to -0.10.

When examining gender within deciles, the gaps become slightly more pronounced. Greater variation is observed between genders in the more deprived parts of the District, becoming more distinct from the fourth decile onwards. This can be seen in Figure 4.

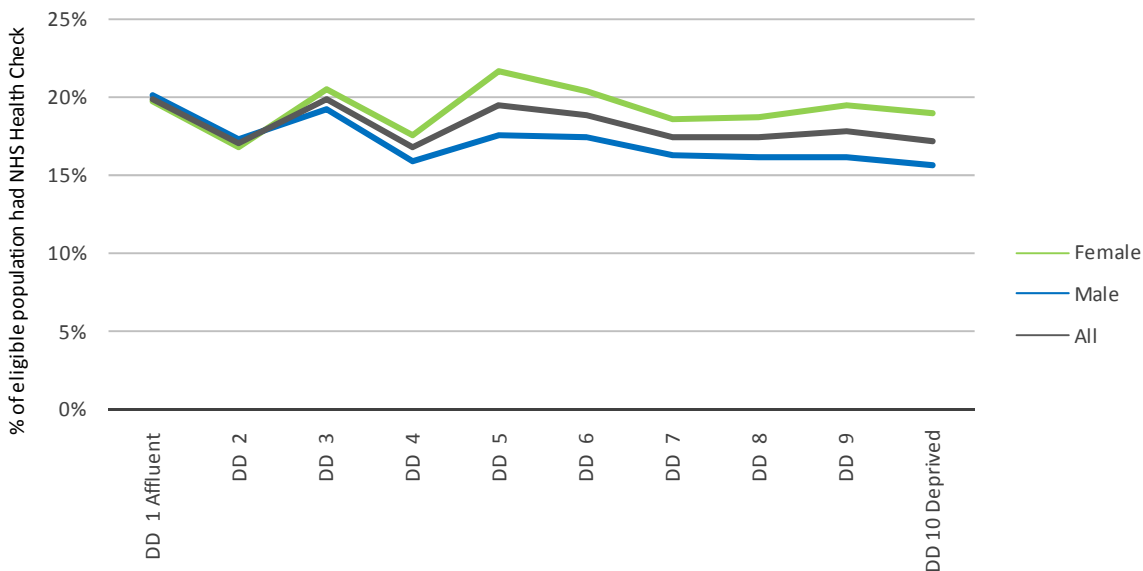


Figure 4: Service uptake in crude rates between genders across deprivation deciles.

The slope index is consequently affected by this gender difference. The SII being effectively 0% amongst females (RII = 0.01), with even a slight bias towards more deprived areas having overall greater access (although this effect is extremely small), and approximately -4% amongst males (RII = -0.23).

This suggests the uptake has been slightly biased towards the more affluent of males, yet broadly equitable amongst females. The differential slopes are shown in Figure 5.

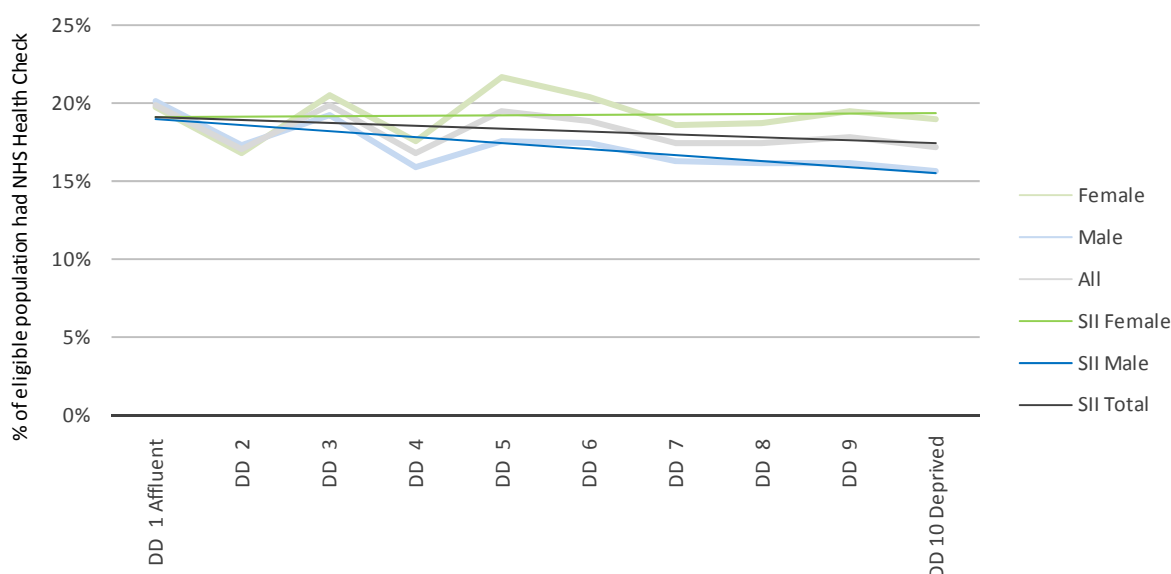


Figure 5: Comparative Slope Index of Inequality of service uptake in crude rates, between genders, across deprivation deciles.

Health Checks by IMD Decile (standardised)

Age-standardised rates offer only a slight additional insight into the decile analysis. However, comparing relative indexes, they again suggest that uptake is skewed towards the more affluent of males, yet marginally more in favour of deprived females. This is shown below in Table 6.

	Directly age-standardised rate per 100 uptake of NHS Health Checks			Crude % uptake of NHS Health Checks		
	Female	Male	All	Female	Male	All
DD 1 Affluent	18.9	19.4	19.1	19.7%	20.1%	19.9%
DD 2	16.3	17.1	16.7	16.9%	17.4%	17.1%
DD 3	20.0	19.0	19.5	20.6%	19.3%	20.0%
DD 4	17.3	15.9	16.6	17.7%	16.0%	16.8%
DD 5	21.4	17.4	19.4	21.7%	17.5%	19.6%
DD 6	20.2	17.3	18.8	20.4%	17.4%	18.9%
DD 7	18.7	16.5	17.6	18.6%	16.3%	17.5%
DD 8	18.8	16.2	17.5	18.7%	16.2%	17.4%
DD 9	19.6	16.4	18.0	19.5%	16.2%	17.8%
DD 10 Deprived	19.1	15.8	17.4	19.0%	15.7%	17.3%
Grand Total	19.0	17.1	18.1	19.2%	17.2%	18.2%
SII	1.39	-3.14	-0.92	0.2%	-4.0%	-1.9%
RII	0.07	-0.18	-0.05	0.01	-0.23	-0.10

Table 6: Standardised and crude rates per 100 of NHS Health Check uptake.

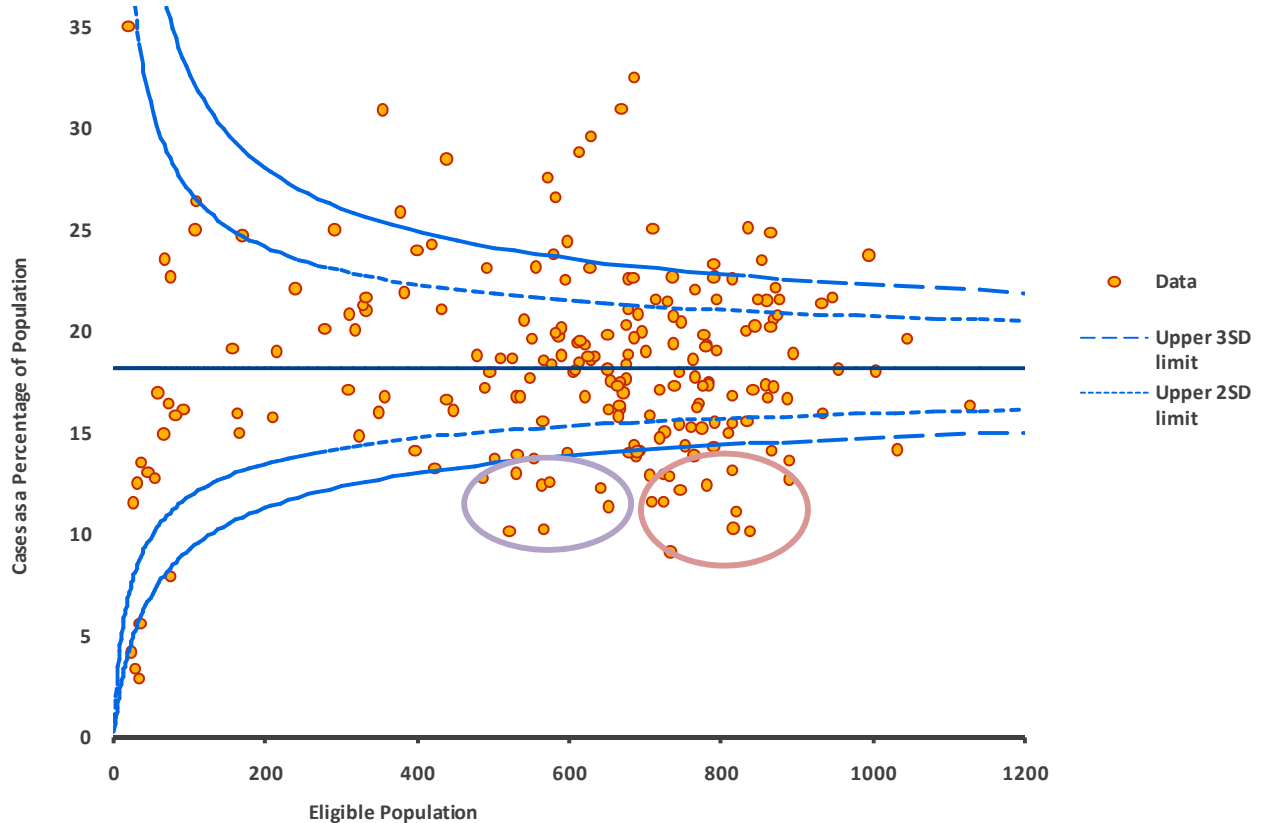
Standardised rates across the deciles are graphed in Figure 12, Figure 13 and Figure 14 in the Appendix. Significant differences between the upper and lower deciles are detected in men (DD1 = 19.4, LCI: 18.4, UCI: 20.5 cf DD10 = 15.8, LCI: 14.9, UCI: 16.7).

Geographical Spread

The analysis of local relative deciles has demonstrated that there doesn't exist a particularly strong pattern with deprivation amongst all persons uptake rates. However, plotting LSOA values in a proportions funnel plot suggests specific areas of interest where uptake is significantly lower than the rest of the district (as defined by being in excess of the upper 3 standard deviation limit).

The red circle identifies areas towards the south-west of Wakefield City: Durkar, Calder Grove, Crigglestone and Kettlethorpe. The purple circle approximately identifies lower population areas in and around the Ossett area.

% uptake of NHS Health Checks by LSOA



Source: SystmOne

Figure 6: Funnel plot showing crude rates of uptake against eligible population, represented at LSOA level.

When these values are represented at postcode level (by assuming the value of their respective LSOA), the pattern is again one of lower uptake on the west of the district. Ossett, Kettlethorpe, Middlestown and Woolley all show lower uptake rates than might be considered desirable. This will be relevant to those operating across the Wakefield Rural NPT boundary. Small pockets also exist in Knottingley, south of Normanton and in Upton.

Also relevant to this analysis, are the large parts of the district where data is inadequate – primarily because the eligible population is predominantly within an EMIS practice, thus creating low denominator values.

Wakefield District - NHS Health Check % Uptake
Lower Super Output Area level data represented at Postcode level

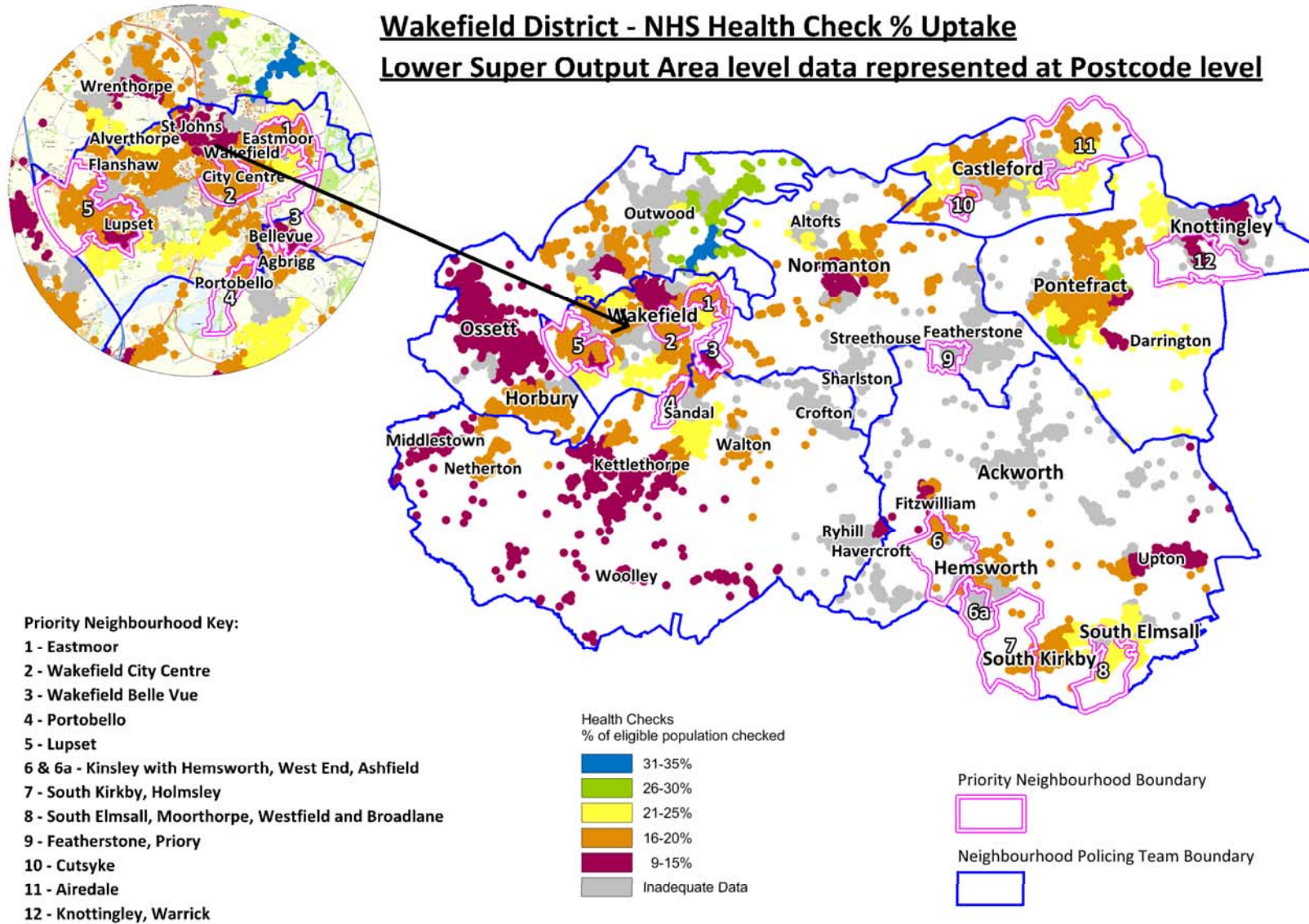


Figure 7: Map of NHS Health Check uptake across Wakefield District, using LSOA data represented at postcode level. Inadequate data refers to low numbers

Mosaic Geodemographics: Uptake by Typology

Standardised uptake rates across each of the Mosaic geodemographics are largely flat. Many of the spikes or troughs in DSRs and associated confidence intervals can be reasonably attributed to low base values amongst the eligible population, notable by their wider confidence intervals. Most demographics are not significantly different than the overall district rate.

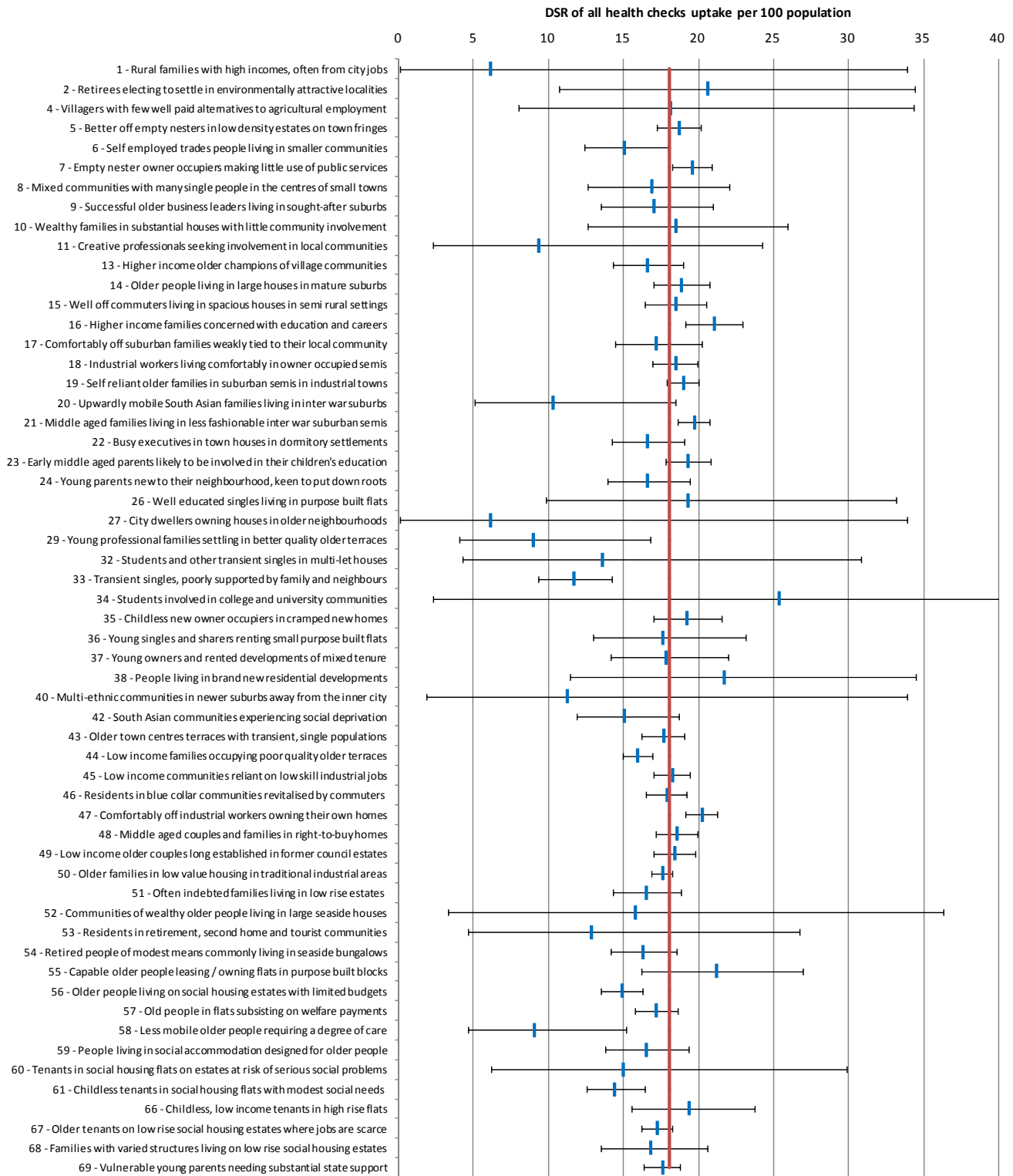


Figure 8: Directly standardised rates of uptake across Mosaic geodemographic typologies, with 95% CIs shown. Red markers indicate Wakefield District DSR of 18.1 per 100. Not all Mosaic types are shown as not all are represented in the eligible population.

A small number of typically better-off demographics (Type 7, 16, 21 and 47) show significantly higher uptake rates than the rest of the district.

However, we report on three specific demographics that show standardised rates and associated upper confidence intervals below that of the district average. These groups have reasonably large base values to warrant further interest. Types 29 and 58 were also below the district average, but show wider confidence intervals.

	Observed Health Checks	Eligible Population	Crude %	DSR per 100	Lower CI	Upper CI
33 - Transient singles, poorly supported by family and neighbours	99	875	11.3%	11.7	9.4	14.3
56 - Older people living on social housing estates with limited budgets	567	3647	15.5%	14.9	13.6	16.4
61 - Childless tenants in social housing flats with modest social needs	227	1586	14.3%	14.4	12.6	16.4

Table 7: Selected Mosaic typologies of interest, showing DSRs below that of the district average (18.1 per 100). Also shown are observed counts, eligible population and associated CIs for standardised rates.

Type G33 - Transient singles, poorly supported by family and neighbours

This Type contains many poorly qualified, transient young people living in poor quality accommodation close to the centres of seaside towns or major service centres. Many are not in employment, education or training (NEETS). This population is attracted to former guest houses, to flats above shops and to cheaper terraced houses whose proximity to town centre pubs and shops make them unattractive to households with children

Residents tend to have shallow roots in the community in which they live. Relatively few residents have been born in the area and many have such poor relations with their parents that they are unable to count on their support in time of need. Many are disrespectful of authority and don't identify with organisations through which other citizens hope to achieve common ends. Many have serious social needs. For various reasons they are often reluctant for the state to become involved in addressing them.

These are communities in which substance abuse and alcoholism are serious social problems. There are particularly high admission rates for mental illness, for self harm and for substance abuse. Suicide rates in these neighbourhoods are much higher than the national average. It is not clear to what extent high rates of hospital admission reflect the tendency for hostels and refuges to be located in areas of this sort. Many residents do not have access to a car. In other respects they tend to have good access to commercial and public services, many being within easy walking distance of town centres.

Interpretation

This particular type of person is transient in nature, may have little attachment to the community and may well actively avoid state-provided services – primarily to avoid detection from council tax and TV licensing authorities. Whether this distrust extends to general practice is not evidenced.

However, this group follows a clear geographical pattern, with practices B87017 and B87029 having about 370 patients in this type between them (well over 40% of the total population of this type). Secondly, B87004, B87012 and B87027 collectively contain another 300 of these patients, representing another third of the Type G33 population. See Table 13 for a list of practice codes and identifiers.

The shifting and transient nature of this population may mean that high uptake rates may never be fully achieved.

Type M56 - Older people living on social housing estates with limited budgets

This Type contains significant numbers of elderly people, many living in social housing. Many residents have lived in the locality all their lives and are likely to be well integrated within the local community. Many will have regular visits from their own children and perhaps grand-children and to benefit from support from extended family members. People are likely to be on personal name terms with many local tradespeople and postmen and milkmen, as well as neighbours that may well keep an occasional eye on their health and general circumstances. They are likely to make demands on adult social services but to a smaller degree than people of similar ages living in neighbourhoods where the majority of residents live in social housing.

Levels of health are adversely affected both by the age and comparatively low educational status of most residents. Large numbers of residents are affected by medical conditions associated with their previous employment in hazardous, blue collar industry and by a poor diet. Most residents come from a generation in which it was not common for people to take exercise other than for daily tasks, or to take health considerations into account when purchasing or preparing food.

For many residents, access to public or commercial services requires the use of either a bus or a car and, since many residents live in households which do not have access to a car, this Type tends to be unusually dependent on local bus services, many of which provide limited and infrequent access to local services. Personal mobility is a serious constraint on access to services in many of these neighbourhoods. Problems with access to services are compounded by low levels of Internet access and unfamiliarity with how to use it to access services. For many residents, contact with people who provide commercial or public services is an important and highly valued source of social interaction.

Interpretation

This particular type of person is likely to have limited transport and is dependant on public transport networks. They are more numerous than Type G33 and their numbers are spread more evenly across the district, with the majority of practices having in excess of 100 patients within their eligible population.

However, if one wished to improve uptake amongst this group, the biggest concentrations (in order of magnitude) are in: B87026, B87039, B87002, B87020 and B87031, which comprise over a thousand of this type, representing just under 30% of this population. Again, see Table 13 for a list of practice codes and identifiers.

Type N61 - Childless tenants in social housing flats with modest social needs

This Type contains people who mostly exist on low incomes and who rent homes in small blocks of flats from the local council or from a housing association. Many of these tenants are young people who find it difficult to find or to hold down a regular job. Residents are typically young single people, co-habitees or parents with perhaps just one young child. They may have been offered a small flat by the council or a local housing association which is not suitable for families with children or is otherwise hard to let.

Residents tend to have been born and brought up in the community, with family and friends living nearby. They are likely to be known to local shop-keepers but not necessarily to other residents in the block in which they live. Generally they are unlikely to be known to local adult or children's social services departments, living quiet and unassuming lives.

The health profile is worse than the national average but not as bad as that of other neighbourhoods dominated by social renting. Levels of disability are above average and some may prefer to live in flats rather than houses on account of limited mobility.

Residents tend to have below average levels of car ownership but mostly live within easy access of retail outlets and of bus routes. Levels of Internet access are below average. However, the Internet is likely to be more intensively used than in other areas of social housing to access information on public services.

Interpretation

This particular type of person is most prevalent in the following practices (in order of magnitude): B87012, B87008, B87004 and B87029. These four practices contain about 520 patients of this type within the eligible population, representing just short of a third of the total eligible population of this type. See Table 13 for a list of practice codes and identifiers.

Variation within GP Practices

Significant variation exists across GP practices. This may have since changed over the last 6 months. About half of practices have an uptake in the range between 13% and 27% (or between 13.0 and 26.2 per 100 persons age standardised). Graphs and inter-quartile range (IQR) data are shown below. This analysis excludes the LCD practice code Y02509.

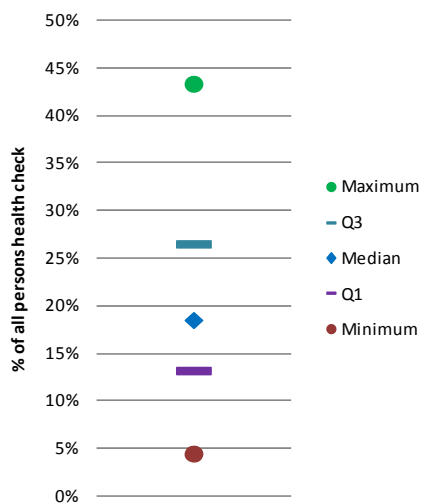


Figure 9: Interquartile range and min/max values for crude rates across Wakefield SystmOne GP Practices

Crude	IQR Values	DSR
43.3%	Maximum	44.3
26.5%	Q3	26.2
18.4%	Median	18.0
13.2%	Q1	13.0
4.4%	Minimum	4.3
18.2%	District	18.1

Table 8: Interquartile range and min/max values for crude rates and DSRs across Wakefield SystmOne GP Practices

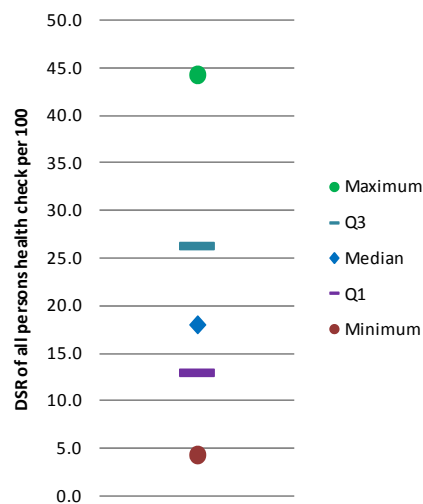


Figure 10: Interquartile range and min/max values for DSRs across Wakefield SystmOne GP Practices

New Diagnoses of Key Conditions

The following tables summarise diagnoses of key conditions that occurred subsequently to the NHS Health Check. Further analyses are negotiable on request.

Hypertension	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Total
Female	67	108	140	156	201	167	130	51	1020
Male	87	164	173	184	258	135	97	20	1118
Persons	154	272	313	340	459	302	227	71	2138

Table 9: New diagnoses of hypertension after NHS Health Check, split by gender and quinary age band.

Diabetes	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Total
Female	12	24	18	19	28	31	24	18	174
Male	22	25	47	41	50	28	20	7	240
Persons	34	49	65	60	78	59	44	25	414

Table 10: New diagnoses of diabetes after NHS Health Check, split by gender and quinary age band.

Atrial Fibrillation	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Total
Female	0	Suppressed	Suppressed	Suppressed	9	15	16	6	53
Male	5	Suppressed	Suppressed	Suppressed	12	15	20	7	71
Persons	5	6	5	8	21	30	36	13	124

Table 11: New diagnoses of atrial fibrillation after NHS Health Check, split by gender and quinary age band. Specific age ranges have their observed numbers suppressed for non-disclosure purposes.

CKD	40-44	45-49	50-54	55-59	60-64	65-69	70-74	75-79	Total
Female	Suppressed	Suppressed	22	20	40	49	67	36	244
Male	Suppressed	Suppressed	10	11	29	26	33	16	129
Persons	<10	<10	32	31	69	75	100	52	373

Table 12: New diagnoses of CKD after NHS Health Check, split by gender and quinary age band. Specific age ranges have their observed numbers suppressed for non-disclosure purposes.

CONCLUSIONS & DISCUSSION

- Almost 23,000 NHS Health Checks have been performed on patients within the district. Almost 25,000 on all patients. This represents about 18% of the eligible population.
- Crude rates of attendance amongst the eligible population are reasonably flat across deprivation deciles. 17.3% of eligible population in the most deprived decile have had a health check, compared to 19.9% of eligible population in the most affluent decile.
- Male uptake is quite different to that of female uptake. When examining gender within deciles, the gap between affluent and deprived becomes slightly more pronounced. Greater variation is observed between genders in the more deprived parts of the District, becoming more distinct from the fourth decile onwards.
- This suggests the uptake has been slightly biased towards the more affluent of males, yet broadly equitable amongst females.
- The west of the district appears to have lower rates of uptake. Significantly lower rates are detected south-west of Wakefield City, comprising of Durkar, Calder Grove, Crigglestone and Kettlethorpe. Ossett also has significantly lower rates of uptake.
- Mosaic analysis suggests that there may be lower rates of uptake in transient groups, although the nature of their population churn may create inflated denominators, thus skewing their uptake rate.
- Specific types of older persons also have significantly lower uptake rates. Practices with higher concentrations of these population types are suggested above.
- The lower uptake amongst some vulnerable groups may respond to specific targeting, possibly via the use of associated workers – those working with NEETs, homeless and housing workers.
- About half of the SystmOne practices included have an uptake in the range between 13% and 27% (or between 13.0 and 26.2 per 100 persons age standardised). The wide variation between practices can be addressed by Clinical Consortia.
- Over 2000 new diagnoses of hypertension, over 400 of diabetes, and over 100 of atrial fibrillation were made in individuals *subsequent* to their NHS Health Check.
- Future analyses should monitor the uptake in south-Asian communities (as defined in the Mosaic typology, rather than the ethnic coding within SystmOne).
- Additional analyses could, with the correct permissions, attempt to monitor how this cohort of individuals interacts with secondary care. It could seek to assess what impact the NHS Health Check has on admission rates, or quantify the leverage of other factors in primary care that affect the likelihood of admission.
- If common long term conditions were extracted from SystmOne and geocoded in the same manner, future analyses could not only examine equity across deprivation, but also by specific health need.
- Further analyses should attempt to ascertain health gain within this cohort as part of a cost-benefit analysis.

REFERENCES

Department of Health. (2009). Putting Prevention First NHS Health Check: Vascular Risk Assessment and Management, Best Practice Guidance. Available via World Wide Web at: <http://www.dh.gov.uk/>

APPENDICES

List of included and excluded practices

Practice Code	Practice Name	Practice	System Flag
B87001	DR DONNAN J S & PARTNERS	MIDDLESTOWN MEDICAL CENTRE	SystemOne
B87002	DR MAYNARD D G & PARTNERS	ORCHARD CROFT MEDICAL CENTRE	SystemOne
B87004	DR O'CONNELL P F & PARTNERS	WARRENGATE MEDICAL CENTRE	SystemOne
B87005	DR ALDRIDGE G R & PARTNERS	RIVERSIDE MEDICAL CENTRE	SystemOne
B87006	DR CHANDY J & PARTNERS	69 STOCKINGATE	SystemOne
B87008	DR TOSH J & PARTNERS	LUPSET HEALTH CENTRE	SystemOne
B87011	DR SLACK & PARTNERS	FRIARWOOD SURGERY	SystemOne
B87012	DR SCOTT M E & PARTNERS	MAYBUSH MEDICAL CENTRE	SystemOne
B87015	STUART ROAD SURGERY	STUART ROAD SURGERY	SystemOne
B87017	DR CRABBE S J & PARTNERS	ALMSHOUSE SURGERY	SystemOne
B87018	DR MCCLINTOCK J H N & PARTNERS	HENRY MOORE CLINIC	SystemOne
B87019	DR WOODROW J M & PARTNERS	STANLEY HEALTH CENTRE	SystemOne
B87020	DR J L SCHINDLER & PARTNERS	CHAPELTHORPE MEDICAL CENTRE	SystemOne
B87021	DR BRAHMA P K & PARTNERS	ASH GROVE SURGERY	SystemOne
B87022	DR DE SOUZA & PARTNERS	HOMESTEAD CLINIC	SystemOne
B87023	DR DUNPHY R H & PARTNERS	PINFOLD SURGERY	SystemOne
B87025	DR PRASAD A & PARTNERS	WELBECK STREET	SystemOne
B87026	DR KAMAL L R M & PARTNERS	THE GRANGE SURGERY	SystemOne
B87027	DR SOUTER K M & PARTNERS	NEW SOUTHGATE SURGERY	SystemOne
B87029	DR TABNER J A & PARTNERS	TRINITY MEDICAL CENTRE	SystemOne
B87030	DR PINDER C A & PARTNERS	FERRYBRIDGE MEDICAL CENTRE	SystemOne
B87031	DR FURNESS F & PARTNERS	GROUP SURGERY OSSETT	SystemOne
B87036	DR D P DIGGLE & PARTNER	LITTLE LANE HEALTH CENTRE	SystemOne
B87039	DR D W BROWN & PARTNERS	PRINCESS STREET SURGERY	SystemOne
B87040	DR SENIOR & PARTNERS	PROSPECT ROAD SURGERY	SystemOne
B87041	CASTLEFORD ROAD SURGERY	CASTLEFORD ROAD SURGERY	SystemOne
B87042	DR GODRIDGE AC & PARTNERS	TIEVE TARA MEDICAL CENTRE	SystemOne
B87600	DR DEWHIRST P	QUEEN STREET SURGERY	SystemOne
B87602	DR G ARUNA PRASAD	PATIENCE LANE SURGERY	SystemOne
B87604	DR LABOR V & PARTNER	EASTMOOR HEALTH CENTRE	SystemOne
Y02509		CORONATION HOUSE	SystemOne
B87003	DR HANNEY I P G & PARTNERS	COLLEGE LANE SURGERY	EMIS PCS
B87007	DR ECCLES D & PARTNERS	NORTHGATE SURGERY	EMIS LV
B87009	DR GORDON P G & PARTNERS	St. THOMAS ROAD	EMIS PCS
B87013	DR J P F EDMONDS & PARTNERS	OUTWOOD PARK MEDICAL CENTRE	EMIS LV
B87016	DR AGGARWAL R K & PARTNERS	WHITE ROSE SURGERY	EMIS LV
B87024	DR RASHID S A & PARTNERS	RYCROFT PRIMARY CARE CENTRE	EMIS LV
B87028	DR LEADING A D & PARTNERS	CROFTON HEALTH CENTRE	EMIS LV
B87032	DR SHUTKEVER M P & PARTNERS	STATION LANE MEDICAL CENTRE	EMIS PCS
B87033	DR VENU P K & PARTNER	NEWLAND LANE SURGERY	EMIS PCS
B87044	DR MCLEAN A B	ALVERTHORPE SURGERY	EMIS LV

Table 13: List of included SystemOne and excluded EMIS GP Practices.

Denominator Age Structure

Row Labels	A 40-44	A 45-49	A 50-54	A 55-59	A 60-64	A 65-69	A 70-74	A 75-79	Total
DD 1 Affluent	2047	2281	2035	1825	2106	1652	1271	640	13857
DD 2	2100	2201	1886	1789	1827	1400	1066	566	12835
DD 3	1751	2033	1768	1547	1654	1451	1179	615	11998
DD 4	2176	2214	1920	1597	1764	1362	1102	521	12656
DD 5	1825	2072	1673	1511	1680	1266	1218	602	11847
DD 6	1965	2002	1684	1475	1547	1262	1100	581	11616
DD 7	2143	2262	1730	1522	1459	1118	1045	572	11851
DD 8	2141	2234	1961	1595	1679	1264	1285	654	12813
DD 9	1938	1915	1667	1379	1440	1217	1192	629	11377
DD 10 Deprived	2450	2466	2029	1781	1922	1423	1493	828	14392
Total	20536	21680	18353	16021	17078	13415	11951	6208	125242

Table 14: Eligible population counts within Wakefield District split by quinary age band.

Row Labels	A 40-44	A 45-49	A 50-54	A 55-59	A 60-64	A 65-69	A 70-74	A 75-79	Total
DD 1 Affluent	15%	16%	15%	13%	15%	12%	9%	5%	100%
DD 2	16%	17%	15%	14%	14%	11%	8%	4%	100%
DD 3	15%	17%	15%	13%	14%	12%	10%	5%	100%
DD 4	17%	17%	15%	13%	14%	11%	9%	4%	100%
DD 5	15%	17%	14%	13%	14%	11%	10%	5%	100%
DD 6	17%	17%	14%	13%	13%	11%	9%	5%	100%
DD 7	18%	19%	15%	13%	12%	9%	9%	5%	100%
DD 8	17%	17%	15%	12%	13%	10%	10%	5%	100%
DD 9	17%	17%	15%	12%	13%	11%	10%	6%	100%
DD 10 Deprived	17%	17%	14%	12%	13%	10%	10%	6%	100%
Total	16%	17%	15%	13%	14%	11%	10%	5%	100%

Table 15: Eligible population within Wakefield District split by quinary age band, with each age band expressed as a percentage of the total eligible population within its respective decile.

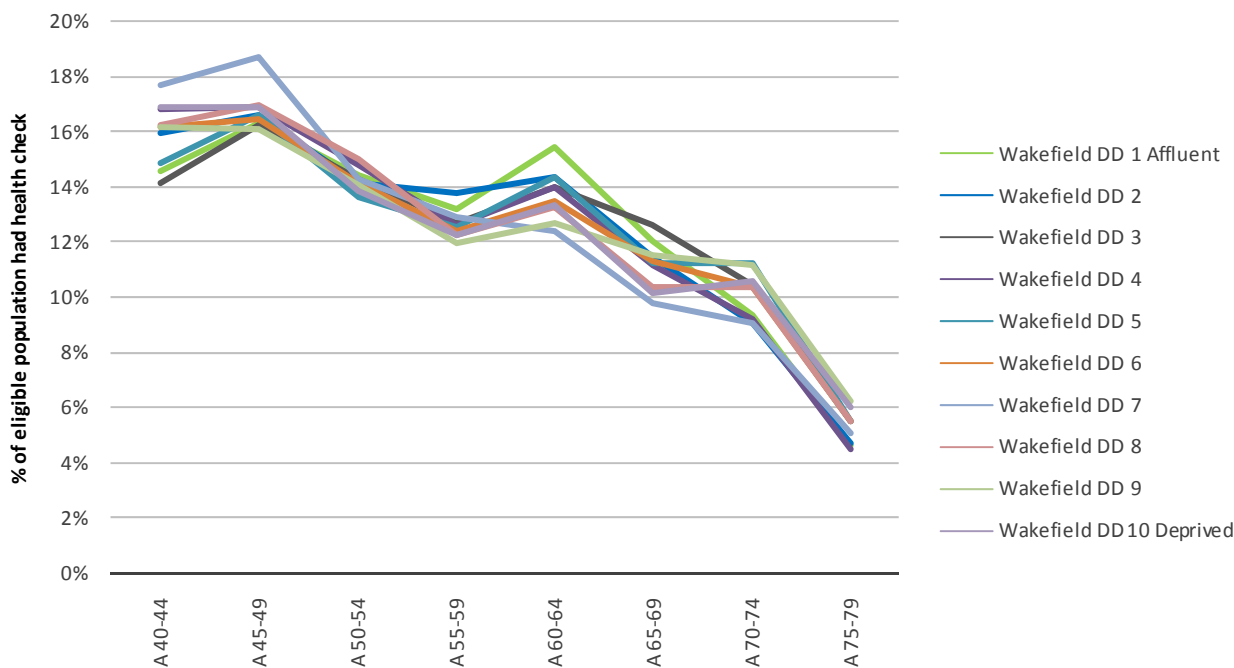


Figure 11: Eligible population within Wakefield District split by quinary age band, with each age band expressed as a percentage of the total eligible population within its respective decile.

SII Calculations

	All Ages	Elig_Pop	Pop Proportion	Cum_Pop	Relative Rank	Y*va	va	b*va
DD 1 Affluent	0.1974567	7156	0.1132099	0.1132099	0.056605	0.066	0.336	0.019
DD 2	0.1686949	6574	0.1040025	0.2172125	0.1652112	0.054	0.322	0.053
DD 3	0.2056668	6141	0.0971523	0.3143648	0.2657886	0.064	0.312	0.083
DD 4	0.1766877	6503	0.1028793	0.4172441	0.3658045	0.057	0.321	0.117
DD 5	0.216552	5957	0.0942414	0.5114855	0.4643648	0.066	0.307	0.143
DD 6	0.204418	5885	0.0931024	0.6045879	0.5580367	0.062	0.305	0.170
DD 7	0.1858257	5898	0.093308	0.6978959	0.6512419	0.057	0.305	0.199
DD 8	0.1870515	6410	0.101408	0.7993039	0.7485999	0.060	0.318	0.238
DD 9	0.1948373	5656	0.0894795	0.8887834	0.8440437	0.058	0.299	0.252
DD 10 Deprived	0.1900427	7030	0.1112166	1	0.9443917	0.063	0.333	0.315
Grand Total	0.1923746	63210	1					
SII	0.002441							
RII	0.0126887							

Table 16: Slope Index of Inequality calculations using crude rates of uptake within female population.

	All Ages	Elig_Pop	Pop Proportion	Cum_Pop	Relative Rank	Y*va	va	b*va
DD 1 Affluent	0.2014925	6700	0.1080262	0.1080262	0.0540131	0.066	0.329	0.018
DD 2	0.1737742	6261	0.1009481	0.2089742	0.1585002	0.055	0.318	0.050
DD 3	0.1931352	5856	0.0944181	0.3033923	0.2561833	0.059	0.307	0.079
DD 4	0.1595969	6153	0.0992067	0.4025991	0.3529957	0.050	0.315	0.111
DD 5	0.1754118	5889	0.0949502	0.4975493	0.4500742	0.054	0.308	0.139
DD 6	0.1739965	5730	0.0923866	0.5899358	0.5437425	0.053	0.304	0.165
DD 7	0.1633613	5950	0.0959337	0.6858695	0.6379027	0.051	0.310	0.198
DD 8	0.1616682	6402	0.1032214	0.789091	0.7374802	0.052	0.321	0.237
DD 9	0.1622378	5720	0.0922253	0.8813163	0.8352036	0.049	0.304	0.254
DD 10 Deprived	0.1565005	7361	0.1186837	1	0.9406582	0.054	0.345	0.324
Grand Total	0.1720035	62022	1					
SII	-0.0397141							
RII	-0.2308912							

Table 17: Slope Index of Inequality calculations using crude rates of uptake within male population.

	All Ages	Elig_Pop	Pop Proportion	Cum_Pop	Relative Rank	Y*va	va	b*va
DD 1 Affluent	0.1993938	13857	0.1106418	0.1106418	0.0553209	0.066	0.333	0.018
DD 2	0.1711726	12835	0.1024816	0.2131234	0.1618826	0.055	0.320	0.052
DD 3	0.1995333	11998	0.0957985	0.3089219	0.2610227	0.062	0.310	0.081
DD 4	0.1683786	12656	0.1010524	0.4099743	0.3594481	0.054	0.318	0.114
DD 5	0.1960834	11847	0.0945929	0.5045672	0.4572707	0.060	0.308	0.141
DD 6	0.1893939	11616	0.0927484	0.5973156	0.5509414	0.058	0.305	0.168
DD 7	0.1745	11851	0.0946248	0.6919404	0.644628	0.054	0.308	0.198
DD 8	0.1743542	12813	0.1023059	0.7942463	0.7430934	0.056	0.320	0.238
DD 9	0.1784302	11377	0.0908401	0.8850865	0.8396664	0.054	0.301	0.253
DD 10 Deprived	0.1728738	14392	0.1149135	1	0.9425432	0.059	0.339	0.320
Grand Total	0.1822711	125242	1					
SII	-0.0191253							
RII	-0.1049279							

Table 18: Slope Index of Inequality calculations using crude rates of uptake within total population.

Standardised Rates

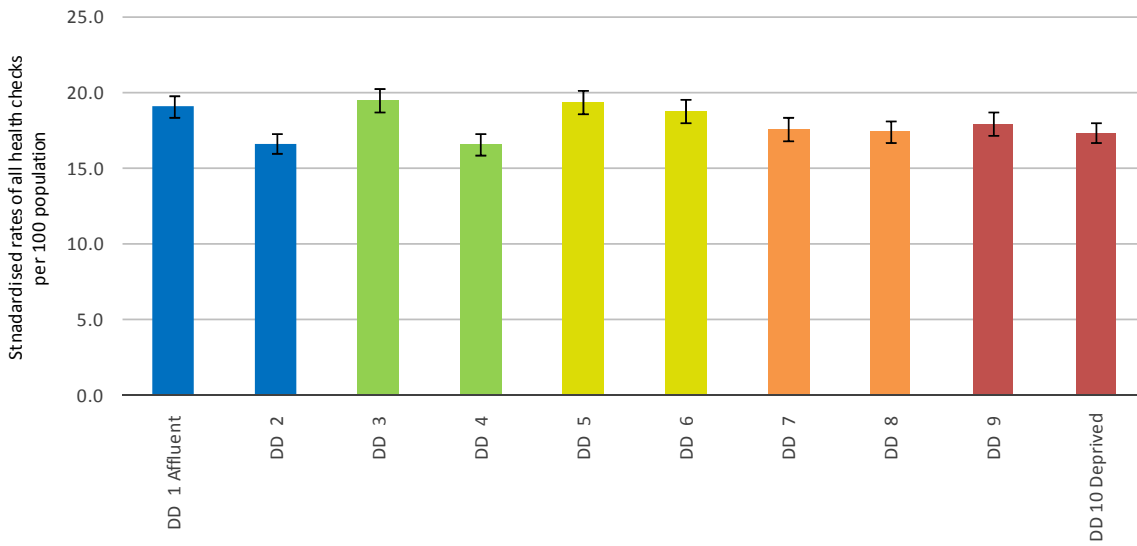


Figure 12: Standardised rates per 100 population amongst total eligible population split by deprivation decile, with 95% CIs.

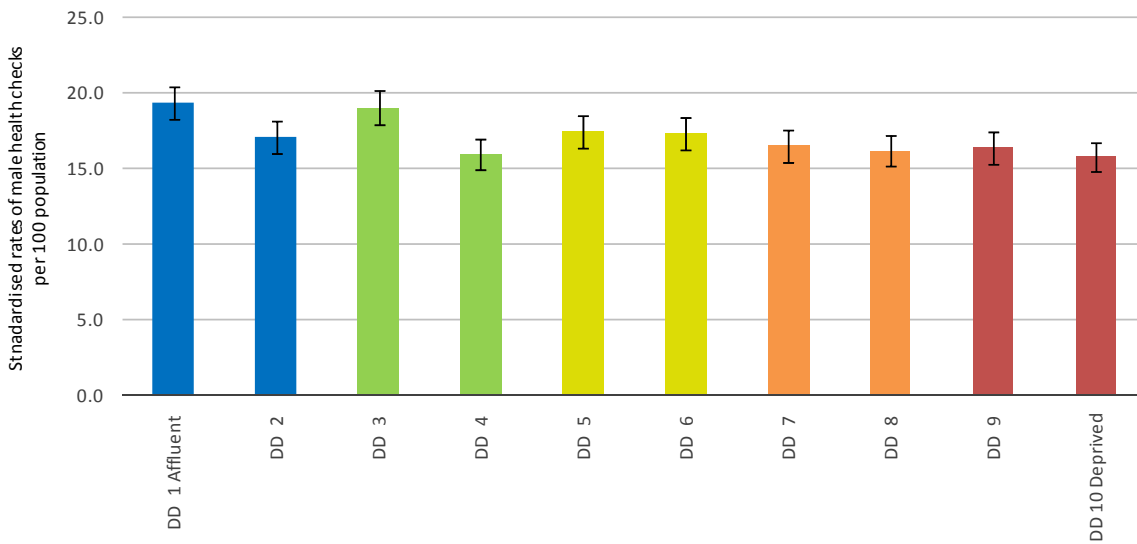


Figure 13: Standardised rates per 100 population amongst total eligible male population split by deprivation decile, with 95% CIs.

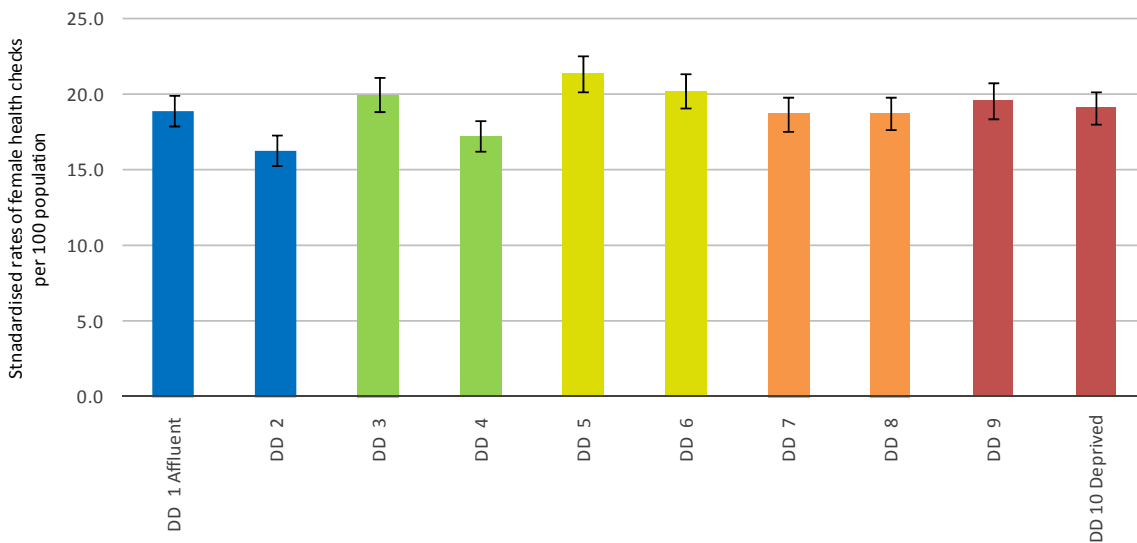


Figure 14: Standardised rates per 100 population amongst total eligible female population split by deprivation decile, with 95% CIs.

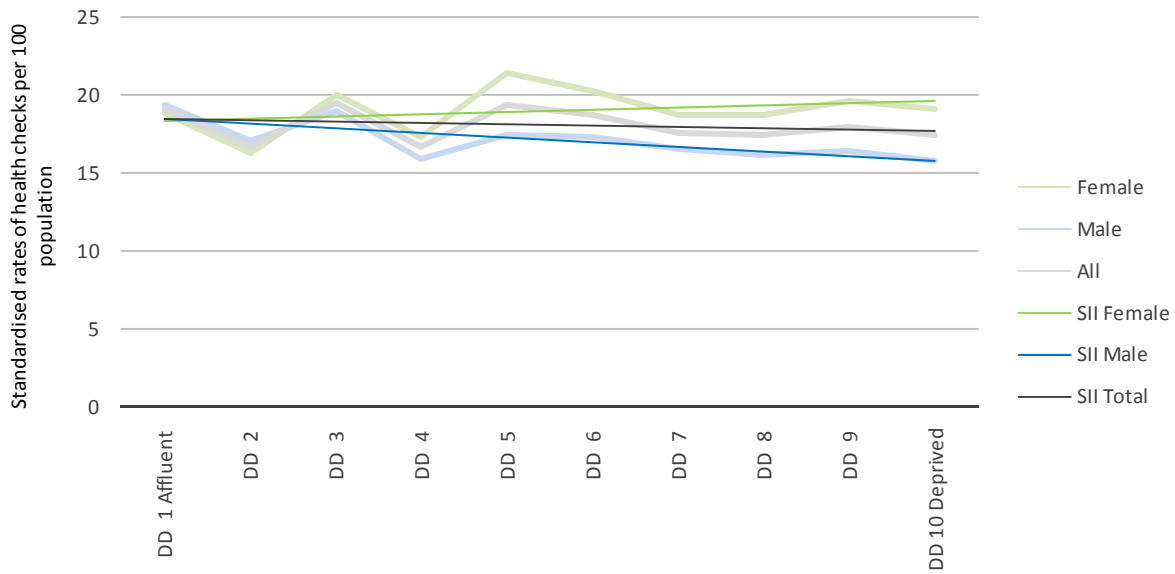


Figure 15: Comparative Slope Index of Inequality of service uptake in standardised rates, between genders, across deprivation deciles.

Mosaic Geodemographics

Profile	DSR	Lower CI	Upper CI
1 - Rural families with high incomes, often from city jobs	6.1	0.2	34.0
2 - Retirees electing to settle in environmentally attractive localities	20.6	10.8	34.5
4 - Villagers with few well paid alternatives to agricultural employment	18.2	8.1	34.4
5 - Better off empty nesters in low density estates on town fringes	18.7	17.3	20.2
6 - Self employed trades people living in smaller communities	15.0	12.4	18.0
7 - Empty nester owner occupiers making little use of public services	19.6	18.3	20.9
8 - Mixed communities with many single people in the centres of small towns	16.9	12.7	22.1
9 - Successful older business leaders living in sought-after suburbs	17.0	13.5	21.1
10 - Wealthy families in substantial houses with little community involvement	18.5	12.6	26.0
11 - Creative professionals seeking involvement in local communities	9.3	2.4	24.3
13 - Higher income older champions of village communities	16.6	14.4	19.0
14 - Older people living in large houses in mature suburbs	18.8	17.1	20.8
15 - Well off commuters living in spacious houses in semi rural settings	18.5	16.5	20.6
16 - Higher income families concerned with education and careers	21.0	19.2	23.0
17 - Comfortably off suburban families weakly tied to their local community	17.2	14.5	20.3
18 - Industrial workers living comfortably in owner occupied semis	18.5	17.0	20.0
19 - Self reliant older families in suburban semis in industrial towns	19.0	18.0	20.1
20 - Upwardly mobile South Asian families living in inter war suburbs	10.3	5.1	18.5
21 - Middle aged families living in less fashionable inter war suburban semis	19.7	18.7	20.8
22 - Busy executives in town houses in dormitory settlements	16.6	14.3	19.2
23 - Early middle aged parents likely to be involved in their children's education	19.3	17.8	20.9
24 - Young parents new to their neighbourhood, keen to put down roots	16.6	14.0	19.4
26 - Well educated singles living in purpose built flats	19.3	9.9	33.2
27 - City dwellers owning houses in older neighbourhoods	6.1	0.2	34.0
29 - Young professional families settling in better quality older terraces	9.0	4.1	16.8
32 - Students and other transient singles in multi-let houses	13.6	4.3	30.9
33 - Transient singles, poorly supported by family and neighbours	11.7	9.4	14.3
34 - Students involved in college and university communities	25.4	2.4	74.7
35 - Childless new owner occupiers in cramped new homes	19.2	17.0	21.6
36 - Young singles and sharers renting small purpose built flats	17.6	13.0	23.2
37 - Young owners and rented developments of mixed tenure	17.8	14.2	22.1
38 - People living in brand new residential developments	21.7	11.5	34.5
40 - Multi-ethnic communities in newer suburbs away from the inner city	11.3	1.9	34.0
42 - South Asian communities experiencing social deprivation	15.1	12.0	18.7
43 - Older town centres terraces with transient, single populations	17.7	16.3	19.1
44 - Low income families occupying poor quality older terraces	16.0	15.0	17.0
45 - Low income communities reliant on low skill industrial jobs	18.2	17.1	19.5
46 - Residents in blue collar communities revitalised by commuters	17.9	16.6	19.2
47 - Comfortably off industrial workers owning their own homes	20.2	19.2	21.3
48 - Middle aged couples and families in right-to-buy homes	18.6	17.2	20.0
49 - Low income older couples long established in former council estates	18.4	17.1	19.9
50 - Older families in low value housing in traditional industrial areas	17.6	16.9	18.3
51 - Often indebted families living in low rise estates	16.5	14.3	18.9
52 - Communities of wealthy older people living in large seaside houses	15.8	3.3	36.4
53 - Residents in retirement, second home and tourist communities	12.9	4.7	26.8
54 - Retired people of modest means commonly living in seaside bungalows	16.3	14.2	18.6
55 - Capable older people leasing / owning flats in purpose built blocks	21.2	16.3	27.0
56 - Older people living on social housing estates with limited budgets	14.9	13.6	16.4
57 - Old people in flats subsisting on welfare payments	17.2	15.8	18.7
58 - Less mobile older people requiring a degree of care	9.1	4.7	15.3
59 - People living in social accommodation designed for older people	16.5	13.9	19.4
60 - Tenants in social housing flats on estates at risk of serious social problems	15.0	6.3	30.0
61 - Childless tenants in social housing flats with modest social needs	14.4	12.6	16.4
66 - Childless, low income tenants in high rise flats	19.4	15.6	23.8
67 - Older tenants on low rise social housing estates where jobs are scarce	17.3	16.3	18.3
68 - Families with varied structures living on low rise social housing estates	16.8	13.5	20.7
69 - Vulnerable young parents needing substantial state support	17.6	16.4	18.8
99 - Unclassified	8.0	5.4	11.4
NOT FOUND	16.0	10.8	22.6
UNKNOWN	5.2	2.7	9.0
Grand Total	18.1	17.8	18.3

Table 19: Directly standardised rates of uptake across Mosaic geodemographic typologies, with 95% CIs shown. Not all Mosaic types are shown as not all are represented in the eligible population.

SystemOne Report Structure

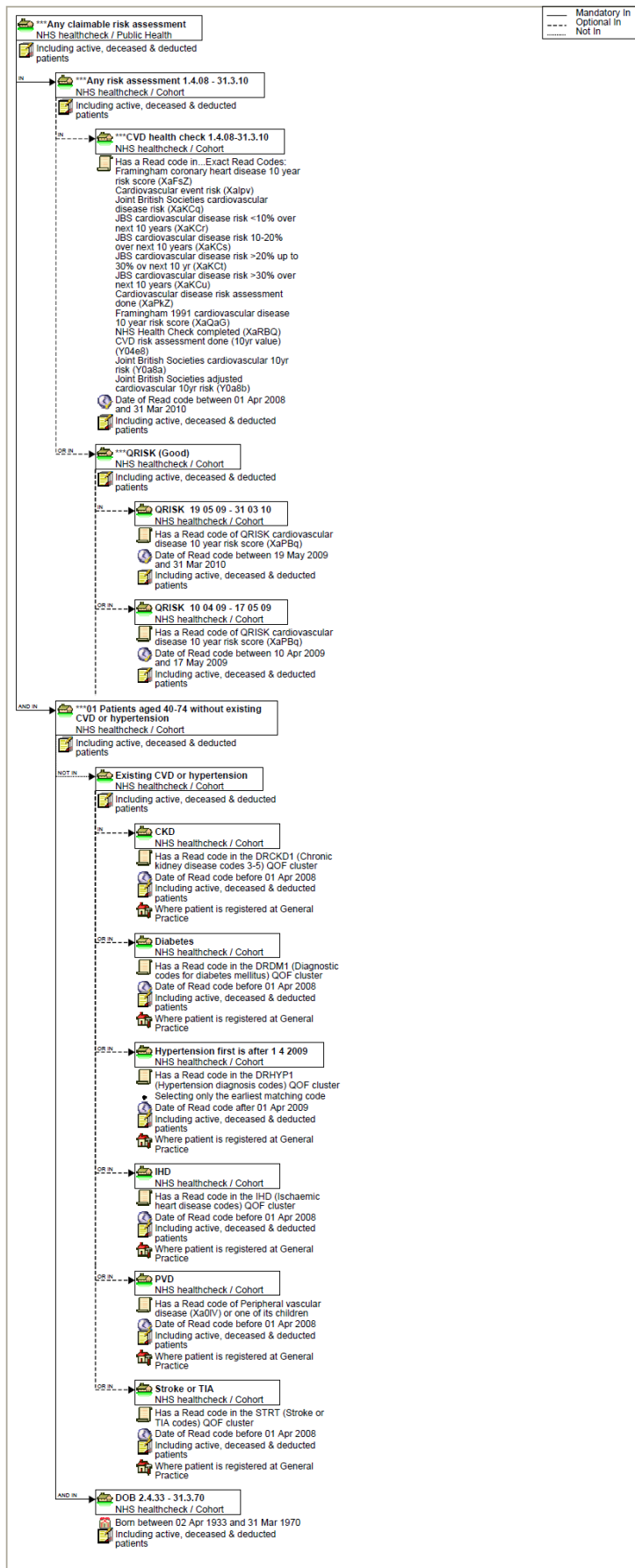


Figure 16: SystemOne query/search terms used to extract health checks data.