HULL JSNA TOOLKIT RELEASE 6:

Chronic Kidney Disease

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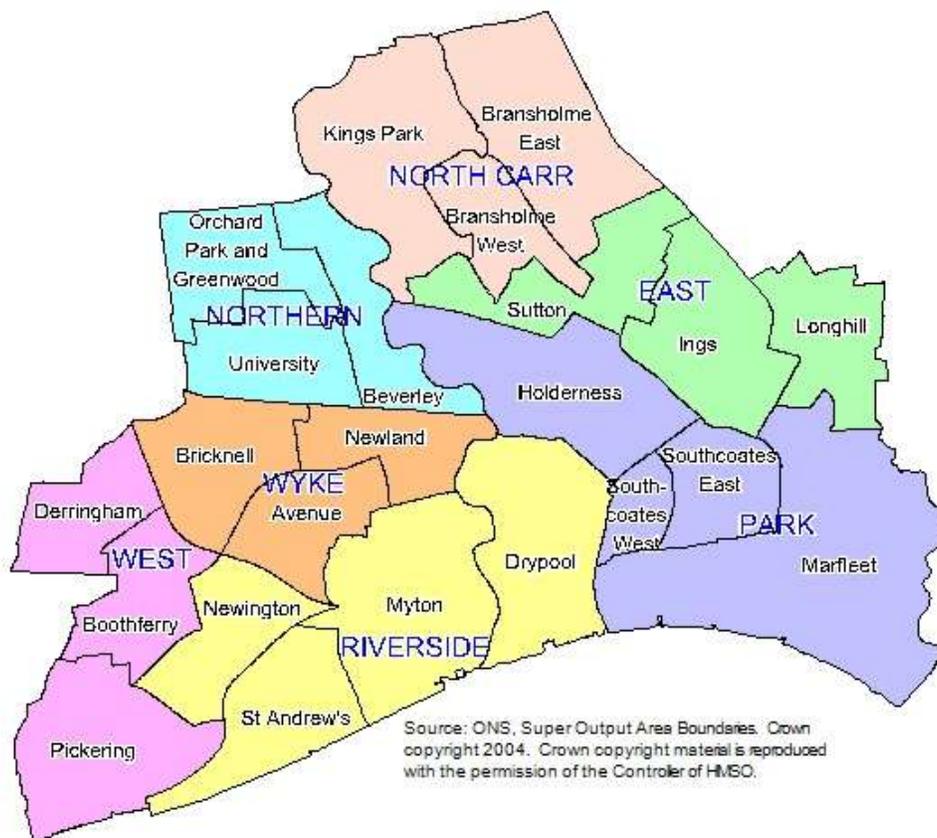
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This document is one of a suite of reports that form the basis of Hull's Joint Strategic Needs Assessment (JSNA). Each of these JSNA documents and summaries are available for perusal or downloading at www.hullpublichealth.org.

Whilst this document contains a substantial quantity of information, it may not include everything you need. If you require any further information not included within this document, or require further explanation, please contact us and we'll try to help.

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This report and others are available at www.hullpublichealth.org

HULL JSNA TOOLKIT: Chronic Kidney Disease

Contents

JSNA TOOLKIT: Chronic Kidney Disease

1   <u>SUMMARY</u>

This release incorporates data provided by NHS Hull, Hull City Council and other partners and forms a foundation for the Joint Strategic Needs Assessment (JSNA) which can be found at www.hullpublichealth.org. It is important to examine levels of health and ill-health as well as levels of risk factors and attitudes towards health in different populations for monitoring purposes including the monitoring of health-related targets, examining trends over time, comparison with other geographical areas, examining patterns of health and risk factors within the population of Hull (e.g. comparison of different groups such as those defined by deprivation), assessment and evaluation of programmes designed to improve health, assessing the existing and future need for health-related services following changes in health, ill-health or risk factors so that the Commissioning function can be adequately fulfilled. Further documents such as the health equity audits, reports from the adult and young people health and lifestyle surveys, social capital surveys, child obesity reports and Index of Multiple Deprivation report are available at www.hullpublichealth.org. A local analysis of the Public Health Outcomes Framework is also available at www.hullpublichealth.org.

Chronic kidney disease (CKD) is a long-term condition where the kidneys do not work effectively.

Risk factors for CKD: Evidence indicates that high blood pressure causes just over a quarter of all cases of kidney failure, and diabetes has been established as the cause of around one-third of all cases. Age and ethnicity are the other main risk factors for CKD.

Prevalence of diagnosed CKD: Hull's prevalence estimate for CKD is relatively high among the comparator areas for the latest period 2014/15, although Wolverhampton (4.42%) and North East Lincolnshire (5.64%) have prevalence estimates that are quite a bit higher than Hull at 4.08%. There are 9,341 patients diagnosed with CKD on the GP disease registers. The prevalence varies substantially across the practices in Hull from 0.25% to 7.83%, although there is no association between the prevalence and deprivation across the practices in Hull for 2014/15

Modelled prevalence of CKD: It is estimated that the prevalence of CKD increases with age, and is less than 1% among those aged under 35 years, increasing to around 7% for men and 13% for women in the 55-64 year age group, and to almost half of the population among those aged 85+ years. From ten year age-specific prevalence estimates, the estimated number of people with CKD at each practice can be calculated. Using this model, it is estimated that almost 19,000 of the registered patients aged 18+ years have CKD (stage 3-5 of the disease), but with just over half of these patients diagnosed and on the GP disease registers. The difference between the modelled estimates of CKD and the actual numbers diagnosed varies dramatically among the practices, as does the percentage diagnosed.

2   **INTRODUCTION**

2.1   **Other Reports**

This revision of the JSNA Toolkit for Hull is a series of stand alone reports on specific diseases or conditions, people groups, risk factors for disease and other health and wellbeing related issues. Each of these individual reports sum to form the JSNA Toolkit, which informs the production of the JSNA. Each of the JSNA Toolkit documents may be accessed on, and downloaded from, www.hullpublichealth.org. The full list of reports is as follows:

Executive Summary
Abbreviations
Glossary
Geographical Area
Demography and Demographics
Housing, Environment and Social Care
Deprivation and Associated Measures
General Health, Disabilities, Caring and Use of Services
Dental Health
Inpatient Hospital Admissions
Life Expectancy
Mortality
Overweight and Obesity
Physical Activity
Diet
Alcohol Consumption
Drug and Substance Abuse
Smoking
Vaccinations and Immunisations
Screening
All Circulatory Disease
Coronary Heart Disease
Stroke
Other Circulatory Diseases
All Cancers
Lung Cancer
Colorectal Cancer
Prostate Cancer
Breast Cancer
Diabetes
Chronic Kidney Disease
All Respiratory Disease
Asthma
Chronic Obstructive Pulmonary Disease

Epilepsy
Hypothyroidism
Palliative Care
Mental Health and Learning Disabilities (includes Social Capital)
Infectious Diseases
Digestive Diseases
Sexual Health
Accidents
Children and Young People
Older People

In order to avoid duplication between the individual reports, references will be made to other reports which may contain further information or explanation.

It is the intention to release the JSNA Toolkit documents on an on-going basis, with new information added to the documents and existing data updated as new information becomes available over time. The two tables in the *APPENDIX* starting on *page 57* give the time period to which the data refers, when the information was last updated and the source for each table and figure within this document.

2.2   Terminology, Abbreviations, Statistical Methods and Terms

Further more technical information is available in the Glossary document on www.hullpublichealth.org which includes specific information on particular datasets (e.g. delays between death occurrence and registration in Public Health Mortality File, explanation of clinical episodes within Hospital Episode Statistics, further information on the Quality Outcomes Framework data, etc), abbreviations used within these JSNA Toolkit documents and other local reports, and an explanation of some statistical methods and statistical terms used within the JSNA Toolkit documents and other local documents, such as problems associated with synthetic or modelled estimates, problems associated with small numbers, explanations of confidence intervals, significance testing, standardisation, life expectancy, total period fertility rate, confounding and effect modification, etc. Some of this information is also included within the *APPENDIX*.

2.3   Data Sources

Where possible, we have used sources of data that are routinely available nationally, either as published material (e.g. the NHS Information Centre Indicator Portal (previously known as the Compendium of Clinical and Health Indicators or Compendium), the Census, labour market website (nomis), Quality and Outcomes Framework (QOF) data, Public Health Outcomes Framework indicators, etc), from Government websites (e.g. Department of Health) or other websites (e.g. those quoted

as data sources for Public Health Outcomes Framework). Elsewhere we have used raw data at patient or episode level (e.g. Public Health Mortality Files) to construct local indicators of health. Local information has been provided by colleagues within the NHS Hull Clinical Commissioning Group, the North Yorkshire and Humber Commissioning Support Unit, Hull City Council and other organisations. The prevalence of lifestyle behavioural risk factors comes from local surveys such as the local Health and Lifestyle and Social Capital Surveys, and comparison information from the annual Health Survey for England (Health Survey for England 2008) and the General Household Survey (Economic and Social Data Service 2008). Full information about each of the local surveys conducted is available at www.hullpublichealth.org. Furthermore, the source of each table and figure is given in *section 5.10* on *page 58* (tables) and in *section 5.10.2* on *page 58* (figures). Also see *section 5.1* on *page 27*.

We have provided the most up-to-date data available. Not all the data relate to the same time period. Different sets of data are published at different times of the year and the most recent data may not yet be published, or if the numbers of events are very low for rare diseases, the data for several years are combined to obtain a more reliable picture.

2.4   Deprivation

Unemployment, poor housing, lack of qualifications, crime and many other social and environmental factors all indirectly affect the health of the population. Different scales and scores have been produced which attempt to measure deprivation. In general, in relation to national averages, Hull has a higher unemployment rate, more poor housing, residents qualified to a lower level and higher levels of crime. Increased deprivation means that there is poorer health, but this is compounded as poor health also affects other measures such as employment and motivation to improve employment, education and the person's environment such as housing. In addition, those who live in the most deprived area are more likely to have risk factors for ill health such as smoking, poor diet, lack of physical activity, etc. It is also generally more difficult to change lifestyle behaviour if the environment is more stressful resulting from poorer employment prospects and housing, increased debt, relationship problems, etc.

The Index of Multiple Deprivation (IMD) 2015 (Communities and Local Government 2015) score has been produced nationally and is a measure of deprivation derived for each lower layer super output area (LLSOA). There are 166 LLSOAs geographical areas defined within Hull following the 2011 Census. These geographical areas have a minimum population size of 1,000 and a mean population size of 1,500. The IMD 2015 index is based on seven domains which are weighted according to their relative importance in relation to the overall score (weights in brackets): (i) income deprivation (22.5%); (ii) employment deprivation (22.5%); (iii) health deprivation and disability (13.5%); (iv) education, skills and training deprivation (13.5%); (v) barriers to housing and services (9.3%); (vi) living environment deprivation (9.3%); and (vii) crime (9.3%). The IMD 2015 score measures deprivation, but is not such a good measure of affluence.

As it is applied to a geographical area, it relates to average levels of deprivation within an area. Therefore, there may be some residents of the area who are very much more deprived than the average and some very much better-off relative to the average.

Using the IMD 2015 score, Hull is ranked as the 3rd most deprived local authority out of 326 (bottom 1%). The IMD 2015 scores for all of England's LLSOAs have been divided into five approximately equal-sized groups ranging from the 20% most deprived areas to the 20% least deprived areas. These five groups are referred to as national quintiles. However, as more than half (52%) of Hull's LLSOAs are within the bottom 20%, local analyses have used Hull's local quintiles.

Further detailed analysis of the IMD and changes over time is available in a separate IMD report available at www.hullpublichealth.org. The Hull JSNA Toolkit: Deprivation and Associated Measures also includes additional information on deprivation as well as information on unemployment, benefit claimants, crime, etc.

2.5   Comparator Areas

Local analyses of comparator areas have been undertaken. The first analysis in 2007, which was updated in 2009, identified 10 comparator areas which were similar to Hull with regard some key measures such as deprivation, population, ethnicity, housing, etc. None of the comparators areas were very similar to Hull with regard to all the measures examined, which means that differences were evident for some comparator areas. The Office for National Statistics (ONS) grouped local authorities into groups, and Hull was in their Industrial Hinterlands group, but Hull was the least similar to the group average. Furthermore, ONS deemed that North East Lincolnshire was Hull's nearest comparator, but this was in a different classification group. Local analyses have used the 10 comparators identified plus North East Lincolnshire as comparator areas. A further analysis of comparator areas was undertaken during 2013 following transfer of Public Health Science to Hull City Council. Hull City Council generally uses 15 comparator areas for their analyses. All their areas together with the 11 areas used previously were examined (some were included in both groups). It was felt that there were too many to use all 15 of Hull City Council comparators and a number of the indicators used to determine similarity were not important from the health or public health point of view[1]. Whilst some of the 11 locally used comparators boundaries of local authority and NHS (i.e. Clinical Commissioning Group) no longer matched, it was decided to continue to use the 11 comparator areas previously used for consistency and comparability.

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[1] Such as taxbase per head of population, percentage of daytime net flow, housing benefit caseload, percentage of households with less than four rooms, percentage of households in purpose-built flats rented from local authority, authorities with coast protection expenditure, etc.

The comparators are as follows:

1. Middlesbrough**
2. Stoke-on-Trent
3. Sandwell*
4. Salford
5. Wolverhampton
6. Sunderland
7. Plymouth*
8. Derby*
9. Leicester
10. Coventry*
11. North East Lincolnshire

*The boundary of the local authority does not match that of the CCG, so data relating to the Quality Outcomes Framework (see **section 5.5** on **page 34**) is unavailable.

**Middlesbrough local authority and Redcar and Cleveland local authority form NHS South Tees CCG. All comparator QOF data trends use South Tees as a comparator area (historical data for the Middlesbrough Primary Care Trust (PCT) and Redcar and Cleveland PCT have been combined for comparability). Redcar and Cleveland local authority is one of the comparator areas used by Hull City Council so is quite similar to Hull in terms of certain characteristics.

Further information on these comparators is available at www.hullpublicheatlh.org.

2.6 **Public Health Outcomes Framework Indicators**

A local analysis of the outcome measures published as part of the Public Health Outcomes Framework (PHOF) is available at www.hullpublichealth.org. The JSNA Toolkit reports also include information on the relevant PHOF indicators for the specific topic. Further details of the indicators is available in **Table 12**, which details which JSNA Toolkit report includes further analysis for each indicator.

There are no specific indicators included in the PHOF which relate to chronic kidney disease.

3   CHRONIC KIDNEY DISEASE

3.1   Background and Risk Factors

NHS Choices provides some background information on chronic kidney disease (CKD). It states that "CKD is a long-term condition where the kidneys do not work effectively. CKD does not usually cause symptoms until reaching an advanced stage. It is usually detected at earlier stages by blood and urine tests. Main symptoms of advanced kidney disease include: tiredness; swollen ankles, feet or hands (due to water retention); shortness of breath; nausea; and blood in the urine" (NHS Choices 2012).

"CKD is the reduced ability of the kidney to carry out its functions in the long-term. This is most often caused by the strain placed on the kidneys by other conditions, most commonly diabetes and high blood pressure." (NHS Choices 2012)). "The evidence indicates that high blood pressure causes just over a quarter of all cases of kidney failure. Diabetes has been established as the cause of around one-third of all cases." (NHS Choices 2012). Age is a risk factor for CKD, and it "is more common in people of south Asian origin (those from India, Bangladesh, Sri Lanka and Pakistan) and black people than the general population. The reasons for this include higher rates of diabetes in south Asian people and higher rates of high blood pressure in African or Caribbean people." (NHS Choices 2012). "There are many other conditions that less commonly cause CKD, including: glomerulonephritis (inflammation of the kidney); pyelonephritis (infection in the kidney); polycystic kidney disease (an inherited condition where both kidneys are larger than normal due to the gradual growth of masses of cysts); failure of normal kidney development in an unborn baby while developing in the womb; systemic lupus erythematosus (a condition of the immune system where the body attacks the kidney as if it were foreign tissue); long-term, regular use of medicines, such as (non-steroidal anti-inflammatory drugs, including aspirin and ibuprofen; and blockages, for example due to kidney stones or prostate disease." (NHS Choices 2012).

3.2   Staging and Severity

CKD is internationally classified into five different stages following US National Kidney Foundation guidance, and the higher the stage, the more severe the kidney disease. Estimates of glomerular filtration rate (GFR) – a measure of the flow rate through the kidney – are used to determine levels of CKD. Stage 1 of CKD represents kidney damage with normal or raised GFR with a GFR (ml/min/1.73m^2) of >90. Stage 2 of CKD represents kidney damage with mildly reduced GFR with a GFR (ml/min/1.73m^2) of 60-89. Stage 3 of CKD represents moderately reduced GFR with a GFR (ml/min/1.73m^2) of 30-59. Stage 4 of CKD represents severe reduction in GFR with a GFR (ml/min/1.73m^2) of 15-29. Stage 5 of CKD represents kidney (renal) failure with a GFR (ml/min/1.73m^2) of <15.

3.3   <u>Diagnosed and Modelled Prevalence</u>

As part of the Quality and Outcomes Framework (QOF), general practices compile disease and medical condition registers. The first financial year for compiling these registers was 2004/05, but not all medical conditions were included from the start. From these registers, the prevalence of these various conditions can be estimated. However, it may take some time before the register for a specific disease is relatively complete and reflects the true prevalence of diagnosed disease. Furthermore, there may be a high proportion of patients who have the disease or medical condition, but it is undiagnosed and the patient is not included on the register(s). It should also be noted that the figures are unadjusted for influencing factors, such as the age of the patients and deprivation. Practices with a high proportion of elderly patients and practices in the most deprived areas will tend to have a higher prevalence of disease (and generally a higher prevalence of undiagnosed disease) so practices have been grouped based on age and deprivation into similar groups (see *section 5.6* on *page 36*). See *section 5.5* on *page 34* for more information on QOF and issues associated with presenting the prevalence at practice level. Also see *Table 9* for mean age of patients and mean deprivation scores for each practice (which will influence the prevalence on the disease registers). There is a register which covers chronic kidney disease (CKD) for those aged 18+ years which started 2006/07. *Table 1* presents the trends in prevalence of diagnosed CKD among those aged 18+ years for all the general practices in Hull up to 2014/15. Blank cells denote practices that did not exist for the specified time period.

There was a problem with all the data released for 2013/14 so this year has not been included in the trend data as it is incorrect.

Table 2 presents the trends in the prevalence of diagnosed CKD among those aged 18+ years up to 2014/15 for Hull and comparator areas as well as for England[2]. Hull's prevalence estimate for CKD is relatively high among the comparator areas for the latest period 2014/15, although Wolverhampton (4.42%) and North East Lincolnshire (5.64%) have prevalence estimates that are quite a bit higher than Hull at 4.08%. There are 9,341 patients diagnosed with CKD on the GP disease registers.

Table 3 and *Table 4* present the data based on the groupings of practices used by Hull's Clinical Commissioning Group. A final decision as to which group Bridge Group will be assigned is yet to be made so there are two versions of the table (it will be assigned to either North 3 or West 2). The historical trend data is not presented, as groups have only been assigned to practices currently in existence.

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[2] Whilst the numbers on the CKD disease register for England was known for 2006/07 (1,279,246), the registered population aged 18+ years was not given so the prevalence has not been calculated.

Table 1: Prevalence of diagnosed chronic kidney disease among those aged 18+ years based on GP disease registers to 2014/15

Grp	Practice	2006/07 N (%)	2007/08 N (%)	2008/09 N (%)	2009/10 N (%)	2010/11 N (%)	2011/12 N (%)	2012/13 N (%)	2014/15 N (%)
A	B81021: Faith House Surgery	249 (4.37)	269 (4.71)	292 (4.97)	311 (5.49)	333 (5.56)	332 (5.36)	342 (5.51)	335 (5.41)
A	B81035: The Avenues Medical Centre	159 (3.16)	174 (3.53)	185 (3.76)	208 (4.25)	264 (5.35)	279 (5.61)	287 (5.91)	264 (5.37)
A	B81056: The Springhead Medical Centre	305 (3.16)	393 (4.01)	388 (3.83)	400 (3.85)	374 (3.44)	366 (3.27)	372 (3.27)	453 (3.75)
A	B81075: Dr Mallik	7 (0.33)	7 (0.34)	5 (0.25)	5 (0.26)	5 (0.27)	4 (0.23)	4 (0.24)	4 (0.25)
A	B81085: Dr Richardson (Haxby - Burnbrae Surgery)	66 (1.52)	191 (4.41)	249 (5.72)	186 (4.33)	173 (3.99)	268 (6.25)	251 (5.94)	187 (4.51)
A	B81094: Dr Datta (Dr Raut)	3 (0.16)	4 (0.22)	3 (0.17)	3 (0.19)	16 (1.11)	25 (1.89)	36 (2.94)	33 (2.88)
A	B81095: Dr Cook (Field View Surgery)	68 (2.09)	159 (4.82)	186 (5.51)	208 (6.13)	207 (6.06)	219 (6.35)	234 (6.98)	235 (7.35)
A	B81097: Holderness Health Open Door	2 (0.15)	3 (0.21)	6 (0.42)	13 (0.92)	84 (5.92)	76 (5.49)	67 (5.08)	67 (5.21)
A	B81104: Dr Nayar (Newland Health Centre)	2 (0.04)	1 (0.02)	2 (0.04)	1 (0.02)	13 (0.24)	17 (0.31)	32 (0.61)	25 (0.47)
A	B81635: Dr Dave	86 (3.36)	112 (4.49)	238 (9.62)	202 (8.41)	182 (7.40)	171 (6.95)	183 (7.31)	152 (5.87)
A	B81644: Chestnut Farm Surgery	11 (0.66)	16 (0.96)	21 (1.24)	20 (1.19)	21 (1.22)	30 (1.69)	34 (2.00)	40 (2.29)
A	B81662: Mizzen Road Surgery*	24 (1.25)	78 (4.14)	79 (4.42)	67 (4.35)	3 (0.27)			
A	B81668: Dr Stryjakiewicz*	64 (2.51)							
A	Y01200: The Calvert Practice (CHCP)	10 (0.77)	10 (0.76)	46 (3.48)	50 (3.68)	52 (3.63)	49 (3.24)	51 (3.18)	66 (3.37)
A	Y02786: Priory Surgery*#				19 (20.73)	55 (7.89)	56 (5.32)	70 (5.42)	80 (4.86)
A	**GROUP A - TOTALS**	**1,056 (2.15)**	**1,417 (3.06)**	**1,700 (3.64)**	**1,693 (3.67)**	**1,782 (3.78)**	**1,892 (4.04)**	**1,963 (4.22)**	**1,941 (4.06)**
B	B81001: Dr Ogunba & Partners*	157 (7.13)	199 (8.58)	200 (7.87)	187 (7.33)	169 (6.50)			
B	B81020: Sutton Manor Surgery	161 (2.75)	177 (3.04)	207 (3.44)	237 (4.04)	251 (4.28)	259 (4.42)	300 (5.09)	332 (5.65)
B	B81038: The Oaks Medical Centre	239 (3.82)	327 (5.24)	335 (5.48)	319 (5.22)	305 (4.99)	292 (4.81)	295 (4.88)	256 (4.41)
B	B81048: The Newland Group	126 (1.74)	148 (2.07)	226 (3.10)	244 (3.55)	257 (3.69)	325 (4.65)	298 (4.31)	254 (3.55)
B	B81049: New Hall Surgery	67 (1.03)	166 (2.48)	177 (2.53)	256 (3.65)	367 (5.20)	341 (4.90)	325 (4.71)	376 (5.22)
B	B81052: Dr Musil	100 (2.30)	113 (2.55)	115 (2.60)	139 (3.10)	157 (3.51)	166 (3.72)	179 (4.04)	191 (4.15)
B	B81072: Dr Percival & Partners	113 (2.07)	216 (3.81)	263 (4.45)	251 (4.18)	358 (6.05)	341 (5.67)	287 (4.84)	239 (4.50)
B	B81646: Dr Shaikh*	1 (0.05)	2 (0.11)	2 (0.12)	3 (0.20)				
B	B81690: St Andrew's - Northpoint	31 (2.25)	35 (2.55)	38 (2.76)	43 (3.18)	57 (4.36)	55 (4.45)	50 (4.37)	53 (5.02)
B	Y02747: Haxby Group (Kingswood, Orchard Park & Priory Surgeries)#				3 (0.45)	8 (0.60)	16 (0.72)	41 (1.40)	65 (1.53)
B	**GROUP B - TOTALS**	**995 (2.42)**	**1,383 (3.33)**	**1,563 (3.70)**	**1,682 (3.97)**	**1,929 (4.63)**	**1,795 (4.51)**	**1,775 (4.42)**	**1,766 (4.28)**

Grp	Practice	2006/07 N (%)	2007/08 N (%)	2008/09 N (%)	2009/10 N (%)	2010/11 N (%)	2011/12 N (%)	2012/13 N (%)	2014/15 N (%)
C	B81008: Morrill Street Group Practice	234 (2.03)	226 (1.97)	214 (1.85)	275 (2.37)	383 (3.31)	477 (4.19)	524 (4.68)	561 (5.21)
C	B81011: Kingston Health (Hull)	97 (2.25)	122 (2.85)	131 (3.10)	143 (3.50)	158 (3.83)	318 (4.75)	328 (4.89)	328 (4.75)
C	B81057: St Andrew's (Dr MacPhie, Raghunath & Partners)	48 (1.64)	73 (2.55)	91 (3.28)	91 (3.40)	106 (4.14)	107 (4.23)	98 (3.96)	79 (3.69)
C	B81066: Dr Chowdhury	65 (3.44)	96 (4.99)	118 (5.90)	127 (6.54)	131 (6.94)	124 (6.67)	105 (5.82)	100 (5.59)
C	B81074: Dr Rej (CHCP)	129 (2.65)	151 (3.20)	138 (4.59)	152 (5.36)	145 (5.22)	143 (5.36)	135 (5.28)	131 (5.33)
C	B81080: Dr Malczekski	47 (2.28)	89 (4.65)	96 (5.22)	107 (5.96)	116 (6.66)	132 (7.81)	131 (7.95)	128 (7.83)
C	B81081: New Green Surgery (Dr Tang)	144 (5.31)	146 (5.46)	154 (5.59)	145 (5.28)	153 (5.37)	154 (5.32)	155 (5.29)	134 (4.35)
C	B81616: Dr Hendow	1 (0.05)	1 (0.05)	148 (7.37)	138 (7.06)	124 (6.40)	117 (6.01)	115 (5.82)	102 (5.14)
C	B81645: East Park Practice (Assura)	35 (1.64)	32 (1.49)	28 (1.50)	21 (1.22)	54 (3.03)	75 (3.75)	102 (4.28)	86 (2.97)
C	B81675: Newington (CHCP)	69 (1.86)	156 (3.82)	166 (2.28)	313 (4.46)	325 (4.86)	296 (4.45)	274 (4.15)	203 (3.22)
C	B81682: Longhill Health Care Centre (Dr Shaikh)	4 (0.14)	11 (0.40)	86 (3.04)	85 (3.04)	86 (2.00)	90 (2.14)	89 (2.11)	114 (2.76)
C	**GROUP C - TOTALS**	**873 (2.13)**	**1,103 (2.70)**	**1,370 (3.25)**	**1,597 (3.88)**	**1,781 (4.22)**	**2,033 (4.56)**	**2,056 (4.62)**	**1,966 (4.46)**
D	B81002: Dr Kumar-Choudhary	56 (2.62)	65 (3.02)	74 (3.38)	127 (4.72)	133 (4.82)	121 (4.54)	115 (4.49)	110 (4.23)
D	B81047: Wolseley Medical Centre	58 (0.99)	94 (1.62)	104 (1.79)	160 (2.75)	179 (2.99)	200 (3.33)	228 (3.89)	208 (3.65)
D	B81053: Diadem Medical Practice	240 (3.07)	327 (4.15)	366 (4.66)	404 (5.13)	431 (5.20)	420 (4.93)	432 (4.97)	419 (4.61)
D	B81054: Dr Varma (Clifton House)	276 (3.01)	390 (4.29)	440 (4.86)	466 (5.37)	491 (5.82)	477 (5.79)	468 (5.78)	446 (5.79)
D	B81058: Sydenham House Group Practice	106 (1.40)	167 (2.26)	192 (2.65)	227 (3.21)	359 (5.07)	359 (5.19)	441 (6.53)	342 (5.33)
D	B81112: St Andrew's - Bransholme	68 (2.63)	64 (2.49)	69 (2.65)	68 (2.74)	97 (3.89)	86 (3.49)	77 (3.14)	63 (2.67)
D	B81119: Dr Palooran & Koshy	34 (1.03)	32 (0.95)	34 (0.98)	35 (1.06)	120 (3.61)	130 (4.06)	131 (4.12)	103 (3.14)
D	B81634: St Andrew's -Dr J Venugopal	74 (3.28)	88 (3.87)	79 (3.52)	69 (3.15)	74 (3.36)	87 (3.98)	86 (4.09)	82 (3.86)
D	B81674: Dr Joseph	46 (3.45)	53 (3.71)	53 (3.45)	83 (5.22)	76 (4.67)	79 (4.60)	89 (5.12)	94 (5.55)
D	B81685: Dr Poulose	38 (2.09)	48 (2.63)	48 (2.65)	49 (2.82)	57 (3.30)	54 (3.24)	58 (3.58)	56 (3.30)
D	Y02344: Northpoint (Assura)			67 (4.45)	39 (3.25)	46 (3.03)	80 (4.43)	91 (4.35)	94 (3.93)
D	Y02748: Haxby Orchard Park Surgery*#				6 (15.38)	27 (5.94)	47 (4.50)	75 (5.58)	72 (4.20)
D	Y02896: Story Street Practice & Walk In Centre				5 (1.49)	14 (1.55)	16 (1.45)	18 (1.55)	14 (1.12)
D	**GROUP D - TOTALS**	**996 (2.27)**	**1,328 (3.03)**	**1,526 (3.37)**	**1,738 (3.87)**	**2,104 (4.49)**	**2,156 (4.54)**	**2,309 (4.85)**	**2,103 (4.38)**
E	B81017: Kingston Medical Group (CHCP)	96 (1.63)	170 (2.92)	176 (3.18)	173 (3.18)	185 (3.39)	171 (2.93)	167 (2.87)	157 (2.71)
E	B81018: Dr Awan & Partners (Orchard 2000)	86 (1.73)	59 (1.20)	53 (1.09)	72 (1.51)	225 (4.72)	234 (4.89)	232 (4.93)	239 (5.22)
E	B81027: St Andrew's Group Practice	150 (3.20)	214 (4.55)	243 (5.12)	260 (5.58)	253 (5.35)	244 (5.14)	239 (5.14)	236 (4.80)
E	B81032: Wilberforce Surgery	11 (0.49)	29 (1.31)	35 (1.62)	40 (1.99)	47 (2.50)	49 (2.74)	52 (2.41)	80 (3.19)
E	B81040: Dr Weir & Partners (Marfleet Group	48 (0.38)	66 (0.51)	308 (2.40)	301 (2.42)	286 (2.26)	267 (2.13)	263 (2.15)	236 (2.07)

Grp	Practice	2006/07 N (%)	2007/08 N (%)	2008/09 N (%)	2009/10 N (%)	2010/11 N (%)	2011/12 N (%)	2012/13 N (%)	2014/15 N (%)
	Practice)								
E	B81046: Bridge Group	196 (2.99)	196 (3.01)	187 (2.82)	217 (3.28)	254 (3.70)	257 (3.75)	288 (4.18)	264 (3.87)
E	B81089: Dr Witvliet	59 (2.39)	85 (3.39)	124 (4.78)	112 (4.34)	103 (3.84)	91 (3.38)	79 (2.93)	64 (2.35)
E	B81631: Dr Raut	47 (2.08)	55 (2.41)	59 (2.49)	66 (2.83)	70 (2.90)	72 (2.90)	80 (3.25)	83 (3.33)
E	B81683: St Andrew's (Dr Raghunath & Partners - Koul)	55 (4.89)	58 (5.34)	67 (5.88)	69 (5.67)	91 (6.94)	78 (5.68)	63 (4.75)	53 (4.09)
E	B81688: Dr Gopal	16 (1.09)	32 (2.14)	40 (2.64)	49 (3.39)	59 (4.02)	60 (4.12)	63 (4.44)	60 (4.21)
E	B81692: The Quays Medical Centre (CHCP)	2 (0.13)	2 (0.13)	4 (0.26)	12 (0.77)	9 (0.61)	8 (0.52)	6 (0.37)	18 (0.82)
E	Y00955: Riverside Medical Centre (CHCP)	29 (1.98)	34 (1.97)	42 (2.12)	47 (2.39)	45 (2.35)	46 (2.43)	49 (2.61)	75 (3.93)
E	GROUP E - TOTALS	795 (1.68)	1,000 (2.10)	1,338 (2.79)	1,418 (3.02)	1,627 (3.42)	1,577 (3.29)	1,581 (3.30)	1,565 (3.26)
	HULL	4,715 (2.12)	6,231 (2.83)	7,497 (3.34)	8,128 (3.67)	9,223 (4.09)	9,453 (4.17)	9,684 (4.27)	9,341 (4.08)

*Practice closed.
#Practices Y02748 and Y02896 were merged with this practice mid-July 2015 (new code Y02747).

Table 2: Prevalence of diagnosed chronic kidney disease among those aged 18+ years based on GP disease registers to 2014/15, Hull versus comparator areas

Area	2006/07 N (%)**	2007/08 N (%)	2008/09 N (%)	2009/10 N (%)	2010/11 N (%)	2011/12 N (%)	2012/13 N (%)	2014/15 N (%)
England	1279246	1589353 (3.73)	1739443 (4.10)	1817871 (4.27)	1854727 (4.26)	1873605 (4.27)	1881631 (4.25)	1859963 (4.13)
Hull	**4715 (2.12)**	**6231 (2.83)**	**7497 (3.34)**	**8128 (3.67)**	**9223 (4.09)**	**9453 (4.17)**	**9684 (4.27)**	**9341 (4.08)**
Leicester	7425 (2.82)	8592 (3.24)	8447 (3.16)	8119 (3.03)	8326 (2.99)	8623 (3.04)	8602 (2.99)	8138 (2.77)
NE Lincs	5469 (4.10)	5954 (4.46)	6366 (4.76)	6954 (5.28)	7444 (5.63)	7264 (5.45)	7312 (5.50)	7560 (5.64)
Salford	5689 (3.07)	6876 (3.79)	6833 (3.65)	7585 (4.07)	7006 (3.65)	7496 (3.86)	7548 (3.88)	7139 (3.53)
South Tees*	7207 (3.11)	8817 (3.90)	9404 (4.15)	9741 (4.40)	9924 (4.38)	9817 (4.32)	9660 (4.23)	8829 (3.84)
Stoke	7744 (3.57)	9686 (4.44)	10045 (4.60)	9591 (4.45)	9301 (4.31)	8926 (4.10)	8505 (3.88)	8832 (3.97)
Sunderland	5091 (2.16)	6739 (2.98)	8370 (3.69)	8943 (4.00)	8914 (3.91)	8873 (3.89)	8922 (3.92)	9315 (4.06)
Wolverh'ton	4790 (2.40)	6800 (3.35)	8147 (3.99)	8585 (4.33)	8897 (4.35)	9710 (4.78)	10186 (4.97)	9120 (4.42)

*Middlesbrough and Redcar & Cleveland local authorities combined.
**Percentage / figures not available for England.

Table 3: Prevalence of diagnosed chronic kidney disease among those aged 18+ years based on GP disease registers, 2014/15 – version 1 – assuming Bridge Group is assigned to North 3 group

Practice	2014/15
	N (%)
B81002: Dr Kumar-Choudhary	110 (4.23)
B81112: St Andrew's - Bransholme	63 (2.67)
B81119: Dr Palooran & Koshy	103 (3.14)
B81616: Dr Hendow	102 (5.14)
B81634: St Andrew's -Dr J Venugopal	82 (3.86)
B81685: Dr Poulose	56 (3.30)
B81688: Dr Gopal	60 (4.21)
B81690: St Andrew's - Northpoint	53 (5.02)
Y02344: Northpoint (Assura)	94 (3.93)
NORTH 1	**723 (3.82)**
B81021: Faith House Surgery	335 (5.41)
B81035: The Avenues Medical Centre	264 (5.37)
B81048: The Newland Group	254 (3.55)
B81049: New Hall Surgery	376 (5.22)
B81072: Dr Percival & Partners	239 (4.50)
B81095: Dr Cook (Field View Surgery)	235 (7.35)
B81104: Dr Nayar (Newland Health Centre)	25 (0.47)
NORTH 2	**1,728 (4.40)**
B81018: Dr Awan & Partners (Orchard 2000)	239 (5.22)
B81046: Bridge Group	264 (3.87)
B81094: Dr Datta (Dr Raut)	33 (2.88)
B81631: Dr Raut	83 (3.33)
B81644: Chestnut Farm Surgery	40 (2.29)
Y02747: Haxby Group (Kingswood, Orchard Park & Priory Surgeries)	65 (1.53)
NORTH 3	**724 (3.45)**
B81008: Morrill Street Group Practice	561 (5.21)
B81020: Sutton Manor Surgery	332 (5.65)
B81053: Diadem Medical Practice	419 (4.61)
B81080: Dr Malczekski	128 (7.83)
B81081: New Green Surgery (Dr Tang)	134 (4.35)
B81635: Dr Dave	152 (5.87)
B81674: Dr Joseph	94 (5.55)
B81682: Longhill Health Care Centre (Dr Shaikh)	114 (2.76)
EAST 1	**1,934 (4.98)**

Practice	2014/15
	N (%)
B81040: Dr Weir & Partners (Marfleet Group Practice)	236 (2.07)
B81066: Dr Chowdhury	100 (5.59)
B81074: Dr Rej (CHCP)	131 (5.33)
B81085: Dr Richardson (Haxby - Burnbrae Surgery)	187 (4.51)
B81089: Dr Witvliet	64 (2.35)
B81097: Holderness Health Open Door	67 (5.21)
B81645: East Park Practice (Assura)	86 (2.97)
EAST 2	**871 (3.26)**
B81017: Kingston Medical Group (CHCP)	157 (2.71)
B81032: Wilberforce Surgery	80 (3.19)
B81047: Wolseley Medical Centre	208 (3.65)
B81052: Dr Musil	191 (4.15)
B81054: Dr Varma (Clifton House)	446 (5.79)
B81692: The Quays Medical Centre (CHCP)	18 (0.82)
Y00955: Riverside Medical Centre (CHCP)	75 (3.93)
Y02896: Story Street Practice & Walk In Centre	14 (1.12)
CITY CENTRE	**1,189 (3.76)**
B81011: Kingston Health (Hull)	328 (4.75)
B81038: The Oaks Medical Centre	256 (4.41)
B81056: The Springhead Medical Centre	453 (3.75)
B81057: St Andrew's (Dr MacPhie, Raghunath & Partners)	79 (3.69)
B81075: Dr Mallik	4 (0.25)
B81675: Newington (CHCP)	203 (3.22)
B81683: St Andrew's (Dr Raghunath & Partners - Koul)	53 (4.09)
Y01200: The Calvert Practice (CHCP)	66 (3.37)
WEST 1	**1,442 (3.79)**
B81027: St Andrew's Group Practice	236 (4.80)
B81058: Sydenham House Group Practice	342 (5.33)
WEST 2	**578 (5.10)**
HULL	**9,189 (4.07)**

Table 4: Prevalence of diagnosed chronic kidney disease among those aged 18+ years based on GP disease registers, 2014/15 – version 2 – assuming Bridge Group is assigned to West 2 group

Practice	2014/15 N (%)
B81002: Dr Kumar-Choudhary	110 (4.23)
B81112: St Andrew's - Bransholme	63 (2.67)
B81119: Dr Palooran & Koshy	103 (3.14)
B81616: Dr Hendow	102 (5.14)
B81634: St Andrew's -Dr J Venugopal	82 (3.86)
B81685: Dr Poulose	56 (3.30)
B81688: Dr Gopal	60 (4.21)
B81690: St Andrew's - Northpoint	53 (5.02)
Y02344: Northpoint (Assura)	94 (3.93)
NORTH 1	**723 (3.82)**
B81021: Faith House Surgery	335 (5.41)
B81035: The Avenues Medical Centre	264 (5.37)
B81048: The Newland Group	254 (3.55)
B81049: New Hall Surgery	376 (5.22)
B81072: Dr Percival & Partners	239 (4.50)
B81095: Dr Cook (Field View Surgery)	235 (7.35)
B81104: Dr Nayar (Newland Health Centre)	25 (0.47)
NORTH 2	**1,728 (4.40)**
B81018: Dr Awan & Partners (Orchard 2000)	239 (5.22)
B81094: Dr Datta (Dr Raut)	33 (2.88)
B81631: Dr Raut	83 (3.33)
B81644: Chestnut Farm Surgery	40 (2.29)
Y02747: Haxby Group (Kingswood, Orchard Park & Priory Surgeries)	65 (1.53)
NORTH 3	**460 (3.24)**
B81008: Morrill Street Group Practice	561 (5.21)
B81020: Sutton Manor Surgery	332 (5.65)
B81053: Diadem Medical Practice	419 (4.61)
B81080: Dr Malczekski	128 (7.83)
B81081: New Green Surgery (Dr Tang)	134 (4.35)
B81635: Dr Dave	152 (5.87)
B81674: Dr Joseph	94 (5.55)
B81682: Longhill Health Care Centre (Dr Shaikh)	114 (2.76)
EAST 1	**1,934 (4.98)**

Practice	2014/15
	N (%)
B81040: Dr Weir & Partners (Marfleet Group Practice)	236 (2.07)
B81066: Dr Chowdhury	100 (5.59)
B81074: Dr Rej (CHCP)	131 (5.33)
B81085: Dr Richardson (Haxby - Burnbrae Surgery)	187 (4.51)
B81089: Dr Witvliet	64 (2.35)
B81097: Holderness Health Open Door	67 (5.21)
B81645: East Park Practice (Assura)	86 (2.97)
EAST 2	**871 (3.26)**
B81017: Kingston Medical Group (CHCP)	157 (2.71)
B81032: Wilberforce Surgery	80 (3.19)
B81047: Wolseley Medical Centre	208 (3.65)
B81052: Dr Musil	191 (4.15)
B81054: Dr Varma (Clifton House)	446 (5.79)
B81692: The Quays Medical Centre (CHCP)	18 (0.82)
Y00955: Riverside Medical Centre (CHCP)	75 (3.93)
Y02896: Story Street Practice & Walk In Centre	14 (1.12)
CITY CENTRE	**1,189 (3.76)**
B81011: Kingston Health (Hull)	328 (4.75)
B81038: The Oaks Medical Centre	256 (4.41)
B81056: The Springhead Medical Centre	453 (3.75)
B81057: St Andrew's (Dr MacPhie, Raghunath & Partners)	79 (3.69)
B81075: Dr Mallik	4 (0.25)
B81675: Newington (CHCP)	203 (3.22)
B81683: St Andrew's (Dr Raghunath & Partners - Koul)	53 (4.09)
Y01200: The Calvert Practice (CHCP)	66 (3.37)
WEST 1	**1,442 (3.79)**
B81027: St Andrew's Group Practice	236 (4.80)
B81046: Bridge Group	264 (3.87)
B81058: Sydenham House Group Practice	342 (5.33)
WEST 2	**842 (4.64)**
HULL	**9,189 (4.07)**

The Eastern Region Public Health Observatory (now part of Public Health England) have created a model which can be used to produce the estimated number of people with diagnosed CKD at disease stage 3-5 (see *section 3.2* on *page 11* for more details about the stage). In general when such models have been produced, the model is based on research undertaken elsewhere in the UK examining the prevalence of diagnosed disease in the community, which has then been modelled and applied to different populations such as those living in a particular PCT area. Therefore, the accuracy of the estimates depends on the quality of the initial research and the modelling itself. If the original research did not include very deprived areas, it is very difficult to generalise and apply the model to very deprived areas like Hull. Furthermore, there are many reasons why the prevalence could differ among practices (see *section 5.5* on *page 34* for more information). Further information about problems associated with models can be found in the Association of Public Health Observatories Technical Briefing (Association of Public Health Observatories 2011) and in *section 5.2* on *page 30*. Therefore, just because practices have a particularly low prevalence or a relatively large difference between the registers and the model, it does not necessarily mean that they are performing badly in any way relative to other general practices. Nevertheless, a comparison of the differences between the modelled prevalence and the practice list registers can act as a starting point for investigation. Practices with a low prevalence or a relatively large difference between the model and the register estimates can be examined further and considered in relation to patient characteristics using local knowledge. Differences might just reflect that the model is not a very good fit for Hull. Also see *Table 9* for mean age of patients and mean deprivation scores for each practice (which will influence the prevalence on the disease registers).

The model uses estimated prevalence for men and women separately for different age groups (18-24, 25-34, 35-44, 45-54, 55-64, 65-74, 75-84 and 85+ years) which are applied to estimated age-specific population figures for each practice to obtain an estimate of the total number of people with CKD at stages 3-5 who are aged over 18 years. No adjustments were made for ethnicity, deprivation or other factors. The original research used to estimate the prevalence was from a UK study undertaken by Stevens et al in 2007 (Stevens, O'Donoghue et al. 2007).

Table 5: Estimated percentage of Stage 3-5 CKD in general population (used in model)

Gender	Estimated prevalence of CKD in each age group (%)							
	18-24	25-34	35-44	45-54	55-64	65-74	75-84	85+
Males	0.01	0.17	0.71	3.08	6.89	17.65	33.16	44.75
Females	0.18	0.79	2.69	2.79	13.09	27.86	41.68	48.61

Table 6 gives the results of the modelling and the actual diagnosed numbers of patients with CKD. Due to the limitations mentioned above, the model does not necessarily represent the actual number of people who should be diagnosed with CKD for each practice; it is only a guide. Furthermore, the characteristics of each practice differ and need to be considered.

The modelled estimates are based on the registered population in Hull as at 1st April 2014 with the number of 18 and 19 year olds estimated as two-fifths the number of 15-19 year olds for each practice. The numbers are compared with the number diagnosed on the QOF disease registers for 2012/13.

As mentioned, it is not known how accurate the model might be, but if it is reasonable, there is a suggestion that around half of people with Stage 3-5 CKD is undiagnosed across Hull (51.4%). The percentage diagnosed out of the total estimated to have CKD varies dramatically across the practices ranging from 1.9% (B81075: Dr Malik) and 15.8% (B81692: Quays Medical Centre) to over 70% for four practices. However, there is not a huge difference in the percentage diagnosed across the four general practice groupings with the exception of the practices with the most deprived patients with 50.7% diagnosed in Group A, 56.0% diagnosed in Group B, 54.3% diagnosed in Group C and 42.1% diagnosed in Group D.

Practices are coloured based on their age/deprivation group (see **section 5.6** on **page 36**). The least deprived practices (group A) are shown in blue and the most deprived practices (group D) in purple, with practices in the middle deprivation group divided by mean patient age into young (group B coloured orange) and old (group C coloured green). Some groups of practices have all been assigned the same group so not all groupings are based on individual practice characteristics.

Table 6: Actual diagnosed and modelled CKD numbers for those aged 18+ years, April 2014

Gp	Practice	Est list size Apr 2014 (aged 18+ years)	Numbers with CKD		
			Modelled estimate (guide only)	Actual diagnosed (QOF 2012/13)	Difference (estimated undiagnosed)
A	B81020: Sutton Manor Surgery	5,871	549	300	249
A	B81021: Faith House Surgery	6,135	631	342	289
A	B81035: Avenues Medical Centre	4,892	485	287	198
A	B81048: Dr Lorenz & Partners	7,269	466	298	168
A	B81056: Springhead Medical Centre	11,523	1,112	372	740
A	B81072: Dr Percival & Partners	5,359	364	287	77
A	B81075: Dr Mallik	1,626	206	4	202
A	B81085: Burnbrae Surgery	4,174	466	251	215
A	B81094: Dr Datta	1,163	109	36	73
A	B81095: Dr Cook	3,240	387	234	153
A	B81097: Dr Yagnik	1,284	150	67	83

Gp	Practice	Est list size Apr 2014 (aged 18+ years)	Numbers with CKD		
			Modelled estimate (guide only)	Actual diagnosed (QOF 2012/13)	Difference (estimated undiagnosed)
A	B81104: Dr Nayar	5,002	66	32	34
A	B81635: Dr Dave	2,552	271	183	88
A	B81644: Chestnut Farm Surgery	1,732	120	34	86
A	Y02747: Kingswood Surgery	3,783	124	41	83
A	Y02748: Haxby Orchard Pk Surgery (D)	1,582	114	75	39
A	Y02786: Priory Surgery	1,598	122	70	52
A	GROUP A - TOTALS	68,785	5,742	2,913	2,829
B	B81002: Dr Kumar-Choudhary	2,581	195	115	80
B	B81008: Morrill Street Group Practice	10,887	935	524	411
B	B81027: St Andrews Group Practice (D)	4,780	444	239	205
B	B81049: Dr Rawcliffe & Partners	7,081	657	325	332
B	B81052: Dr Musil & Partner	4,540	302	179	123
B	B81057: St Andrews-Newington (C)	2,198	193	98	95
B	B81066: Dr Chowdhury & Partner	1,779	157	105	52
B	B81112: St Andrews - Bransholme	2,377	163	77	86
B	B81119: Dr Palooran & Partners	3,205	234	131	103
B	B81616: Dr Hendow	1,960	182	115	67
B	B81634: Dr Venugopal & Partner	2,115	134	86	48
B	B81645: East Park Practice	2,822	215	102	113
B	B81674: Dr Joseph	1,698	137	89	48
B	B81675: Dr Tak & Partners	6,500	429	274	155
B	B81683: Dr Raghunath & Partners (D)	1,267	86	63	23
B	B81685: Dr Poulose & Partners	1,630	122	58	64
B	B81688: Dr Gopal (D)	1,402	94	63	31
B	B81690: St Andrews Northpoint (A)	1,087	101	50	51
B	Y02344: Northpoint (D)	2,311	172	91	81
B	Y02896: Story St Practice & Walk In (D)	1,223	50	18	32
B	GROUP B - TOTALS	63,443	5,002	2,802	2,200
C	B81011: Kingston Health (Hull)	6,836	637	328	309
C	B81038: Dr Miller & Partners	5,898	640	295	345
C	B81053: Diadem Medical Practice	8,999	891	432	459
C	B81054: Clifton House Medical Centre	7,816	703	468	235
C	B81058: Dr Lovett & Partner	6,461	578	441	137
C	B81074: Dr Rej	2,488	248	135	113
C	B81080: Dr Malczewski	1,623	182	131	51
C	B81081: New Green Surgery	2,998	273	155	118

Gp	Practice	Est list size Apr 2014 (aged 18+ years)	Numbers with CKD		
			Modelled estimate (guide only)	Actual diagnosed (QOF 2012/13)	Difference (estimated undiagnosed)
C	B81682: Dr Shaikh & Partner	4,146	406	89	317
C	**GROUP C - TOTALS**	**47,265**	**4,558**	**2,474**	**2,084**
D	B81017: Kingston Medical Group	5,713	402	167	235
D	B81018: Dr Awan & Partners	4,599	369	232	137
D	B81032: Wilberforce Surgery	2,418	126	52	74
D	B81040: Dr Weir & Partners	11,748	984	263	721
D	B81046: Bridge Group Practice	6,852	574	288	286
D	B81047: Dr Singh & Partners	5,758	414	228	186
D	B81089: Dr Witvliet	2,695	212	79	133
D	B81631: Dr Raut & Partner	2,506	135	80	55
D	B81692: Quays Medical Centre	1,925	38	6	32
D	Y00955: Riverside Medical Centre	1,893	119	49	70
D	Y01200: Calvert Practice (A)	1,807	174	51	123
D	**GROUP D - TOTALS**	**47,914**	**3,547**	**1,495**	**2,052**
	HULL	**227,407**	**18,849**	**9,684**	**9,165**

3.4   Mortality

Over the three year period 2012-14, there were 18 deaths to Hull residents from CKD (12 men and 6 women) of which five occurred under the age of 75 years (three men and two women).
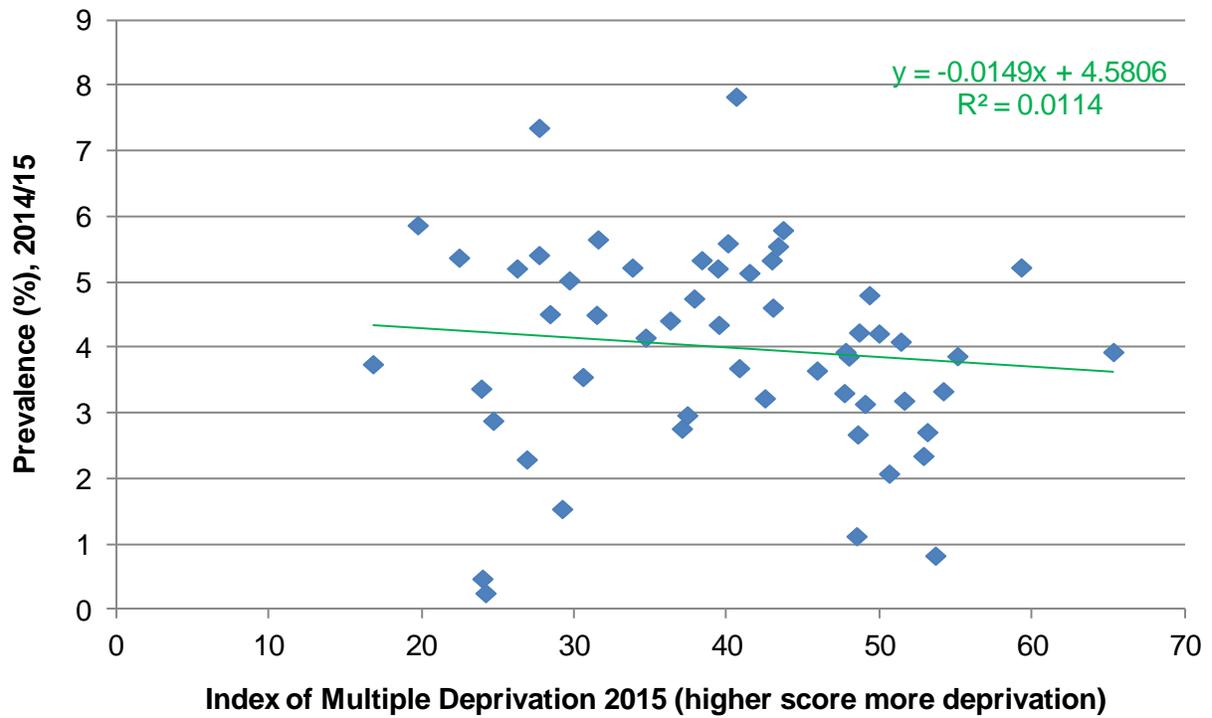
3.5   Diagnosed Prevalence in Relation to Deprivation

It is possible to assign a deprivation score to each general practice using the Index of Multiple Deprivation 2015 score assigned to each patient (based on their postcode) and calculate the mean IMD 2015 score for each practice (i.e. weighted by patient population). *Table 7* shows the prevalence of diagnosed chronic kidney disease on the practice disease registers for 2014/15 grouping the practices into five groups. *Figure 1* shows the practice IMD 2015 scores and the prevalence of diagnosed chronic kidney disease among those aged 18+ years for each practice. It can be seen from both the table and the figure that there is no association between the diagnosed prevalence of chronic kidney disease among those aged 18+ years and deprivation measured at practice level, and the difference is not statistically significant (p=0.44). The underlying data for the figure is given in the *APPENDIX* on *page 55*.

Table 7: Diagnosed prevalence of chronic kidney disease among those aged 18+ years by deprivation quintile at practice level, 2014/15

Practice IMD	Number of practices	IMD range	Total list size	Number	Prevalence (%)
Most deprived fifth	12	49.4 - 65.3	48,033	1,565	3.26
2	12	43.0 - 49.1	46,297	2,031	4.39
3	11	37.1 - 42.5	44,094	1,966	4.46
4	8	29.2 - 36.3	41,237	1,766	4.28
Least deprived fifth	12	16.8 - 28.4	46,176	1,861	4.03
HULL	**55**	**16.8 - 65.3**	**225,837**	**9,189**	**4.07**

Figure 1: Diagnosed prevalence of chronic kidney disease among those aged 18+ years by deprivation score at practice level

Scatter plot with trendline equation $y = -0.0149x + 4.5806$ and $R^2 = 0.0114$. Y-axis: Prevalence (%), 2014/15. X-axis: Index of Multiple Deprivation 2015 (higher score more deprivation).

4 <u>REFERENCES</u>

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5 APPENDIX

5.1 Data Sources

The data sources for each table and figure included within this report are listed in *section 5.10* on *page 57*.

Local and national data is available from the NHS Information Centre Indicator Portal (www.indicators.ic.nhs.uk/webview) which was previously known as the Compendium (of Clinical and Health Indicators). The information provided is quite varied, such as resident population estimates, information from the Quality and Outcomes Framework (GP disease and quality of care registers), age-specific and indirectly and directly standardised mortality rates for the main causes of death, cancer incidence, screening uptake rates, number of births, fertility rates, hospital episode statistics, standardised admission or procedural rates for a limited number of diseases or procedures, etc. The NHS Information Centre Indicator Portal provides information for different geographical areas (national – England, regional, and at local authority and/or CCG level). Some information, particularly mortality rates, is usually provided for males and females separately and combined, and for different age groups. The standardised mortality rates are generally provided for all ages and for those aged under 75 years, with (indirectly) standardised mortality ratios (SMRs) standardised to the English population and the directly standardised mortality rates standardised to the 2013 European Standard Population. This report generally[3] uses the mortality rates from the NHS Information Centre Indicator Portal when presenting information for Hull overall, because these are the nationally recognised figures and it is also useful to have the equivalent comparison information for England, the local region and comparator areas.

For indicators within the Public Health Outcomes Framework (PHOF), England and the local authority level data can be downloaded at www.phoutcomes.info. The Excel data file also contains a "meta data" worksheet which contains information about the definition of the indicator and the data sources. In some indicators, reference is made to nationally available data which is available at geographical areas smaller than local authorities. For other indicators, it is possible to calculate the indicator at different geographical area using local data (e.g. using hospital records or mortality data).

A number of other datasets and reports are available from the Information Centre (www.ic.nhs.uk), including vaccination data (Information Centre for Health and Social Care 2011) and Stop Smoking Service data (Information Centre for Health and Social Care 2010).

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[3] Note that locally derived estimates for mortality rates and life expectancy differ in relation to the national estimates as different population estimates are used locally, however, the local estimates are produced as the information is available around 4-6 months earlier and local estimates can be produced for different defined groups (such as by deprivation quintile or at ward or area level), and these rates are not produced nationally.

Information from the 2011 Census is available for different geographical areas from http://neighbourhood.statistics.gov.uk and www.nomisweb.co.uk/census/2011.

Information relating to the Index of Multiple Deprivation 2015 was downloaded from the Communities and Local Government website (Communities and Local Government 2015). ACORN and Health ACORN classifications at postcode and output area level were purchased from CACI (www.caci.co.uk/insite). Customer profile types (housing types) were obtained from Hull City Council who derived the profiles.

The prevalence from the Quality and Outcomes Framework (QOF) GP disease registers (see *section 5.5* on *page 34* for more information) have been taken from Excel files downloaded from the Information Centre (Information Centre for Health and Social Care 2010).

The models to estimate the prevalence of disease (and compare the figures to the figures on the QOF GP registers) were obtained from the Association of Public Health Observatories (www.apho.org.uk) which are now part of Public Health England.

The GP registration file was available on the Primary Care Information System (PCIS), previously known as Open Exeter (Connecting for Health, 2009). This file included individual level data on all people registered with GPs within the Hull and East Riding of Yorkshire PCTs (plus a few practices outwith this area). The file included gender, date of birth, GP information and the postcode of the residence, and was merged with the NHS postcode lookup file so that other geographical information was available (e.g. lower layer super output areas). From this file, an estimate of the resident population could be derived for subpopulations of Hull, such as the number of residents based on ward or deprivation scores (derived from the Index of Multiple Deprivation 2015 score assigned to the lower layer super output area (LLSOA) geography which includes the residents' postcodes, see Hull JSNA Toolkit: Deprivation and Associated Measures and *section 2.4* on *page 8* for more information about deprivation scores). However, since 2013, individual-level population data has not been available. Aggregated data is still available for each primary care practice[4], and has been used in some local analyses in particular analyses involving the registered or patient population of Hull such as the analysis of the QOF GP disease registers. For local analyses which require an estimate of the resident population, figures from the Office for National Statistics have been used who produce estimates at ward and LLSOA level as well as for Hull overall. Their estimates are produced for each gender separately and by single year of age. Breast and cervical cancer screening uptake rates are also available from PCIS at practice level.

More recently, the individual level population data has not been available from PCIS, but the estimated registered population by practice is available by gender in 5 year age bands from the Health and Social Care Information Centre.

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[4] For all primary care practices in England, the number of registered patients by gender and single year of age is available, as well as the total number of registered patients living in each LLSOA.

The Public Health Mortality Files (PHMF) and the Public Health Birth Files (PHBF) are both available to PCTs and more recently Public Health analysts at the local authority from the Office for National Statistics (most recently via the Primary Care Mortality Database). These files contain individual records for all deaths and births respectively in Hull. The age, gender and postcode of each individual are included in the file. The PHMF includes the date of death, underlying cause of death and place of death. The PHMF has been used for analyses involving the calculation of the number of deaths from specific causes as well as the calculation of standardised rates when mortality information has been presented for wards and other local geographical areas, or by deprivation quintiles. For these analyses, resident population estimates were derived from the GP registration file mentioned above (Connecting for Health, 2009). In some cases, the estimate for Hull has been presented, but this will not be the same as the figure produced in the NHS Information Centre Indicator Portal due to the differing population estimates. In these circumstances, the figure from the NHS Information Centre Indicator Portal should be used in preference to any locally derived figures. Using the resident population estimate from the GP registration file tends to produce a slightly higher life expectancy estimate and a slightly lower directly standardised mortality rate compared to the NHS Information Centre Indicator Portal, because the local population estimate (from the GP file) is slightly higher than ONS's estimate.

Patient level data for daycase and inpatient admissions was obtained from local Hospital Episode Statistics (Office for National Statistics 2009; Information Centre for Health and Social Care 2014). Prior to April 2013, the HES dataset was provided by colleagues in the Performance team of NHS Hull. The file included patient's gender, date of birth, dates of admission and discharge, primary and secondary causes of admission and information on any surgical procedures undertaken as well as the type of admission (daycase, elective or emergency). For more information about Hospital Episode Statistics data, see *section 5.4* on *page 34*.

Projected population estimates were obtained from the Office for National Statistics (ONS) from www.statistics.gov.uk.

Local information on the prevalence of lifestyle and behavioural risk factors and measures of social capital was obtained from local surveys (see *section 5.3* on *page 32*). National prevalence information was obtained from the General Lifestyle Survey (previously General Household Survey) (Economic and Social Data Service 2008), the Health Survey for England (Health Survey for England 2008) or Integrated Household Survey (Office for National Statistics 2013). Alternatively, for indicators within the Public Health Outcomes Framework, the data from the PHOF data tool was used (Public Health England 2015) or data from sources quotes from within the "metadata" worksheet within Excel data file downloaded from the PHOF data tool website.

Population projections relating to older people were obtained from the Projecting Older People Population Information System (POPPI) website (see www.poppi.org.uk).

Social care information was obtained from Projecting Adult Needs and Service Information (PANSI) (Oxford Brookes University and Institute of Public Care 2012).

Yorkshire & the Humber Public Health Observatory Programme Budgeting and Marginal Analysis toolkit was available from www.yhpho.org.uk.

5.2 Synthetic or Modelled Estimates

The Association of Public Health Observatories (APHO) has produced a technical briefing on prevalence modelling (Association of Public Health Observatories 2011). This discusses some of the problems associated with producing a modelled or synthetic estimate. The following was produced independently of the APHO, by the Public Health Sciences Team, but covers a number of the same points:

Research and modelling methodology: The accuracy of any synthetic estimates depends on the quality of the initial research and the modelling itself. If the model is too simple, for example, just containing age and sex as predictors, this means that the resulting estimates will be poor for geographical areas with particularly low or particularly high levels of other factors that influence the estimates, such as deprivation. If the model is complex and contains a high number of predictive factors, it is very possible that the model would be "over-fitted". This is a statistical term meaning that the model is (artificially) a good model using the initial research, but a much poorer model when applied elsewhere.

Testing: Even if the modelling has been undertaken by qualified statisticians who understand the numerous problems associated with generating models, it needs to be 'tested' and any modelling is still based on initial research. It is very rare for models to be 'tested', so generally the accuracy with which the model predicts the true situation is largely unknown.

Validity and generalisability: The quality of the original epidemiological studies could differ substantially, and it is possible that these studies, for any number of reasons, may not be appropriate or of sufficiently high quality to use in modelling. Furthermore, it is possible that a number of different epidemiological studies have been used to generate the model and this has its own complications; combining data from different studies that have used different methodology and definitions, and undertaken at different points in time. It is likely that the initial research was not originally intended to generate such a model, and if different studies have been used it is possible that the factors / variables in the model differ. This means that assumptions need to be made or changes need to be made to the original data to generate a model. For example, it is possible that different measures of deprivation have been used in the original research, but one measure needs to be used in the final model. The time lapse between the original research and the period to which the modelling refers may be long enough to render the model inaccurate under more recent circumstances. It is very possible that the initial research was undertaken in a very specific geographical area, and if this was the case, then there

might be very little or no data at the extremes of a highly influential factor, which would result in a very poor model when applied to geographical areas which are substantially different from the geographical area of the initial research. For example, if the original research was undertaken in a geographical area with "average" deprivation and relatively few or no deprived areas, then there would be little or no data from the original research to provide good predictions for more deprived areas. The model would generate predictions for much more deprived areas, but it is likely that the predictions could be very poor as the model is generating a prediction outside the range of the original data. This is particularly the case for Hull due to its high level of deprivation. Even where the model is constructed from data drawn from a wide range of situations (e.g. high/low deprivation), the linear assumptions made by most models may break down at the extremes, and all too often Hull is at the extreme end of either explanatory or observed variables. This will lead to inappropriate extrapolation and inaccurate and systematically biased estimates.

Lack of transparency in relation to synthetic estimates: Most of the time, the details of the model used to create the synthetic estimates are not available. Therefore, it is difficult to assess the quality of the estimate or the quality of the original research used to derive the model. Furthermore, synthetic estimates are sometimes provided without stating where the estimate comes from or even that it is a modelled / synthetic estimate.

Problems with updating synthetic estimates: Without knowing the details of the model, it is very difficult to assess how and when the model will change in the future (when new data included in the model becomes available). For example, the Index of Multiple Deprivation score was created in 2001 and updated in 2004 and 2007, and if the model included this then it is not likely to change until 2010 or even later (if at all). Some models will use data from the Census, which is updated every ten years with the last Census conducted during 2001. So information from the Census is relatively out of date, and new Census data will not be available until around 2012-2013 once the 2011 Census data is analysed and published.

Examples. Synthetic estimates have been derived by the Public Health Observatories (PHO), and 'factsheets' are available for each Primary Care Trust / Local Authority from the Yorkshire and the Humber PHO (YHPHO)[5]. Historically the synthetic estimates for smoking prevalence in Hull have been considerably higher than local Health and Lifestyle Survey estimates (almost one third higher). The PHO estimate for 2006-2008 was 32.5% for smoking prevalence which was similar to the local surveys conducted in Hull. However, the estimate prior to this (included in the profiles published during 2009) was 41.9%. **Table 8** gives the synthetic estimates and estimates from the local surveys[6] conducted in Hull, and presenting the information is just illustrative as a example of the potential problems with synthetic estimates particularly when modelling occurs at the extremes (like Hull in terms of deprivation).   More recent estimates of prevalence

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[5] Health Intelligence Practice Profiles and PCT Level Profiles on http://www.yhpho.org.uk/
[6] All the local surveys in Hull have used quota sampling so are representative of Hull's population in terms of age, gender and geography (and employment status).

estimates at a local level have generally been obtained from larger national surveys, so synthetic estimates have been produced and presented to a lesser degree recently.

Table 8: Public Health Observatory synthetic lifestyle prevalence estimates for Hull compared to estimates from local health and lifestyle surveys

Estimate type	Time period / survey	Prevalence estimate in Hull (%)*				
		Smoking	Binge drink	Healthy eating	Physically active	Obese
Synthetic	2003-2005 (used in 2009 profiles)	40.9	26.2	20.0	12.2	27.3
	2006-2008 (used in 2011 and 2012 profiles)	32.5	28.1	**	**	**
From local surveys	Health & Lifestyle Survey 2007	31.7	21.9	23.0	26.3	20.8
	Prevalence Survey 2009	35.1	19.9	26.1	30.8	24.4
	Social Capital Survey 2009	32.7	**	28.1	39.2	26.3

*These 'terms' are not defined, so it is difficult to know exactly what is meant by 'physically active' or 'healthy eating'. Locally, 'healthy eating' is defined as eating 5-A-DAY, and physical activity was defined based on fulfilling the national physical activity recommendations. So definitions may not be comparable.
**Not published or not asked in local survey.

5.3   Local Surveys

In order to have an impact on reducing inequity in health and preventing disease rather than just treating disease, it is necessary to influence people's attitudes and behaviours towards health, and in order to accomplish this it is necessary to have knowledge about health-related attitudes and behaviours and people's perceptions towards their health, as well as the prevalence of risk factors, such as smoking, and prevalence of diseases and medical conditions.

National data are available for some health and lifestyle issues from nationally conducted surveys, but since this covers the whole of England, historically relatively few people within the local area have participate in the survey but more recently the numbers within each local authority are much larger. Information from these national surveys is useful as local results can be compared with national results (usually for England), e.g. prevalence of smoking, prevalence of alcohol consumption or general health status. However, in many cases different questions and response categories, and differences in the survey designs, mean that it is not straightforward to compare the results directly.

A number of local quantitative and qualitative surveys have been conducted as follows:

- Adult Health and Lifestyle Surveys
    - 2003
    - 2007
    - 2009
    - 2011-12
    - 2014
- Adult Black and Minority Ethnic Health and Lifestyle Surveys
    - 2007
    - 2012
- Young People Health and Lifestyle Surveys
    - 2002
    - 2008-09
    - 2012
- Veterans' Health and Lifestyle Survey 2009
- Social Capital Surveys
    - 2004
    - 2009
    - (2007, 2011-12 and 2014 Adult Health and Lifestyle Surveys also contained some questions on social capital)
- Qualitative and Social Marketing Research
    - Attitudes to Health Focus Groups 2007
    - Reflector Groups Following 2007 Adult Health and Lifestyle Survey
    - Reflector Groups Following 2008-09 Young People Health and Lifestyle Survey
    - Reflector Groups Following 2011-12 Adult Health and Lifestyle Survey
    - Reflector Groups Following 2012 Young People Health and Lifestyle Survey

Further information about each of these local surveys and all the survey reports can be found at www.hullpublichealth.org Further (less detailed) information about each survey is also given in the Hull JSNA Toolkit: Summaries and Information, and some of the other Hull JSNA Toolkit reports where local survey data is presented, for example, those reports reporting health status or the prevalence of risk factors.

Some other quantitative and qualitative surveys, and patient and public involvement projects have also been conducted by colleagues in NHS Hull as follows:

- Other Surveys
    - 5-A-DAY Survey 2004
    - Community Groups Physical Activity Survey 2006-09 (see Hull JSNA Toolkit: Physical Activity for more information)
- Patient and Public Involvement Projects
    - Membership
    - Listening Exercise "We're All Ears"

Further information about these other surveys and patient and public involvement projects are given within the Hull JSNA Toolkit Release 4 report.

A number of other research projects have examined attitudes towards risk factors and diseases for the purposes of informing local social marketing projects, and these are mentioned within the specific Hull JSNA Toolkit documents, e.g. Chronic Obstructive Pulmonary Disease, Breastfeeding.

5.4   Hospital Episode Statistics

Hospital Episode Statistics (HES) refers to the data generated during a stay in hospital. Inpatient admission rates provide useful information about the general level of illness and the use of hospital services within geographical areas. Although many factors influence admission rates so findings should be interpreted cautiously with regard to assessing the general level of illness. A detailed discussion of this and a list of various factors which can influence the hospital admission rate are given in the JSNA Toolkit: Glossary document. These documents also explain the difference between "clinician episodes" and hospital stays.

5.5   Quality and Outcomes Framework

As part of the General Medical Services contract implemented in April 2004, the Quality Outcomes and Framework (QOF) was set out as a means for practices to measure achievement against a set of clinical and other indicators that reflected the quality of care provided to their patients. GP practices have been submitting QOF data since this time via the Quality Management and Analysis System (QMAS), the national system established to support the calculation of GP practice payments according to the achievements against QOF.

Within each of the Hull JSNA Toolkit disease-specific reports the diagnosed prevalence of the relevant disease is given from the Quality Outcomes and Framework (QOF), where available. The Excel data tables can be downloaded from the Information Centre (Information Centre for Health and Social Care 2010). Patients can be on more than

one disease register. Further information is available relating to the quality of care received by patients on the specific disease registers. For instance, the number of people on the diabetes register who have had retinal screening during the previous 15 months, or the number of people on the coronary heart disease register in whom the last blood pressure reading (measured in the last 15 months) was 150/90 or less, etc. However, within this report it is not possible to examine these additional indicators. Some key indicators have been examined in more detail at practice level for some of the equity audits available at www.hullpublichealth.org.

In general, one would expect that Hull would have a higher prevalence of these conditions relative to England as a whole and other less deprived areas, as the prevalence of the risk factors is generally higher in Hull. However, this is not necessarily the case, patients in more deprived areas may be less likely to present with symptoms or their concerns and may as a result be more likely to be undiagnosed. Furthermore, if mortality rates are particularly high for a particular disease compared to another geographical area perhaps because patients present with their symptoms later or because patients have other risk factors and/or co-morbidities which influence their mortality, then it is possible that the prevalence of disease is lower in a deprived area compared to a more affluent geographical area.

Note that the prevalence is not adjusted in any way for the patient population – for example, practices with a relatively high percentage of elderly patients, patients in nursing homes and patients who live in more deprived areas (who will have a higher prevalence of risk factors such as smoking and poor diet and may be less likely to present if they develop symptoms). However, as well as differences among the practices which will be due to the patient population, there will also be differences in the prevalence due to differences in how well the practices diagnose and record cases of each disease and medical condition. A more detailed document has been produced which discusses these and other issues (available on request). However, in summary the following factors can influence the prevalence of diagnosed disease on the practice registers:

- Differences in age and gender structure among practices;
- Differences in deprivation among practices (influenced by poor housing, unemployment and lower paid jobs, increased stress, higher prevalence of risk factors for poor health such as smoking, obesity, poor diet, lack of physical activity, etc);
- Differences in patient profiles among practices, such as practices predominately serving student populations, a high proportion of nursing or care homes, or high risk groups such as the homeless, drug addicts and asylum seekers, or other choices made by the patient based on ethnicity or ease of travelling to the practice which can influence the structure of the practice population;
- Differences in resources and skills base among practices with larger practices, in general, being able to produce more accurate and complete disease registers;
- Different GPs specialising in different diseases and medical conditions, so registers in those practices may be more accurate and complete compared to

other practices as patients with those specific diseases as patients within those practices have been targeted by the GP(s) over a long period of time;

- Differences in the knowledge and attitudes to health among the patients will affect the completeness of the register, with patients who tend to be more knowledgeable about their health more likely to consult their GP about a particular problem and therefore more likely to be subsequently placed on a disease register compared to patients who accept poor health at a younger age due to their family history and low expectations of health;
- Differences in list size errors among practices can influence the disease prevalence as practices with an inflated list size will have a higher true prevalence of the condition compared to their calculated prevalence (based on the incorrect list size).

Therefore, when comparing the prevalence and achievement figures among practices, it is important to consider potential biases and circumstances for those particular practices. The mean age and deprivation scores of registered patients is given in *Table 9*, and QOF prevalence information presented by practices have used General Practice Groupings which categorise practices into four groups based on the mean age and deprivation scores of their registered patients.

5.6   General Practice Groupings

The general practices in Hull differ with regard to their registered population in terms of deprivation and age of patients (and other characteristics). When assessing different characteristics of a practice in terms of health need, such as the prevalence of diagnosed disease, hospital admission rates or mortality rates, it is generally more useful to consider if a particular practice has a higher or lower prevalence or rate in relation to other similar Hull practices (comparing like-with-like[7]) rather than compare each practice with the Hull average or a national figure.

The Index of Multiple Deprivation 2015 has been used to measure deprivation (see Hull JSNA Toolkit: Deprivation and Associated Measures and *section 2.4* on *page 8* for more information). Nationally, a deprivation score has been assigned to each of the lower layer super output areas (LLSOAs) within Hull. On average, 1,500 residents live in each of the 166 LLSOAs in Hull. This IMD 2015 score has been determined for each registered patient based on their postcode (and which of the 166 LLSOA they live within). There is an assumption that the average deprivation score for the LLSOA is representative for each registered patient and this might not be the case (the patients registered at a specific practice may be more deprived than the average for their area – see Hull JSNA Toolkit: Deprivation and Associated Measures for more information). The age distribution of all the patients registered with a practice is also known, so it is

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[7] Theoretically it is possible to group practices using more characteristics than deprivation and age, however, as the number of characteristics increase, in practice, it becomes much more difficult to group the practices into similar groups.

possible to calculate the mean deprivation scores and mean ages of the patients for each Hull practice.

The primary care groups were originally defined using the IMD 2007 using the population as at April 2010 to calculate the mean IMD score and mean age of the patients and practices were grouped into eight different groups (in JSNA Toolkit Release 4). However, the local CCG preferred a four peer comparison groups with a small number of practices assigned to the same group for practical reasons, e.g. the practices share the same practice manager[8]. In 2013, these four groupings were derived from the mean IMD 2010 score and mean age of their patients to group practices into four different groups (least deprived, most deprived, middle deprivation group with younger population, middle deprivation group with older population).

In November 2015, a new Index of Multiple Deprivation 2015 was published (see Hull JSNA Toolkit: Deprivation and Associated Measures and *section 2.4* on *page 8* for more information), and the local CCG were forming their own groups of practices for different purposes. Their groups were based on economies of scale, and were based on which practices were currently working together or which practices might work together in the future. Thus their groupings were more geographically based.

Within the JSNA Toolkit reports, the reason for grouping practices was different, so a different set of groupings were produced. These comparison groupings together with the CCGs geographical-based groupings have both been used when presenting practice-level information such as disease prevalence information from the Quality and Outcomes Framework, or hospital admission rates.

The new 2015 PHS groupings are based on the mean IMD 2015 scores and not the mean age of the patients. It can be seen that within *Figure 2*, the mean age of the patients does not differ greatly except for practices with a mean deprivation score under 30 or so. Thus, to simplify the primary care groupings, it was decided to simply group on deprivation alone. As five groupings have generally been used in other analyses, it was decided to use five primary care groups.

Table 9 gives the mean age of the patients registered with each practice (as at April 2015). The deprivation scores are given in *Table 9*, and should be used as a guide to the level of deprivation within each practice.

Table 9 and *Figure 3* give the assigned groups for each practice based on the mean deprivation score of their registered patients. The groupings finalised so the total list size of each group of practices were approximately similar. Group A (least deprived) included 12 practices and had a total list size of 56,076 patients as at April 2015, Group B included 8 practices with a total list size of 57,155 patients, Group C included 11 practices with a total list size of 55,980, Group D had 12 practices with a total list size of

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[8] The Clinical Commissioning Group (CCG) asked if practices could be grouped into four different groups with certain practices included in the same group as the practice manager was the same, and they did not want to produce different 'peer group' reports if their practices were in two or more peer groups.

59,043 and Group E (most deprived) included 12 practices with a total list size of 62,044 patients.

Table 9 includes seven practices which were open in 2004/05 when the QOF GP disease registers were first introduced, but have since closed. The list sizes, mean deprivation scores (IMD 2004, 2007 or 2010) and mean age of patients are based on their registered patients prior to closure.

Table 10 and **Table 11** give the CCG groupings which are more geographical-based. There are two versions as a final decision has not been made as to which group "Bridge Group" will be assigned. It will either be assigned to North 3 (**Table 10**) or West 2 (**Table 11**).

A map illustrating the location of general practices in Hull is given In Hull JSNA Toolkit: Geographical Area.

Figure 2: Mean deprivation score and mean age of registered patients for each general practice as at April 2015
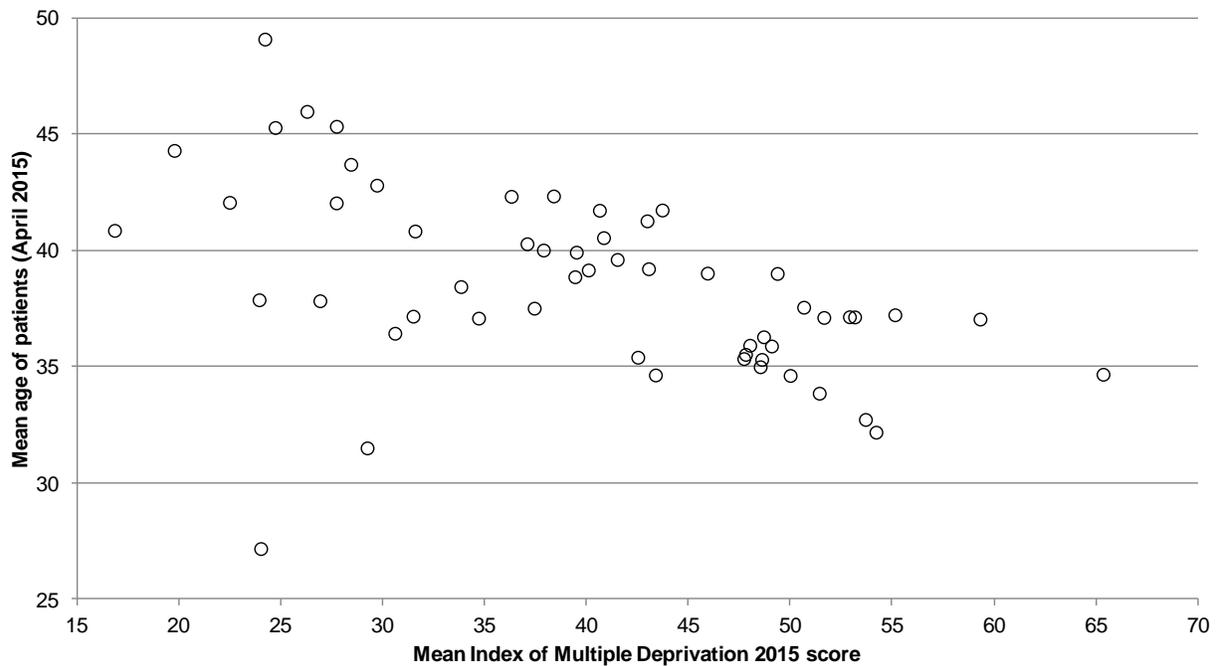
Figure 3: Mean deprivation score and mean age of registered patients for each general practice as at April 2015 and assignment to peer groups (based on deprivation alone)
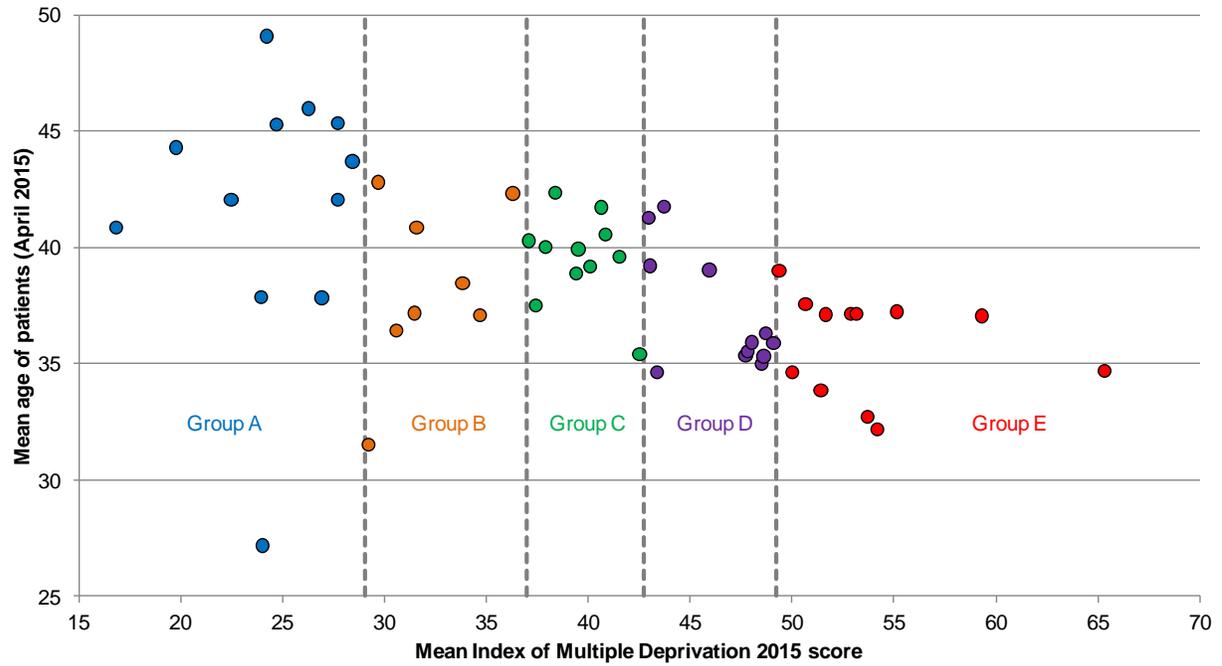
Table 9: Mean deprivation score and mean age of registered patients for each general practice as at April 2015 and assignment to peer groups (based on deprivation alone)

Group	Practice	List size	Mean IMD 2015	Mean patient age	Approximate closure date (if applicable)
A	B81021: Faith House Surgery	7,639	27.71	42.04	
A	B81035: The Avenues Medical Centre	6,004	22.47	42.06	
A	B81056: The Springhead Medical Centre	15,266	16.82	40.86	
A	B81075: Dr Mallik	1,792	24.20	49.08	
A	B81085: Dr Richardson (Haxby - Burnbrae Surgery)	5,000	28.42	43.70	
A	B81094: Dr Datta (Dr Raut)	1,309	24.71	45.28	
A	B81095: Dr Cook (Field View Surgery)	3,828	27.71	45.33	
A	B81097: Holderness Health Open Door	1,502	26.27	45.97	
A	B81104: Dr Nayar (Newland Health Centre)	5,685	24.00	27.17	
A	B81635: Dr Dave	3,128	19.75	44.30	
A	B81644: Chestnut Farm Surgery	2,242	26.90	37.83	
A	B81662: Mizzen Road Surgery*	1,719	22.36	45.18	Dec-2011
A	B81668: Dr Stryjakiewicz*	3,282	26.12	37.95	Mar-2008
A	B81676: Dr Jones & Partner*	2,620	20.69	26.51	Jul-2005
A	Y01200: The Calvert Practice (CHCP)	2,681	23.92	37.87	
A	Y02786: Priory Surgery*	1,716	28.78	34.91	Jul-2015
B	B81001: Dr Ogunba & Partners*	3,333	32.10	38.92	Mar-2011
B	B81020: Sutton Manor Surgery	7,457	31.57	40.83	
B	B81038: The Oaks Medical Centre	7,170	36.29	42.32	
B	B81048: The Newland Group	8,800	30.58	36.43	
B	B81049: New Hall Surgery	9,322	33.82	38.44	
B	B81052: Dr Musil	5,741	34.69	37.08	
B	B81072: Dr Percival & Partners	6,552	31.48	37.17	
B	B81646: Dr Shaikh*	1,822	33.98	40.53	Nov-2010

Group	Practice	List size	Mean IMD 2015	Mean patient age	Approximate closure date (if applicable)
B	B81690: St Andrew's - Northpoint	1,266	29.69	42.80	
B	Y02747: Haxby Group (Kingswood, Orchard Park & Priory Surgeries)	10,847	29.22	31.50	
C	B81008: Morrill Street Group Practice	13,789	39.42	38.86	
C	B81011: Kingston Health (Hull)	8,738	37.88	40.01	
C	B81057: St Andrew's (Dr MacPhie, Raghunath & Partners)	2,591	40.83	40.54	
C	B81066: Dr Chowdhury	2,300	40.08	39.15	
C	B81074: Dr Rej (CHCP)	3,009	38.37	42.34	
C	B81080: Dr Malczekski	2,081	40.63	41.72	
C	B81081: New Green Surgery (Dr Tang)	3,880	39.49	39.92	
C	B81616: Dr Hendow	2,505	41.50	39.61	
C	B81645: East Park Practice (Assura)	3,657	37.42	37.51	
C	B81675: Newington (CHCP)	8,153	42.51	35.40	
C	B81682: Longhill Health Care Centre (Dr Shaikh)	5,277	37.07	40.28	
D	B81002: Dr Kumar-Choudhary	3,453	48.68	36.28	
D	B81047: Wolseley Medical Centre	7,015	45.92	39.02	
D	B81053: Diadem Medical Practice	11,881	43.03	39.21	
D	B81054: Dr Varma (Clifton House)	9,281	43.70	41.73	
D	B81058: Sydenham House Group Practice	7,743	42.96	41.27	
D	B81112: St Andrew's - Bransholme	3,141	48.59	35.31	
D	B81119: Dr Palooran & Koshy	4,376	49.07	35.88	
D	B81634: St Andrew's -Dr J Venugopal	2,794	48.01	35.92	
D	B81674: Dr Joseph	2,362	43.37	34.64	
D	B81685: Dr Poulose	2,338	47.71	35.34	
D	Y02344: Northpoint (Assura)	3,192	47.80	35.52	
D	Y02748: Haxby Orchard Park Surgery*	*1,824*	*48.16*	*33.08*	*Jul-2015*
D	Y02896: Story Street Practice & Walk In Centre	1,467	48.52	34.99	
E	B81017: Kingston Medical Group (CHCP)	7,110	53.15	37.13	
E	B81018: Dr Awan & Partners (Orchard 2000)	6,044	59.31	37.04	

Group	Practice	List size	Mean IMD 2015	Mean patient age	Approximate closure date (if applicable)
E	B81027: St Andrew's Group Practice	6,231	49.35	39.00	
E	B81032: Wilberforce Surgery	2,949	51.64	37.11	
E	B81040: Dr Weir & Partners (Marfleet Group Practice)	14,732	50.65	37.55	
E	B81046: Bridge Group	8,972	55.13	37.23	
E	B81089: Dr Witvliet	3,644	52.90	37.14	
E	B81631: Dr Raut	3,516	54.20	32.18	
E	B81683: St Andrew's (Dr Raghunath & Partners - Koul)	1,806	51.42	33.85	
E	B81688: Dr Gopal	1,915	49.99	34.62	
E	B81692: The Quays Medical Centre (CHCP)	2,638	53.68	32.72	
E	Y00955: Riverside Medical Centre (CHCP)	2,487	65.35	34.67	

*Practice closed.

Table 10: CCG primary care groupings, 2015 (version 1)

Group	Practice code	Practice name	List size, Sept 2015
North 1	B81002	Dr Kumar-Choudhary	3,463
	B81112	St Andrew's - Bransholme	3,204
	B81119	Dr Palooran & Koshy	4,427
	B81616	Dr Hendow	2,513
	B81634	St Andrew's -Dr J Venugopal	2,722
	B81685	Dr Poulose	2,394
	B81688	Dr Gopal	1,921
	B81690	St Andrew's - Northpoint	1,234
	Y02344	Northpoint (Assura)	3,152
North 2	B81021	Faith House Surgery	7,683
	B81035	The Avenues Medical Centre	6,123
	B81048	The Newland Group	8,785
	B81049	New Hall Surgery	9,401
	B81072	Dr Percival & Partners	6,608
	B81095	Dr Cook (Field View Surgery)	3,742
	B81104	Dr Nayar (Newland Health Centre)	5,510
North 3	B81018	Dr Awan & Partners (Orchard 2000)	6,049
	B81046	Bridge Group	9,017
	B81094	Dr Datta (Dr Raut)	1,323
	B81631	Dr Raut	3,523
	B81644	Chestnut Farm Surgery	2,252
	Y02747	Haxby Group (Kingswood, Orchard Pk & Priory Surgeries)	11,136
East 1	B81008	Morrill Street Group Practice	13,836
	B81020	Sutton Manor Surgery	7,446
	B81053	Diadem Medical Practice	11,875
	B81080	Dr Malczekski	2,070
	B81081	New Green Surgery (Dr Tang)	3,964
	B81635	Dr Dave	3,141
	B81674	Dr Joseph	2,395
	B81682	Longhill Health Care Centre (Dr Shaikh)	5,274
East 2	B81040	Dr Weir & Partners (Marfleet Group Practice)	14,644
	B81066	Dr Chowdhury	2,297
	B81074	Dr Rej (CHCP)	3,005
	B81085	Dr Richardson (Haxby - Burnbrae Surgery)	4,942
	B81089	Dr Witvliet	3,571
	B81097	Holderness Health Open Door	1,496
	B81645	East Park Practice (Assura)	3,660

Group	Practice code	Practice name	List size, Sept 2015
City Centre	B81017	Kingston Medical Group (CHCP)	7,172
	B81032	Wilberforce Surgery	3,092
	B81047	Wolseley Medical Centre	7,046
	B81052	Dr Musil	5,782
	B81054	Dr Varma (Clifton House)	9,250
	B81692	The Quays Medical Centre (CHCP)	2,866
	Y00955	Riverside Medical Centre (CHCP)	2,552
	Y02896	Story Street Practice & Walk In Centre	1,459
West 1	B81011	Kingston Health (Hull)	8,824
	B81038	The Oaks Medical Centre	7,222
	B81056	The Springhead Medical Centre	15,652
	B81057	St Andrew's (Dr MacPhie, Raghunath & Partners)	2,606
	B81075	Dr Mallik	1,773
	B81675	Newington (CHCP)	7,923
	B81683	St Andrew's (Dr Raghunath & Partners - Koul)	1,769
	Y01200	The Calvert Practice (CHCP)	2,757
West 2	B81027	St Andrew's Group Practice	6,280
	B81058	Sydenham House Group Practice	7,784

Table 11: CCG primary care groupings, 2015 (version 2)

Group	Practice code	Practice name	List size, Sept 2015
North 1	B81002	Dr Kumar-Choudhary	3,463
	B81112	St Andrew's - Bransholme	3,204
	B81119	Dr Palooran & Koshy	4,427
	B81616	Dr Hendow	2,513
	B81634	St Andrew's -Dr J Venugopal	2,722
	B81685	Dr Poulose	2,394
	B81688	Dr Gopal	1,921
	B81690	St Andrew's - Northpoint	1,234
	Y02344	Northpoint (Assura)	3,152
North 2	B81021	Faith House Surgery	7,683
	B81035	The Avenues Medical Centre	6,123
	B81048	The Newland Group	8,785
	B81049	New Hall Surgery	9,401
	B81072	Dr Percival & Partners	6,608
	B81095	Dr Cook (Field View Surgery)	3,742
	B81104	Dr Nayar (Newland Health Centre)	5,510

Group	Practice code	Practice name	List size, Sept 2015
North 3	B81018	Dr Awan & Partners (Orchard 2000)	6,049
	B81094	Dr Datta (Dr Raut)	1,323
	B81631	Dr Raut	3,523
	B81644	Chestnut Farm Surgery	2,252
	Y02747	Haxby Group (Kingswood, Orchard Pk & Priory Surgeries)	11,136
East 1	B81008	Morrill Street Group Practice	13,836
	B81020	Sutton Manor Surgery	7,446
	B81053	Diadem Medical Practice	11,875
	B81080	Dr Malczekski	2,070
	B81081	New Green Surgery (Dr Tang)	3,964
	B81635	Dr Dave	3,141
	B81674	Dr Joseph	2,395
	B81682	Longhill Health Care Centre (Dr Shaikh)	5,274
East 2	B81040	Dr Weir & Partners (Marfleet Group Practice)	14,644
	B81066	Dr Chowdhury	2,297
	B81074	Dr Rej (CHCP)	3,005
	B81085	Dr Richardson (Haxby - Burnbrae Surgery)	4,942
	B81089	Dr Witvliet	3,571
	B81097	Holderness Health Open Door	1,496
	B81645	East Park Practice (Assura)	3,660
City Centre	B81017	Kingston Medical Group (CHCP)	7,172
	B81032	Wilberforce Surgery	3,092
	B81047	Wolseley Medical Centre	7,046
	B81052	Dr Musil	5,782
	B81054	Dr Varma (Clifton House)	9,250
	B81692	The Quays Medical Centre (CHCP)	2,866
	Y00955	Riverside Medical Centre (CHCP)	2,552
	Y02896	Story Street Practice & Walk In Centre	1,459
West 1	B81011	Kingston Health (Hull)	8,824
	B81038	The Oaks Medical Centre	7,222
	B81056	The Springhead Medical Centre	15,652
	B81057	St Andrew's (Dr MacPhie, Raghunath & Partners)	2,606
	B81075	Dr Mallik	1,773
	B81675	Newington (CHCP)	7,923
	B81683	St Andrew's (Dr Raghunath & Partners - Koul)	1,769
	Y01200	The Calvert Practice (CHCP)	2,757
West 2	B81027	St Andrew's Group Practice	6,280
	B81046	Bridge Group	9,017
	B81058	Sydenham House Group Practice	7,784

5.7 Outcome Measures, Performance Targets and Progress Towards Targets

5.7.1 Historical Indicators, Outcome Measures and Targets

Further information about historical outcome measures and targets, and progress towards historical targets is given in the JSNA Toolkit Release 4.

5.7.2 Problems Associated With Some Outcome Measures

Further information about some of the problems associated with specific measures, such as using life expectancy and the all age all cause mortality rate as outcome measures are given in Hull JSNA Toolkit: Mortality report.

5.7.3 Public Health Outcomes Framework

5.7.3.1 Introduction

The current key indicators for public health are those specified in the Public Health Outcomes Framework (PHOF) which was published in January 2012 (Department of Health 2012; Department of Health 2012).

From the Introduction to the Public Health Outcomes Framework 2013 to 2016 document produced in January 2012[9], "The responsibility to improve and protect our health lies with us all – government, local communities and with ourselves as individuals. There are many factors that influence public health over the course of a lifetime. They all need to be understood and acted upon. Integrating public health into local government will allow that to happen – services will be planned and delivered in the context of the broader social determinants of health, like poverty, education, housing, employment, crime and pollution. The NHS, social care, the voluntary sector and communities will all work together to make this happen. The new Public Health Outcomes Framework (PHOF) that has been published is in three parts. Part 1 introduces the overarching vision for public health, the outcomes we want to achieve and the indicators that will help us understand how well we are improving and protecting health. Part 2 specifies all the technical details we can currently supply for each public health indicator and indicates where we will conduct further work to fully specify all indicators. Part 3 consists of the impact assessment and equalities impact assessment."

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[9] https://www.gov.uk/government/publications/healthy-lives-healthy-people-improving-outcomes-and-supporting-transparency

The vision for the PHOF is "to improve and protect the nation's health and wellbeing, and improve the health of the poorest fastest". There are two overarching outcomes to "increase healthy life expectancy and to reduce differences in life expectancy and healthy life expectancy between communities." There are also four domains:

- "**Domain 1 – Improving the wider determinants of health**
  - o Objective: improvements against wider factors that affect health and wellbeing, and health inequalities.
- **Domain 2 – Health improvement**
  - o Objective: people are helped to life healthier lifestyles, make healthy choices and reduce health inequalities
- **Domain 3 – Health protection**
  - o Objective: the population's health is protected from major incidents and other threats, while reducing health inequalities
- **Domain 4 – Healthcare public health and preventing premature mortality**
  - o Objective: reduced numbers of people living with preventable ill health and people dying prematurely, while reducing the gap between communities."

A small number of the PHOF outcomes are still under development, but where data is available it has been published nationally on www.phoutcomes.info. A number of the indicators also have sub-indicators, and data has been published males and females separately in addition to main indicator for some of the indicators. There are approximately 200 indicators or sub-indicators. A list of the main indicators is available in *Table 12* in *section 5.7.3.3*. Specific details of all the indicators and sub-indicators are given in the local analysis of the PHOF indicators at www.hullpublichealth.org as well as in Hull's JSNA Toolkit documents specified in *Table 12*.

5.7.3.2   National Profile for Hull and "Tartan Rug"

Nationally, profiles for each local authority have been produced and can be downloaded from www.phoutcomes.info. These are referred to as 'tartan rugs' as each indicator is colour coded for the local authority depending on whether its value is statistically significantly higher or lower than England's value. Pale blue is used where the local authority's value is significantly higher than England's, amber where there is no significant difference, and dark blue where the local authority's value is significantly lower than England's.

5.7.3.3   Local Analysis

A local analysis of indicators within the PHOF has been undertaken. The following documents have been produced:

- Each indicator summarised on single page of a document
- Each indicator summarised on single row on a single table
- Performance card summarising key local PHOF outcome measures

The first set of documents (one document for overarching outcome measures and one document for each of the four domains, plus other documents grouping some of the outcome measures, e.g. a document covering all indicators for Children and Young People) give a detailed description of the indicator, and information about the indicator such as data source, time periods of baseline and latest data, and other relevant information about the indicator data. There are also up to five graphs for each indicator depending on how much data is available for the specific indicator. These five graphs are: (1) the latest figures for Hull and its comparator geographical areas; (2) trends over time for Hull; (3) comparison trends over time for Hull relative to England (together with regression lines if appropriate); (4) differences among the five local deprivation quintiles/fifths (based on the Index of Multiple Deprivation 2010) over time; and (5) latest data for the 23 wards in Hull. Six key points summarises Hull's baseline and latest values of the indicator, the change in the inequalities gap between Hull and England, and between the most and least deprived local deprivation quintiles, and differences across the wards. There is also a section which gives the ranking (out of 12 comparators), the 'tartan' rug colour and whether the trends and national and local inequalities gaps have improved over time or not. A significant lower indicator might denote a worse situation for some indicators whereas for other indicators a significantly higher indicator might denote a worse situation. . Therefore, for the local 'tartan rug', whether the value of Hull's indicator is 'worse', 'identical' or 'better' than England has also been noted. Although the 'tartan rug' colour may differ for one or two indicators within this report from those published nationally as within this document they are based on overlapping or non-overlapping 95% confidence intervals, and the 'tartan rug' colours might be determined differently for those published nationally.

The summary table document summarises each indicator in a single line of a table. For each indicator, the following information is given: latest values for Hull and England, the ranking of Hull for the latest value of the indicator in relation to 11 other geographical areas which are comparable to Hull, the 'tartan rug' colour for the indicator for Hull, if the indicator has improved or not in Hull over time, and whether the difference in the indicator (national (England v Hull) and local (most v least deprived quintile/fifth of areas of Hull) inequalities gap) has narrowed or widened over time.

Within these two sets of local documents, the comparator areas used for Hull are Coventry, Derby City, Leicester City, Middlesbrough, North East Lincolnshire, Plymouth, Salford, Sandwell, Stoke-on-Trent, Sunderland and Wolverhampton.

These documents are all available on our website www.hullpublichealth.org.

Information relating to each specific outcome measure has also been included within the JSNA Toolkit documents. *Table 12* details which JSNA Toolkit documents gives more information for each of the PHOF indicators.

Table 12: List of which JSNA Toolkit documents include information on each of the Public Health Outcomes Framework indicators

Domain and indicator	Hull JSNA Toolkit:
Indicators corresponding to overarching outcomes	
0.1 Healthy life expectancy	Life Expectancy
0.2 Differences in life expectancy and healthy life expectancy between communities	Life Expectancy
Domain 1: Improving the wider determinants of health	
1.01 Children in poverty	Deprivation and Associated Measures
1.02 School readiness	Deprivation and Associated Measures
1.03 Pupil absence	Deprivation and Associated Measures
1.04 First-time entrants to the youth justice system	Deprivation and Associated Measures
1.05 16-18 year olds not in education, employment or training (NEETS)	Deprivation and Associated Measures
1.06 People with mental illness or disability in settled accommodation	Mental Health
1.07 People in prison who have a mental illness or significant mental illness*	Mental Health
1.08 Employment for those with a long-term health condition including those with a learning difficulty / disability or mental illness	Mental Health
1.09 Sickness absence rate	Deprivation and Associated Measures
1.10 Killed or seriously injured casualties on England's roads	Accidents
1.11 Domestic abuse	Deprivation and Associated Measures
1.12 Violent crime (including sexual violence)	Deprivation and Associated Measures
1.13 Re-offending	Deprivation and Associated Measures
1.14 The percentage of the population affected by noise	Housing, Environment and Social Care
1.15 Statutory homelessness	Housing, Environment and Social Care
1.16 Utilisation of green spaces for exercise / health reasons	Housing, Environment and Social Care
1.17 Fuel poverty	Deprivation and Associated Measures
1.18 Social isolation among adult social care users and their carers	Housing, Environment and Social Care
1.19 Older people's perception of community safety	Mental Health
Domain 2. Health improvement	
2.01 Low birth weight of term babies	Children and Young People
2.02 Breastfeeding	Children and Young People

Domain and indicator	Hull JSNA Toolkit:
2.03 Smoking status at time of delivery	Smoking
2.04 Under 18 conceptions	Sexual Health
2.05 Child development at 2-2.5 years*	Children and Young People
2.06 Excess weight in 4-5 and 10-11 year olds	Overweight and Obesity
2.07 Hospital admissions caused by unintentional and deliberate injuries in children	Accidents
2.08 Emotional wellbeing of looked-after children	Children and Young People
2.09 Smoking prevalence – 15 year olds	Smoking
2.10 Hospital admissions as a result of self-harm*	Mental Health
2.11 Diet	Diet
2.12 Excess weight in adults	Overweight and Obesity
2.13 Proportion of physically active and inactive adults	Physical Activity
2.14 Smoking prevalence – adult (over 18s)	Smoking
2.15 Successful completion of drug treatment	Drug and Substance Abuse
2.16 People entering prison with substance dependence issues who are previously not known to community treatment*	Drug and Substance Abuse
2.17 Recorded diabetes	Diabetes
2.18 Alcohol-related admissions to hospital	Alcohol Consumption
2.19 Cancer diagnosed at stage 1 and 2	Cancer
2.20 Cancer screening coverage	Screening
2.21 Access to non-cancer screening programmes	Screening
2.22 Take up of the NHS Health Check Programme – by those eligible	Screening
2.23 Self-reported wellbeing	Mental Health
2.24 Falls and injuries in the over 65s	Older People
Domain 3. Health protection	
3.01 Air pollution	Housing, Environment and Social Care
3.02 Chlamydia diagnoses (15-24 year olds)	Sexual Health
3.03 Population vaccination coverage	Vaccinations and Immunisations
3.04 People presenting with HIV at a late state of infection	Sexual Health
3.05 Treatment completion for tuberculosis	Infectious Diseases
3.06 Public sector organisations with board-approved sustainable development management plans	Housing, Environment and Social Care
3.07 Comprehensive, agreed inter-agency plans for responding to public health incidents	Housing, Environment and Social Care
Domain 4. Healthcare public health and preventing premature mortality	
4.01 Infant mortality	Mortality
4.02 Tooth decay in children aged 5 years	Dental Health
4.03 Mortality from causes considered preventable	Mortality
4.04 Mortality from all cardiovascular disease	All Circulatory Disease
4.05 Mortality from cancer	All Cancers
4.06 Mortality from liver disease	Digestive Diseases
4.07 Mortality from respiratory disease	All Respiratory Disease
4.08 Mortality from communicable diseases	Infectious Disease
4.09 Excess under 75 mortality in adults with serious mental health	Mental Health
4.10 Suicide	Mental Health

Domain and indicator	Hull JSNA Toolkit:
4.11 Emergency re-admissions within 30 days of discharge from hospital	Inpatient Hospital Admissions
4.12 Preventable sight loss	General Health, Disabilities, Caring and Use of Services
4.13 Health-related quality of life for older people	Older People
4.14 Hip fractures in over 65s	Older People
4.15 Excess winter deaths	Mortality
4.16 Dementia and its impacts	Mental Health

*No national data published. The indicator is mentioned within the JSNA Toolkit stated, but no data is generally available.

5.8   Statistical and Epidemiological Methods and Terms

Knowledge of these statistical methods is essential for many tables and figures in order to interpret the information correctly.

More detailed information on these topics is also given within the Hull JSNA Toolkit: Glossary document, including other topics not covered here, e.g. variation, incidence and prevalence, health scores and scales, etc.

There is also a statistical presentation on www.hullpublichealth.org which covers the following topics (with detailed 'notes' pages):

- What is statistics?
- Variability
- Confidence intervals
- Problems of small numbers
- Standardisation
- Causality
- Questions to ask (when examining/interpreting data/statistics)

This document also gives examples of variability in relation to numbers surveyed and the implication on the width of confidence intervals.

Another document on www.hullpublichealth.org provides more detailed information on standardisation, including worked examples of both indirect and direct standardisation.

5.8.1 Confounding, Effect Modification and Interaction

Confounding occurs when another factor (or factors) influences the association of interest. This occurs when this other factor is associated with both the risk factor of interest and the outcome of interest. Age, gender and deprivation are frequently confounders. Failure to take into account or consider confounders when examining associations can lead to biased results – known as confounding bias. Therefore, it is important to adjust for, or consider confounders when interpreting statistical and epidemiological data.

It is also possible that one factor modifies the effect of one factor on another (effect modification). For example, it could be that there is a strong association between two factors at younger ages, but at older ages the association could disappear. Age is modifying the association between the two factors of interest.

Interaction between two different factors can also occur which influence the relationship with another factor. For example, there could be twice the risk of developing a disease for a smoker compared to a non-smoker, and twice the risk of developing the same disease if the person is overweight compared to someone who is within the 'desirable' weight category, but for an overweight smoker the risk of developing the disease may be ten times greater than a person who is a non-smoker and not overweight.

5.8.2 Confidence Intervals

A confidence interval (CI), calculated using statistical methods, gives a range of likely values for the parameter of interest. Since one cannot generally survey all people for all years within all geographical areas of interest, it is common practice to obtain necessary data from a sample of the population. However, different samples will result in different estimates for the measure of interest due to natural variation of measurement data (assuming all other influences remain constant). Therefore, it is useful to have a range of values for the measure of interest (e.g. percentage or mean, difference between two means or measure of risk, etc) rather than a single value to get an idea of the range of likely values. The usual CI calculated is the 95% CI, in which we are 95% confident that the interval obtained (from the sample) will contain the true underlying measure of interest (of your population of interest).

Interpreting confidence intervals is an essential to interpreting statistical and epidemiological data. Interpretation also needs to be considered in relation to clinical significance.

When dealing with small numbers of events (see *section 5.8.3* on *page 53*), it is very important to consider the implications of this and present and assess the width of CIs to determine how much confidence there is in the estimate presented. If there is too much variability or the numbers are too small, and the confidence intervals are wide, then it is

not possible to present any conclusions, and it is possible that findings could be misleading with incorrect assumptions being drawn.

5.8.3 Small Number of Events

When comparing the mortality rates for specific relatively rare cancers, for example, skin cancer, differences in the mortality rates can occur which appear to be large, but are actually only based on a very small number of deaths. This can lead to incorrect conclusions being drawn. Therefore, it is important to consider the confidence (see *section 5.8.2* on *page 52*) of the estimate before drawing conclusions.

5.8.4 Percentiles, Quartiles, Quintiles and Medians

Percentiles divide a distribution of ordered numerical values into groups. The 10th percentile is the value of a numerical variable for which 10% of the people or sample of values fall below. For example, if from a survey of employees at a particular company the 10th percentile for annual income is £10,000, then this would mean that 10% of the employees for this particular company were earning £10,000 or less (and 90% were earning £10,000 or more). Deciles, quintiles and quartiles are alternative names for specific percentiles. Deciles divide the observations into 10 groups (tenths) as illustrated in the example above which present one of these (10%). The quintiles divide the sample or observations or people into five groups (fifths) whereas the quartiles divide the observations into four groups. The median is the name given to the middle quartile or 50th percentile.

5.8.5 Standardisation

The prevalence of ill-health, risk factors and disease and mortality within a particular population will depend on the age and gender structure of that population (as well as many other factors such as deprivation).

In terms of the provision of resources in relation to the prevalence of ill-health, disease and risk factors in the population, it is most helpful to report on the prevalence without taking into account the age and gender distribution of the population. This is because it is necessary to treat and have the provision to treat the existing population, regardless of the age and gender structure. However, if one wishes to assess whether one population has an excess rate of disease or if there is a difference in the prevalence of disease among different levels of deprivation, it is necessary to take the age and gender structure into consideration. Otherwise any differences found may be simply due to differences in the age and gender structure of the different populations, and not due to the factor of interest, e.g. deprivation. The age and gender structure can be taken into

consideration by using standardisation. Two different methods are used to standardise: direct[10] or indirect[11] standardisation.

5.8.6   Significance Testing

It is often useful to compare a particular summary parameter (for instance, mean, median, measure of risk) among different groups. Since there is natural variation associated with virtually all measurements and since we generally only have a sample and have not measured the entire population, it is necessary to distinguish between differences which are close enough together to be explained by chance and differences which are 'unlikely' to be explained by chance. Such a comparison can be undertaken using a statistical test which takes into the account chance variation. However, even if a difference is statistically significant, the differences might not be sufficiently large enough to be of clinical importance.

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[10] Involves applying the age/gender specific rates of disease/prevalence of a risk factor observed in the study (e.g. Hull) population to a 'standard' population. For direct standardisation, the 'standard' population is generally the 2013 European Standard Population. The resulting directly standardised (mortality) rate (DSR) is frequently given as the number of deaths per 10,000 or 100,000 population.

[11] Involves applying the age/gender specific rates of disease/prevalence of a risk factor observed in the 'standard' population to the study (e.g. Hull) population. For indirect standardisation, the 'standard' population is generally England (latest mortality rates). This results in a standardised mortality (or morbidity) ratio with 100 denoting the same mortality (morbidity) rate as England after adjusting for the differences in the age/gender structure of the local study population and a value of more than 100 denoting increased mortality relative to England (e.g. an SMR of 150 denotes a mortality rate 50% higher than England after adjusting for the age/gender structure of the local population).

5.9   Underlying Data for Figures

Diagnosed chronic kidney disease prevalence by deprivation score at practice level

The underlying data for **Figure 1** from QOF (with IMD at practice level calculated using deprivation scores at lower layer super output area weighted by resident population estimated from registered population) is given in the table below.

Practices are coloured based on their deprivation group (see **section 5.6** on **page 36**). The practices range from least deprived (group A) to most deprived (group E).

Grp	Practice	IMD score	List size	Number on register	Prevalence (%)
A	B81021: Faith House Surgery	27.7	6,190	335	5.41
A	B81035: The Avenues Medical Centre	22.5	4,914	264	5.37
A	B81056: The Springhead Medical Centre	16.8	12,095	453	3.75
A	B81075: Dr Mallik	24.2	1,596	4	0.25
A	B81085: Dr Richardson (Haxby - Burnbrae Surgery)	28.4	4,146	187	4.51
A	B81094: Dr Datta (Dr Raut)	24.7	1,145	33	2.88
A	B81095: Dr Cook (Field View Surgery)	27.7	3,195	235	7.35
A	B81097: Holderness Health Open Door	26.3	1,287	67	5.21
A	B81104: Dr Nayar (Newland Health Centre)	24.0	5,315	25	0.47
A	B81635: Dr Dave	19.8	2,590	152	5.87
A	B81644: Chestnut Farm Surgery	26.9	1,746	40	2.29
A	Y01200: The Calvert Practice (CHCP)	23.9	1,957	66	3.37
B	B81020: Sutton Manor Surgery	31.6	5,876	332	5.65
B	B81038: The Oaks Medical Centre	36.3	5,803	256	4.41
B	B81048: The Newland Group	30.6	7,154	254	3.55
B	B81049: New Hall Surgery	33.8	7,202	376	5.22
B	B81052: Dr Musil	34.7	4,600	191	4.15
B	B81072: Dr Percival & Partners	31.5	5,312	239	4.50
B	B81690: St Andrew's - Northpoint	29.7	1,055	53	5.02
B	Y02747: Haxby Group (Kingswood, Orchard Park & Priory Surgeries)	29.2	4,235	65	1.53
C	B81008: Morrill Street Group Practice	39.4	10,773	561	5.21
C	B81011: Kingston Health (Hull)	37.9	6,908	328	4.75
C	B81057: St Andrew's (Dr MacPhie, Raghunath & Partners)	40.8	2,143	79	3.69
C	B81066: Dr Chowdhury	40.1	1,788	100	5.59
C	B81074: Dr Rej (CHCP)	38.4	2,456	131	5.33
C	B81080: Dr Malczekski	40.6	1,635	128	7.83
C	B81081: New Green Surgery (Dr Tang)	39.5	3,083	134	4.35
C	B81616: Dr Hendow	41.5	1,985	102	5.14

Grp	Practice	IMD score	List size	Number on register	Prevalence (%)
C	B81645: East Park Practice (Assura)	37.4	2,900	86	2.97
C	B81675: Newington (CHCP)	42.5	6,296	203	3.22
C	B81682: Longhill Health Care Centre (Dr Shaikh)	37.1	4,127	114	2.76
D	B81002: Dr Kumar-Choudhary	48.7	2,601	110	4.23
D	B81047: Wolseley Medical Centre	45.9	5,701	208	3.65
D	B81053: Diadem Medical Practice	43.0	9,090	419	4.61
D	B81054: Dr Varma (Clifton House)	43.7	7,700	446	5.79
D	B81058: Sydenham House Group Practice	43.0	6,414	342	5.33
D	B81112: St Andrew's - Bransholme	48.6	2,357	63	2.67
D	B81119: Dr Palooran & Koshy	49.1	3,281	103	3.14
D	B81634: St Andrew's -Dr J Venugopal	48.0	2,123	82	3.86
D	B81674: Dr Joseph	43.4	1,695	94	5.55
D	B81685: Dr Poulose	47.7	1,694	56	3.30
D	Y02344: Northpoint (Assura)	47.8	2,390	94	3.93
D	Y02896: Story Street Practice & Walk In Centre	48.5	1,251	14	1.12
E	B81017: Kingston Medical Group (CHCP)	53.2	5,795	157	2.71
E	B81018: Dr Awan & Partners (Orchard 2000)	59.3	4,576	239	5.22
E	B81027: St Andrew's Group Practice	49.4	4,917	236	4.80
E	B81032: Wilberforce Surgery	51.6	2,509	80	3.19
E	B81040: Dr Weir & Partners (Marfleet Group Practice)	50.7	11,375	236	2.07
E	B81046: Bridge Group	55.1	6,824	264	3.87
E	B81089: Dr Witvliet	52.9	2,729	64	2.35
E	B81631: Dr Raut	54.2	2,490	83	3.33
E	B81683: St Andrew's (Dr Raghunath & Partners - Koul)	51.4	1,296	53	4.09
E	B81688: Dr Gopal	50.0	1,424	60	4.21
E	B81692: The Quays Medical Centre (CHCP)	53.7	2,190	18	0.82
E	Y00955: Riverside Medical Centre (CHCP)	65.3	1,907	75	3.93

5.10   Time Period for Information, Date Last Updated and Source for Each Table and Figure

The data refer to the dates or years as indicated (Q refers to quarters generally based on financial years so April-June is referred to as Q1). Where dates or years are in brackets after the specified dates, it means that the data was applied to the specified time period by applying rates from the dates or years in brackets. For example, [2012-2035 (2012)] might be the population predicted for the years 2012-2035 from the population estimate of 2012. For example, [2007 (2013)] might be the prevalence of diabetes estimated for the Hull population for the year 2013 from national prevalence figures from the year 2007, i.e. national prevalence estimates for the year 2007 were applied to the most recent population estimates for Hull (2013). Where a range of years is given, the data may be either combined from a number of years (particularly if the event is relatively rare and small numbers might be a problem) or the data is presented over a period of time to assess the trend over time. Where there is a source in brackets, this is generally secondary such as the source of data for the prevalence which was then applied to local population estimates or national age-specific mortality rates which were then applied to local data to calculate a standardised mortality ratio, etc.

Further information about data sources is also given in *section 5.1* on *page 27*.

Reference	Description of source
C&LG	Index of Multiple Deprivation 2015 from Communities and Local Government (Communities and Local Government 2015)
PCIS/HSCIC	Primary Care Information System (Open Exeter). Hull and East Riding of Yorkshire population file of GP registrations (Connecting for Health, 2009) / Health and Social Care Information Centre GP registration information (totals in 5 year age bands)
QOF	Quality and Outcomes Framework (Information Centre for Health and Social Care 2010)

5.10.1   Tables

Reference	Page	Data time period	Last updated	Data source(s)
Table 1	*13*	2006/07 – 2014/15	Dec 15	QOF
Table 2	*15*	2006/07 – 2014/15	Dec 15	QOF
Table 3	*16*	2014/15	Dec 15	QOF
Table 4	*18*	2014/15	Dec 15	QOF
Table 5	*20*	2007	Jun 14	(Stevens, O'Donoghue et al. 2007)
Table 6	*21*	2012/13 / Apr 2014	Jun 14	QOF/PCIS (www.apho.org.uk)
Table 7	*24*	2014/15	Dec 15	QOF / C&LG (IMD)

5.10.2   Figures

Reference	Page	Data time period	Last updated	Data source(s)
Figure 1	*25*	2014/15	Dec 15	QOF / C&LG (IMD)

6 INDEX