

HULL JSNA TOOLKIT RELEASE 6:

Prostate Cancer



Mandy Porter, Robert Sheikh-Iddenden, Tim Greene, Des Cooper

January 2016

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.

Epidemiologists/Statisticians,
Public Health Sciences,
Hull Public Health,
Hull City Council,
Brunswick House
Strand Close,
Beverley Road
Hull.
HU2 9DB

mandy.porter@hullcc.gov.uk	(01482 616304)
robert.iddenden@hullcc.gov.uk	(01482 616305)
tim.greene@hullcc.gov.uk	(01482 616031)
des.cooper@hullcc.gov.uk	(01482 616241)

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

HULL JSNA TOOLKIT: Prostate Cancer

Contents

1	SUMMARY	5
2	INTRODUCTION	6
2.1	Other Reports	6
2.2	Terminology, Abbreviations, Statistical Methods and Terms	7
2.3	Data Sources	7
2.4	Deprivation	8
2.5	Comparator Areas	9
2.6	Public Health Outcomes Framework Indicators	10
3	PROSTATE CANCER	11
3.1	Risk Factors	11
3.2	Incidence	11
3.3	Inpatient Hospital Admissions	13
3.4	Mortality	14
3.5	Survival Rates	19
3.6	Inpatient Admissions in Relation to Deprivation	21
3.7	Mortality in Relation to Deprivation	22
4	REFERENCES	23
5	APPENDIX	24
5.1	Data Sources	24
5.2	Synthetic or Modelled Estimates	27
5.3	Local Surveys	27
5.4	Hospital Episode Statistics	29
5.5	Quality and Outcomes Framework	30
5.6	General Practice Groupings	31
5.7	Outcome Measures, Performance Targets and Progress Towards Targets	40
5.7.1	Historical Indicators, Outcome Measures and Targets	40
5.7.2	Problems Associated With Some Outcome Measures	40
5.7.3	Public Health Outcomes Framework	40
5.8	Definitions and Classifications	45
5.8.1	Disease Definitions Using International Classification of Diseases	45
5.9	Statistical and Epidemiological Methods and Terms	47
5.9.1	Confounding, Effect Modification and Interaction	48
5.9.2	Confidence Intervals	48
5.9.3	Small Number of Events	49

5.9.4	Percentiles, Quartiles, Quintiles and Medians	49
5.9.5	Standardisation	49
5.9.6	Impact of Changes to European Standard Population on Directly Standardised Rates	50
5.9.7	Occurrence Versus Registration of Deaths	52
5.9.8	Moving Average	52
5.9.9	Significance Testing	52
5.10	Underlying Data for Figures	53
5.11	Time Period for Information, Date Last Updated and Source for Each Table and Figure.....	56
5.11.1	Tables	57
5.11.2	Figures	57
6	INDEX.....	58

JSNA TOOLKIT: Prostate Cancer

1 SUMMARY

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.

Prostate cancer incidence: The age-standardised incidence (using the 1976 European standard Population) of prostate cancer in Hull in 2009-2011 (121.2 per 100,000 men) was statistically significantly higher than for England (106.8 per 100,000 men), Humber and Yorkshire Coast Cancer Network (101.9 per 100,000 men), eight of the ten comparator areas and North East Lincolnshire.

Inpatient hospital admissions due to prostate cancer: During 2008/09-2010/11 there were 450 admissions in men due to prostate cancer.

Prostate cancer mortality: Mortality rates in 2012-14 from prostate cancer among men in Hull were similar to, although slightly lower than, those for England, with the age-standardised rate (using the 2013 European Standard Population) 44.8 per 100,000 men in Hull and 49.5 per 100,000 men in England. Rates were also a little lower than those for the Yorkshire and Humber region and most of the comparator areas.

Prostate cancer survival: One-year survival rates from prostate cancer are high, at 97%, similar to both England and the Humber and Yorkshire Coast Cancer Network (HYCCN).

Five-year survival rates have almost doubled between 1985-1989 and 2001-2005, reaching 78% in Hull, although lower than for HYCCN (83%) statistically significantly lower than for England (84%).

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 56** 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 5.11** on **page 57** (tables) and in **section 5.11.2** on **page 57** (figures). Also see **section 5.1** on **page 5.1**.

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 view¹. 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.

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 30**) 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.hullpublichealth.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 13**, which details which JSNA Toolkit report includes further analysis for each indicator.

3 **PROSTATE CANCER**

3.1 **Risk Factors**

Cancer Research UK provide information on the risk factors for prostate cancer (Cancer Research UK 2008). Age, family history and ethnicity are established risk factors, but no modifiable risk factors have been identified. Many other factors have been studied but the evidence is inconclusive. These potential factors include diet, alcohol consumption, smoking, bodyweight, physical activity, medications, previous medical procedures and infections, endogenous hormones and diabetes.

3.2 **Incidence**

Due to cancer registration, incidence estimates are available for cancer. The latest information available on the NHS Information Centre Indicator Portal is for 2009-2011 but only for a limited number of cancer sites.

Local cancer incidence information is publicly available from the Northern and Yorkshire Cancer Registry and Information Service (NYCRIS) for the period 2004-2008 (Northern and Yorkshire Cancer Registry and Information Service, 2008). NYCRIS has produced 'Factsheets' for each of the former PCTs within their geographical area (23 PCTs across Yorkshire and the North East of England) which give information on incidence and mortality for different cancers. Each PCT is compared with the relevant cancer network, which in the case of Hull PCT is the Humber and Yorkshire Coast Cancer Network. The four page factsheet for Hull can be downloaded directly from the NYCRIS website at www.nycris.nhs.uk/reports/pct_factsheets/. More up to date cancer information can be accessed through the National Cancer Information Service, an online service that is populated with cancer incidence, mortality and survival information from the United Kingdom regional cancer registries. A password for NCIS can be requested through NYCRIS. At the time of publication the NCIS was populated with cancer incidence data up to 2010.

Table 1 and **Table 2** give the directly age-standardised rates (DSR) for prostate cancer incidence over the period 2009-2011 for all ages and under 75s respectively, from the NHS Information Centre Indicator Portal, for men in Hull and comparator areas. The 95% confidence intervals are given except for the average of the 10 comparators (as individual data is not available to calculate this, but the confidence interval will be narrower than the confidence interval for Hull as the number of cancer cases will be around ten times larger and the confidence interval for the 10 comparators will be slightly wider than that of the Yorkshire and Humber regional average). For International Classification of Diseases (ICD) version 10 coding see **section 5.8.1** on **page 45**.

Table 1: Age-standardised all age incidence rate per 100,000 for prostate cancers diagnosed in Hull and comparator areas 2009-2011

Area	Age-standardised all age incidence rate for prostate cancer per 100,000, 2009-2011 (95% CI)
	Males
England	106.8 (106.2 to 107.5)
Hull	121.2 (110.6 to 132.4)
Yorkshire and Humber	101.9 (99.9 to 103.9)
Wolverhampton	114.4 (104.5 to 124.9)
Salford	92.3 (82.8 to 102.6)
Derby	78.3 (70.0 to 87.2)
Stoke-on-Trent	95.6 (86.6 to 105.2)
Coventry	98.4 (89.9 to 107.6)
Plymouth	100.7 (91.8 to 110.2)
Sandwell	112.6 (103.6 to 122.2)
Middlesbrough	101.6 (89.0 to 115.6)
Sunderland	90.1 (82.0 to 98.7)
Leicester	70.2 (62.5 to 78.5)
Average of 10 comparators	95.4
North East Lincolnshire	86.7 (76.7 to 97.7)

Table 2: Age-standardised under 75 incidence rate per 100,000 for prostate cancers diagnosed in Hull and comparator areas for 2009-2011

Area	Age-standardised under 75 incidence rate for prostate cancer per 100,000, 2009-2011 (95% CI)
	Males
England	79.2 (78.6 to 79.8)
Hull	96.4 (86.5 to 107.1)
Yorkshire and Humber	75.6 (73.8 to 77.5)
Wolverhampton	85.3 (76.2 to 95.3)
Salford	68.7 (60.1 to 78.2)
Derby	51.4 (44.2 to 59.4)
Stoke-on-Trent	70.0 (62.1 to 78.8)
Coventry	76.8 (68.8 to 85.5)
Plymouth	68.4 (60.6 to 76.9)
Sandwell	80.8 (72.7 to 89.6)
Middlesbrough	77.4 (65.8 to 90.4)
Sunderland	67.2 (59.9 to 75.1)

Area	Age-standardised under 75 incidence rate for prostate cancer per 100,000, 2009-2011 (95% CI)
	Males
Leicester	45.2 (38.7 to 52.6)
Average of 10 comparators	69.1
North East Lincolnshire	63.9 (54.8 to 74.0)

3.3 Inpatient Hospital Admissions

Table 3 gives the total number of daycase and inpatient admissions over the three year period 2008/09 to 2010/11 and the average annual directly age standardised admission rate for admissions (DSR) for men where the primary diagnosis was prostate cancer (for at least one of the clinician episodes during the hospital stay) per 100,000 resident population (standardised to the European Standard Population). As previously mentioned, usage of services will depend on many different things, such as prevalence of risk factors and disease, willingness to visit GPs, referral rates within Primary Care, accessibility of Primary and Secondary Care services, etc. It is also possible that one or more patients could have been admitted a number of times over the three year period, and each admission would be included.

Table 3: Total three year admissions and annual average age-standardised prostate cancer inpatient admission rate in Hull, financial years 2008/09 to 2010/11

Area	Total three year admissions and annual average DSR per 100,000 Hull men with primary diagnosis of prostate cancer 2008/09 to 2010/11 (95% CI)	
	N	DSR
North Carr	27	69 (46, 101)
Northern	76	129 (102, 163)
East	77	96 (75, 120)
Park	92	132 (106, 162)
Riverside	74	99 (78, 125)
West	68	94 (72, 120)
Wyke	36	76 (53, 106)
Hull	450	104 (95, 114)

3.4 Mortality

From the NHS Information Centre Indicator Portal, the age-specific mortality rates for prostate cancer for 2012-2014 are given in **Table 4** for Hull and comparator areas. The numbers of deaths are small for men aged 35-64 years so are not presented. The mortality rates in Hull are lower than most of its comparators for men aged 65+ years, having decreased among men aged 65-74 and 75+ years in Hull since 2011-13 (from rates 75.1 and 384 per 100,000 men aged 65-74 years and 75+ years respectively).

Table 4: Prostate cancer age-specific mortality rates for 2012-2014

Area	Prostate cancer age specific mortality rates per 100,000 for 2012-2014		
	65-74	75+	All ages
England	74.0	404	36.2
Hull	65.6	365	27.6
Yorkshire and Humber	79.7	396	36.5
Wolverhampton	55.3	472	39.2
Salford	47.6	310	23.1
Derby	100.7	387	34.9
Stoke-on-Trent	71.9	428	33.9
Coventry	60.3	388	28.9
Plymouth	77.1	453	39.2
Sandwell	96.1	396	32.9
Middlesbrough	72.1	462	37.5
Sunderland	63.1	466	42.1
Leicester	59.1	424	23.4
Average above 10	70.6	407	32.3
N. E. Lincolnshire	73.5	508	47.3

Using the PHMF and the ONS produced mid-year population estimates for Hull, the age-specific mortality rates have been calculated for 2012-2014 for each Locality (**Table 5**). The total number of deaths from prostate cancer over the three year period 2012-2014 was 103.

Table 5: Prostate cancer age-specific mortality rates for 2012-2014 by Locality in Hull

Locality	Prostate cancer age specific mortality rates per 100,000 for 2012-14		
	65-74	75+	All ages
North Hull	63.1	348	23.1
East Hull	80.0	392	32.9
West Hull	53.2	327	23.2
Hull	65.8	357	26.6

As the majority of prostate cancer deaths occur in people aged over 75 years, all further analysis is presented for all ages combined. The total number of deaths and directly standardised mortality rates from prostate cancer for all ages for the three year period 2012-2014 are given in **Table 6**, age-standardised using the 2013 European Standard Population.² The confidence intervals are given, and it can be seen that they are wide for the Localities, and the observed differences are not statistically significant.

Table 6: Total number of deaths and directly standardised mortality rates for prostate cancer per 100,000 men, Hull 2012-2014, age-standardised using the 2013 European Standard Population

Locality	Total deaths over three years and DSRs for prostate cancer 2012-2014 per 100,000 men (95% CI), age-standardised using the 2013 European Standard population	
	N	DSR
North Hull	21	44.0 (25.9 to 69.0)
East Hull	45	48.5 (35.0 to 65.3)
West Hull	37	39.0 (27.1 to 54.1)
Hull	103	44.0 (35.7 to 53.7)

The all age directly standardised prostate cancer mortality rates among men in Hull and comparators in 2012-2014, age-standardised using the 2013 European Standard Population are shown in **Table 7**, together with 95% confidence intervals. The rate for Hull was slightly below the rates for England, the Yorkshire and Humber region, the average of the 10 comparator areas and North East Lincolnshire. Only one of the 10 comparator areas (Salford) had a DSR lower than Hull.

² The European Standard Population (ESP), which was first used in 1976, was revised in 2013. Figures using the 1976 and 2013 ESPs are not comparable. See **Impact of Changes to European Standard Population on Directly Standardised Rates**

in the **APPENDIX** for further details.

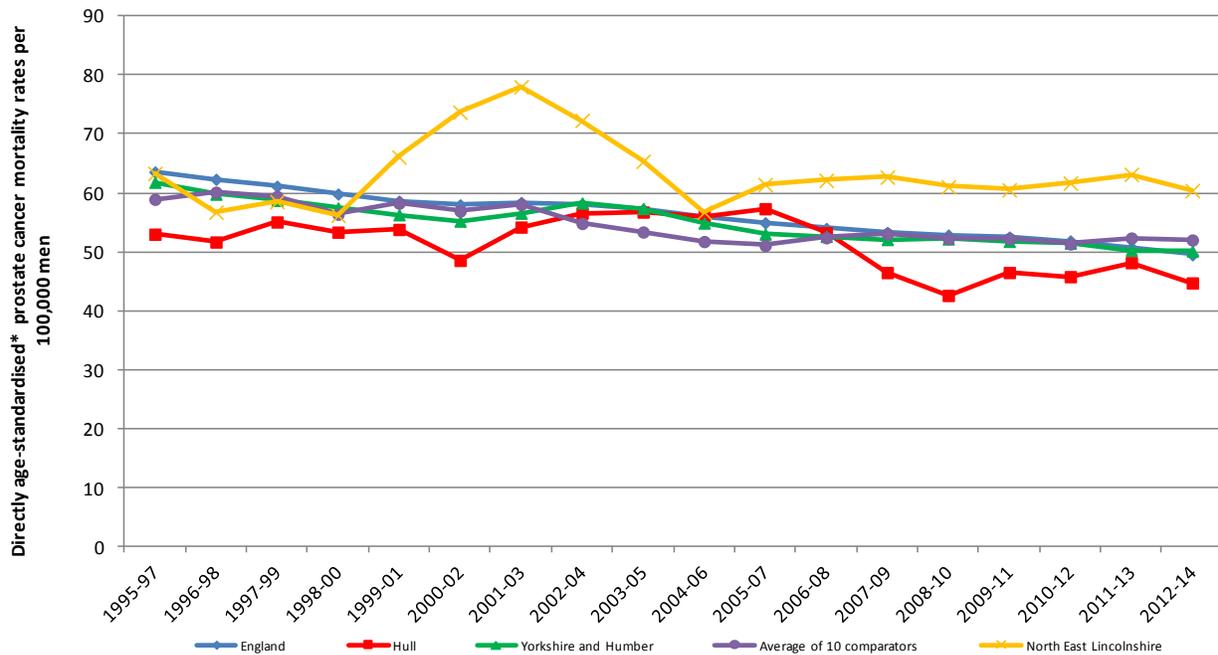
Table 7: Total number of deaths and directly standardised mortality rates for prostate cancer per 100,000 men, Hull and comparators 2012-2014, age-standardised using the 2013 European Standard Population

Locality	Total deaths over three years and DSRs for prostate cancer 2012-2014 per 100,000 men (95% CI), age-standardised using the 2013 European Standard population	
	N	DSR
England	28,453	49.5 (48.9 to 50.1)
Hull	105	44.8 (36.4 to 54.5)
Yorks. & Humber	2,846	50.1 (48.2 to 52.1)
Wolverhampton	144	53.6 (44.9 to 63.3)
Salford	82	37.5 (29.6 to 46.9)
Derby	129	51.2 (42.5 to 61.1)
Stoke-on-Trent	125	56.4 (46.2 to 68.0)
Coventry	141	46.2 (38.7 to 54.6)
Plymouth	150	55.2 (46.5 to 65.0)
Sandwell	150	53.4 (44.8 to 63.0)
Middlesbrough	75	59.5 (46.1 to 75.4)
Sunderland	168	59.4 (50.1 to 69.9)
Leicester	115	47.6 (39.2 to 57.3)
Average above 10	128	52.0 (-----)
NE Lincolnshire	110	60.5 (49.3 to 73.3)

The trends in the directly standardised all age mortality rates (DSRs) for prostate cancer for Hull and comparator areas, age-standardised using the 2013 European Standard Population, are given per 100,000 men in **Figure 1**. The underlying data are given in the **APPENDIX** on **page 53**. The variation in the mortality rate was greater for Hull and North East Lincolnshire due to the smaller number of deaths within each period (all other areas included have considerably higher populations and hence number of deaths). The overall pattern of Hull's mortality rate followed that of the comparator areas, with a decreasing trend in all age prostate cancer DSRs.

The mortality rate in Hull decreased between 1995-97 and 2012-14 by 16% which was smaller than the 22% decrease seen for England, or the 19% decrease seen for the Yorkshire and Humber region, but higher than the 12% decrease seen in the 10 comparator area average. It should be noted, however, as illustrated by **Figure 1**, that due to the relatively few deaths from prostate cancer in Hull each year, the observed differences between Hull and comparators will be influenced by the considerable period-on-period random variation. Most of the decrease in Hull DSRs has occurred since 2005-07, having decreased by 22% from 57.3 per 100,000 men in 2005-07 to 44.8 per 100,000 men in 2012-14.

Figure 1: Trends over time in all age directly standardised mortality rates for prostate cancer for men



*using the 2013 European Standard Population

Table 8 gives all age SMRs for prostate cancer for Hull and comparators relating to deaths which were registered during the period 2012-2014. All age prostate cancer mortality in Hull was 7% lower in Hull than England, having been similar to England in 2011-13. The SMR in Hull was lower than the Yorkshire and Humber region as well as the average of the 10 comparator areas, with only three comparator areas (Salford, Coventry and Leicester) having a similar or lower SMR.

Table 8: All age standardised mortality ratios for prostate cancer for Hull and comparators for men, 2012-2014

Area	All age prostate cancer SMR 2012-2014 (95% CI) for men
England	100.0 (98.8, 101.2)
Hull	93.0 (75.8, 112.2)
Yorkshire and Humber	102.4 (98.7, 106.2)
Wolverhampton	108.0 (90.8, 126.8)
Salford	78.9 (63.0, 98.3)
Derby	103.4 (86.6, 123.2)
Stoke-on-Trent	105.9 (88.3, 126.4)
Coventry	92.4 (77.8, 109.0)
Plymouth	111.1 (94.3, 130.8)
Sandwell	105.0 (88.8, 123.1)
Middlesbrough	117.5 (91.9, 146.4)
Sunderland	119.8 (102.6, 139.7)
Leicester	93.1 (77.2, 112.2)
Average of 10 comparators	102.2 (84.7, 121.3)
North East Lincolnshire	120.3 (99.1, 145.4)

The equivalent SMRs for localities in Hull are shown for 2012-2014 in **Table 9**. The locally produced SMRs are lower than the nationally produced SMRs, due to using different population sources (the local population data, derived from GP registered populations, tends to be higher than the national population estimates for Hull). With wide and overlapping confidence intervals there were no statistically significant differences between the localities, with none of the localities significantly different to England.

Table 9: All age standardised mortality ratios for prostate cancer for Hull Localities for men, 2012-2014

Area	All age prostate cancer SMR 2012-2014 (95% CI) for men
North Hull	88.9 (55.0, 135.9)
East Hull	100.3 (73.2, 134.2)
West Hull	80.8 (56.9, 111.3)
Hull	90.1 (73.6, 109.3)

3.5 Survival Rates

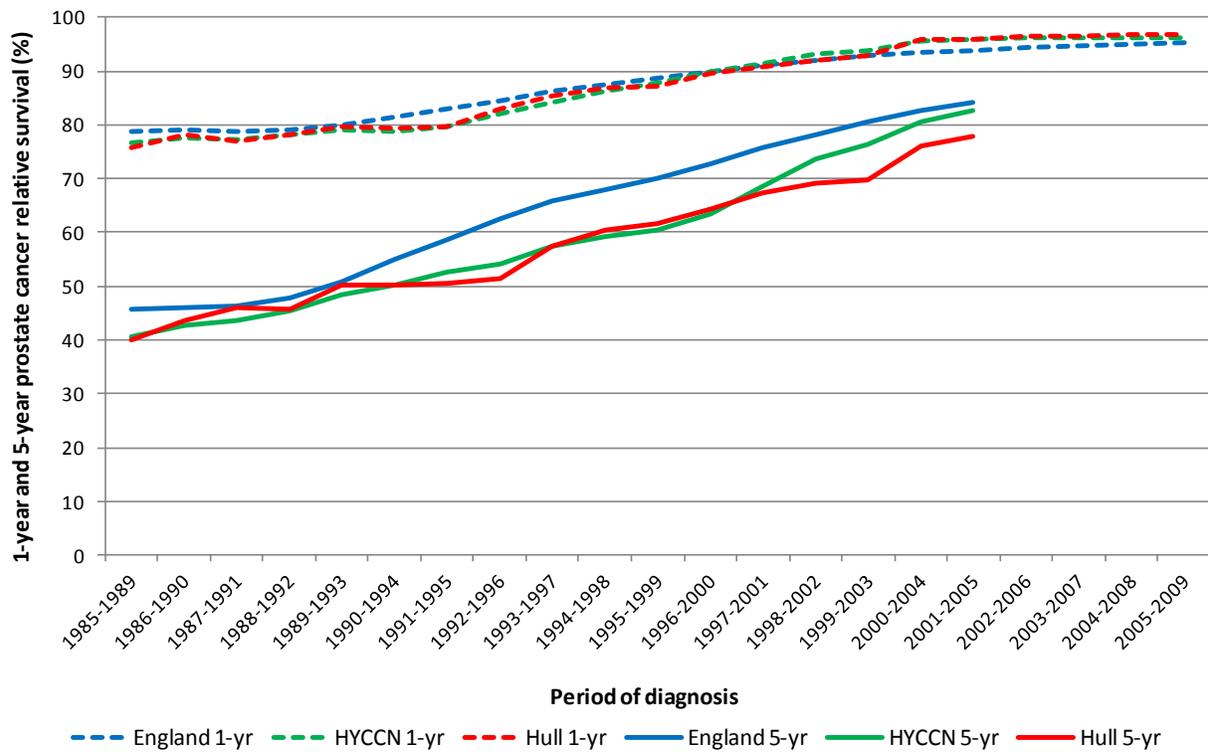
Trends in survival rates by PCT are available through the National Cancer Information Service (NCIS) for a small number of cancer sites, including prostate cancer. **Figure 2** shows the trends in one-year and five-year survival from prostate cancer for residents of Hull for cases diagnosed between 1985-1989 and 2005-2009, with comparisons to the Humber and Yorkshire Coast Cancer Network (HYCCN) and England. Relative survival rates are adjusted to take into account that, in a cohort of people of similar age, some people would have died of other causes over a five year period, so it reflects the survival rate for people diagnosed with lung cancer relative to the general population.

Both one-year and five-year relative survival rates have been increasing in Hull, HYCCN and England, with increases in five-year relative survival greater than one-year relative survival. One-year relative survival from prostate cancer increased in Hull between 1985-1989 and 2005-2009 by 28%, compared with 26% in HYCCN and 21% in England, although throughout most of the period differences between Hull, HYCCN and England were relatively small. The differential increases in one-year survival over time did mean that Hull went from having lower one-year survival in 1985-1989 (0.8 percentage points lower than HYCCN and 2.9 percentage points lower than England) to having higher one-year relative survival in 2005-2009 (0.5 percentage points higher than HYCCN and 1.4 percentage points higher than England). None of the differences between Hull and either England or HYCCN were statistically significant.

Five-year relative survival increased massively over this period, increasing by 94% in Hull, 103% in HYCCN and 84% in England, due to earlier diagnosis through increased PSA testing, as well as improved treatments, although it is possible that some of this increase may be due to what is known as 'lead-time bias', which is where a diagnosis of cancer is made before it is clinically apparent, such as through PSA testing, but the treatment received may not prolong the life of a patient much beyond where they would have died had the cancer not been diagnosed until it presented clinically. Despite Hull seeing a larger relative increase in 5-year relative survival than England, the gap between Hull and England grew so that Hull had five-year relative survival 6.5 percentage points lower than England in 2001/05 compared with 5.6 percentage points in 1985/89. Five-year relative survival from prostate cancer was statistically significantly lower in Hull than England from 1991-95 onwards, but differences with HYCCN were not statistically significant (based on overlapping confidence intervals).

The lower relative survival in Hull may indicate lower rates of PSA testing in Hull, or it may be that people in Hull being diagnosed at a later stage as they do not visit their GP when they first develop symptoms, or both, either of which would mean more high grade tumours. It may also be that people in Hull diagnosed with prostate cancer may have more co-morbidities which could affect their survival. The underlying data are given in the **APPENDIX** on **page 54**.

Figure 2: Trends in one-year and five-year relative survival from prostate cancer in Hull, Humber and Yorkshire Coast Cancer Network and England

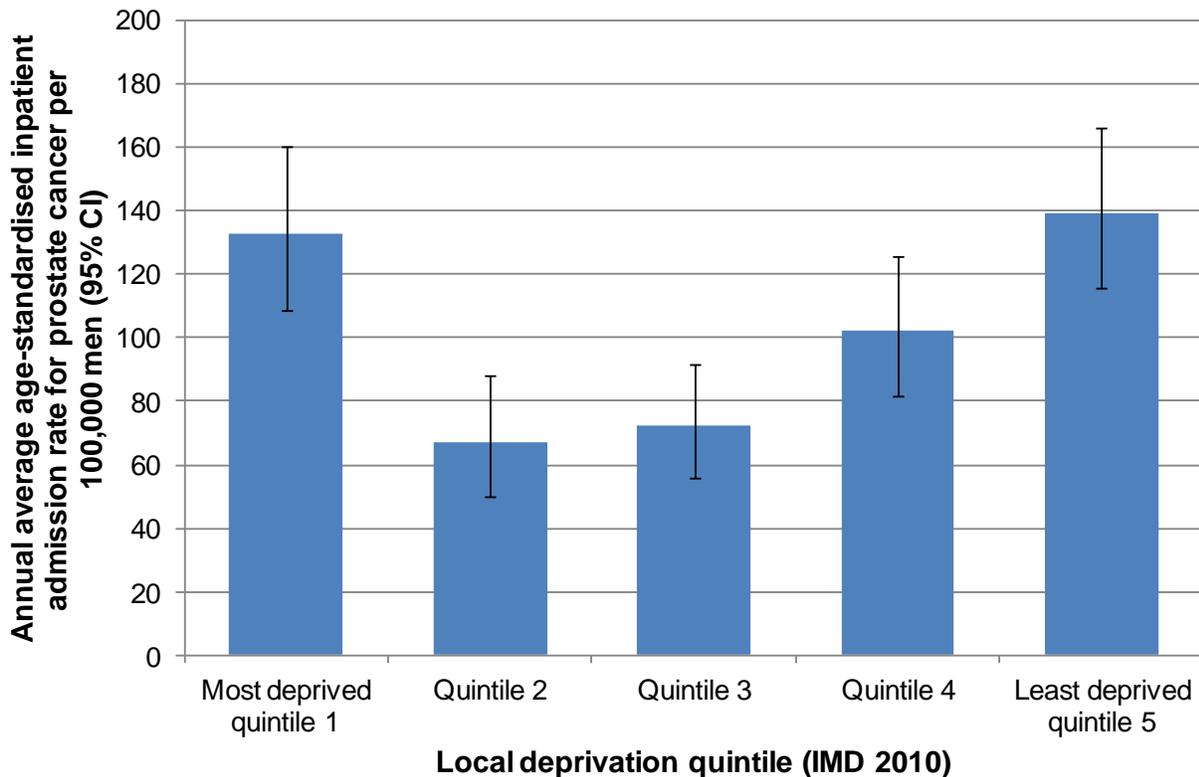


3.6 Inpatient Admissions in Relation to Deprivation

Figure 3 illustrates the average annual directly age-standardised daycase and inpatient admission rates which involve a primary diagnosis of prostate cancer (any clinician episode within that hospital stay) by local deprivation quintile over three financial years 2008/09 to 2010/11 (standardised to the European Population). The 95% confidence intervals are shown. See **section 2.4** on **page 8** for more information on deprivation. There is a statistically significant difference among the quintiles for daycase and inpatient admissions for prostate cancer. However, the trend is not consistent across the deprivation quintiles, with the lowest admission rate occurring for the least deprived quintile with rates gradually increasing with reducing deprivation, but the most deprived and least deprived local quintiles have similar admission rates. The underlying data are given in the **APPENDIX** on **page 55**.

It is possible that referral and treatment differs among the practices which could potentially affect admission rates when examined at deprivation level. A very small number of patients could have a relatively large number of admissions over the three year period, which could influence the admission rates. However, it is felt it was more useful to examine total admissions over the three year period rather than the total patients admitted, as admissions reflect service use and ‘need’.

Figure 3: Age-standardised prostate cancer annual daycase and inpatient admission rate per 100,000 population for all ages by local deprivation quintile for Hull



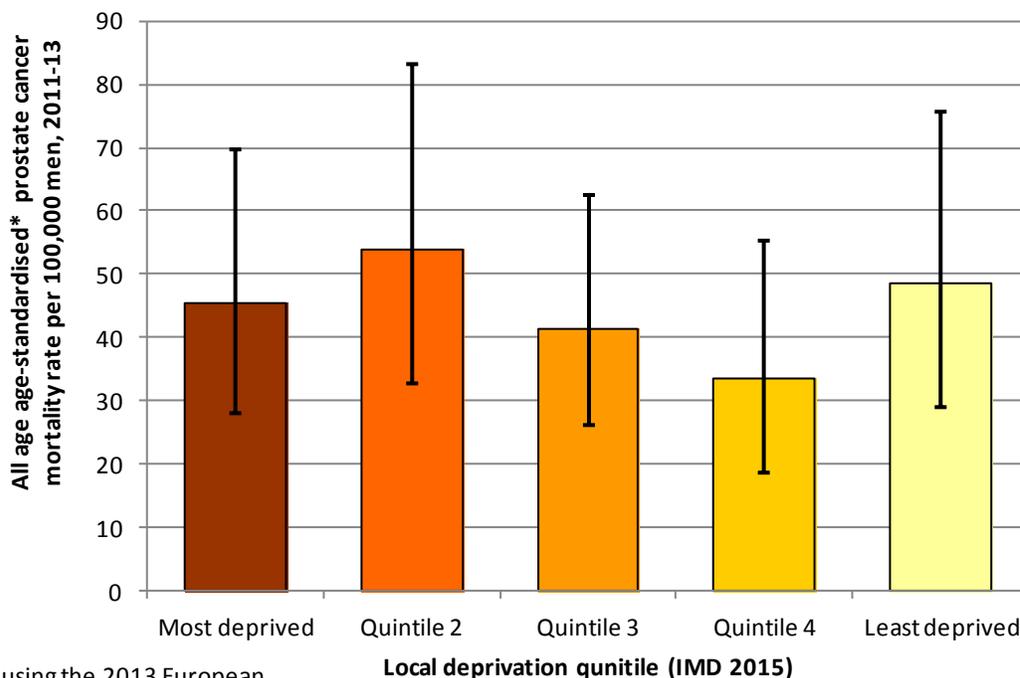
3.7 Mortality in Relation to Deprivation

The all age directly standardised mortality rates for deaths from prostate cancer among men are given in **Figure 4** (age-standardised using the 2013 European Standard Population) for Hull for the period 2012 to 2014, by local quintiles of the Index of Multiple Deprivation 2015 (Communities and Local Government 2015).

With relatively few deaths (21, 22, 23, 16 and 21 for most deprived to least deprived quintiles respectively), the confidence intervals are wide and overlapping, meaning there are no significant differences in the mortality rates among the deprivation quintiles.

The underlying data are given in the **APPENDIX** on **page 55**.

Figure 4: All age standardised mortality rates for prostate cancer per 100,000 men by local deprivation quintile for Hull for 2012-2014, using 2013 European Standard Population



*using the 2013 European Standard Population

4 **REFERENCES**

- Cancer Research UK (2008). Prostate risk factors. www.cancerresearchuk.org. London, Cancer Research UK.
- Communities and Local Government (2015). Index of Multiple Deprivation 2015 (<https://www.gov.uk/government/statistics/english-indices-of-deprivation-2015>). London, Communities and Local Government.
- Department of Health (2012). Improving outcomes and supporting transparency. Part 1: A public health outcomes framework for England, 2013-2016. London, Department of Health.
- Department of Health (2012). Improving outcomes and supporting transparency. Part 2: Summary technical specifications of public health indicators, January 2012. London, Department of Health.
- Economic and Social Data Service (2008). General Household Survey. www.esds.ac.uk. Essex and Manchester, Economic and Social Data Service.
- Health Survey for England (2008). Health Survey for England. www.ic.nhs.uk. London, Economic and Social Data Service.
- Information Centre for Health and Social Care (2010). Quality and Outcomes Framework 2009/10. www.ic.nhs.uk. London, Information Centre for Health and Social Care.
- Information Centre for Health and Social Care (2010). Statistics on NHS Stop Smoking Services England, April 2009 – March 2010. www.ic.nhs.uk. London, Information Centre for Health and Social Care.
- Information Centre for Health and Social Care (2011). NHS Immunisation statistics, England 2010-11. www.ic.nhs.uk. London, Information Centre for Health and Social Care.
- Information Centre for Health and Social Care (2012). The NHS Information Centre Indicator Portal. www.indicators.ic.nhs.uk/webview. London, Information Centre for Health and Social Care.
- Information Centre for Health and Social Care (2014). Hospital Episode Statistics: HES online. www.hesonline.nhs.uk. London, Information Centre for Health and Social Care.
- Jones, L., M. A. Bellis, et al. (2008). Alcohol-attributable fractions for England: alcohol-attributable mortality and hospital admissions. www.nwph.net/nwpho. Liverpool, North West Public Health Observatory and Liverpool John Moores University.
- Office for National Statistics (2009). Hospital Episode Statistics. www.ons.gov.uk. London, Office for National Statistics.
- Office for National Statistics (2012). Public Health Mortality File. www.ons.gov.uk. London, Office for National Statistics.
- Office for National Statistics (2013). Integrated Household Survey. www.ons.gov.uk. London, Office for National Statistics.
- Oxford Brookes University and Institute of Public Care (2012). Projecting Adult Needs and Service Information. www.pansi.org.uk. Oxford, Oxford Brookes University and Institute of Public Care.
- Public Health England (2015). Public Health Outcomes Framework data tool. www.phoutcomes.info/. London, Public Health England.

5 APPENDIX

5.1 Data Sources

The data sources for each table and figure included within this report are listed in **section 5.11** on **page 56**.

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 generally³ 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).

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 30** for more information) have been taken from Excel files downloaded from the Information Centre (Information Centre for Health and Social Care 2010).

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 practice⁴, 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.

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

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.

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 29**.

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

Cancer incidence and survival data are available from Northern and Yorkshire Cancer Registry and Information Service (NYCRIS) website (www.nycris.nhs.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 27**). 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

Synthetic or modelled estimates have been generated nationally, particularly in relation to estimating the prevalence of behavioural and lifestyle risk factors at local authority level. They are not based on 'real' data, but the estimates have been generated from a statistical model. There are a number of reasons why they can be misleading such as the poor quality or narrow focus of the original research, statistical problems with the model such as 'over-fitting' a model or lack of testing of the model, there are often problems with generalisability of the model, and there is often lack of transparency so it is not possible to assess the quality of the underlying research or the model or know when the model might be updated. Furthermore, just because the factors included in the model change (e.g. age distribution or number of benefit claimants), it does not necessarily mean that this will have a direct influence on the value obtained when the model is updated. The synthetic estimates that have been generated to estimate the smoking prevalence in Hull are misleading.

Further more detailed discussion of the problems with synthetic estimates is available in the JSNA Toolkit: Glossary report. A further detailed document on this specific topic available at www.hullpublichealth.org.

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. Patients admitted to a bed for elective surgery, but discharged the same day are classed as daycases, and these are included within inpatients in this document, unless otherwise stated. However, it is very important to note that admission rates depend on how willing people are to make use of medical services, the location and accessibility of services, as well as differences in referral patterns and practices within primary and secondary care. These factors may differ between geographical areas, and may explain different levels of hospital activity rather than differences in the prevalence of disease. For example, in general, people who live in more deprived areas are less likely to visit their GP than people with similar levels of symptoms who live in more affluent areas. Referral rates can vary dramatically among different GPs which can influence admission rates. Therefore, findings should be interpreted cautiously with regard to assessing the general level of illness. Nevertheless, analysis of inpatient admission rates will give an indication of the usage of hospital services by patients or residents of different geographical areas.

When a patient is admitted to hospital a “clinician episode” is generated. If the patient is transferred to the care of another clinician during their hospital stay, another clinician episode is generated. Thus, there could be one or many clinician episodes during a patient’s hospital stay. It is not necessarily the case that the primary and secondary diagnoses codes remain the same. A patient could be admitted for cancer treatment with this as the primary diagnosis, but they may develop respiratory problems during their stay and be transferred under the care of another clinician (generating another

clinician episode) and their primary diagnosis may change. Therefore, when examining hospital episode statistics with a specific primary or secondary diagnosis, or assessing the number of procedures or operations that have occurred, different results will be obtained depending on which clinician episode is examined. If all clinician episodes are examined then this will mean that all relevant diagnoses or procedures are included, but reporting on the number of clinician episodes is not as useful as reporting on the number of hospital stays/admissions or the number of patients.

The majority of admissions generate a single clinician episode, but a small number of admission can generate a number of clinician episodes. There were 266,244 clinician episodes for Hull residents over the three year period 2008/2009 to 2010/2011, and 224,590 (84%) were first clinician episodes, 29,886 (11%) were second clinician episodes, and 7,489 (2.8%) were third clinician episodes. The maximum number of clinician episodes during one patient's hospital stay was 20.

These 266,244 clinician episodes were the result of 225,169 hospital admissions for Hull residents over the three year period, and a total of 98,221 patients were admitted to hospital during the three year period. Therefore, these patients were admitted on average 2.3 times over the three year period.

For specific disease the number of admissions and the number of patients admitted over the three year period could differ substantially. Therefore, when examining the data at ward or practice level, it is possible that one or two patients could inflate the numbers substantially. However, it was thought best to present the data in terms of the total number of admissions over a period of time rather than the total number of patients admitted, as admissions will reflect service usage. A small number of tables present diagnoses out of all clinician episodes.

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. As part of QOF, practices obtained funds for producing and maintaining disease registers for specific diseases. The data from these registers have been used to measure diagnosed prevalence of disease within each of the Hull JSNA Toolkit disease-specific reports. These prevalence estimates are not adjusted in any way for the patient population, and practices with a relatively high percentage of elderly patients or patients living in the most deprived areas will tend to have a higher prevalence of disease. Other factors which can influence the practice prevalence rates and further information about QOF are given within the JSNA Toolkit: Glossary report.

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-like⁵) 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 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 manager⁶. 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

⁵ 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.

⁶ 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.

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 5**, 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 10 gives the mean age of the patients registered with each practice (as at April 2015). The deprivation scores are given in **Table 10**, and should be used as a guide to the level of deprivation within each practice.

Table 10 and **Figure 6** 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 59,043 and Group E (most deprived) included 12 practices with a total list size of 62,044 patients.

Table 10 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 11 and **Table 12** 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 11**) or West 2 (**Table 12**).

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

Figure 5: Mean deprivation score and mean age of registered patients for each general practice as at April 2015

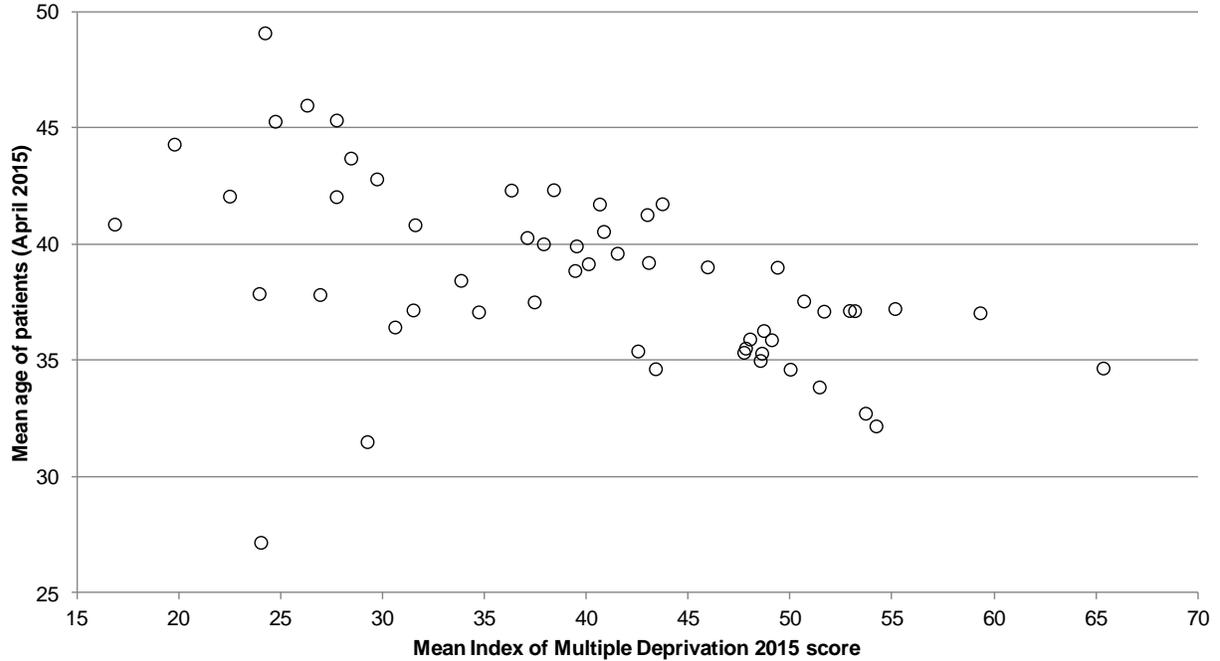


Figure 6: Mean deprivation score and mean age of registered patients for each general practice as at April 2015 and assignment to peer groups (based on deprivation alone)

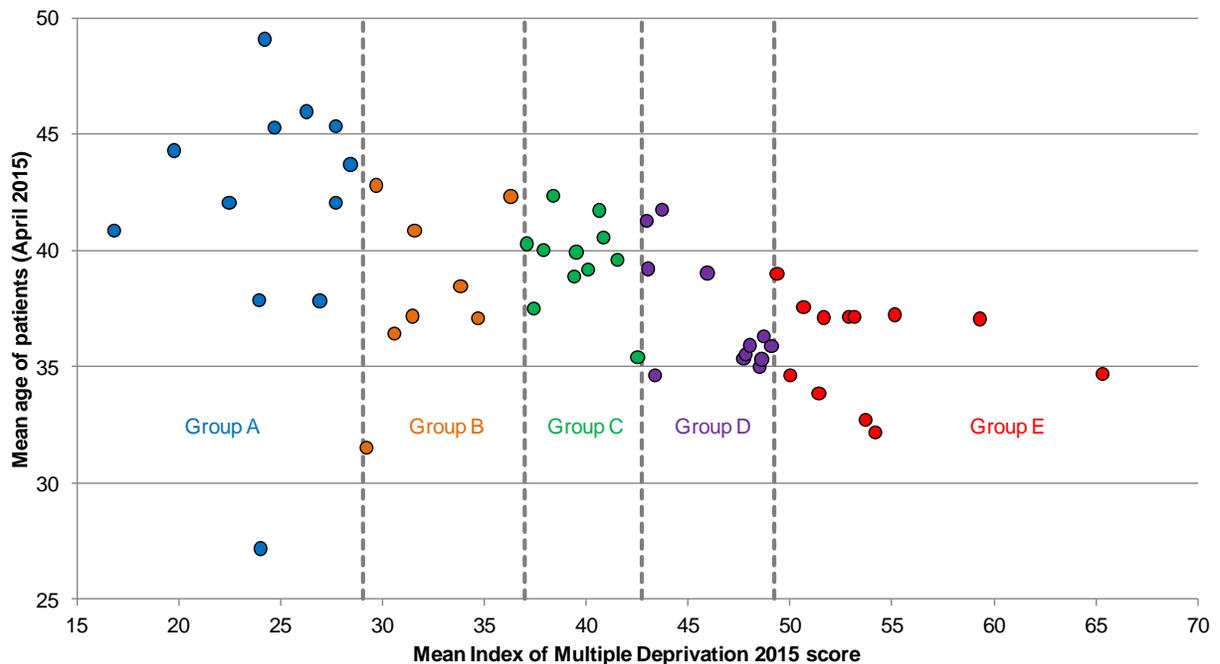


Table 10: Mean deprivation score and mean age of registered patients for each general practice as at April 2015 and assignment to peer groups (based on deprivation alone)

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 Poulouse	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 11: 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 Poulouse	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 12: 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 2012⁷, “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.”

⁷<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**
 - Objective: improvements against wider factors that affect health and wellbeing, and health inequalities.
- **Domain 2 – Health improvement**
 - Objective: people are helped to live healthier lifestyles, make healthy choices and reduce health inequalities
- **Domain 3 – Health protection**
 - 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**
 - 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 13** 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 13**.

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 13** details which JSNA Toolkit documents gives more information for each of the PHOF indicators.

Table 13: 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 Definitions and Classifications

5.8.1 *Disease Definitions Using International Classification of Diseases*

The International Classification of Disease (ICD) is the international standard method used to diagnose and define disease status. The version currently being used is version 10 (since 2001). The disease definitions are also given in relation to the indicators within the Public Health Outcomes Framework (PHOF), see **section 5.7.3** on **page 40** for more information. **Table 14** gives the ICD codes for the different diseases used in this document. Prior to 2001, ICD version 9 was used, but versions 9 and 10 are not easily cross-linked for all diseases and medical conditions. Therefore, for these tables and figures, there have been some adjustments so that trends over time are more comparable so the information being presented is comparing like-with-like. These adjustments have been made by the Office for National Statistics and the details of such adjustments are not given within this report.

Table 14: International Classification of Diseases: classifications used

Disease or medical condition	ICD 10
Deaths considered preventable (PHOF 4.03)	A15-19, B17.1, B18.2, B20-24, B90, C00-16, C18-22, C33-34, C43, C45, C50, C53, E10-14, F10-16, F18-19, G31.2, G62.1, I20-26, I42.6, I71, I80.1-80.3, I80.9, I82.9, J09-11, J40-44, K29.2, K70, K73-74 (excl. K74.3-74.5), K86.0, U50.9, V01-Y34, Y60-69, Y83-84 for under 75s except E10-14 (aged under 50 only) and B20-24, U50.9, V01-Y34, Y60-69, Y83-84 (all ages).
Alcohol-related (locally defined)	See Hull JSNA Toolkit: Alcohol Consumption
Alcohol-related (Jones, Bellis et al. 2008)	See Hull JSNA Toolkit: Alcohol Consumption
Cancer (PHOF 4.05i)	C00 to C97
Cancer deaths considered preventable (PHOF 4.05ii)	C00-C16, C18-C22, C33-C34, C43, C45, C50, C53 for under 75s
Bladder cancer	C67
Brain cancer	C71
Breast cancer	C50
Cervical cancer	C53
Colorectal cancer	C17 to C21*
Haematological cancers	C81 to C96
Kidney cancer	C64
Lung cancer	C33 to C34**
Oesophagus cancer	C15
Ovary	C56
Prostate cancer	C61
Pancreatic cancer	C25
Skin cancer	C43 to C44***
Stomach	C16
Uterus	C54****
Cardiovascular disease (PHOF 4.04i)	I00 to I99
Cardiovascular deaths considered preventable (PHOF 4.04ii)	I20-I26, I42.6, I71, I80.1-I80.3, I80.9, I82.9 for under 75s
Coronary heart disease	I20 to I25
Stroke	I60 to I69 [#]
Communicable disease (PHOF 4.08)	A00-B99, J09-J18 (all ages)
Dementia	F00 to F03
Diabetes	E10 to E14
Fractured neck of the femur (PHOF 1.14)	S72.0, S72.1, S72.2
Injuries among children – unintentional and deliberate (PHOF 2.07)	S00-T79 and/or V01-Y36
Injuries due to falls (PHOF 2.24)	Primary diagnosis codes S00-T98 and secondary cause W00-W19
Injury, poisoning and certain other consequences of external causes	S00-T98

Disease or medical condition	ICD 10
Liver disease (PHOF 4.06i)	B15-B19, C22, I81, I85, K70-K77, T86.4
Liver disease deaths considered preventable (PHOF 4.06ii)	B17.1, B18.2, C22, K70, K73-K74 (excluding K74.3-K74.5) for under 75s
Chronic liver disease including cirrhosis	K70, K73 to K74
Mental/behavioural disorders (drugs)	F10-F19
Intentional self-harm	X60 to X84
Respiratory disease (PHOF 4.07i)	J00-J99
Respiratory disease deaths considered Preventable (PHOF 4.07ii)	J09-J11, J40-J44 for under 75s
Chronic obstructive pulmonary disease	J40 to J44
Suicide or event of undetermined intent	X60 to X84 and Y10 to Y34 excl Y33.9
Suicide (PHOF 4.10)	X60-X84 (all ages), Y10-Y34 (ages 15+ only)
Violent crime – hospital admissions (PHOF 1.12i)	X85-Y09

*Also defined as C18-C20 if otherwise stated in specific table/figure.

**Also defined as just C34 if otherwise stated in specific table/figure.

***Melanoma of the skin only is defined as C43 and is stated in specific table/figure.

****Also defined as C54 and C55 if otherwise stated in specific table/figure.

#Although the ICD10 coding for stroke differs in the NHS Information Centre Indicator Portal depending on if mortality or hospital admission data are being analysed.

5.9 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.

5.9.1 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.

5.9.2 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 5.9.3** on **page 49**), 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.

5.9.3 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 5.9.2** on **page 48**) of the estimate before drawing conclusions.

5.9.4 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.

5.9.5 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: direct⁸ or indirect⁹ standardisation.

5.9.6 Impact of Changes to European Standard Population on Directly Standardised Rates

Age standardised rates allow comparison between populations which may contain different proportions of people of different ages. The European Standard Population (ESP) is a widely used artificial population structure for the calculation of directly age standardised rates. The replacement of the ESP first used in 1976 with an updated version published in 2013 resulted in an increase of all-cause mortality rates for England and Wales by 85%, with similar increases seen for Hull. Figures using the 1976 and 2013 ESPs are therefore not comparable. Information about this change in methods can be found on the ONS website at: <http://www.ons.gov.uk/ons/about-ONS/get-involved/consultations/consultations/implementation-of-the-2013-european-standard-population/index.html>. A comparison of directly standardised mortality rates for Hull derived using the 1976 and 2013 European Standard Populations, for a selection of causes of death, is shown in **Table 15** for all age DSRs and **Table 16** for under 75 DSRs.

Table 15: All age directly age-standardised mortality rates per 100,000 Hull residents 2010-12 using the 1976 and 2013 European Standard Populations, selected causes of death

Cause of death	Gender	All age directly age-standardised mortality rates per 100,000 Hull residents, using the 1976 and 2013 European Standard Populations		
		ESP 1976	ESP 2013	% change
All causes	Men	747.2	1,351.3	+80.8
	Women	552.7	1,023.3	+85.1
CHD	Men	116.7	209.5	+79.5
	Women	54.5	110.2	+102.2
Stroke	Men	46.5	96.6	+107.7
	Women	35.4	75.6	+113.6

⁸ 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.

⁹ 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).

Cause of death	Gender	All age directly age-standardised mortality rates per 100,000 Hull residents, using the 1976 and 2013 European Standard Populations		
		ESP 1976	ESP 2013	% change
Lung cancer	Men	66.7	112.5	+68.7
	Women	55.6	87.0	+56.5
Colorectal cancer	Men	25.7	44.3	+72.4
	Women	14.8	26.2	+77.0
Breast cancer	Women	24.6	37.1	+50.8
Prostate cancer	Men	21.5	43.2	+100.9
COPD	Men	51.7	100.8	+95.0
	Women	45.4	77.2	+70.0
Dementia	Men	22.9	54.4	+137.6
	Women	25.7	61.7	+140.1
Alcohol related deaths	Men	14.9	16.4	+10.1
	Women	6.5	6.7	+3.1

Table 16: Under 75 directly age-standardised mortality rates per 100,000 Hull residents 2010-12 using the 1976 and 2013 European Standard Populations, selected causes of death

Cause of death	Gender	Under 75 directly age-standardised mortality rates per 100,000 Hull residents, using the 1976 and 2013 European Standard Populations		
		ESP 1976	ESP 2013	% change
All causes	Men	408.6	549.1	+34.4
	Women	280.6	375.0	+33.6
CHD	Men	66.3	91.2	+37.6
	Women	21.3	30.8	+44.6
Stroke	Men	17.7	25.5	+44.1
	Women	10.8	15.5	+43.5
Lung cancer	Men	44.7	66.0	+47.7
	Women	42.9	59.8	+39.4
Colorectal cancer	Men	15.5	21.8	+40.6
	Women	8.8	12.4	+40.9
Breast cancer	Women	18.7	24.0	+28.3
Prostate cancer	Men	7.7	11.7	+51.9
COPD	Men	24.8	38.0	+53.2
	Women	21.1	31.7	+50.2
Dementia	Men	2.3	3.6	+56.5
	Women	0.9	1.6	+77.8
Alcohol related deaths	Men	15.3	17.5	+14.4
	Women	6.8	7.3	+7.4

5.9.7 Occurrence Versus Registration of Deaths

Deaths and mortality rates produced by the NHS Information Centre Indicator Portal and local analyses involving the Public Health Mortality File (PHMF) are based on year of registration of the death rather than year of death. In most cases, the calendar year in which the death occurred will be the same as the calendar year in which the deaths were registered, although there can be considerable delays between occurrence and registration for deaths where an investigation by a local coroner is required.

5.9.8 Moving Average

A moving average is an average or mean value over a number of years, with the years 'moving' over time. A three-year moving average is very common (where the value presented is the mean value over three years). A moving average is very useful in summarising data where the number of events are small on an annual basis and there are potentially large fluctuations in the rate of events. Calculating the moving average smoothes out the fluctuations and makes interpretation easier so that the overall trend can be better seen.

5.9.9 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.

5.10 Underlying Data for Figures

Trend in all age prostate cancer mortality rate in men

The underlying data for **Figure 1** from the NHS Information Centre Indicator Portal is given in the table below.

Area	Trends in all age prostate cancer directly standardised mortality rates per 100,000 males, age-standardised using the 1976 European Standard Population																	
	1995-97	1996-98	1997-99	1998-00	1999-01	2000-02	2001-03	2002-04	2003-05	2004-06	2005-07	2006-08	2007-09	2008-10	2009-11	2010-12	2011-13	2012-14
England	63.6	62.3	61.2	59.8	58.6	58.0	58.4	58.1	57.3	55.9	55.0	54.0	53.3	52.9	52.5	51.9	50.8	49.5
Hull	53.0	51.7	55.1	53.4	53.8	48.6	54.2	56.6	56.8	56.0	57.3	53.3	46.5	42.6	46.5	45.8	48.2	44.8
Yks. & Humber	61.8	59.8	58.8	57.5	56.3	55.2	56.6	58.3	57.4	54.9	53.0	52.7	52.1	52.2	51.8	51.5	50.3	50.1
Wolverhampton	71.5	68.9	63.1	57.7	62.7	58.4	55.4	48.7	52.6	58.8	60.9	60.7	52.0	49.8	52.4	54.1	54.9	53.4
Salford	65.2	65.2	62.6	60.7	65.9	65.1	62.3	59.5	50.7	48.5	42.7	54.0	60.3	64.5	57.9	45.9	41.4	37.5
Derby	54.4	60.4	59.0	54.5	48.0	49.9	45.4	42.9	37.8	41.5	43.2	49.8	50.8	51.6	50.2	50.3	52.8	51.2
Stoke-on-Trent	66.7	59.2	54.6	53.9	61.1	57.8	54.1	48.4	46.2	45.6	47.9	52.8	57.0	56.1	52.4	53.8	53.3	56.5
Coventry	51.8	55.5	54.0	52.0	55.3	60.3	66.8	62.9	60.7	54.6	51.5	44.5	46.3	45.3	48.6	43.6	45.3	46.0
Plymouth	64.8	61.0	59.1	55.0	53.5	53.0	54.9	58.1	55.3	54.4	52.3	54.7	50.7	53.2	50.4	57.6	57.1	55.4
Sandwell	55.1	56.8	60.1	54.6	57.1	58.3	66.9	61.8	58.6	54.2	60.1	63.8	65.4	53.3	47.6	48.5	54.5	53.8
Middlesbrough	49.9	59.9	67.2	62.9	65.0	52.5	53.0	48.8	54.4	58.8	55.8	55.5	53.5	54.7	58.7	59.5	58.2	59.7
Sunderland	58.0	58.7	56.6	55.5	56.1	60.5	69.2	66.1	59.7	52.9	53.1	51.5	55.3	50.9	52.6	48.9	56.0	59.4
Leicester	51.9	55.8	57.8	57.2	58.1	53.7	53.0	51.2	57.8	48.5	43.5	37.0	39.7	43.2	52.0	51.5	50.3	47.6
Avg. above 10	58.9	60.1	59.4	56.4	58.3	57.0	58.1	54.8	53.4	51.8	51.1	52.4	53.1	52.3	52.3	51.4	52.4	52.0
NE Lincolnshire	63.3	56.8	58.5	56.2	66.1	73.7	78.0	72.3	65.4	56.7	61.4	62.2	62.7	61.1	60.6	61.7	63.2	60.4

Trend in one-year and five-year relative survival from prostate cancer

The underlying data for **Figure 2** from the National Cancer Information Service is given in the table below.

Period	Trends in one-year and five-year relative survival (95% confidence interval) from prostate cancer					
	Hull		Humber & Yorkshire Coast Cancer Network		England	
	One-year	Five-year	One-year	Five-year	One-year	Five-year
1985-1989	75.9 (70.1, 81.7)	40.1 (32.3, 47.9)	76.7 (73.9, 79.6)	40.6 (36.7, 44.5)	78.8 (78.4, 79.2)	45.7 (45.0, 46.3)
1986-1990	78.3 (72.8, 83.8)	43.7 (35.9, 51.4)	77.4 (74.7, 80.2)	42.6 (38.8, 46.5)	79.0 (78.6, 79.4)	46.0 (45.4, 46.6)
1987-1991	77.0 (71.5, 82.5)	46.0 (38.2, 53.7)	77.3 (74.5, 80.0)	43.7 (39.9, 47.6)	78.9 (78.5, 79.3)	46.4 (45.8, 47.0)
1988-1992	78.3 (72.9, 83.6)	45.8 (38.2, 53.5)	78.3 (75.6, 80.9)	45.4 (41.6, 49.2)	79.1 (78.7, 79.5)	47.8 (47.2, 48.4)
1989-1993	79.6 (74.5, 84.7)	50.1 (42.6, 57.7)	78.9 (76.4, 81.4)	48.5 (44.8, 52.2)	79.9 (79.5, 80.2)	50.8 (50.3, 51.4)
1990-1994	79.4 (74.5, 84.3)	50.3 (43.1, 57.6)	78.8 (76.4, 81.2)	50.2 (46.7, 53.8)	81.4 (81.0, 81.7)	54.9 (54.4, 55.4)
1991-1995	79.7 (74.8, 84.6)	50.6 (43.4, 57.8)	79.8 (77.4, 82.1)	52.8 (49.3, 56.2)	82.9 (82.5, 83.2)	58.7 (58.1, 59.2)
1992-1996	83.0 (78.4, 87.5)	51.3 (44.2, 58.4)	82.1 (79.9, 84.3)	54.2 (50.8, 57.6)	84.6 (84.3, 84.9)	62.6 (62.1, 63.1)
1993-1997	85.4 (81.1, 89.7)	57.4 (50.3, 64.5)	84.0 (82.0, 86.1)	57.3 (54.0, 60.6)	86.2 (85.9, 86.5)	65.7 (65.2, 66.2)
1994-1998	86.7 (82.6, 90.8)	60.5 (53.6, 67.4)	86.1 (84.2, 88.1)	59.2 (55.9, 62.4)	87.6 (87.3, 87.9)	67.9 (67.5, 68.4)
1995-1999	87.2 (83.1, 91.3)	61.5 (54.6, 68.5)	87.8 (86.0, 89.7)	60.6 (57.4, 63.8)	88.7 (88.4, 89.0)	70.1 (69.6, 70.6)
1996-2000	89.6 (85.8, 93.4)	64.3 (57.5, 71.0)	90.0 (88.3, 91.7)	63.5 (60.4, 66.6)	90.0 (89.7, 90.2)	72.7 (72.3, 73.2)
1997-2001	90.8 (87.3, 94.4)	67.5 (61.0, 74.0)	91.5 (89.9, 93.1)	68.6 (65.7, 71.6)	91.1 (90.9, 91.3)	75.7 (75.3, 76.1)
1998-2002	91.9 (88.5, 95.2)	69.2 (62.9, 75.4)	93.1 (91.7, 94.5)	73.6 (70.9, 76.4)	92.0 (91.8, 92.2)	78.1 (77.7, 78.5)
1999-2003	93.0 (89.9, 96.1)	69.8 (63.7, 75.8)	93.7 (92.4, 95.0)	76.5 (73.8, 79.1)	92.8 (92.6, 93.0)	80.5 (80.1, 80.8)
2000-2004	96.0 (93.5, 98.6)	76.0 (70.4, 81.5)	95.7 (94.5, 96.8)	80.5 (78.0, 82.9)	93.5 (93.3, 93.7)	82.7 (82.3, 83.0)
2001-2005	95.8 (93.4, 98.3)	77.7 (72.4, 83.0)	95.9 (94.8, 97.0)	82.6 (80.3, 84.9)	93.9 (93.7, 94.1)	84.2 (83.9, 84.6)
2002-2006	96.5 (94.3, 98.8)	*	96.1 (95.1, 97.2)	*	94.3 (94.1, 94.5)	*
2003-2007	96.5 (94.3, 98.7)	*	96.2 (95.2, 97.2)	*	94.7 (94.6, 94.9)	*
2004-2008	96.9 (94.8, 98.9)	*	96.2 (95.2, 97.2)	*	95.1 (94.9, 95.2)	*
2005-2009	96.8 (94.8, 98.9)	*	96.3 (95.4, 97.3)	*	95.4 (95.3, 95.6)	*

*5-year survival for this period not yet available.

Age-gender standardised prostate cancer annual inpatient admission rate per 100,000 persons by local deprivation quintile

The underlying data for **Figure 3** derived from Hospital Episode Statistics and Primary Care Information System (population) is given in the table below.

Local IMD 2010 deprivation quintile	Standardised admission rate per 100,000 persons aged under 75 years (95% CI) for prostate cancer
Most deprived	133 (109, 160)
2	67 (50, 88)
3	72 (56, 92)
4	102 (82, 126)
Least deprived	139 (116, 166)
Hull	104 (95, 114)

All age standardised mortality rate per 100,000 men by local deprivation quintile for 2012-2014

The underlying data for **Figure 4** derived from the PHMF (deaths) and Primary Care Information System (population), age-standardised using the 2013 European Standard Population, are given in the table below for prostate cancer deaths. The overall all age DSR for Hull is also given.

Local IMD 2015 deprivation quintile	Under 75 standardised mortality rates (95% CI) for prostate cancer per 100,000 men 2012-2014 (2013 European Standard Population)
Most deprived	45.6 (28.1 to 69.8)
Quintile 2	54.0 (32.8 to 83.1)
Quintile 3	41.5 (26.1 to 62.5)
Quintile 4	33.5 (18.6 to 55.2)
Least deprived	48.5 (29.0 to 75.6)
Hull	44.0 (35.7 to 53.7)

5.11 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 24**.

Reference	Description of source
C&LG	Index of Multiple Deprivation 2015 from Communities and Local Government (Communities and Local Government 2015)
HES	Hospital Episode Statistics (Office for National Statistics 2009; Information Centre for Health and Social Care 2014)
ICIP	NHS Information Centre Indicator Portal (Information Centre for Health and Social Care 2012) previously known as the Compendium of Clinical and Health Indicators (Information Centre for Health and Social Care, 2008a)
NYCRIS	Northern and Yorkshire Cancer Registry and Information Service (now part of Public Health England)
ONS	Office for National Statistics
PCIS	Primary Care Information System (Open Exeter). Hull and East Riding of Yorkshire population file of GP registrations (Connecting for Health, 2009)
PHMF	Hull and East Riding of Yorkshire Public Health Mortality File (Office for National Statistics 2012)
PHOF	Public Health Outcomes Framework (Public Health England 2015)

5.11.1 Tables

Reference	Page	Data time period	Last updated	Data source(s)
Table 1	12	2009 – 2011	Oct 14	ICIP
Table 2	12	2009 – 2011	Oct 14	ICIP
Table 3	13	2008/09 – 2010/11	Oct 11	HES / PCIS
Table 4	14	2012 – 2014	Jan 16	ICIP
Table 5	14	2012 – 2014	Jul 15	PHMF / ONS
Table 6	15	2012 – 2014	Jul 15	PHMF / ONS
Table 7	16	2012 – 2014	Jan 16	ICIP
Table 8	18	2012 – 2014	Jan 16	ICIP
Table 9	18	2012 – 2014	Jul 15	PHMF / ONS

5.11.2 Figures

Reference	Page	Data time period	Last updated	Data source(s)
Figure 1	17	1995-97 – 2012-14	Jan 16	ICIP
Figure 2	20	1985-9+5y, 2005-9+1y	Oct 14	NYCRIS
Figure 3	21	2008/09 – 2010/11	Oct 11	HES / PCIS / C&LG (IMD)
Figure 4	22	2012 – 2014	Nov 15	PHMF (ONS) / C&LG (IMD)

6 INDEX

Abbreviations.....	7	European Standard Population	15, 50
Appendix.....	24	Explanation of terms.....	7
Benchmarking		Figures	
general practices.....	31	date last updated	57
Cancer		date sources	57
incidence.....	11	underlying data	54
prostate	11	General practice	
Changes to mortality rates.....	15, 50	benchmarking	31
Clinical significance	48, 52	groupings.....	31
Comparator areas.....	9	Glossary	7
Confidence intervals	7	GP disease registers.....	<i>See QOF</i>
explained.....	48	Grouping of general practices	31
Confounding		Hospital episode statistics	
explained.....	48	explained	29
Contents page	3	ICD	45
Data sources	7	IMD	
for each table/figure	56	differences in	
general.....	24	mortality	<i>See Deprivation</i>
Data underlying figures.....	54	prevalence	<i>See Deprivation</i>
Date last updated		risk factors.....	<i>See Deprivation</i>
tables and figures.....	56	lower layer super output level	8
Daycases.....	<i>See Inpatient admissions</i>	national ranks	8
Deaths		quintiles	8
occurrence versus registration	52	Incidence	
Definitions.....	45	cancers	11
cause of death	45	Index of multiple deprivation.....	<i>See IMD</i>
ICD.....	45	Indicators.....	10, 40
Delay in registering deaths	52	Indirect standardisation	
Deprivation	8	explained	49
IMD	8	Inpatient admissions	
Index of multiple deprivation	8	data explained	29
prostate cancer and inpatient		prostate cancer	13
admissions	21	prostate cancer and deprivation	21
prostate cancer and mortality	22	Interaction	
Direct standardisation		explained	48
explained.....	49	International classification of diseases	45
Directly standardised mortality rate ..	<i>See</i>	Introduction	6
DSR		LLSOAs.....	8
Disease registers.....	<i>See QOF</i>	Local surveys	27
DSR		Median	
explained.....	49	explained	49
Effect modification		Modelled estimates	7, 27
explained.....	48	Mortality	
ESP	15, 50		

changes due to European Standard Population	15, 50	prostate cancer	11
occurrence versus registration	52	Significance testing explained	52
prostate cancer	14	Small numbers	7
prostate cancer and deprivation	22	problem explained	49
Moving average explained	52	SMR explained	49
Outcome measures	10, 40	Sources of data	24, 56
Percentiles explained	49	Standardisation	7
Performance targets	40	change in European Standard Population	15, 50
PHOF	10, 40	explained	49
local analysis	41	Standardised mortality ratio.....	See SMR
national profile	41	Statistical methods	7
tartan rug	41	Statistical terms	7
Prevalence registers	See QOF	Statistics problem of small numbers explained	49
Prostate cancer	11	Summary	5
inpatient admissions	13	Surveys local	27
inpatient admissions and deprivation	21	Survival prostate cancer	19
mortality	14	Synthetic estimates	7, 27
mortality and deprivation	22	Tables date last updated	57
risk factors	11	date sources	57
survival	19	Targets	40
Public Health Outcomes Framework See PHOF		Tartan rug	41
P-values explained	52	Technical information	7
QMAS explained	30	Testing significance explained	52
QOF	Also see Prevalence	Three year period data explained	52
explained	30	Uncertainty problem of small numbers explained	49
problems with comparing GPs	30	Underlying data for figures	54
Quality and outcomes framework	See QOF	Updated tables/figures data sources	56
Quartiles explained	49	date last updated	56
Quintiles explained	49	Variability	7
References	23	and small numbers	49
Registration of deaths	52		
Risk factors for			