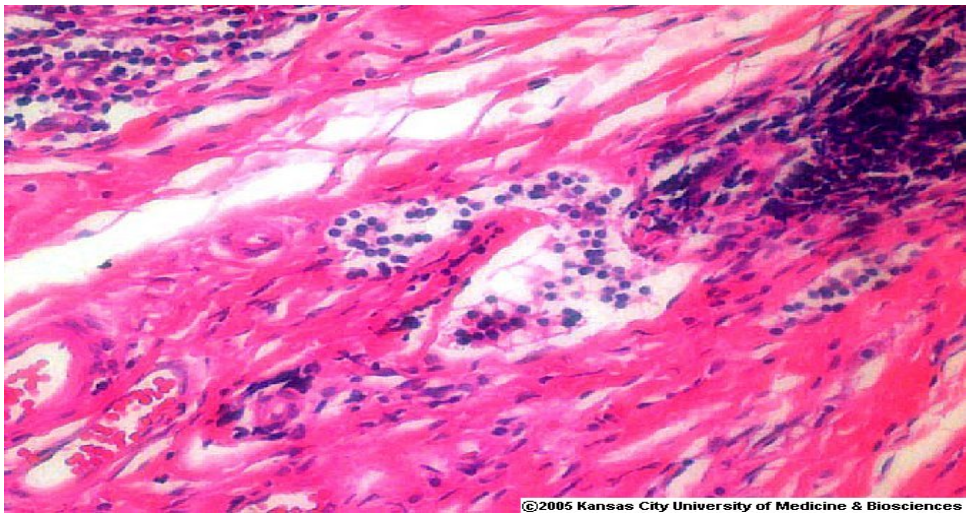
Hull and East Yorkshire Cancer Equity Audit

March 2006



Andrew Taylor
Mandy Lee
Tim Greene

Project team:

Dr Wendy Richardson	Director of Public Health for Hull
Dr Tim Allison	Director of Public Health for East Riding of Yorkshire
Kate Birkenhead	Operational Manager
Des Cooper	Performance Analyst
David Duxbury	Head of Public Protection
Richard Dixon	Information Manager
Karen Ellis	Head of Capacity and Choice
Tim Fowler	Associate Director of Commissioning
Goetz Gerstenberger	Primary Care Information Analyst
Tim Greene	Epidemiologist
Mandy Lee	Public Health Intelligence Analyst
Professor Mike Lind	Professor of Clinical Oncology
Hannah Mitchell	Cancer Network representative
Dr Andrew Taylor	Head of Public Health Science
Julie Taylor-Clarke	Cancer Network Director
Mark Williamson	Medical Director
Kathleen Young	Public Health Nurse Consultant

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Hull and East Riding of Yorkshire Cancer Equity Audit March 31st 2006

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Cover picture - Some lymphocytes in a lymphatic vessel with thanks to Kansas City University of Medicine and Biosciences

1 Abbreviations

BMI	Body Mass Index
BP	Blood Pressure
CI	Confidence Interval
DSRR	Direct Standardised Registration Ratio
EH	Eastern Hull (Primary Care Trust)
ERoY	East Riding of Yorkshire (Local Authority)
EY	East Yorkshire (Primary Care Trust)
GP	General Practitioner
HIA	Health Impact Assessment
HNA	Health Needs Assessment
ICD	International Classification of Diseases
IMD	Index of Multiple Deprivation
KuH	Kingston-upon-Hull (Local Authority)
LA	Local Authority
LSP	Local Strategic Partnership
NSF	National Services Framework
N&EY&NL	North and East Yorkshire and Northern Lincolnshire (Strategic Health Authority)
NYCRIS	Northern and Yorkshire Cancer Registry and Information Service
OPCS	Office of Population Censuses and Surveys
PCT	Primary Care Trust
PHDT	Public Health Development Team
PSA	Public Service Agreements
QOF	Quality and Outcomes Framework
SHA	Strategic Health Authority
SMR	Standardised Mortality Ratio
SOA	Super Output Area
SRR	Standardised Registration Ratio
WH	West Hull (Primary Care Trust)
YW&C	Yorkshire Wolds and Coast (Primary Care Trust)

2 Equity Audit

2.1. Purpose and Outline

A cancer health equity audit aims to inform the planning and delivery of services for reducing inequalities related to cancer in Hull and East Riding.

Primary Care Trusts (PCTs) are expected to demonstrate the effective use of health equity audit to attain star ratings.

Equity is now a dimension of the Government's approach to setting national targets and managing performance on health inequalities. Targets aim to see faster progress compared with the average in the most deprived areas (including Hull PCTs). With respect to cancer, the Public Service Agreements inequalities target for the 2004 Spending Review is set:

- by 2010, from a baseline of 1995-1997, to reduce mortality rates from cancer by at least a 6% reduction in the inequalities gap between the fifth of areas with the worst health and deprivation indicators and the population as a whole (Treasury Department,).

The objectives of the cancer health equity audit are, as developed by the Project Team:-

1. To support effective deployment of services and resources for diagnosing and treating cancer according to need and potential for reducing health inequalities.

2. To provide a baseline to enable future audits to evaluate the effectiveness/acceptability/usefulness of the new policies in relation to reducing health inequity.

3. To assess the quality and usefulness of routinely available information about cancer in the local population

Health Equity Audit would be expected to: -

- Influence the agreement of key local objectives between partners.
- Influence change in investment or delivery.

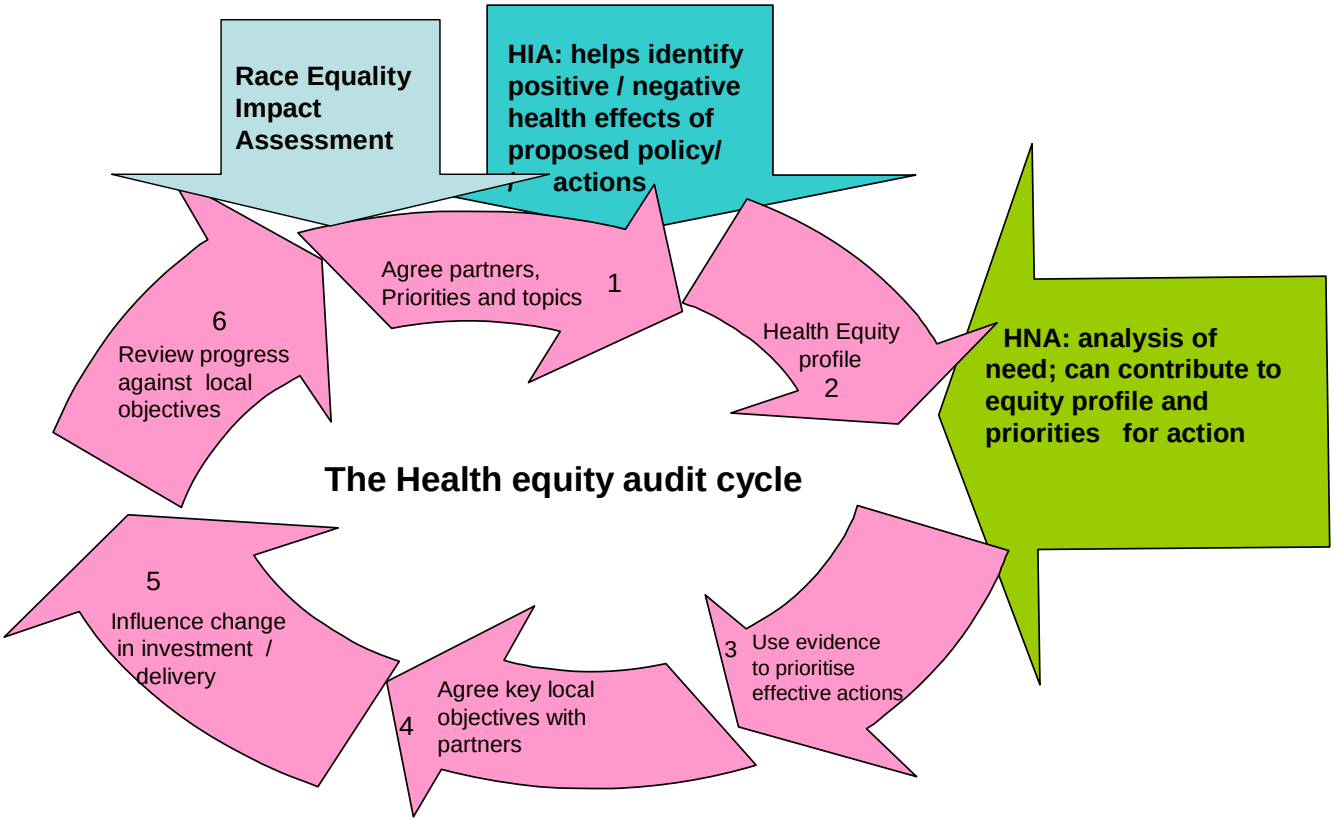
Because Health Equity Audit is an iterative process future work should: -

- Review progress against local objectives.
- Inform the selection of future Health Equity Audit topics.

2.2. Health Equity Audit Cycle

Figure 1 illustrates the health equity audit cycle, and how the public health tools such as Health Needs Assessment (HNA) and Health Impact Assessment (HIA) are related.

Figure 1: Health equity audit cycle



The health equity audit cycle is not complete until change occurs which reduces health inequalities; therefore it is likely that there will be repetitions of the former steps in future.

Health Equity Audit then, is an iterative process which fits in the planning cycle and conforms to the above structure.

This means that this health equity audit is only the first step as subsequent step(s) are required in the future to assess the progress against local objectives. It would be hoped that local objectives could be set in relation to an evidence-based of what policies work to reduce inequalities. However, it is possible that there is little evidence base, and local objectives need to be set in relation to educated supposition. Therefore, a single health equity audit which includes a review of progress in the future will not necessarily reduce the inequalities observed. So, even if the changes made were successful, there still may be inequalities present (either different inequalities or the same inequalities at a

reduced level) and it may be necessary to repeat the health equity audit to agree new actions to reduce inequity further.

2.3. Definition of an Health Equity Audit

There are a range of meanings and definitions relating to health equity and inequalities. The following definitions of health equity have been adopted for the purposes of this audit.

- Equity in health is the absence of systematic disparities in health (or in the major social determinants of health) between groups with different levels of underlying social advantage/disadvantage. …..It is the right to the highest attainable standard of health, as reflected by the standard of health enjoyed by the most socially advantaged group within a society (Braveman and Gruskins, 2003).

- Equity of access (opportunity) to services for equal need involves ensuring that there are appropriate and accessible services for all; and consequently that services address any barriers to access and specific needs relating to particular groups (Mooney, 1983).

Two primary benchmarks were therefore used to define health inequalities in Hull and East Riding and examine the potential for improvement:

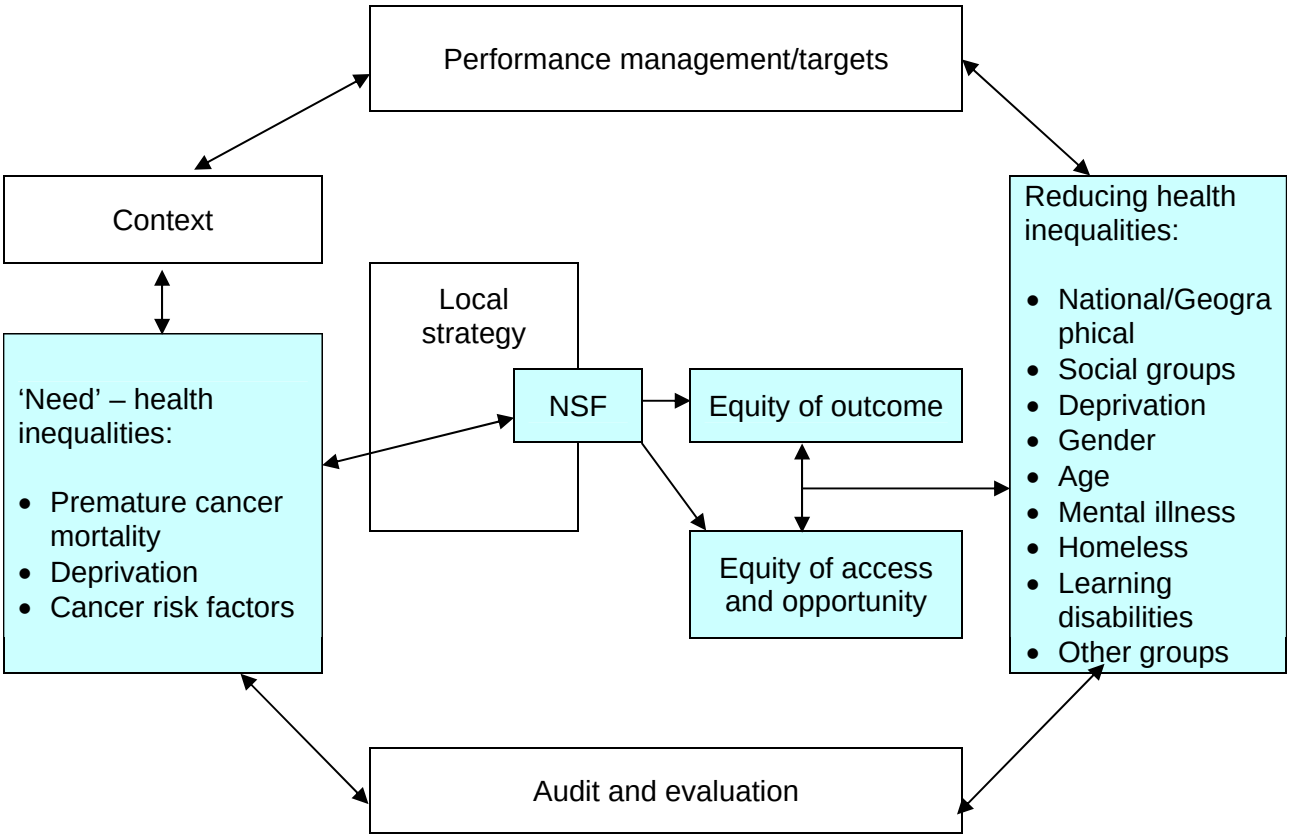
- The level of inequality in cancer between Hull and East Riding populations in comparison to the national average for England and Wales, and against national targets.

- The inequalities in cancer between the different social groups/areas within Hull and East Riding.

2.4. Cancer Equity Audit Framework

The framework for the audit is presented in ***Figure 2***.

Figure 2: Cancer equity audit framework



The audit framework involved profiling the pattern of 'need' with respect to inequalities in cancer and an audit of the services.

2.4.1. Profiling the Pattern of 'Need' With Respect to Inequalities in Cancer

Cancer incidence is the foremost measure of need; however because of problems obtaining comprehensive and analysable (with respect to inequalities) incidence data, other indicators were used to assess 'need': cancer mortality, hospital admissions with a cancer diagnosis, and known cancer risk factors.

Deprivation, as measured by the Index of Multiple Deprivation (IMD 2004) was used as the main measure of deprivation at a small area level. The IMD is described in more detail in a subsequent section.

National IMD scores for small areas, super output areas (SOAs) and wards in Hull and East Riding (and their quintile bandings) were used to examine the relationship between deprivation and cancer mortality and cancer risk factors (smoking, eating patterns and physical activity levels).

2.4.2. Equity Audit of Services

- A local Cancer Equity Audit group met several times in 2005/6 agreeing terms of reference and developing this audit, paying particular attention to the scope of the audit, and on which inequalities and cancer types to focus.

- Evidence that the service was being accessed locally by the most deprived groups. Where possible, this equity of access locally was determined by examining the relationship between deprivation (deprivation bandings) and use of services.

If the above criteria were met, it could be assumed that development of the service could contribute to reducing inequalities in the cancer experienced by the people of Hull and East Riding.

The quality of the evidence available was also considered.

2.4.3. Deprivation and the Index of Multiple Deprivation

The Index of Multiple Deprivation (IMD) 2004 (Office of the Deputy Prime Minister,) has been calculated for small geographical areas of around 1,500 people ('super output areas': SOAs[1]). The IMD 2004 measures multiple deprivation across seven domains and the scores on each domain are weighted and combined to give the final index score for each SOA (as shown in ***Table 1***).

[1] **Super Output Areas (SOAs)** Super Output Areas (SOAs) are a new geographical unit designed to improve the reporting of small area statistics. They have been introduced initially for use on the **Neighbourhood Statistics (NeSS)** website, but it is intended that they will eventually become the standard across National Statistics.

Table 1: Domains of the Index of Multiple Deprivation 2004 and their weights

Domain of IMD 2004	Domain weight (%)
Income deprivation	22.5
Employment deprivation	22.5
Health deprivation and disability	13.5
Education, skills and training deprivation	13.5
Barriers to housing and services	9.3
Living environment deprivation	9.3
Crime	9.3

From the Neighbourhood Statistics website, Hull is ranked as the 9th most deprived local authority of England whereas East Riding of Yorkshire is ranked as the 208th most deprived local authority (out of 354). So Hull is in the most deprived 3% of all local authorities and East Riding is in the most deprived 59% of local authorities. Deprivation is a significant risk factor for smoking, poor diet, diabetes, coronary heart disease, accidents and certain cancers.

3 Sources of Data, Definitions and Statistical Methods

Details of the sources of national and local data used in this report, definitions used in classifying risk factors from the local surveys and details of the statistical methods used in analysing data in this health equity audit are given in ***Appendix 1***.

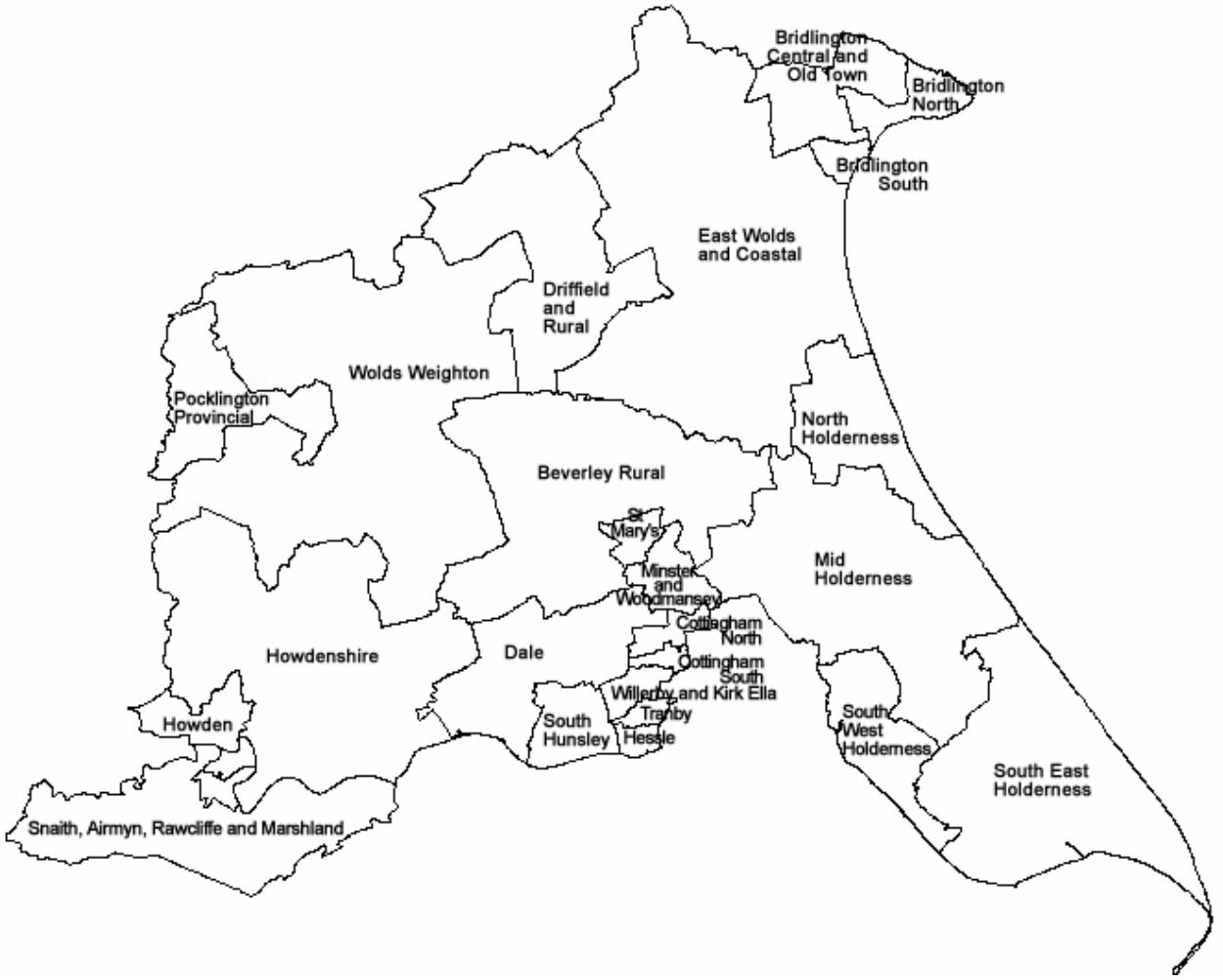
4 East Riding of Yorkshire and Kingston-upon-Hull

4.1 Geographical Area

The local authorities of East Riding of Yorkshire and Kingston-upon-Hull are both within the North and East Yorkshire and North Lincolnshire (N&EY&NL) Strategic Health Authority (SHA). East Riding of Yorkshire contains two Primary Care Trusts (PCTs) East Yorkshire PCT and Yorkshire Wolds and Coast PCT. Kingston-upon-Hull also contains two PCTs, Eastern Hull PCT and West Hull PCT.

East Yorkshire PCT is made up of 15 wards and Yorkshire Wolds and Coast PCT is made up of 11 wards which are illustrated in ***Figure 3***.

Figure 3: Wards within East Riding of Yorkshire



Eastern Hull PCT is made up of 11 wards and West Hull PCT is made up of 12 wards which are illustrated in ***Figure 4***.

Figure 4: Wards within Kingston-upon-Hull

4.2 Population

There are different estimates of population available from different sources. Estimates can be derived from the 2001 Census population updated for births, deaths and migration (updated mid-year population estimates available annual), or from the number of patients registered with General Practitioners (GPs). A person can be assigned to a geographical location (e.g. ward or PCT) based on the postcode or their residence or the postcode of their GP practice. In most cases, the geographical location is the same, but not always.

GP registration data is available for October 2005, and contains all registrations with GP practices within East Riding of Yorkshire and Kingston-upon-Hull. Therefore, this data will contain patients who are registered with a GP practice within the area, but who actually reside out-with East Riding of Yorkshire or Kingston-upon-Hull. In addition, residents of East Riding of Yorkshire and Kingston-upon-Hull (particularly the former due to the geographical boundaries of the areas) may be registered with GPs out-with the area. This occurs particularly in wards close to York, for instance, Wolds Weighton and Pocklington Provincial.

Based on GP registration data from October 2005 (***Table 2***), it can be seen that 10% (28,982 out of 284,761) of patients have a GP which is based in Kingston-upon-Hull but they themselves reside in East Riding of Yorkshire. This is an important consideration with respect to access to services.

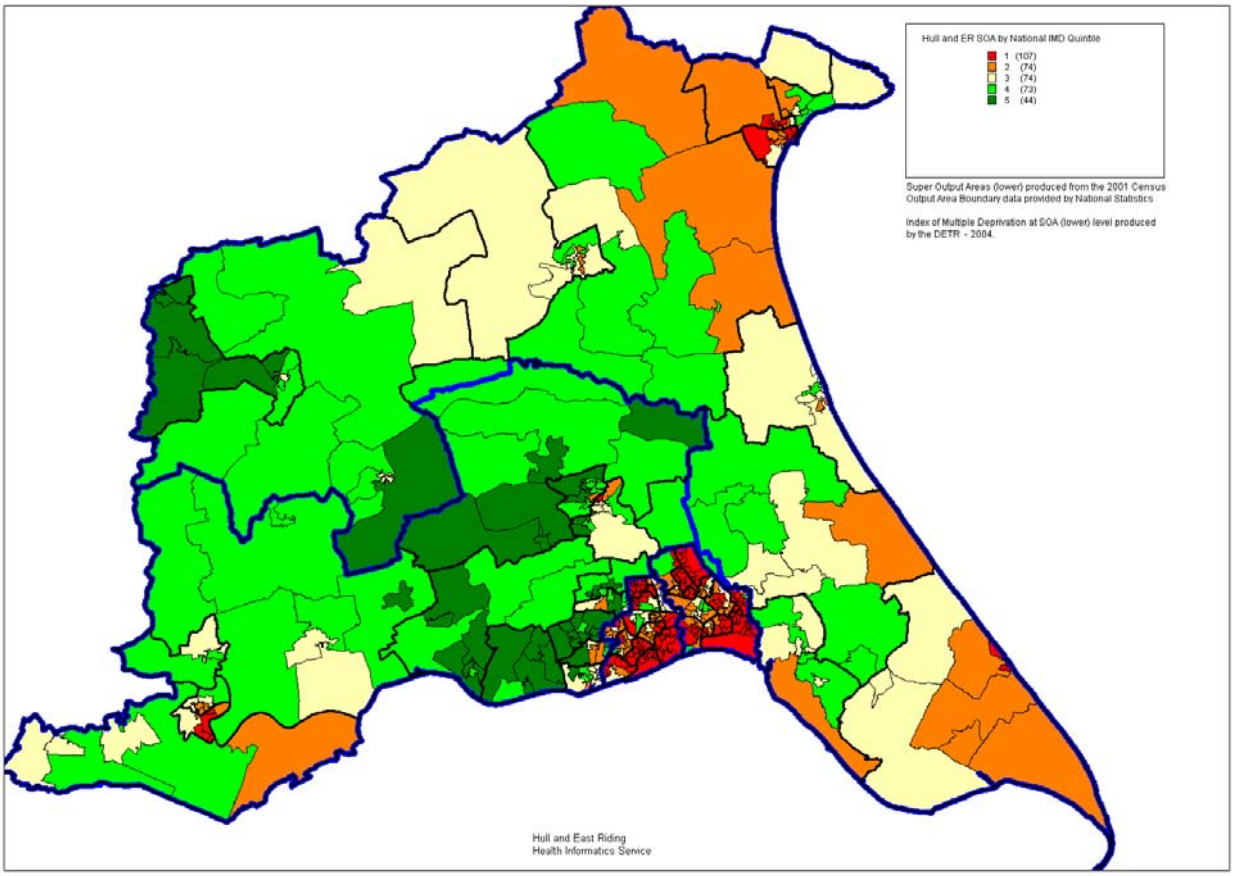
Table 2: Local authority of GP and resident

Age (years)	Local Authority of based on GP practice location and residence of patients, 2005						Total
	ERoY GP and resident	KuH GP and resident	ERoY GP but KuH resident	KuH GP but ERoY resident	ERoY GP but resident outwith area	KuH GP but resident outwith area	
0 to 4	13,604	14,195	229	1,100	212	36	29,376
5 to 9	16,080	14,827	225	1,496	172	23	32,823
10 to 14	18,860	17,026	231	1,847	147	16	38,127
15 to 19	19,120	18,402	255	2,220	88	22	40,107
20 to 24	14,584	21,034	313	1,648	125	24	37,728
25 to 29	13,614	18,698	293	1,196	193	48	34,042
30 to 34	17,414	19,335	362	1,578	230	44	38,963
35 to 39	21,065	19,545	329	2,076	211	43	43,269
40 to 44	22,773	19,302	323	2,441	174	21	45,034
45 to 49	21,049	16,680	289	2,124	115	25	40,282
50 to 54	20,032	14,696	247	2,061	102	21	37,159
55 to 59	23,857	14,876	246	2,298	118	15	41,410
60 to 64	19,070	10,441	155	1,673	93	1	31,433
65 to 69	16,727	10,077	178	1,686	74	4	28,746
70 to 74	14,156	9,121	176	1,441	42	2	24,938
75 to 79	11,348	7,543	131	975	41	0	20,038
80 to 84	8,410	5,525	95	638	26	0	14,694
85+	6,735	4,111	68	484	13	0	11,411
Total	298,498	255,434	4,145	28,982	2,176	345	589,580

4.3 Deprivation

The Index of Multiple Deprivation (IMD) 2004 scores for all of England's SOAs have been divided into five approximately equal-sized groups ranging from the 20% most deprived areas to the 20% least deprived areas. These groups are referred to as national quintiles[2]. The national quintiles give an indication of how the Hull and East Riding's SOAs and wards compare with England in terms of deprivation. ***Figure 5*** illustrates the IMD 2004 deprivation national quintiles for East Riding and Hull. The areas in red are within the top 20% most deprived areas nationally and those areas in dark green are within the top 20% most affluent areas nationally. It can be seen that there are pockets of deprivation in East Riding which include areas within Bridlington, Withernsea and Goole, and areas near the coast show deprivation. None of the wards in Hull are within the most affluent 40% nationally.

Figure 5: IMD 2004 national quintiles for East Riding (and Hull)



[2] The IMD 2004 score for wards can also be estimated from the average score for each SOA within the ward (weighting by the population within each SOA), and these ward scores can also be grouped into quintiles (either national or local).

Figure 6 illustrates the pattern of deprivation within Hull in more detail. The average IMD 2004 score for the wards have been calculated from the SOAs which are included in the wards weighted by population size.

Figure 6: IMD 2004 national quintiles for Hull

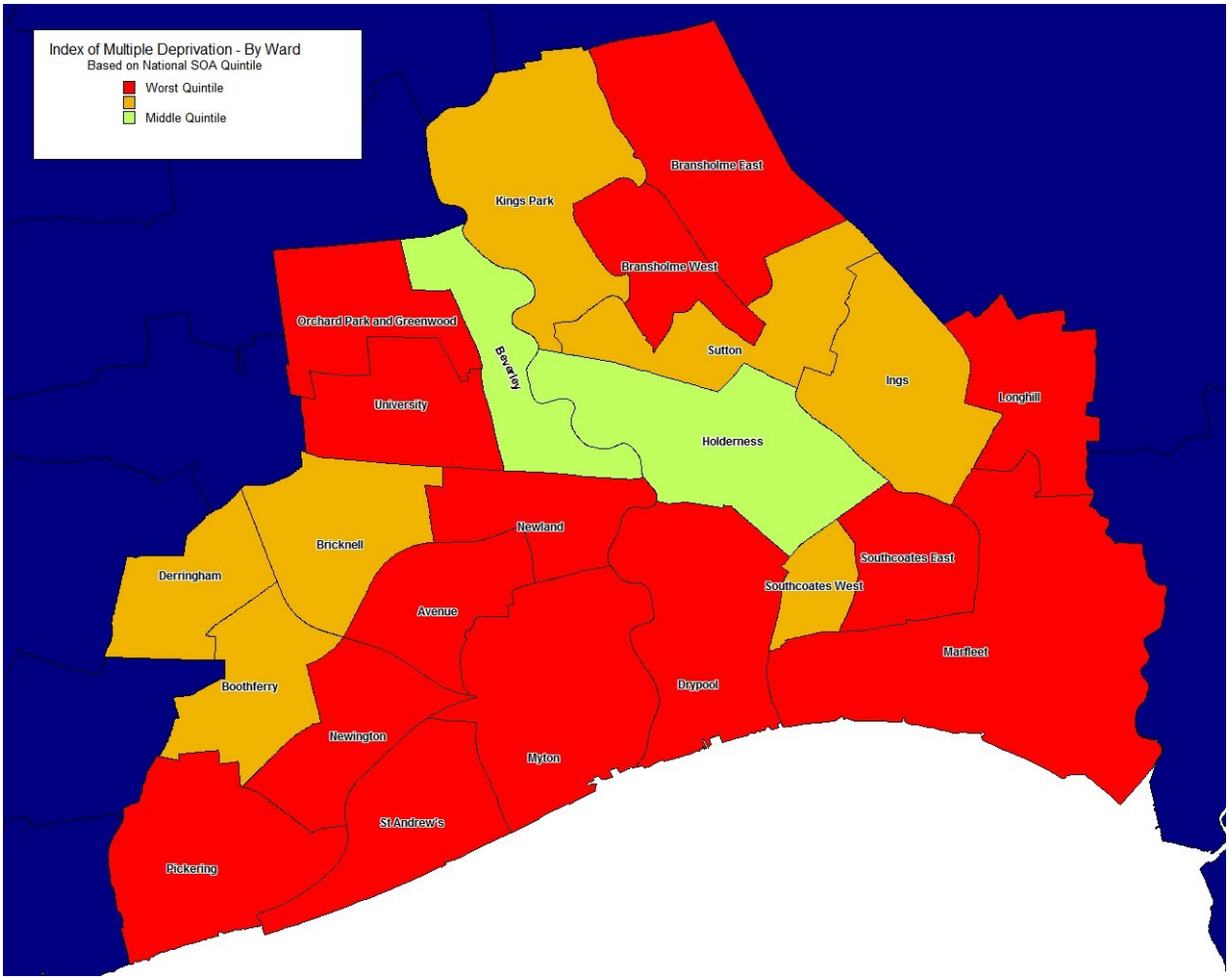


Table 3 gives the IMD scores for the wards of East Riding. The higher the IMD score, the worst the deprivation. The local ranks are provided with the a value of one denoting the most deprived area locally and 26 denoting the most affluent ward locally. The national ranking is also given, and similarly a low rank denotes more deprivation. The national rank percentile is provided. For example, if the value is 10, it means that that the ward is in the worst 10% of deprived wards nationally, and a value of 75 means that the ward is in the top 75% of deprived wards or alternatively the top 25% least deprived wards.

Table 3: Index of Multiple Deprivation 2004 scores and ranks of wards in East Riding

Ward Name	IMD Score	Local Rank (out of 26)	National Rank (Out of 7,932)	Percentile National Rank
East Yorkshire PCT				
Goole South	33.1	2	1,007	13
Goole North	21.3	5	2,393	31
Snaith, Airmyn, Rawcliffe & Marshland	16.3	8	3,396	43
Hessle	15.7	10	3,594	46
Cottingham South	15.1	11	3,752	48
Minster & Woodmansey	14.5	13	3,932	50
Tranby	13.9	14	4,107	52
Howdenshire	12.1	17	4,812	61
Howden	11.4	19	5,082	65
St Mary's	8.5	20	6,340	80
Cottingham North	8.4	21	6,358	81
Beverley Rural	6.6	22	7,074	90
Willerby & Kirk Ella	6.2	24	7,214	91
Dale	5.8	25	7,335	93
South Hunsley	5.4	26	7,465	95
Yorkshire Wolds & Coast PCT				
Bridlington South	40.1	1	540	7
Bridlington Central & Old Town	29.9	3	1,287	17
South East Holderness	26.7	4	1,633	21
North Holderness	19.1	6	2,780	36
Bridlington North	17.1	7	3,221	41
East Wolds & Coastal	15.8	9	3,538	45
Driffield & Rural	14.8	12	3,838	49
Mid Holderness	13.3	15	4,347	55
South West Holderness	13.2	16	4,378	56
Wolds Weighton	11.7	18	4,988	63
Pocklington Provincial	6.4	23	7,163	91

Table 4 gives the equivalent data for the 23 wards of Hull.

Table 4: Index of Multiple Deprivation 2004 scores and ranks of wards in Hull

Ward	Index Score	Local Rank (out of 23)	National Rank (out of 7,932)	National Percentile
Eastern Hull PCT				
Southcoates East	57.8	4	77	1
Marfleet	57.7	5	78	1
Bransholme East	57.1	6	84	2
Bransholme West	53.7	7	131	2
Longhill	48.5	9	247	4
Drypool	35.0	14	866	11
Ings	32.9	15	1,019	13
Southcoates West	32.4	16	1,064	14
Sutton	29.6	17	1,315	17
Kings Park	21.6	21	2,349	30
Holderness	18.8	22	2,830	36
West Hull PCT				
St Andrew's	70.1	1	15	1
Orchard Park & Greenwood	66.8	2	28	1
Myton	65.5	3	34	1
Newington	53.0	8	136	2
Newland	39.1	10	598	8
University	37.5	11	699	9
Pickering	36.8	12	749	10
Avenue	36.3	13	784	10
Derringham	27.0	18	1,598	21
Boothferry	24.5	19	1,880	24
Bricknell	22.1	20	2,258	29
Beverley	18.7	23	2,842	36

4.4 General Health

Table 5 gives local individual patient-level mortality data and GP registration population estimates age standardised mortality ratios (SMR) for all causes for persons aged under 75 years for each ward in East Riding for (2001-2003). The rates are compared with England. East Yorkshire PCT has rates that are lower than England (SMR<100), whereas rates are the same for Yorkshire Wolds and Coast PCT for men and slightly higher for women. Some wards have higher mortality rates than those observed nationally (SMR>100), and some wards have rates are significantly lower or significantly higher than the national average[3].

[3] If the 95% CI does not include 100 then the rate differs significantly than the national rate (see Statistical Methods section). However, one would expect 5% of statistical comparisons to be classified 'statistically significant' by chance even when there was no difference between the rate and that national rate so this must be borne in mind.

Table 5: Age-standardised all cause under 75 mortality ratio for East Riding, 2001-2003

PCT	Ward Name	Age-standardised mortality ratio for persons aged <75 years (95% CI)		
		Males	Females	Persons
EY	Beverley Rural	71 (56, 90)	76 (56, 101)	73 (60, 88)
EY	Cottingham North	79 (59, 105)	58 (37, 87)	71 (56, 89)
EY	Cottingham South	66 (48, 88)	98 (72, 130)	79 (64, 97)
EY	Dale	86 (68, 106)	66 (48, 89)	78 (65, 93)
EY	Goole North	108 (85, 136)	124 (93, 161)	114 (96, 136)
EY	Goole South	104 (80, 133)	109 (79, 147)	106 (87, 128)
EY	Hessle	81 (64, 101)	115 (91, 144)	95 (80, 111)
EY	Howden	73 (46, 110)	50 (24, 92)	64 (44, 90)
EY	Howdenshire	88 (70, 108)	80 (59, 105)	85 (71, 100)
EY	Minster and Woodmansey	97 (78, 119)	96 (74, 123)	97 (82, 113)
EY	St Mary's	86 (64, 113)	123 (91, 163)	100 (82, 122)
EY	Snaith, Airmyn, Rawcliffe & Marshland	68 (50, 89)	76 (54, 105)	71 (57, 87)
EY	South Hunsley	57 (44, 73)	71 (53, 93)	63 (52, 75)
EY	Tranby	85 (65, 108)	67 (46, 93)	77 (63, 94)
EY	Willerby and Kirk Ella	56 (43, 72)	93 (72, 118)	71 (59, 84)
East Yorkshire PCT		**79 (74, 84)**	**87 (81, 94)**	**82 (78, 86)**
YW&C	Bridlington Central & Old Town	124 (101, 151)	149 (118, 187)	134 (115, 156)
YW&C	Bridlington North	98 (80, 117)	82 (63, 104)	91 (78, 106)
YW&C	Bridlington South	133 (112, 157)	171 (141, 205)	148 (130, 167)
YW&C	Driffield and Rural	96 (78, 118)	103 (80, 131)	99 (84, 116)
YW&C	East Wolds and Coast	91 (74, 112)	93 (71, 119)	92 (78, 107)
YW&C	Mid Holderness	78 (62, 96)	85 (64, 110)	80 (68, 95)
YW&C	North Holderness	101 (80, 126)	107 (81, 139)	103 (87, 122)
YW&C	Pocklington Provincial	117 (93, 146)	113 (84, 148)	115 (97, 137)
YW&C	South East Holderness	111 (92, 132)	145 (118, 175)	124 (108, 141)
YW&C	South West Holderness	93 (75, 115)	85 (64, 111)	90 (76, 106)
YW&C	Wolds Weighton	67 (52, 86)	84 (62, 111)	74 (61, 89)
Yorkshire Wolds and Coast PCT		**100 (94, 106)**	**110 (103, 118)**	**104 (99, 109)**

Table 6 gives the equivalent information for Hull. The overall mortality rate for Eastern Hull PCT is 20% higher than the mortality rate in England. Most wards have higher mortality with the exception of Holderness and Kings Park. Mortality rates are almost 30% higher for males and 10% higher for females in West Hull PCT compared to England. There is more variability in West Hull compared to Eastern Hull. More wards in West Hull have lower mortality rates, but more wards have much higher mortality rates. Newland, Derringham and Pickering wards have rates more than 1.5 times as high as England for both males and females. Some wards have rates that are

significantly higher than the national average (only Bricknell for females has a rate significantly lower)[4].

Table 6: Age-standardised mortality ratio from all causes for those <75 years for Hull, 2001-2003

PCT	Ward Name	Age-standardised mortality ratio for persons aged <75 years (95% CI)		
		Males	Females	Persons
EH	Bransholme East	148 (114, 189)	130 (92, 180)	141 (115, 171)
EH	Bransholme West	116 (90, 148)	134 (98, 178)	123 (101, 148)
EH	Drypool	104 (82, 130)	159 (124, 201)	124 (105, 146)
EH	Holderness	80 (61, 102)	79 (56, 107)	79 (65, 96)
EH	Ings	114 (93, 138)	123 (98, 152)	118 (102, 136)
EH	Kings Park	91 (62, 130)	78 (44, 127)	86 (63, 115)
EH	Longhill	141 (115, 170)	133 (105, 166)	137 (118, 159)
EH	Marfleet	154 (128, 184)	126 (99, 159)	142 (123, 164)
EH	Southcoates East	132 (101, 169)	129 (93, 174)	131 (107, 158)
EH	Southcoates West	113 (85, 146)	104 (71, 148)	110 (88, 135)
EH	Sutton	122 (98, 149)	113 (86, 147)	118 (100, 139)
Eastern Hull PCT		**120 (112, 128)**	**121 (111, 131)**	**120 (114, 126)**
WH	Avenue	124 (99, 153)	98 (71, 134)	115 (96, 136)
WH	Beverley	94 (71, 121)	98 (69, 135)	96 (77, 117)
WH	Boothferry	91 (71, 115)	83 (60, 111)	88 (72, 105)
WH	Bricknell	94 (69, 124)	99 (68, 138)	96 (76, 119)
WH	Derringham	99 (78, 124)	68 (48, 95)	86 (71, 104)
WH	Myton	178 (153, 207)	164 (130, 204)	173 (153, 196)
WH	Newington	135 (109, 165)	122 (90, 162)	130 (110, 154)
WH	Newland	125 (95, 162)	153 (110, 209)	135 (110, 165)
WH	Orchard Park & Greenwood	162 (137, 192)	131 (103, 165)	150 (131, 171)
WH	Pickering	125 (102, 151)	109 (84, 140)	119 (102, 138)
WH	St Andrew's	187 (151, 228)	152 (110, 205)	175 (147, 206)
WH	University	115 (89, 147)	83 (57, 118)	102 (83, 125)
West Hull PCT		**129 (121, 137)**	**111 (102, 121)**	**122 (116, 128)**

4.5 Life Expectancy

From the Compendium, life expectancy at birth has been estimated using 2001-2003 data. ***Table 7*** gives the estimated life expectancy at birth (in years) for England, East Riding of Yorkshire and Kingston-upon-Hull. The life expectancy in East Riding of Yorkshire is slightly higher than for England as a whole, being one year more for males and five months more for females. The life expectancy in Kingston-upon-Hull is

[4] If the 95% CI does not include 100 then the rate differs significantly than the national rate (see Statistical Methods section). However, one would expect 5% of statistical comparisons to be classified 'statistically significant' by chance even when there was no difference between the rate and that national rate so this must be borne in mind.

significantly lower than England, 2.5 years lower for males and one year four months lower for females.

Table 7: Life expectancy at birth for 2001-2003

Life expectancy at birth in years (95% CI)	England	East Riding of Yorkshire	Kingston-upon-Hull
Males	76.2 (76.2 to 76.3)	77.2 (76.8 to 77.6)	73.7 (73.3 to 74.2)
Females	80.7 (80.7 to 80.8)	81.1 (80.7 to 81.5)	79.4 (79.0 to 79.8)

For males, life expectancy at birth ranges from 71.8 years in Manchester to 80.1 years in East Dorset. For females, life expectancy at birth ranges from 77.6 years in Blackburn and Darwen to 84.8 in Kensington and Chelsea. So there is a considerable difference in the life expectancy over the country. It is useful to compare the ranks[5] of the life expectancy in relation to the 352 local authorities and the percentile. ***Table 8*** gives the ranks for the local authorities. East Riding of Yorkshire has a better life expectancy for males and females than the English average, with the life expectancy for males being in the top 40% of local authorities and for females being in the top half of local authorities. For men, life expectancy in Hull is particularly bad in relation to other parts of England as only 4% of local authorities in England have a lower life expectancy. For females in Hull, the figure is slightly better, but nevertheless only 12% of local authorities in England have a figure lower than Hull.

Table 8: Rank of life expectancy for 2001-2003 (in relation to all local authorities in England)

Life expectancy at birth (years)	East Riding of Yorkshire		Kingston-upon-Hull	
	Rank (out of 352)	Percentile	Rank (out of 352)	Percentile
Males	139	39	337	96
Females	171	49	309	88

[5] If three local authorities had the highest life expectancy then they were ranked as 1, with the local authority with the next highest life expectancy being ranked fourth (as three local authorities had been ranked prior to it).

5 Cancer in Hull and East Riding

This section presents incidence/prevalence, hospital admission and mortality data for all and selected cancer types. Section 6 will relate these to inequalities in deprivation, age and gender.

5.1 All Types of Cancer

5.1.1 Incidence and Prevalence

It is difficult to obtain comprehensive information on the incidence of cancer. New cases of cancer are registered nationally, but the data collection is often subject to delays. For example, Northern and Yorkshire Cancer Registration and Information Service (NYCRIS) have, during February 2006, made available information for the latest year of 2002 (on their website) or 2003 (by special request). This is one of the few sources of data available which can provide information on incidence of cancer. More recent data is collected through the Cancer Waiting Times (CWT) project, which monitors the 2 week wait target from presentation through referral to being seen by a specialist. Although performance against this target is beyond the scope of this audit, the data collected centrally has the potential to provide accurate, comprehensive and timely incidence data. Summary data was obtained from the CWT database for the 12 months October 2004 to September 2005. However the smallest geographical unit for which this data was available was PCT, and so it was not possible to analyse the data from an equity perspective. It is recommended that representations be made to the national CWT User Group that PCTs be supplied with geographically referenced or referenceable data to full postcode level.

From information available on the NYCRIS website, the number of new cases of cancer, the crude incidence rate and the age-standardised incidence rate (to the standard European population) which occurred during the period 1998 to 2002 for each PCT (based on residence of patient) is given in ***Table 9***. It can be seen that the standardised incidence rates are slightly higher in Hull than East Riding of Yorkshire.

Table 9: Mean annual number of new cases of cancer, 1998-2002

PCT	Mean annual cases of cancer, 1998-2002		
	New cancer cases	Crude incidence rate per 100,000 persons	Age-standardised incidence rate per 100,000 persons (95% CI)
East Yorkshire	857	511	368 (357, 380)
Yorkshire Wolds and Coast	752	524	357 (345, 369)
Eastern Hull	630	485	398 (383, 413)
West Hull	521	443	389 (373, 404)

Using information provided by NYCRIS, it was also possible to calculate the overall age-standardised incidence rate standardised to the Hull and East Riding of Yorkshire population for all cancers (ICD 10: C00-C97). This gives a better indication of the number of new cases in the local population (***Table 10***) than the rates in **Table 9** which are standardised to the European standard population[6].

Table 10: Age-standardised incidence rate per 100,000 persons from Hull and East Riding of Yorkshire, 2001-2003

Gender	Age	Age-standardised incidence rate per 100,000 persons in Hull and East Riding of Yorkshire, 2001-2003 (95% CI)
Male	Under 75 years	429 (405 to 454)
	All ages	668 (638 to 698)
Female	Under 75 years	416 (392 to 441)
	All ages	616 (587 to 644)

Table 11 gives the age-standardised incidence rates per 100,000 persons aged under 75 years in Hull and East Riding of Yorkshire for 2001-2003 for specific types of cancers. In the same way as for ***Table 10***, the rates are standardised to the Hull and East Riding of Yorkshire population so will reflect the incidence rates observed locally per 100,000 persons aged under 75 years.

Table 11: Age-standardised incidence rate per 100,000 persons aged under 75 years from Hull and East Riding of Yorkshire, 2001-2003

Type of cancer	Age-standardised incidence rate per 100,000 persons aged under 75 years, 2001-2003 (95% CI)	
	Males	Females
All cancers	429 (405 to 454)	416 (392 to 441)
Lung cancer	58.7 (50.1 to 68.6)	41.3 (34.0 to 49.8)
All cancers except lung	371 (348 to 394)	375 (352 to 399)
Colorectal cancer	46.3 (38.7 to 55.2)	31.3 (24.8 to 38.7)
Skin incl malignant melanoma	104 (92.0 to 117)	80.6 (70.3 to 92.3)
Bladder cancer	13.6 (9.5 to 18.6)	5.4 (2.9 to 8.8)
Breast cancer	very low	116 (103 to 129)
Cervical cancer	N/A	14.0 (9.8 to 19.2)
Prostate cancer	64.9 (55.8 to 75.3)	N/A

As part of the new contract for GPs, GP practices score points for achievements against a range of indicators. The system is known as the Quality and Outcomes Framework (QOF) and is used for calculating financial payment. One of the achievements is forming registers of patients with specific diseases which include cancer. However,

[6] The European standard population has a relatively low percentage of elderly men and women, so does not represent national or local populations structures. Nevertheless, the European standard population is useful when comparing rates for different countries or geographical areas.

since the practices achieve the points for forming the register rather than forming an accurate and complete register, it can only be used for epidemiological purposes as a guide. Clearly, it is in their non-financial interests to maintain a good register, but since the new GP system has only been in place a short period of time simply forming a register might be the first priority for many practices with limited resources.

Nevertheless, it is useful to assess the quality of this information as it could potentially be useful source of information for the cancer equity audit. The prevalence of cancer calculated from the QOF registry for each GP practice has been made available at a national level. However, the individual level data is not available (at this time), although that might change locally in the future. The number of people with cancer and prevalence of cancer are not adjusted in any way to take into consideration age and gender structure of the GP practice[7]. Therefore, it is possible that GP practices with a high proportion of elderly patients have a higher registration of cancer cases, which is due to the age of the patients rather than any particular factor associated with their local geographical area or deprivation. For England, there were 270,033 patients on the GP practices cancer registry according to QOF giving an overall prevalence of 0.5% or approximately 500 patients per 100,000.

Table 12 gives the prevalence of cancer according to QOF in the local areas. The prevalence is given as the percentage and the number of patients per 100,000 (so it can be related to the NYCRIS incidence data). It can be seen that the prevalence is slightly higher than prevalence reported nationally.

Table 12: Prevalence of cancer according to the GP's QOF information (unadjusted for age)

PCT	Total number of:		Patients on cancer registry		
	GP practices	Patients	Number	Percentage	Per 100,000 persons
East Yorkshire	23	153,469	855	0.6	557
Yorkshire Wolds and Coast	15	153,003	1,105	0.7	722
Eastern Hull	28	123,147	644	0.5	523
West Hull	27	162,129	931	0.6	574

The number of cases (prevalence) per 100,000 persons is given so that this can be compared to the number of new cases (incidence) per 100,000 persons reported by NYCRIS. Clearly, one would expect that a GP practice would add a patient to their cancer registry when they are confirmed as having cancer. However, it is probably less clear at what stage the patient should be removed from the cancer registry if the cancer is 'cured' or not being treated due to remission. This is not mentioned in the updated QOF guidance and evidence base document (Dept of Health (2005A)). One would expect that the incidence rate and prevalence rate would be quite different, depending

[7] The age-gender standardised prevalence rates could be calculated if individual level data was made available in the future.

on diagnosis, survival, treatment, definition of 'cured', efficiency of removal from registry, etc and these will differ depending on the type of cancer.

The incidence (***Table 9*** from NYCRIS), prevalence (***Table 12*** from QOF) and difference between the two are given in ***Table 13***.

It can be seen that the relative difference between the incidence and prevalence data differs by PCT. It is likely that there may be minor differences between incidence and prevalence among the PCTs as the type of cancer, age at diagnosis, etc may differ among the PCTs slightly. However, there is no reason to suppose that this would differ substantially among the PCTs as it does in ***Table 13***, and a more probable reason is that the data is not been recorded accurately or consistently among the PCTs. This could be associated with problems with the information provided by NYCRIS, but it is more likely that the problem is associated with the QOF data. This is a new GP system and it is possible that the registry of patients required for the QOF have not been consistently entered across all GP practices within the area. There may also be issues regarding the removal of patients from the GP practice registries.

Therefore, at this time, the available data from QOF as been shown to be unreliable.

Whilst it is disappointing that we cannot use this data for this cancer equity audit, it is useful to have assessed its quality. It is very likely that the quality will improve in future years, and that it will become a valuable source of information for health equity audits, accordingly it is recommended that this data be reviewed with the aim of using it in future years.

Table 13: Incidence from NYCRIS relative to prevalence from QOF

PCT	Crude rates per 100,000 persons			Relative difference (%)
	Incidence	Prevalence	Difference	
East Yorkshire	511	557	46	9
Yorkshire Wolds and Coast	524	722	198	38
Eastern Hull	485	523	38	8
West Hull	443	574	131	30

5.1.2 Inpatient Admissions

Local information is available on the number of inpatient admissions with a primary diagnosis of cancer from the Hospital Episode Statistics.

Table 14 gives the number of inpatient hospital admissions for five financial years from 2000-01 to 2004-05. It is possible and indeed likely that some of the admissions relate to the same person being admitted on more than one occasion. However, the total number of hospital admissions will give some indication of the resources needed.

Table 14: Number of inpatient admissions with a primary diagnosis of cancer

Number of inpatient admissions from 2000-01 to 2004-05 by site of cancer (ICD 10 coding)	Total	Average (annual)
Lip, oral cavity and pharynx (C00-C14)	619	103
Digestive organs (C15-C26)	11,685	1,948
Respiratory and intrathoracic organs (C30-C39)	4,262	710
Bone and articular cartilage (C40-C41)	142	24
Skin (C43-C44)	3,923	654
Mesothelial and soft tissue (C45-C49)	610	102
Breast (C50)	2,891	482
Female genital organs (C51-C58)	1,972	329
Male genital organs (C60-C63)	1,770	295
Urinary tract (C64-C68)	6,872	1,146
Eye, brain and other parts of central nervous system (C69-C72)	572	95
Thyroid and other endocrine glands (C73-C75)	164	27
Ill-defined, secondary and unspecified sites (C76-C80)	4,153	692
Lymphoid, haematopoietic and related tissue (C81-C96)	10,622	1,770
Independent (primary) multiple sites (C97)	1	0

The inpatient admissions for the digestive organs mainly comprised admissions for cancer of the colon (C18) with 5,009 admission over the six year periods, followed by 2,468 admissions for cancer of the rectum (C20), 1,611 for cancer of the oesophagus (C15) and then 1,071 admissions for cancer of the stomach (C16). Ninety percent of the respiratory admissions were for lung cancer (3,815), and over 90% of the urinary tract admissions were for bladder cancer (6,261). Almost one-third (3,338) of the admissions for cancer of the lymphoid, haematopoietic and related tissues were for multiple myeloma and malignant plasma cell neoplasms (C90), followed by 2,413 admissions for other and unspecified types of non-Hodgkin's lymphoma (C85), 1,771 admissions for lymphoid leukaemia and 1,190 admissions for myeloid leukaemia.

5.1.3 Mortality

From the Compendium, the age specific mortality rates from cancer per 100,000 persons for 2001-2003 (pooled) is given in the ***Table 15*** for males.

The death rates from cancer are lower than the national average for East Riding of Yorkshire except in the oldest age group. East Yorkshire PCT has rates that are lower than the national average for those aged less than 75 years and slightly higher rates for those 75+ years. Yorkshire Wolds and Coast PCT has rates that are comparable with the national average for all age groups.

The mortality rates from cancer are particularly high in West Hull PCT in particularly for younger males. Due to the small number of deaths from cancer within these younger

age groups, it is possible that the mortality rate for those aged 1-4 years for 2001-2002 may not be typical of the underlying mortality rate in West Hull. For persons aged 35+ years, the mortality rates are higher in both Eastern Hull and West Hull PCT compared with the national average.

Table 15: Male cancer mortality rates, 2001-2003

Area	Cancer mortality rates per 100,000 males by age (years)					
	1-4	5-14	15-34	35-64	65-74	75+
England and Wales	3.2	3.0	7.4	158	990	2256
England	3.3	3.1	7.4	157	988	2252
East Riding of Yorkshire LA	0.0	1.7	3.9	144	953	2394
East Yorkshire PCT	0.0	0.0	1.7	138	913	2428
Yorkshire Wolds & Coast PCT	0.0	3.6	6.6	151	995	2358
Kingston-upon-Hull LA	5.5	1.9	9.0	206	1227	2708
Eastern Hull PCT	0.0	0.0	7.9	191	1163	2698
West Hull PCT	11.4	4.0	9.9	221	1282	2717

Table 16 gives the equivalent data for females.

The cancer mortality rates tend to be higher in Yorkshire Wolds and Coast PCT compared to East Yorkshire PCT for all age groups. The rates do not differ substantially from the national average.

The cancer mortality rates are higher than the national average in Hull for those aged 5-14 years. For females aged 15-34 years, the mortality rates are higher in West Hull and lower in Eastern Hull relative to the national rates whereas the reverse is true for females aged 35-64 years. For older females, the rates in Hull are higher than those observed nationally.

Table 16: Female cancer mortality rates, 2001-2003

Area	Cancer mortality rates per 100,000 females by age (years)					
	1-4	5-14	15-34	35-64	65-74	75+
England and Wales	2.9	2.6	8.0	146	666	1354
England	2.9	2.6	8.0	145	664	1354
East Riding of Yorkshire LA	0.0	0.0	7.9	157	625	1324
East Yorkshire PCT	0.0	0.0	7.0	152	601	1313
Yorkshire Wolds & Coast PCT	0.0	0.0	9.1	162	651	1335
Kingston-upon-Hull LA	0.0	4.0	7.4	149	755	1587
Eastern Hull PCT	0.0	3.9	4.1	169	777	1618
West Hull PCT	0.0	4.1	10.3	129	735	1562

The age-standardised mortality rates standardised to the Hull and East Riding of Yorkshire population were 301 (95% CI 281 to 321) for men and 260 (95% CI 242 to 279) for women per 100,000 persons for all ages.

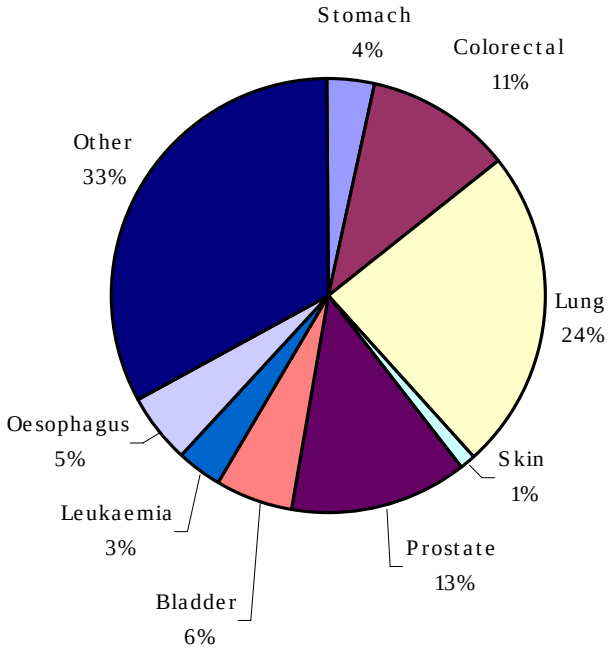
Table 17 gives the age-standardised mortality rates per 100,000 persons aged under 75 years in Hull and East Riding of Yorkshire for 2001-2003 for specific types of cancers. The rates are standardised to the Hull and East Riding of Yorkshire population so will reflect the mortality rates observed locally per 100,000 persons aged under 75 years.

Table 17: Age-standardised mortality rate per 100,000 persons aged under 75 years from Hull and East Riding of Yorkshire, 2001-2003

Type of cancer	Age-standardised mortality rate per 100,000 persons aged under 75 years, 2001-2003 (95% CI)	
	Males	Females
All cancers	168 (153 to 184)	137 (123 to 152)
Lung cancer	51.3 (43.0 to 60.4)	32.4 (25.8 to 39.9)
All cancers except lung	117 (104 to 130)	105 (93.9 to 118)
Colorectal cancer	19.0 (14.2 to 24.9)	10.0 (6.7 to 14.8)
Skin incl malignant melanoma	1.8 (0.6 to 4.3)	1.6 (0.4 to 3.9)
Breast cancer	very low	24.0 (18.5 to 30.7)
Cervical cancer	N/A	3.1 (1.3 to 5.9)
Prostate cancer	11.6 (8.0 to 16.5)	N/A

For males, mortality from cancer by cancer type is given in ***Figure 7*** for East Riding of Yorkshire for deaths occurring during the three years 2001 to 2003.

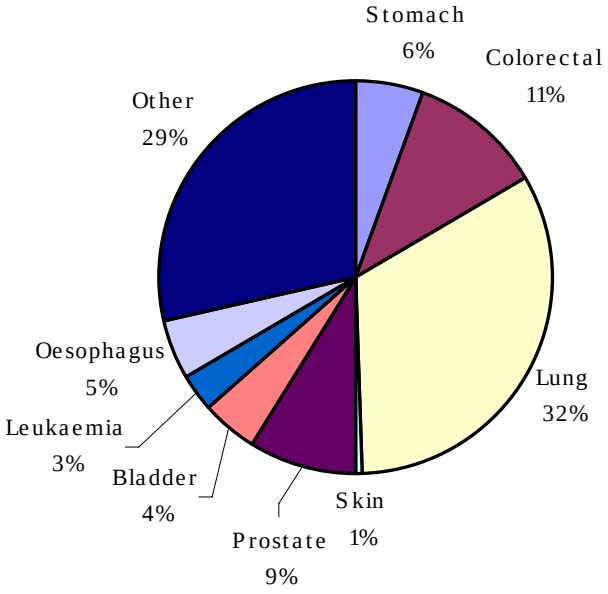
Figure 7: Cancer mortality by type of cancer for males in East Riding of Yorkshire



Cancer mortality in men		
Type of cancer	**Number**	**Percentage**
Stomach	54	3.7
Colorectal	156	10.7
Lung	353	24.1
Skin	13	0.9
Prostate	194	13.3
Bladder	85	5.8
Leukaemia	48	3.3
Oesophagus	77	5.3
Other	484	33.1
All cancers	**1,464**	**100.0**

Figure 8 illustrates the cancer mortality data for men in Kingston-upon-Hull over the same period of time.

Figure 8: Cancer mortality by type of cancer for males in Kingston-upon-Hull

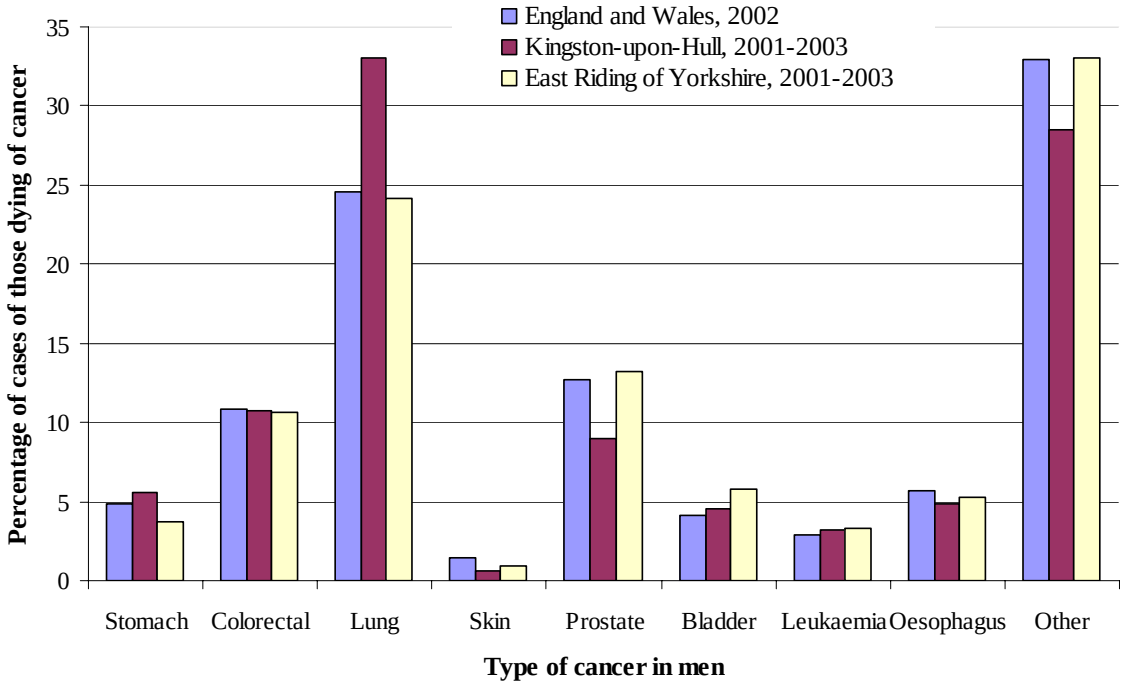


Cancer mortality in men		
Type of cancer	**Number**	**Percentage**
Stomach	65	5.6
Colorectal	124	10.7
Lung	382	33.0
Skin	7	0.6
Prostate	104	9.0
Bladder	52	4.5
Leukaemia	37	3.2
Oesophagus	56	4.8
Other	330	28.5
All cancers	**1,157**	**100.0**

It is not easy to compare the percentages between East Riding and Hull in the above figures, therefore ***Figure 9*** illustrates the differences in the percentages and in addition shows how the percentages compare with England and Wales (2002).

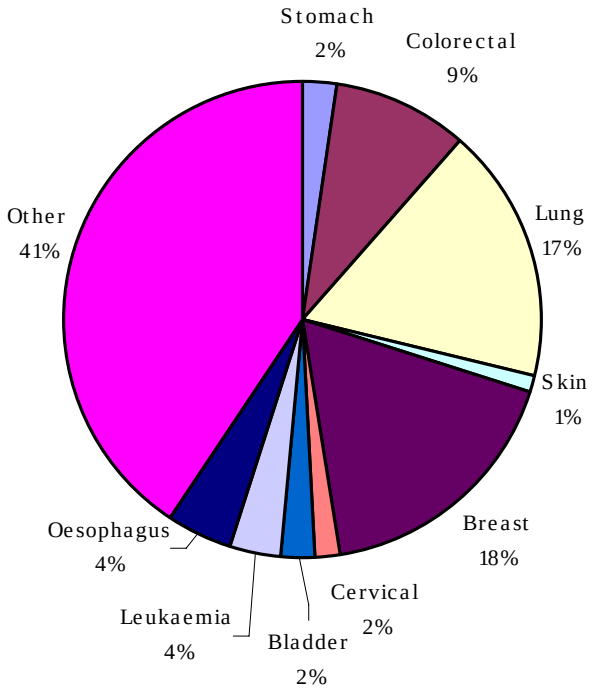
The type of cancer men die from is similar between England and Wales and East Riding of Yorkshire, the types are also similar between England and Wales and Kingston-upon-Hull with the exception of lung and prostate cancer. A much higher proportion of cancer deaths are from lung cancer in Hull compared to nationally, and the reverse is true for prostate cancer.

Figure 9: Cancer mortality by type of cancer for males



For females, mortality from cancer by cancer type is given in ***Figure 10*** for East Riding of Yorkshire for deaths occurring during the three years 2001 to 2003.

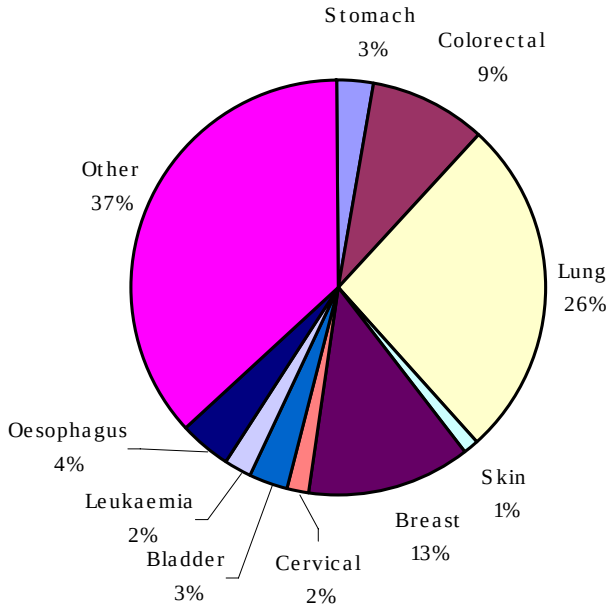
Figure 10: Cancer mortality by type of cancer for females in East Riding of Yorkshire



Cancer mortality in women		
Type of cancer	**Number**	**Percentage**
Stomach	31	2.3
Colorectal	121	9.1
Lung	229	17.3
Skin	15	1.1
Breast	234	17.7
Cervical	21	1.6
Bladder	28	2.1
Leukaemia	51	3.9
Oesophagus	56	4.2
Other	538	40.6
All cancers	**1,324**	**100.0**

The comparable information for females from Kingston-upon-Hull is given in ***Figure 11***.

Figure 11: Cancer mortality by type of cancer for females in Kingston-upon-Hull

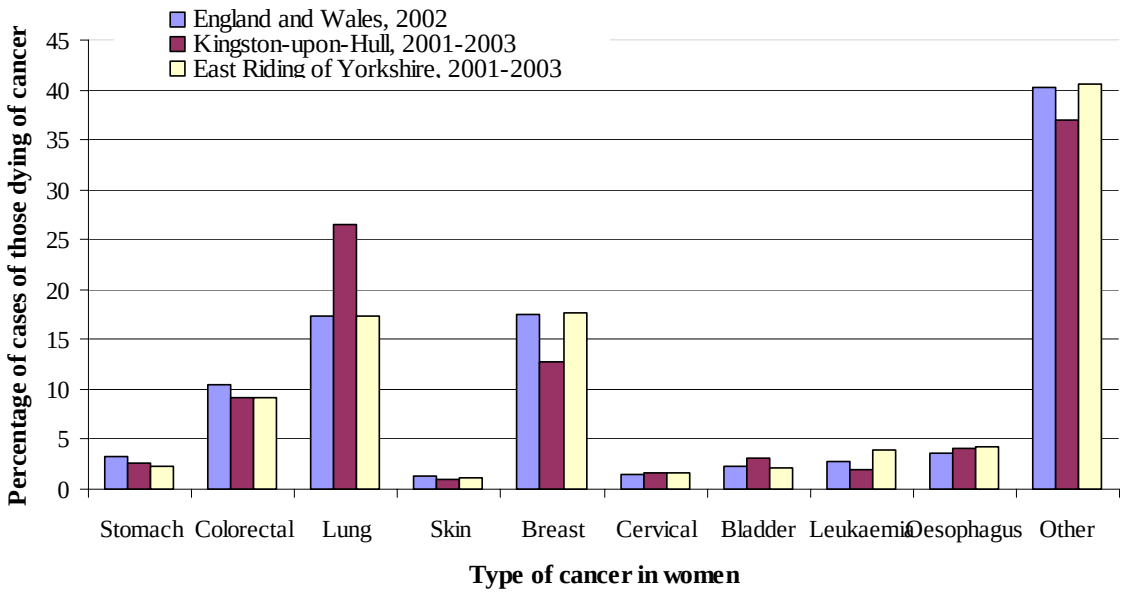


Cancer mortality in women		
Type of cancer	**Number**	**Percentage**
Stomach	26	2.7
Colorectal	90	9.2
Lung	258	26.5
Skin	10	1.0
Breast	124	12.7
Cervical	16	1.6
Bladder	31	3.2
Leukaemia	19	2.0
Oesophagus	40	4.1
Other	360	37.0
All cancers	**974**	**100.0**

It is not easy to compare the percentages between East Riding and Hull in the above figures, so ***Figure 12*** illustrates the differences in the percentages and in addition shows how the percentages compare with England and Wales (2002).

The type of cancer resulting in mortality is similar between England and Wales and East Riding of Yorkshire for women. For Kingston-upon-Hull the percentage of cancer deaths from lung cancer is higher than the national average, whereas the percentage of cancer deaths from breast cancer is lower than England and Wales.

Figure 12: Cancer mortality by type of cancer for females



From local individual patient-level mortality data and population estimated from GP registrations, the age standardised mortality ratios (SMRs) from deaths of cancer for males and females under the age of 75 years are given in ***Table 18*** for each ward in East Riding of Yorkshire for the years 2001-2003.

The rates are compared with England. East Yorkshire PCT has lower rates of under 75 years cancer mortality compared to England for males and slightly lower rates for females. Men from Cottingham South, South Hunsley, and Willerby and Kirk Ella, and women from Dale experience significantly lower under 75 year mortality rates compared to England[8]. Yorkshire Wolds and Coast PCT experiences the same under 75 cancer mortality rates as England for men and slightly higher rates than England for women. Men under 75 years of age from Wolds Weighton experience significantly lower rates of cancer mortality than England, but men under 75 years from Pocklington Provincial and women under 75 years from Bridlington Central and Old Town and Bridlington South experience significantly higher rates of cancer mortality. However, the 95% CI are relatively wide which gives more uncertainty about the estimates.

[8] If the 95% CI does not include 100 then the rate differs significantly than the national rate (see Statistical Methods section). However, one would expect 5% of statistical comparisons to be classified 'statistically significant' by chance even when there was no difference between the rate and that national rate so this must be borne in mind.

Table 18: Age-standardised cancer under 75 mortality ratio for East Riding, 2001-2003

PCT	Ward Name	Age-standardised cancer mortality ratio for persons aged <75 years (95% CI)		
		Males	Females	Persons
EY	Beverley Rural	91 (61, 129)	89 (57, 132)	90 (67, 117)
EY	Cottingham North	104 (65, 157)	57 (27, 105)	82 (56, 116)
EY	Cottingham South	53 (28, 90)	111 (70, 167)	79 (55, 110)
EY	Dale	105 (73, 145)	63 (37, 99)	85 (64, 112)
EY	Goole North	126 (84, 181)	129 (84, 191)	127 (96, 166)
EY	Goole South	113 (72, 168)	83 (45, 140)	100 (71, 137)
EY	Hessle	77 (50, 113)	124 (86, 172)	98 (75, 126)
EY	Howden	84 (38, 160)	57 (18, 135)	72 (39, 121)
EY	Howdenshire	85 (57, 123)	81 (50, 122)	83 (62, 110)
EY	Minster and Woodmansey	100 (68, 141)	118 (81, 165)	108 (83, 138)
EY	St Mary's	109 (69, 164)	136 (86, 204)	121 (88, 161)
EY	Snaith, Airmyn, Rawcliffe & Marshland	86 (54, 129)	67 (36, 113)	78 (55, 107)
EY	South Hunsley	58 (36, 88)	104 (72, 145)	79 (60, 103)
EY	Tranby	86 (54, 130)	83 (49, 131)	84 (60, 115)
EY	Willerby and Kirk Ella	67 (44, 98)	105 (73, 148)	84 (64, 109)
East Yorkshire PCT		**87 (79, 97)**	**96 (86, 106)**	**91 (84, 98)**
YW&C	Bridlington Central & Old Town	88 (56, 131)	158 (110, 220)	119 (91, 154)
YW&C	Bridlington North	115 (84, 153)	69 (44, 103)	94 (73, 119)
YW&C	Bridlington South	122 (89, 164)	160 (117, 213)	139 (112, 170)
YW&C	Driffield and Rural	89 (60, 128)	108 (73, 154)	98 (74, 126)
YW&C	East Wolds and Coast	84 (57, 120)	78 (49, 119)	82 (61, 107)
YW&C	Mid Holderness	124 (90, 166)	98 (65, 141)	112 (88, 141)
YW&C	North Holderness	105 (69, 151)	110 (71, 162)	107 (80, 140)
YW&C	Pocklington Provincial	146 (101, 205)	122 (78, 182)	135 (103, 175)
YW&C	South East Holderness	97 (69, 133)	115 (81, 160)	105 (83, 132)
YW&C	South West Holderness	94 (64, 133)	77 (48, 118)	86 (64, 113)
YW&C	Wolds Weighton	43 (23, 72)	88 (55, 134)	62 (44, 87)
Yorkshire Wolds and Coast PCT		**100 (90, 111)**	**106 (95, 118)**	**103 (95, 111)**

Table 19 gives the equivalent data for the wards in Kingston-upon-Hull

In Eastern Hull PCT, men experience 20% higher under 75 years mortality rates compared to England and women experience rates 14% higher. Men from Ings and Longhill have significantly higher mortality rates compared to England[9]. In West Hull PCT, women overall experience the same rates of cancer mortality for those aged less than 75 years as England, however, men experience rates that are 30% higher than that of England. Men in Newland and Pickering experience the highest rates of under 75

[9] If the 95% CI does not include 100 then the rate differs significantly than the national rate (see Statistical Methods section). However, one would expect 5% of statistical comparisons to be classified 'statistically significant' by chance even when there was no difference between the rate and that national rate so this must be borne in mind.

years cancer mortality and the rates are significantly higher than English rates. However, the 95% CI are wide illustrating considerable uncertainty about the true underlying ratio.

Table 19: Age-standardised cancer under 75 mortality ratio for Kingston-upon-Hull, 2001-2003

PCT	Ward Name	Age-standardised cancer mortality ratio for persons aged <75 years (95% CI)		
		Males	Females	Persons
EH	Bransholme East	128 (76, 203)	114 (62, 192)	122 (83, 172)
EH	Bransholme West	122 (77, 183)	126 (76, 197)	124 (89, 167)
EH	Drypool	102 (66, 151)	148 (98, 215)	122 (91, 160)
EH	Holderness	68 (40, 107)	108 (69, 161)	86 (62, 116)
EH	Ings	153 (112, 203)	94 (62, 137)	124 (98, 156)
EH	Kings Park	80 (36, 153)	122 (60, 218)	99 (60, 153)
EH	Longhill	166 (121, 223)	141 (98, 197)	154 (122, 193)
EH	Marfleet	124 (85, 175)	121 (81, 174)	123 (94, 157)
EH	Southcoates East	135 (83, 207)	106 (59, 175)	121 (85, 168)
EH	Southcoates West	102 (59, 163)	70 (32, 134)	88 (57, 129)
EH	Sutton	120 (81, 170)	102 (64, 155)	112 (84, 146)
Eastern Hull PCT		**120 (107, 135)**	**114 (100, 130)**	**118 (108, 128)**
WH	Avenue	141 (96, 199)	73 (39, 125)	111 (81, 148)
WH	Beverley	121 (79, 178)	108 (64, 171)	115 (84, 155)
WH	Boothferry	100 (66, 146)	70 (40, 114)	86 (63, 116)
WH	Bricknell	121 (75, 185)	107 (61, 175)	115 (81, 158)
WH	Derringham	125 (86, 177)	69 (38, 114)	99 (73, 132)
WH	Myton	134 (97, 180)	108 (67, 163)	124 (95, 158)
WH	Newington	127 (85, 182)	116 (71, 179)	122 (90, 161)
WH	Newland	113 (65, 185)	157 (91, 252)	132 (91, 186)
WH	Orchard Park & Greenwood	153 (111, 205)	133 (91, 188)	144 (113, 180)
WH	Pickering	137 (98, 187)	115 (77, 167)	127 (99, 161)
WH	St Andrew's	192 (132, 270)	91 (45, 163)	150 (109, 202)
WH	University	98 (58, 155)	70 (35, 127)	85 (57, 123)
West Hull PCT		**130 (117, 145)**	**100 (87, 114)**	**117 (108, 127)**

5.2 Lung Cancer

5.2.1 Incidence

The indirectly standardised registration ratios (SRRs) for England, East Riding of Yorkshire and Kingston-upon-Hull are given in ***Table 20*** for the years 1998 to 2000 (pooled data) for lung cancer[10]. This is the latest available data on registrations from the Compendium.

[10] The rates are compared to England (=100).

It can be seen that the ratio is less than 100 in East Riding of Yorkshire so that the incidence rate of lung cancer is lower (but not statistically significantly so as the confidence interval include the value of 100) than England.

The rate of lung cancer is more than 50% higher in Kingston-upon-Hull than England. The difference is highly statistically significant. Later analyses in Section 6 examine and discuss these differences by deprivation bands and other lifestyle factors such as smoking.

Table 20: Indirectly standardised registration ratio for lung cancer 1998 to 2000

		Geographical area		
		England	**East Riding**	**Hull**
Males	Registrations	58,520	405	452
	SRR (95% CI)	100 (99.2, 100.8)	95.3 (86.2, 105.0)	161.4 (146.8, 177.0)
Females	Registrations	36,169	234	271
	SRR (95% CI)	100 (99.0, 101.0)	90.3 (79.1, 102.7)	154.2 (136.3, 173.6)
All persons	Registrations	94,689	639	723
	SRR (95% CI)	100 (99.4, 100.6)	93.4 (86.3, 100.9)	158.6 (147.2, 170.6)

5.2.2 Mortality

The Compendium provides more recent data on mortality. The age-specific mortality rates per 100,000 persons from lung cancer are given for 2001 to 2003 (pooled) in ***Table 21*** for East Riding of Yorkshire and Kingston-upon-Hull.

The rates for East Riding did not differ substantially from those observed in England. However, there were slightly differences across the age bands. A slightly lower mortality rate in males aged 35-74 years and a slightly higher rate for older males, and the rate was higher for females aged 35-64 years but lower for females aged 65+ years. Lung cancer mortality was higher in Yorkshire Wolds and Coast PCT compared to East Yorkshire PCT for males and females in all age groups, except for females aged 75+ years.

For males, the mortality rates from lung cancer were substantially higher for Hull residents than for those in England as a whole. The rates were twice as high for males aged 35-64 years and 50% higher for males aged 65+ years. For females, the lung cancer mortality rates were almost 20% higher in Hull compared to England for those aged 35-64 years, twice as high for those aged 65-74 years and 75% higher for those aged 75+ years. Lung cancer mortality rates were higher in West Hull PCT compared to Eastern Hull PCT for males and females in all age groups except for males aged 75+ years.

The total number of deaths in the 35-64 year age group will be approximately 25 at the PCT level for East Riding of Yorkshire and approximately 10 in the 35-64 and 65-74

year age groups for Kingston-upon-Hull, so the relatively small number of events should be borne in mind when interpreting any differences observed.

Table 21: Age-specific mortality rates for lung cancer during 2001 to 2003

Area	Age-specific mortality rate for lung cancer per 100,000 persons					
	Males, aged (years)			Females, aged (years)		
	35-64	65-74	75+	35-64	65-74	75+
England & Wales	39.4	278	513	24.3	146	217
England	39.2	278	512	24.1	145	218
N&E Y & NL SHA	41.4	284	550	23.0	146	240
East Riding of Yorkshire	34.4	255	540	32.6	119	199
East Yorkshire PCT	30.7	236	532	29.0	117	213
Yorkshire Wolds and Coast PCT	38.6	275	547	36.8	121	183
Kingston-upon-Hull	74.8	450	779	28.7	292	384
Eastern Hull PCT	64.5	416	850	33.8	261	371
West Hull PCT	84.5	480	719	23.8	320	395

5.3 Colorectal Cancer

5.3.1 Incidence

The indirectly standardised registration ratios (SRRs) for England, East Riding of Yorkshire and Kingston-upon-Hull are given in ***Table 22*** for the years 1998 to 2000 (pooled data) for colorectal cancer[11]. This is the latest available data on registrations from the Compendium.

It can be seen that the ratio is slightly higher than 100 for males and slightly lower than 100 for females in East Riding of Yorkshire so that the incidence rate of colorectal cancer is slightly higher in males and slightly lower in females compared to England.

The ratio is higher than 100 for males and slightly lower than 100 for females in Kingston-upon-Hull so that the incidence rate of colorectal cancer is higher in males and slightly lower in females compared to England.

[11] The rates are compared to England (=100).

Table 22: Indirectly standardised registration ratio (SRR) for colorectal cancer 1998 to 2000

		Geographical area		
		England	**East Riding**	**Hull**
Males	Registrations	47,582	349	248
	SRR (95% CI)	100 (99.1, 100.9)	101.2 (90.9, 112.4)	109.0 (95.8, 123.4)
Females	Registrations	42,216	298	195
	SRR (95% CI)	100 (99.1, 101.0)	99.2 (88.2, 111.1)	95.6 (92.6, 109.9)
All persons	Registrations	89,798	647	443
	SRR (95% CI)	100 (99.4, 100.7)	100.3 (92.7, 108.3)	102.6 (93.3, 112.6)

5.3.2 Mortality

The Compendium provides more recent data on mortality. The age-specific mortality rates per 100,000 persons from colorectal cancer are given for 2001 to 2003 (pooled) in ***Table 23*** for East Riding of Yorkshire and Kingston-upon-Hull. Mortality rates are not given for those aged less than 35 years as the rates are very low.

The mortality rates for colorectal cancer are comparable or slightly lower in East Riding of Yorkshire compared to England.

For males, the colorectal cancer mortality rates are approximately 25% higher for Hull compared to England. For females, the mortality rates for colorectal cancer are only slightly higher for those aged 65+ years and slightly lower for those aged 35-64 years

The total number of deaths at the PCT level is relatively small (less than 10 in the 35-64 and 65-74 year age groups and less than 15 in the 75+ year age group), so the small number of events should be borne in mind when interpreting any differences observed.

Table 23: Age-specific mortality rates for colorectal cancer during 2001 to 2003

Area	**Age-specific mortality rate for colorectal cancer per 100,000 persons**					
	Males, aged (years)			**Females, aged (years)**		
	35-64	**65-74**	**75+**	**35-64**	**65-74**	**75+**
England & Wales	17.2	110	241	10.7	61.5	168
England	17.1	109	240	10.6	61.6	167
N&E Y & NL SHA	18.4	119	260	11.1	62.5	164
East Riding of Yorkshire	18.9	113	216	11.2	43.5	144
East Yorkshire PCT	17.7	118	201	10.0	45.1	153
Yorkshire Wolds and Coast PCT	20.4	108	231	12.6	41.7	134
Kingston-upon-Hull	20.3	134	307	9.8	65.3	169
Eastern Hull PCT	21.0	121	241	12.3	78.3	155
West Hull PCT	19.7	145	364	7.4	53.4	181

5.4 Breast Cancer

5.4.1 Incidence

The indirectly standardised registration ratios (SRRs) for England, East Riding of Yorkshire and Kingston-upon-Hull are given in ***Table 24*** for the years 1998 to 2000 (pooled data) for breast cancer[12]. This is the latest available data on registrations from the Compendium.

It can be seen that the ratio is less than 100 in East Riding of Yorkshire so that the incidence rate of breast cancer is lower (but not statistically significantly so, as the confidence interval includes the value of 100) than England.

It can be seen that the ratio is less than 100 in Kingston-upon-Hull so that the incidence rate of breast cancer is lower than England (and statistically significantly lower as the confidence interval does not include 100).

Table 24: Indirectly standardised registration ratio for breast cancer 1998 to 2000

		Geographical area		
		England	**East Riding**	**Hull**
Females	Registrations	102,569	698	394
	SRR (95% CI)	100 (99.4, 100.6)	95.7 (88.8, 103.1)	81.1 (73.3, 89.6)

5.4.2 Mortality

The Compendium provides more recent data on mortality. The age-specific mortality rates per 100,000 females from breast cancer are given for 2001 to 2003 (pooled) in ***Table 25*** for East Riding of Yorkshire. Mortality rates are not given for those aged less than 35 years as the rates are very low.

The rates are similar between East Riding of Yorkshire and England across the age groups. Yorkshire Wolds and Coast PCT has a higher mortality rate from breast cancer for all age groups being approximately 20% higher for those aged 35-74 years and 10% higher for those aged 75+ years. East Yorkshire PCT has lower mortality rates compared to England.

The mortality rates from breast cancer in females are lower in Kingston-upon-Hull compared to England for all age groups.

The total number of deaths at the PCT level for East Riding of Yorkshire is relatively small (less than 15 in the 35-64 age group, less than 10 in the 65-74 year age group and less than 20 in the 75+ year age group). For Kingston-upon-Hull, these figures are even lower (less than 10 in the 35-64 age group, less than 5 in the 65-74 year age group and

[12] The rates are compared to England (=100).

less than 15 in the 75+ year age group). The small number of events should be borne in mind when interpreting any differences observed.

Table 25: Age-specific mortality rates for breast cancer during 2001 to 2003

Area	Age-specific mortality rate for breast cancer per 100,000 females, aged (years)		
	35-64	65-74	75+
England & Wales	38.2	97.4	202
England	38.1	97.1	202
N&E Y & NL SHA	36.7	98.8	197
East Riding of Yorkshire	38.0	100.9	203
East Yorkshire PCT	30.8	86.4	183
Yorkshire Wolds and Coast PCT	46.2	116.9	224
Kingston-upon-Hull	30.2	68.4	184
Eastern Hull PCT	36.9	71.8	169
West Hull PCT	23.8	65.2	197

5.5 Cervical Cancer

5.5.1 Incidence

The directly standardised registration rates (DSRRs) per 100,000 females for England, East Riding of Yorkshire and Kingston-upon-Hull are given in ***Table 26*** for the years 1998 to 2000 (pooled data) for cervical cancer[13]. This is the latest available data on registrations from the Compendium.

It can be seen that the rate of cervical cancer in East Riding of Yorkshire is almost twice that of England (and statistically significantly higher).

It can be seen that the rate of cervical cancer in Kingston-upon-Hull is almost 50% higher than that of England.

Table 26: Directly standardised registration ratio for cervical cancer 1998 to 2000

		Geographical area		
		England	East Riding	Hull
Females	Registrations	7,726	84	53
	DSRR (95% CI)	9.1 (8.9, 9.4)	16.0 (12.5, 19.6)	13.3 (9.6, 17.0)

[13] Standardised to European Standard population.

5.5.2 Mortality

The Compendium provides more recent data on mortality. The age-specific mortality rates per 100,000 females from cervical cancer are given for 2001 to 2003 (pooled) in ***Table 27*** for East Riding of Yorkshire. Mortality rates are not given for those aged less than 65 years as the rates are very low.

There appears to be quite large relative differences between England and East Riding of Yorkshire and Kingston-upon-Hull PCTs, but the number of deaths is small. The mortality rates are not given for each PCT as the total number of deaths at the PCT level is extremely small (approximately one individual in the 65-74 year and 75+ year age groups), so it is not possible to make sensible comparisons.

Table 27: Age-specific mortality rates for cervical cancer during 2001 to 2003

Area	Age-specific mortality rate for cervical cancer per 100,000 females, aged (years)	
	65-74	75+
England & Wales	7.5	13.7
England	7.5	13.4
N&E Y & NL SHA	7.1	13.4
East Riding of Yorkshire	11.9	13.6
Kingston-upon-Hull	6.2	15.1

5.6 Skin Cancer

5.6.1 Incidence

The directly standardised registration rates (DSRRs) per 100,000 persons for England, East Riding of Yorkshire and Kingston-upon-Hull are given in ***Table 28*** for the years 1998 to 2000 (pooled data) for skin cancer[14]. This is the latest available data on registrations from the Compendium.

It can be seen that the rate is considerably higher for both males and females in East Riding of Yorkshire compared to England (and statistically significantly higher).

It can be seen that the rate is lower for males and slightly higher for females in Kingston-upon-Hull compared to England.

[14] Standardised to European Standard population.

Table 28: Directly standardised registration ratio for skin cancer 1998 to 2000

		Geographical area		
		England	**East Riding**	**Hull**
Males	Registrations	83,772	789	387
	DSRR (95% CI)	101.7 (101.0, 102.4)	133.4 (124.0, 142.8)	97.1 (87.3, 106.9)
Females	Registrations	76,641	680	411
	DSRR (95% CI)	72.4 (71.8, 72.9)	89.2 (81.9, 96.4)	78.5 (70.2, 86.8)
All persons	Registrations	160,413	1469	798
	DSRR (95% CI)	84.5 (84.0, 84.9)	108.4 (102.6, 114.1)	86.1 (79.9, 92.3)

5.6.2 Mortality

The Compendium provides more recent data on mortality from skin cancer excluding malignant melanoma and mortality from malignant melanoma. These have been summed to obtain the mortality rates for skin cancer, and are given as age-specific mortality rates per 100,000 persons for 2001 to 2003 (pooled) in ***Table 29*** for East Riding of Yorkshire and Kingston-upon-Hull. Mortality rates are not given for those aged less than 65 years as the rates are very low.

For males, whilst there appears to be a relatively higher mortality rate is recorded for men aged 65-74 years in East Riding of Yorkshire, this is counter-balanced by a lower mortality rate in the older age group. In addition the rates are based on a relatively small number of deaths. For females in East Riding of Yorkshire, the rates are lower than those rates observed nationally, and the rates in Kingston-upon-Hull are comparable or lower than those observed nationally. The mortality rates are not given at the PCT level as the number of deaths are extremely small (less than one individual in the 65-74 year and 75+ year age groups), so it is not possible to make useful comparisons.

Table 29: Age-specific mortality rates for skin cancer during 2001 to 2003

Area	**Age-specific mortality rate for skin cancer per 100,000 persons**			
	Males, aged (years)		**Females, aged (years)**	
	65-74	**75+**	**65-74**	**75+**
England & Wales	11.4	26.9	7.2	17.7
England	11.3	26.6	7.2	17.7
N&E Y & NL SHA	10.7	18.8	6.3	13.0
East Riding of Yorkshire	13.1	9.8	4.0	13.6
Kingston-upon-Hull	3.5	10.6	9.3	15.1

6 Cancer and Potential Inequalities

6.1 Age and Gender

6.1.1 Incidence

The age-standardised incidence rates from NYCRIS are given separately for males and females, but not for different age groups. The age-standardised incidence rates for all cancers excluding malignant melanoma for the four local PCTs are given in ***Table 30*** (standardised to the European standard population).

Table 30: Age-standardised incidence rates for males and females, 1998-2002

Primary Care Trust	Males		Females	
	Number of cases	Age-standardised incidence rate (95% CI)	Number of cases	Age-standardised incidence rate (95% CI)
East Yorkshire	417	398 (381, 415)	440	362 (346, 378)
Yorkshire Wolds & Coast	381	389 (371, 407)	371	341 (324, 358)
Eastern Hull	266	449 (424, 473)	254	355 (334, 376)
West Hull	326	463 (440, 486)	305	358 (338, 378)

It can be seen that the age-standardised incidence rate for all cancers excluding malignant melanoma is slightly lower for females compared to males for all PCTs. This could be associated with factors such as the differences in the cancer sites between males and females, and may not necessarily mean inequity exists between the genders. However, it could reflect differences in risk factors between men and women.

Nevertheless, different endowments of risk factors which are dependent on gender are of concern from a public health perspective.

6.1.2 Inpatient Admissions

Since local information is available on inpatient hospital admissions over the five financial years 2000-01 to 2004-05 which involve a primary diagnosis of cancer, this can be examined in relation to age and gender. The number of admissions differ considerably from patient to patient; most patients over the five year period have a single inpatient admission with a primary diagnosis of cancer, but a very small number have up to 90 admissions (and one patient has 198 admissions). The number of admissions will depend on many different factors, such as, age of patient, existing co-morbidities, type of cancer, available treatment options, patient and clinician preference for different treatments, likelihood of survival, time between diagnosis and death or treatment, etc. As such, any difference that may be found between different age groups and between the genders would be difficult to attribute to specific reasons. Therefore, the number of first inpatient admissions will be examined (i.e. number of patients).

Table 31 gives the actual annual average number of first inpatient admissions[15] on involving a primary diagnosis of cancer as well as the number per 100,000 population[16].

As expected, the number of admissions increases with age per 100,000 population.

For the older patients in particular, the differences between males and females are dramatic with males being twice as likely to be admitted as a cancer inpatient compared to females. In contrast, females aged under 60 years are more likely to be admitted as a cancer inpatient compared to males, particularly those aged 30-44 years. However, the absolute numbers are small with only 122 male and 213 female patients under 50 years of age being admitted as cancer inpatients annually.

Table 31: Annual number of patients admitted as an inpatient with a primary diagnosis of cancer per 100,000 population by age and gender

Age (years)	Annual number of patients admitted as an inpatient with a primary diagnosis of cancer over the five year period from 2000-01 to 2004-05				
	Males		Females		Relative difference per 100,000 (%)
	Actual number	Per 100,000 population	Actual number	Per 100,000 population	
0-29	29	21	32	24	–16
30-34	10	37	21	81	–54
35-39	16	56	33	120	–53
40-44	25	90	54	205	–56
45-49	42	169	73	305	–45
50-54	80	306	115	458	–33
55-59	125	539	165	723	–25
60-64	182	951	169	870	9
65-69	255	1,472	173	948	55
70-74	278	1,923	214	1,275	51
75-59	273	2,498	204	1,401	78
80-84	187	2,844	145	1,317	116
85+	123	3,229	145	1,440	124

Again this could reflect differences in the age at diagnosis, site of cancer, type of treatment(s) available and other factors that do not necessarily denote an inequality, but there could be inequalities present. Further examination of the potential reasons for the differences should be undertaken.

[15] This information is only approximate. The number of patients may be an overestimate as identifying information (to link each patients' visits) is not always present or recorded accurately. In the cases where information is missing, it is assumed that the patient is a new patient, but it is possible that they have already had a previous inpatient admission and the subsequent admission cannot be linked to it because of a lack of identifying information (such as NHS number).

[16] Population estimated from GP practice lists averaging lists for October 2001 and October 2004.

6.1.3 Mortality

The mortality rates to a certain degree will reflect incidence rates, but the relationship between mortality and incidence might differ between males and females, between different age groups, and between different types of cancer.

In terms of mortality from all types of cancer, the rates differ substantially between males and females and across different age groups as illustrated previously in ***Tables 15 and 16***. The mortality rates are similar for males and females for children aged 1-4 years and 5-14 years, being approximately three male deaths and three female deaths per year per 100,000 children.[17] The rates increase in the 15-34 year age group for both males and females to approximately nine deaths per 100,000, and again the rates are similar between males and females. The cancer mortality rates increase to approximately 140-220 male deaths and 150-170 female deaths per 100,000 for those aged 35-64 years. The rates vary among the four PCTs which reflect differences in risk factors and underlying levels of deprivation (both discussed later). East Yorkshire PCT has the lowest male mortality rate for those aged 35-64 years (128 deaths per 100,000 males) with Yorkshire Wolds and Coast PCT having a rate which is approximately 10% higher (151 deaths per 100,000 males). Kingston-upon-Hull has a much higher cancer mortality rate for males within this age range, which is almost 40% higher in Eastern Hull PCT (191 deaths per 100,000 males) and 60% higher for West Hull PCT (221 deaths per 100,000 males). For females, West Hull PCT has the lowest mortality rate (129 deaths per 100,000 females), with the mortality rates in the other PCTs following the same pattern with East Yorkshire PCT having the next lowest rates (152 deaths per 100,000), followed by Yorkshire Wolds and Coast PCT (162 deaths per 100,000) then Eastern Hull PCT (169 deaths per 100,000). Therefore, the pattern is similar for females except that West Hull PCT had the highest mortality rate for males, but the lowest mortality rate for females, and additionally, there is much less variability in the mortality rates among the four PCTs for females compared to males. However, it is in the older age groups where the differences in mortality rates between males and females becomes more evident. Males aged 65-74 years have a mortality rate of approximately 950 per 100,000 in East Riding of Yorkshire and 1200 per 100,000 in Kingston-upon-Hull, whereas females of the same age have mortality rates of approximately 600 and 750 per 100,000 respectively, i.e. 60% higher in both local authorities. This also occurs for males and females aged 75 years or more. The mortality rates are approximately 2,400 per 100,000 for men in East Riding of Yorkshire and 2,700 per 100,000 for men in Kingston-upon-Hull, whereas mortality rates in women are approximately 1,300 per 100,000 in East Riding of Yorkshire (i.e. 85% higher) and 1,600 per 100,000 in Kingston-upon-Hull (i.e. 70% higher). The differences in mortality rates will reflect differences in life expectancy, differences in the incidence and survival of specific cancers, and differences in the prevalence of risk factors, but will also very likely be

[17] The mortality rate for boys aged 1-4 years is particularly high in West Hull PCT. However, examining Table 3 it can be seen that there are approximately 28,800 children aged 0-4 years in East Riding of Yorkshire and Kingston-upon-Hull, and with further analysis there are 3,591 boys aged 1-4 years in West Hull PCT, so a death rate of 11.4 per 100,000 refers to a single death per year over the three year period. This could have occurred by chance, and due to the very small numbers involved in this analysis, undue focus on this should not be made.

influenced by differences in presentation between the genders, with some men being more reluctant to visit their GP compared to women.

Mortality from lung cancer is similar for males and females in East Riding of Yorkshire aged 35-64 years (***Table 21***). However, in Kingston-upon-Hull for this age group, there are marked differences with mortality rates being 2.6 times higher than females (75 versus 39 deaths per 100,000 persons). For East Riding of Yorkshire, the lung cancer mortality rates are higher for males than females, 2.1 times higher for those aged 65-74 years and 2.7 times higher for those aged 75+ years. The differences between males and females in Kingston-upon-Hull is slightly less marked for these age groups, with males experiencing lung cancer mortality rates 1.5 times higher for those aged 65-74 years and twice as high for those aged 75+ years. These differences are likely to be reflected by differences in smoking patterns and the stage of the cancer at the time of presentation.

The mortality rate from colorectal cancer is also higher for men compared to women (***Table 23***). In East Riding of Yorkshire, males are 1.8, 2.6 and 1.5 times more likely to die of colorectal cancer than women for those aged 35-64, 65-74 and 75+ years respectively. In Kingston-upon-Hull, differences also occur with men being 2.1 and 1.8 times more likely to die of colorectal cancer than women for those aged 35-74 and 75+ years respectively.

It is difficult to compare the mortality rates for skin cancer as the numbers dying from skin cancer is low (***Table 29***). However, there does appear to be slight differences between men and women. Men in East Riding of Yorkshire appear to be more likely to die of skin cancer then females, which probably reflects the prevalence of working outside in rural areas between men and women. In Kingston-upon-Hull, the skin cancer mortality rates are slightly higher for women compared to men. It is possible that this could reflect the use of sun-tan cream, use of tanning saloons, and/or differences in preference for a tan between males and females.

6.2 Ethnicity

Information on ethnicity is not available on the Compendium, and the local mortality data does not contain information on ethnicity. Therefore, it is difficult to address any potential inequity. However, it is likely that there will be differences in uptake of cervical and breast screening among different ethnic groups, and this could easily impact on mortality rates. In addition, it is likely that the prevalence of some cancer risk factors will differ among different ethnic groups which will influence both incidence and mortality.

Currently, data which it would be hoped would record ethnicity is either incomplete or has problems with coding, with two different systems in operation. Whilst it might have been thought in the past within Hull in particular that ethnicity was not of high relevance, due to the low numbers of ethnic groups, it should be recognised that there are discrete areas within Hull where ethnicity has changed substantially in the last five years. PCTs have a duty to address these issues and this report will recommend suitable initial actions.

6.3 Other Groups Where Potential Inequity May Be Present

Inequity is also likely to occur for other groups, such as those with mental illness or with physical or learning disabilities, as they may be less likely to obtain necessary information in an appropriate format to access the health services they need whether this is attendance at screening, knowledge about risk factors and symptoms of cancer, or information about diagnosis and treatment of cancer. Nationally, it is acknowledged that those with mental illness do not access routine primary care (Office of the Deputy Prime Minister (2004)).

In addition, people who are homeless, living in hostels, asylum seekers and travellers are probably more likely to not attend screening programmes or access primary health care.

Inequity may also be present for other groups such as those with physical disabilities or who are obese in terms of attending breast screening. Those with physical disabilities may not be able to get into the mobile bus in which breast screening takes part, and the mammography machine cannot accommodate those women who are obese.

However, in general, the extent of inequities for other groups is unknown as there is insufficient information on the prevalence of disabilities and measurements of health such as the attendance at screening programmes in the general population.

Whilst these groups generally only form a small percentage of the overall population in East Riding of Yorkshire and Hull at the moment, this is not important. An inequity is present and the NHS has a duty to respond

6.4 Deprivation

6.4.1 Incidence and Prevalence

As illustrated earlier (***Table 9***), the cancer incidence for 1998-2002 supplied by NYCRIS does differ among the four PCTs. The two PCTs in East Riding of Yorkshire have a slightly lower age-standardised incidence rate (357-368 per 100,000 persons – European standard population) compared to the two PCTs in Kingston-upon-Hull (389-398 per 100,000 persons – European standard population). Based on an examination of the 95% confidence intervals, the differences between the age-standardised cancer incidence rates between East Riding and Hull will be statistically significant.

As mentioned earlier, as part of the new GP contract, GP practices are paid to keep patient registers for specific diseases for QOF, which include a register for cancer patients. As this is the first year, and the relationship between this data and the incidence data provided by NYCRIS, suggest that the registers are incomplete. However, if it can be assumed that the completeness of the registers do not differ by deprivation (based on GP practice), then the estimate GP prevalence of cancer could be compared with a GP practice-based IMD 2004 quintile calculated based on population-

weighted IMD 2004 scores from SOAs of patients. However, on further examination, there is a negative relationship between the IMD 2004 score and cancer prevalence, so the higher the deprivation score (the more deprivation), the lower the cancer prevalence. More deprived areas will have more cases of cancer, and therefore, it is likely that the completeness of the GP cancer registries does depend on deprivation, with GP practices in more deprived areas more likely to have an incomplete register. So it is not possible to use the QOF information to assess potential inequalities in prevalence between different levels of deprivation.

Table 32 gives the age-standardised incidence rates per 100,000 local population for 2001-2003 for men aged under 75 years. For lung cancer there is a clear association between increasing incidence with more deprivation. However, for prostate cancer and skin cancer including malignant melanoma there is a higher incidence in the least deprived groups. There is a U-shaped distribution for colorectal cancer and all cancers combined, with higher incidence rates for the most deprived and the least deprived groups and lower incidence rates for the middle deprivation groups.

Table 32: Age-standardised incidence rates for 2001-2003 by national deprivation quintile for men aged under 75 years

Cancer type	Age-standardised incidence rate per 100,000 local men aged <75 years for 2001-2003 (95% CI) for each IMD national quintile				
	Most deprived	2	3	4	Least deprived
All cancers (C00-C97)	440 (415,465)	419 (395,444)	415 (392,440)	419 (395,444)	453 (428,479)
Lung (C33-C34)	96 (85,108)	59 (50, 69)	45 (37, 53)	42 (35, 50)	32 (26, 40)
Colorectal (C17-C21)	49 (41, 58)	44 (36, 52)	38 (31, 46)	43 (36, 52)	56 (47, 66)
Prostate (C61)	49 (41, 58)	64 (55, 75)	72 (62, 82)	66 (57, 77)	84 (73, 95)
Skin (C43-C44)	78 (68, 89)	88 (78,100)	115 (102,128)	117 (105,131)	137 (123,151)

Table 33 gives the age-standardised incidence rates per 100,000 local population for 2001-2003 for women aged under 75 years. In females, the association between increasing lung cancer incidence with more deprivation is also present. Local smoking figures show highest levels of smoking in deprived areas, these are discussed more fully in section 7.2.1. The association between skin cancer including malignant melanoma and deprivation follows a similar pattern to that observed for men, with increasing incidence for the least deprived quintiles. However, for colorectal cancer, the association between incidence and deprivation is different to males in that there is an increasing incidence with lower levels of deprivation. For breast cancer, there is a U-shaped association between deprivation and incidence. Overall, there is no clear association between cancer incidence and deprivation.

Table 33: Age-standardised incidence rates for 2001-2003 by national deprivation quintile for women aged under 75 years

Cancer type	Age-standardised incidence rate per 100,000 local women aged <75 years for 2001-2003 (95% CI) for each IMD national quintile				
	Most deprived	2	3	4	Least deprived
All cancers (C00-C97)	423 (399,449)	387 (400,450)	426 (402,452)	413 (389,438)	430 (406,456)
Lung (C33-C34)	67 (57, 77)	41 (33, 49)	38 (31, 46)	28 (22, 35)	19 (14, 25)
Colorectal (C17-C21)	28 (22, 35)	26 (20, 32)	38 (31, 46)	32 (26, 40)	36 (30, 45)
Breast (C50)	116 (103,130)	110 (98,124)	109 (96,122)	115 (102,128)	129 (116,144)
Skin (C43-C44)	59 (50, 69)	58 (49, 68)	100 (89,113)	90 (79,102)	112 (99,125)

Using the incidence rates given on the NYCRIS website for each of the four local PCTs for the years 1998-2002, similar relationships were observed between deprivation and incidence for these cancer types (defining Hull as most deprived and East Riding of Yorkshire as least deprived). For breast cancer, both West Hull PCT and Eastern Hull PCT had lower incidence rates than both East Yorkshire PCT and Yorkshire Wolds and Coast PCT, which is similar to the relationship given in ***Table 33*** (and by comparing all four PCTs in this way it is not possible to distinguish between this pattern of association and a U-shaped association).

6.4.2 Inpatient Admissions

Table 34 gives the age-gender standardised rate of first inpatient admissions[18] on average per year involving a primary diagnosis of cancer per 100,000 people (per 100,000 women for breast cancer) by national deprivation quintile[19]. Due to the higher prevalence of risk factors in the most deprived quintile, one would expect that the inpatient admission rate would be higher, and this is the case for all cancers and lung cancer. However, it is not the case for colorectal cancer, so it is possible that there is some inequity present. The pattern also does not occur in women for breast cancer, however because the trend was not observed locally.

[18] This information is only approximate. The number of patients may be an overestimate as identifying information (to link each patients' visits) is not always present or recorded accurately. In the cases where information is missing, it is assumed that the patient is a new patient, but it is possible that they have already had a previous inpatient admission and the subsequent admission cannot be linked to it.

[19] Population estimated from GP practice lists averaging lists for October 2001 and October 2004 with age groups 0-29, 30-49, 50-59, 60-69, 70-79 and 80+ used for standardisation. Standardised to Hull and East Riding population.

Table 34: Annual age-standardised inpatient admission rate for those with a primary diagnosis of cancer by deprivation

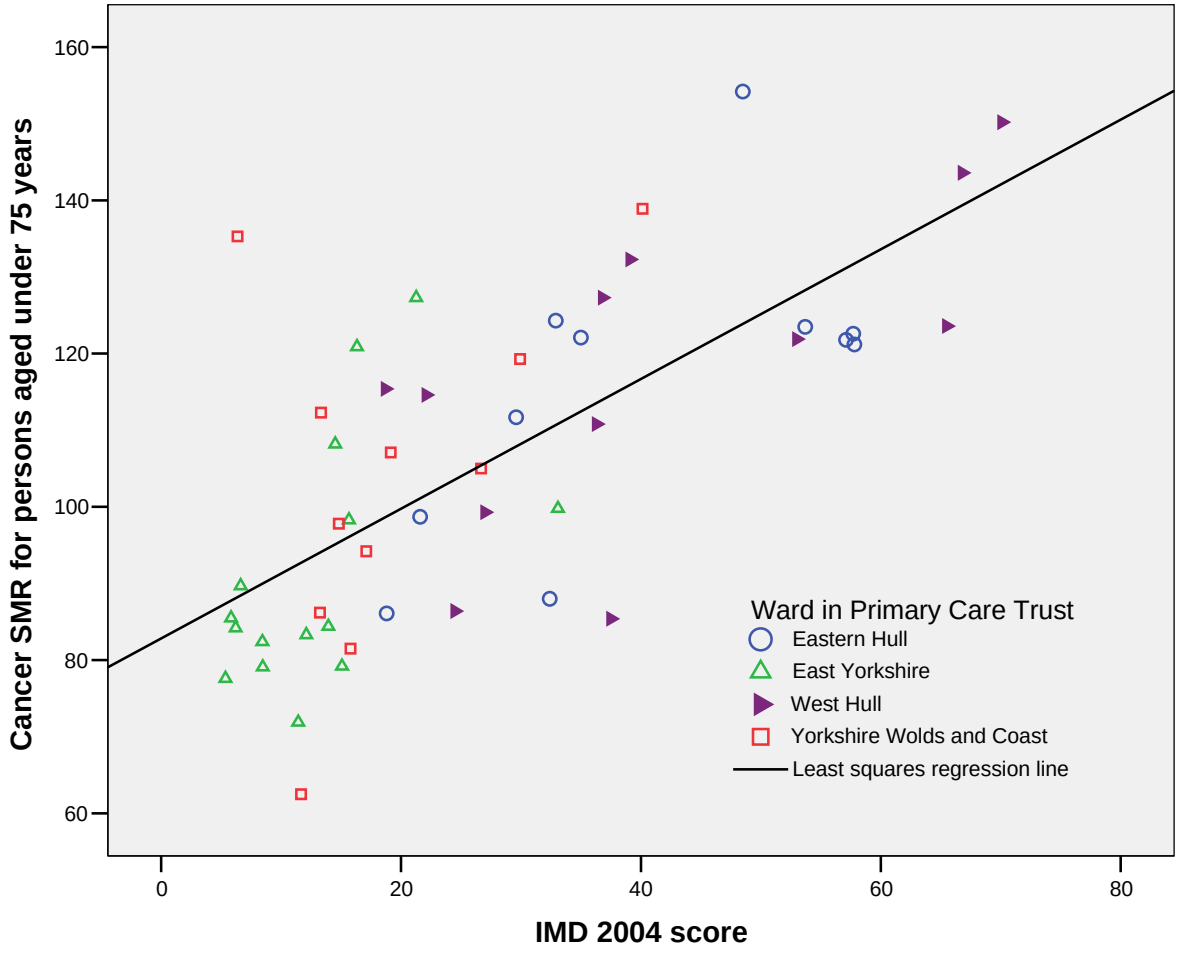
IMD 2004 national quintile	Age-standardised annual rate of patients admitted as inpatients per 100,000 persons with primary diagnosis of cancer (95% CI)			
	Cancer (any)	Lung cancer	Colorectal cancer	Breast cancer
Most deprived	560 (541, 579)	75.6 (68.7, 83.0)	50.6 (45.0, 56.7)	99 (88, 111)
2	543 (524, 562)	55.6 (49.7, 62.0)	54.1 (48.4, 60.5)	103 (92, 115)
3	539 (520, 558)	44.6 (39.4, 50.4)	57.2 (51.3, 63.8)	111 (99, 123)
4	517 (498, 535)	36.6 (31.9, 41.8)	54.7(48.9, 61.1)	120 (107, 133)
Least deprived	512 (494, 531)	27.3 (23.3, 31.9)	51.0 (45.3, 57.1)	116 (104, 128)

6.4.3 Mortality

Figure 13 illustrates the relationship between deprivation and cancer SMR for persons under the age of 75 years for each ward[20] in East Riding of Yorkshire and Kingston-upon-Hull for deaths in the period 2001-2003. The higher the IMD 2004 score the more deprivation and the higher the SMR the higher the mortality (relative to England as the standard of 100). Therefore, mortality from cancer under the age of 75 years increases as deprivation increases. For an increase of 10 points on the IMD 2004 score, there is an estimated corresponding increase in the cancer SMR for those aged under 75 years of 8.5 (95% CI 6 to 11).

[20] Population-weighted means of the IMD score for each SOA were used to obtain the ward IMD scores.

Figure 13: Relationship between cancer mortality and deprivation



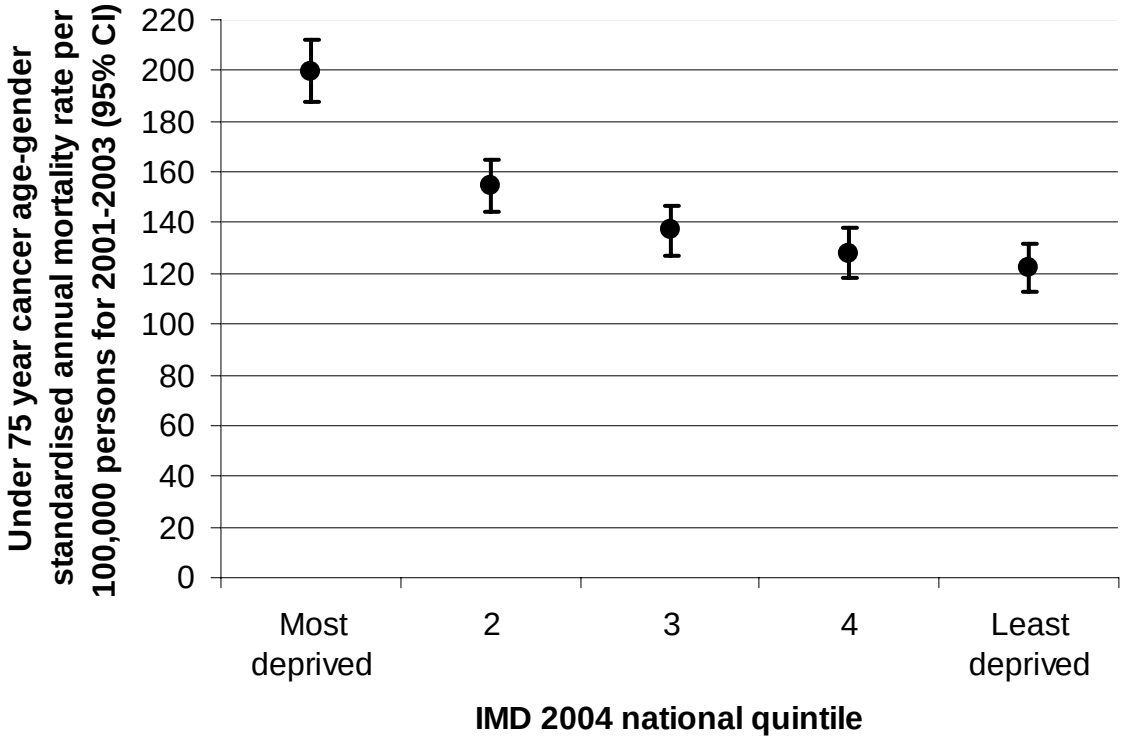
The IMD 2004 scores were derived for each SOA nationally, and therefore when calculating the mean IMD 2004 scores for each ward by averaging the scores for the SOAs contained within the ward, differences within the wards are averaged out. Therefore, whilst ***Figure 13*** provides useful information on the relationship between deprivation and mortality (in particular information at the ward level which is a commonly-used geographical area), information is lost. A more powerful way of presenting the information is to examine the mortality rates and deprivation for each SOA within Kingston-upon-Hull and East Riding of Yorkshire, and categorise each SOA into a national quintile based on their IMD 2004 score. Each SOA is assigned to the most appropriate deprivation category in this way, rather than averaging the effects out by calculating an IMD 2004 score for each ward. The under 75 year mortality rates were age and gender standardised, so that any differences that may occur between deprivation quintiles cannot be because of age and gender differences in the population between these groups[21]. The number of deaths occurring for those persons aged under 75 years have been obtained from local mortality data and the number of deaths which

[21] Age groups used were 0-29, 30-34, 35-39, 40-44, 45-49, 50-54, 55-59, 60-64, 65-69 and 70-74 years.

occurred during 2001, 2002 and 2003 have been included in the analysis. The population aged under 75 years has been estimated from GP practice lists for October 2001. The 95% confidence intervals for the mortality rates were also calculated[22].

It can be seen that there is strong evidence of an association between deprivation and age-gender standardised annual mortality rate from cancer in those aged under 75 years (***Figure 14***). The trend is highly statistically significant (χ^2 test for trend, X=120 p<0.001).

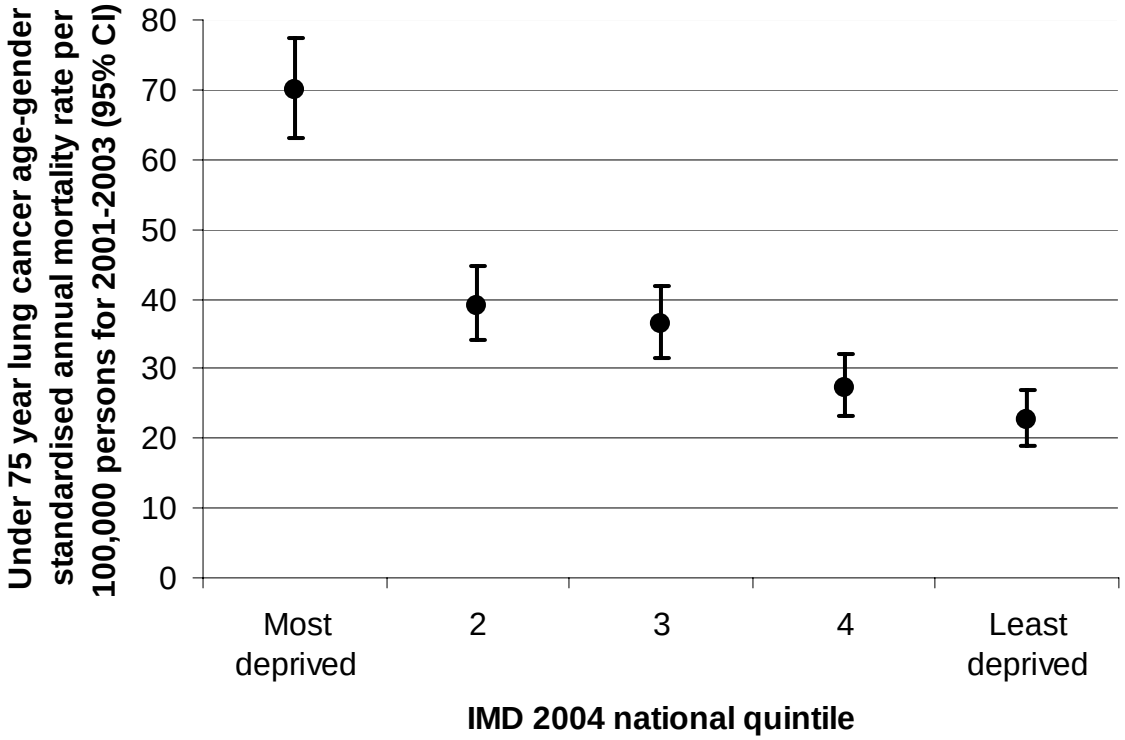
Figure 14: Relationship between age-gender standardised cancer mortality rate and deprivation for those aged under 75 years



[22] Using exact Poisson method (available in Stata version 8).

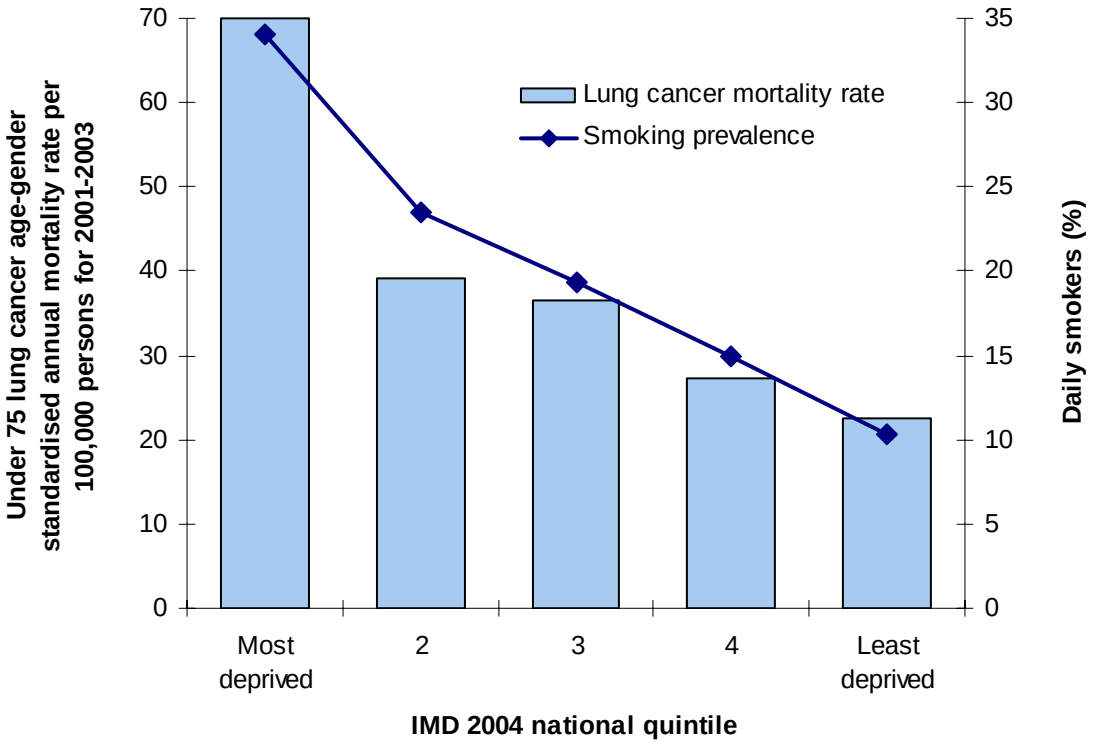
Figure 15 illustrates the association between deprivation and age-gender standardised lung cancer annual mortality rate for those aged under 75 years. The trend is highly statistically significant (χ^2 test for trend, X=156, p<0.001).

Figure 15: Relationship between age-gender standardised lung cancer mortality rate and deprivation for those aged under 75 years



Smoking status was collected as part of the local Health and Lifestyle surveys, and the percentage of daily smokers (occasional smokers not included) is illustrated in ***Figure 16*** which shows a very similar to pattern to that of the rate of lung cancer mortality (from ***Figure 15***).

Figure 16: Relationship between age-gender standardised lung cancer mortality rate and deprivation for those aged under 75 years, and prevalence of smoking



It is possible that the association between deprivation and all cancer mortality is mainly due to the association between deprivation and lung cancer mortality. ***Figure 17*** shows the association between deprivation and mortality from all cancers excluding lung cancer. The trend is highly statistically significant (χ^2 test for trend, X=28, p<0.001). Therefore, there must be other cancers, additional to lung cancer, where a trend in mortality also exists over the deprivation quintiles.

Figure 17: Relationship between age-gender standardised mortality rate for all cancers excluding lung cancer and deprivation for those aged under 75 years

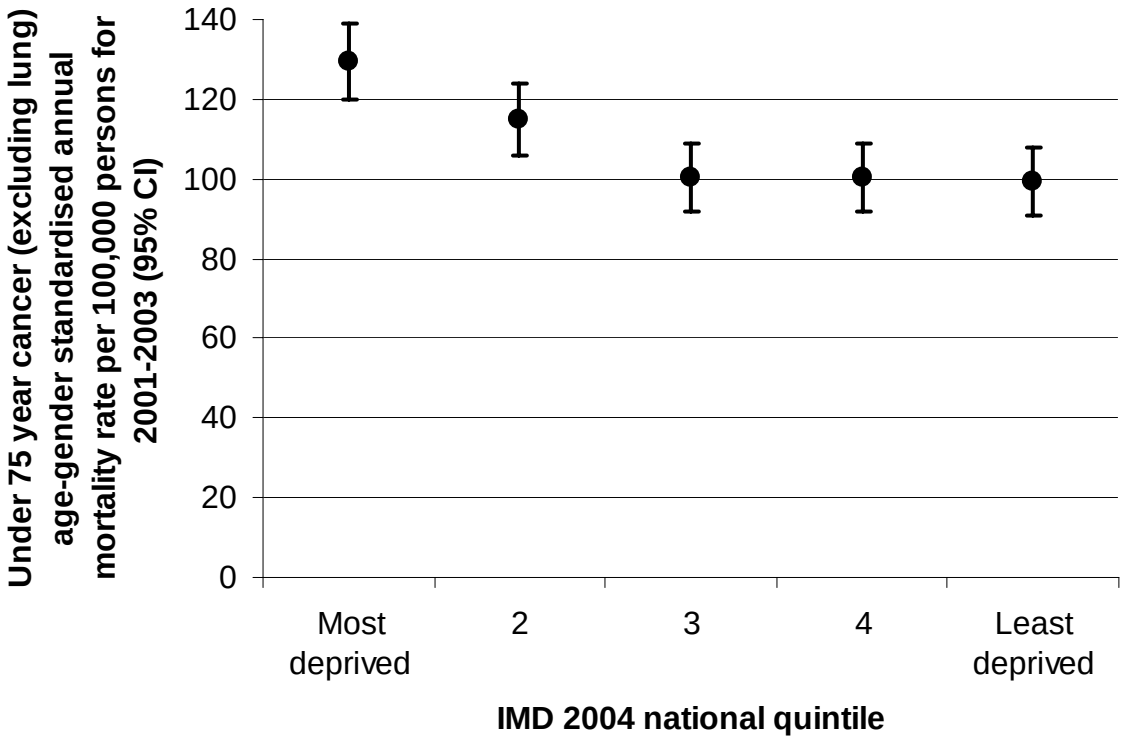
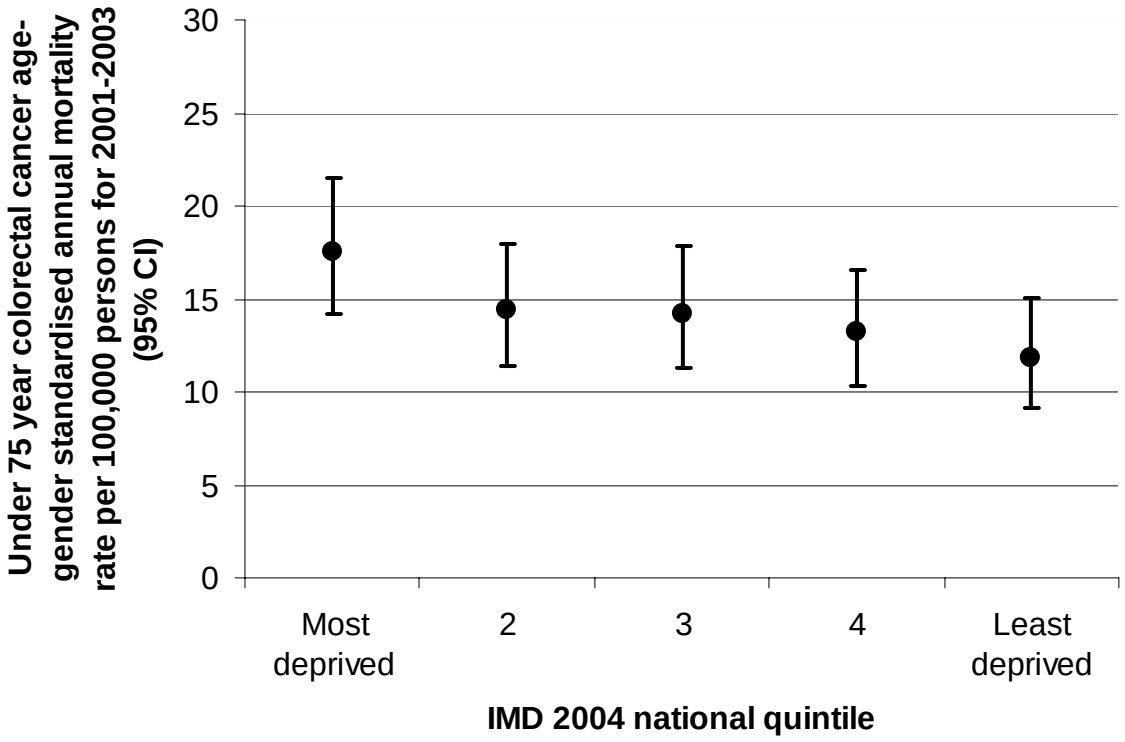


Figure 18 illustrates the association between deprivation and age-gender standardised colorectal cancer annual mortality rate for those aged under 75 years. The trend is statistically significant (χ^2 test for trend, X=6.1, p=0.014).

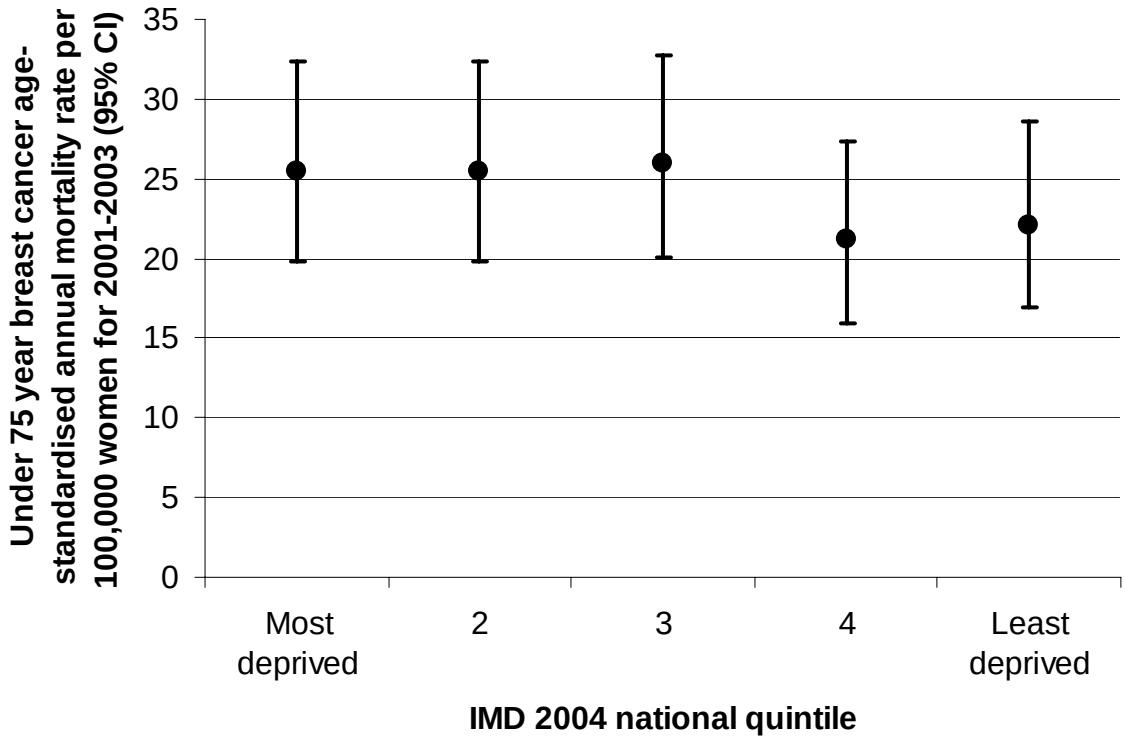
Figure 18: Relationship between age-gender standardised colorectal cancer mortality rate and deprivation for those aged under 75 years



For cervical cancer in those aged under 75 years, there appears to be a trend over the most deprived four quintiles, but the least deprived quintile has a relatively high annual mortality cervical cancer mortality rate. However, the numbers of deaths over the three year period are small, with only eight deaths on average per year for women aged under 75 years. As a result, caution should be exercised in interpretation of this information, and the trend is not statistically significant (χ^2 test for trend, X=1.0, p=0.32).

Figure 19 illustrates the association between deprivation and age-standardised breast cancer annual mortality rate for women aged under 75 years. Generally, in the UK as a whole, there is an increased incidence (and mortality) for breast cancer as deprivation decreases (i.e. the association is the reverse of that observed for most other cancers). However, no such trend was observed locally (χ^2 test for trend, X=1.6, p=0.21).

Figure 19: Relationship between age-standardised breast cancer mortality rate and deprivation for those aged under 75 years



6.4.4 Incidence Relative to Mortality Rate

It is useful to examine the relationship between incidence and mortality by deprivation quintile to assess if inequity exists. If there are differences between the incidence rates and mortality rates among the IMD quintiles, then this could reflect differences in risk factors, stage at diagnosis, co-morbidity, treatment options, type of cancer, survival or other factors.

The individual-level incidence data for 2001-2003 provided by NYCRIS includes the IMD 2004 national quintile and can be standardised using the same age groups[23] as the individual-level mortality data. The mortality data for 2001-2003 is used. [24]

Table 35 gives the annual age-standardised incidence and mortality rates for 2001-2003 per 100,000 population aged under 75 years. The standard population used is East Riding of Yorkshire and Hull combined.

It can be seen that there is quite a dramatic trend in the incidence to mortality ratio. In the most deprived areas for both males and females the mortality rate is much higher relative to the incidence rate compared to the least deprived areas. However we do not know to what extent this is a case of raised mortality for deprived areas, or raised incidence for "well-off" areas.

Table 35: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of cancer by deprivation for those aged under 75 years

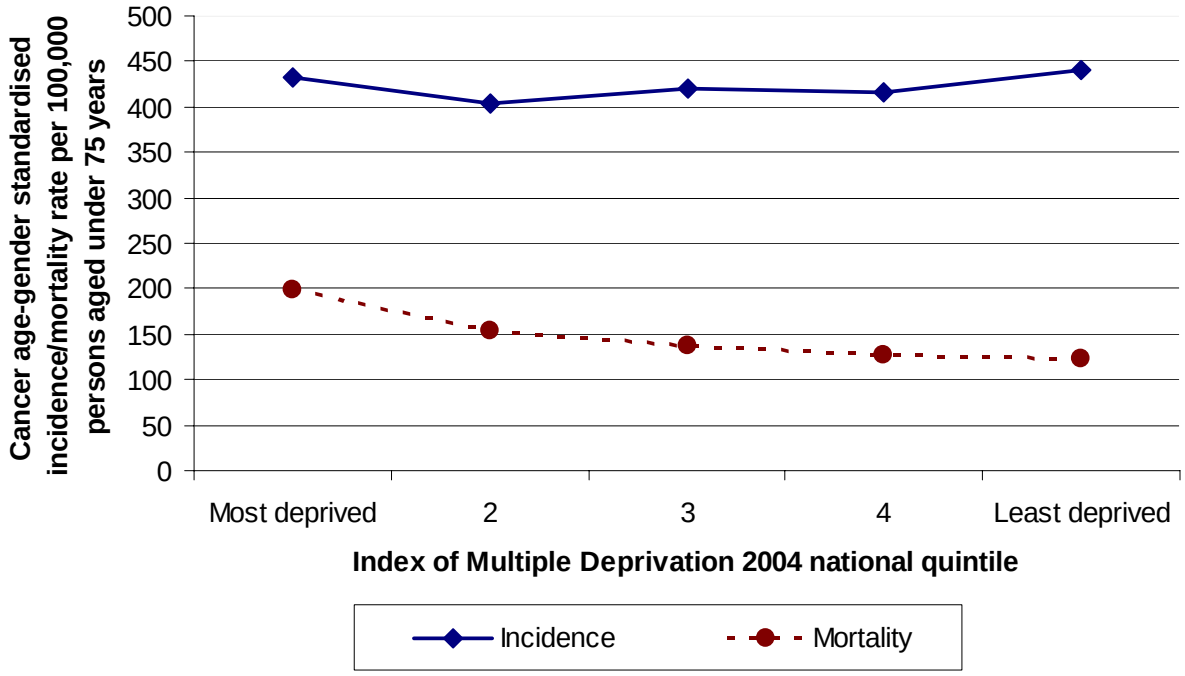
IMD 2004 national quintile	Annual incidence and mortality rate per 100,000 persons aged under 75 years during 2001 to 2003 for all cancer					
	Males			Females		
	Incidence rate	Mortality rate	Ratio (%)	Incidence rate	Mortality rate	Ratio (%)
Most deprived	440	229	0.52	423	169	0.40
2	419	166	0.40 (–24%)	387	142	0.37 (–8%)
3	415	141	0.34 (–35%)	426	133	0.31 (–22%)
4	419	142	0.34 (–35%)	413	112	0.27 (–32%)
Least deprived	453	131	0.29 (–45%)	430	114	0.26 (–34%)

[23] Age groups: 0-29, 30-49, 50-59, 60-64, 65-69, 70-74, 75-79, 80-84 and 85+ years.

[24] There may be some individuals who have an entry in both the incidence and mortality datasets, however, there will be many individuals in one dataset but not the other dataset. In addition, those individuals who are included in both files cannot be examined separately as the data provided by NYCRIS is provided without any identifiers for confidentiality reasons.

Figure 20 illustrates the difference between the incidence and mortality rates for males and females **combined** for those aged under 75 years.

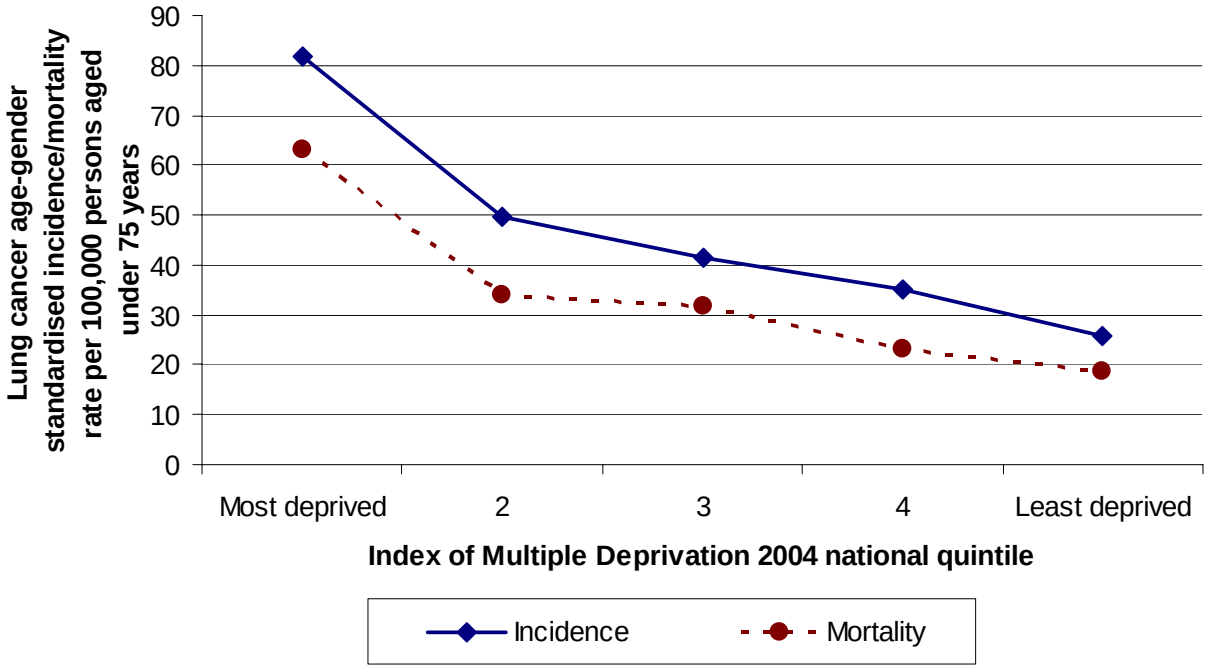
Figure 20: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of cancer by deprivation for those aged under 75 years



As mentioned earlier, differences in the incidence to mortality ratio will be influenced by many factors including type of cancer and relative survival. It has previously been noted that the incidence rate is considerably higher in the most deprived groups due to an increasing prevalence of smoking. Since the mortality rate for this particular cancer is high, it is possible that the trend in the incidence to mortality ratio highlighted above is explained by lung cancer.

However, examining the incidence to mortality ratio for lung cancer (individual data not shown but summarised in ***Figure 21***) the ratios differ among the deprivation quintiles but show no real trend. The ratios are between 0.73 and 0.98 for men and between 0.75 and 0.85 for women. So because the mortality rates for cancer are high with survival not strongly influence to deprivation, there is actually less of a trend in the incidence to mortality ratio for lung cancer (***Figure 21***).

Figure 21: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of lung cancer by deprivation for those aged under 75 years



Nevertheless, due to the high incidence rate for lung cancer in the most deprived quintiles, ***Table 36*** examines the incidence to mortality ratio for all cancers excluding lung cancer. It can be seen that the same association between the ratio and the deprivation quintiles occur as when considering all cancers.

Table 36: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of cancer excluding lung cancer by deprivation for those aged under 75 years

IMD 2004 national quintile	Annual incidence and mortality rate per 100,000 persons aged under 75 years during 2001 to 2003 for all cancers excluding lung cancer					
	Males			Females		
	Incidence rate	Mortality rate	Ratio (%)	Incidence rate	Mortality rate	Ratio (%)
Most deprived	344	141	0.41	356	117	0.33
2	360	118	0.33 (–20%)	347	112	0.32 (–2%)
3	371	97	0.26 (–36%)	389	104	0.27 (–18%)
4	377	112	0.30 (–28%)	385	88	0.23 (–30%)
Least deprived	420	100	0.24 (–42%)	411	99	0.24 (–27%)

As speculated above with lung cancer, it is possible that this association is occurring for all cancers or just for specific cancers. Due to the low mortality and/or incidence rates for certain specific cancers, it is only possible to examine the incidence to mortality ratios for a relatively small number of specific cancers. ***Table 37*** compares the incidence to mortality ratio for colorectal cancer.

For colorectal cancer in males aged under 75 years, there is a considerable difference in the incidence to mortality ratio between the most deprived quintile and the least deprived quintile as well as between the most deprived quintile and the remaining four quintiles. There is relatively little difference in the ratios for the three middle quintiles. For females, there is also a higher mortality rate relative to incidence for the most deprived quintile compared to the least deprived quintile, and there appears to be a trend in the ratio but the trend is not linear across the five groups. The incidence rate and mortality rates are considerably lower for females compared to males, and the results may be influenced by the relatively small numbers of events being considered.

Table 37: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of colorectal cancer by deprivation for those aged under 75 years

IMD 2004 national quintile	Annual incidence and mortality rate per 100,000 persons aged under 75 years during 2001 to 2003 for colorectal cancer					
	Males			Females		
	Incidence rate	Mortality rate	Ratio (%)	Incidence rate	Mortality rate	Ratio (%)
Most deprived	49	25	0.50	27	10	0.37
2	44	18	0.41 (–41%)	26	11	0.41 (+12%)
3	38	16	0.43 (–43%)	38	12	0.31 (–15%)
4	43	19	0.44 (–44%)	32	7	0.23 (–38%)
Least deprived	56	13	0.23 (–54%)	36	11	0.30 (–19%)

Figure 22 illustrates the difference between the incidence and mortality rates for both genders combined.

Figure 22: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of colorectal cancer by deprivation for those aged under 75 years

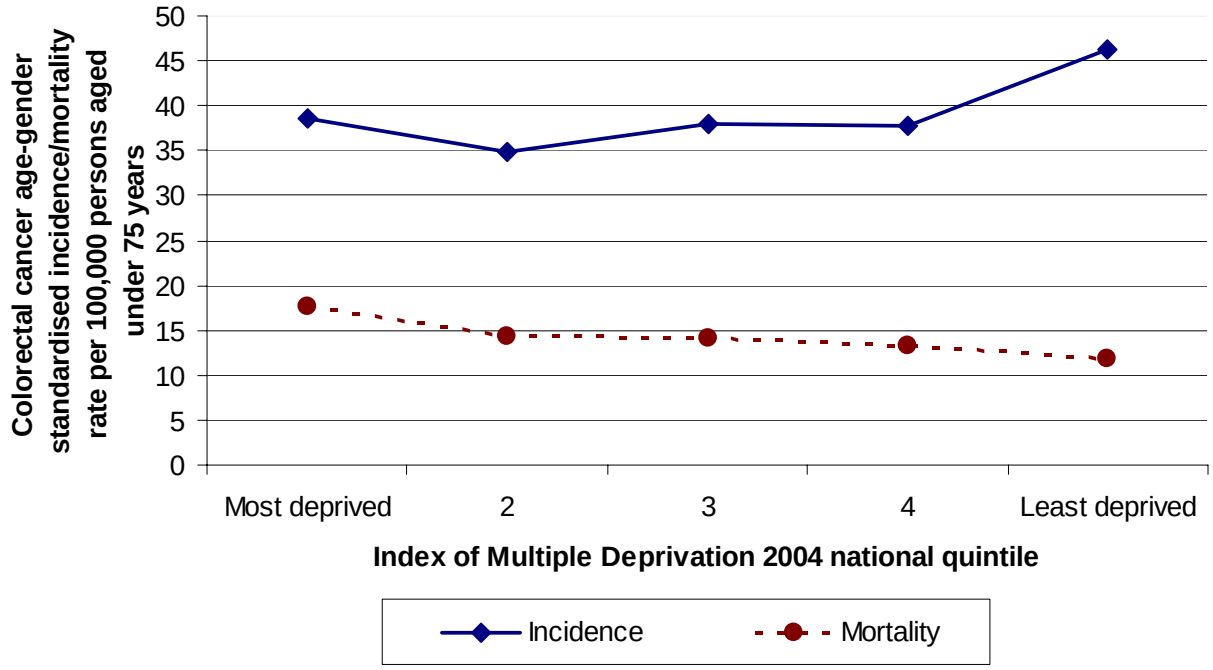


Table 38 illustrates the differences in the incidence to mortality ratio for breast cancer in women aged under 75 years. It can be seen that there is minor differences between the three most deprived quintiles (ratios 0.22 to 0.24) and between the two least deprived quintiles (ratios 0.17 and 0.18), but a slight differences between these two groups.

Table 38: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of breast cancer by deprivation for women aged under 75 years

IMD 2004 national quintile	Annual incidence and mortality rate per 100,000 women aged under 75 years during 2001 to 2003 for breast cancer			
	Incidence rate	Mortality rate	Ratio	Percentage
Most deprived	116	25	0.22	
2	110	26	0.23	6
3	109	26	0.24	10
4	115	21	0.18	–16
Least deprived	129	22	0.17	–22

Figure 23 illustrates the information provided in ***Table 36*** graphically.

Figure 23: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of breast cancer by deprivation for women aged under 75 years

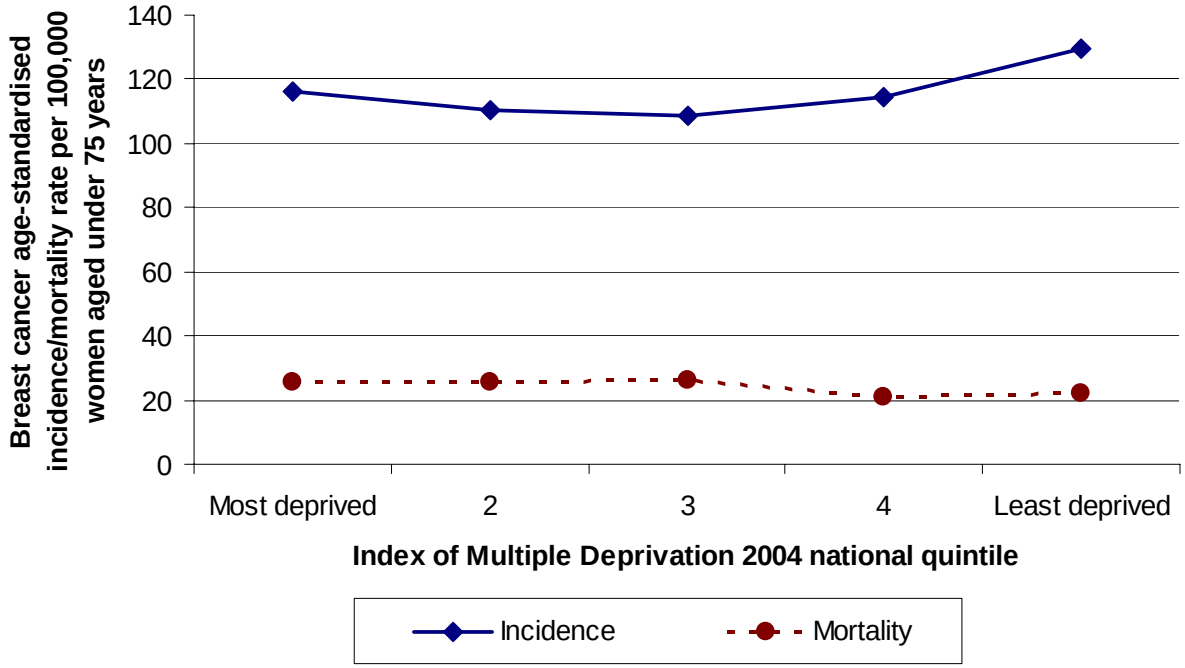


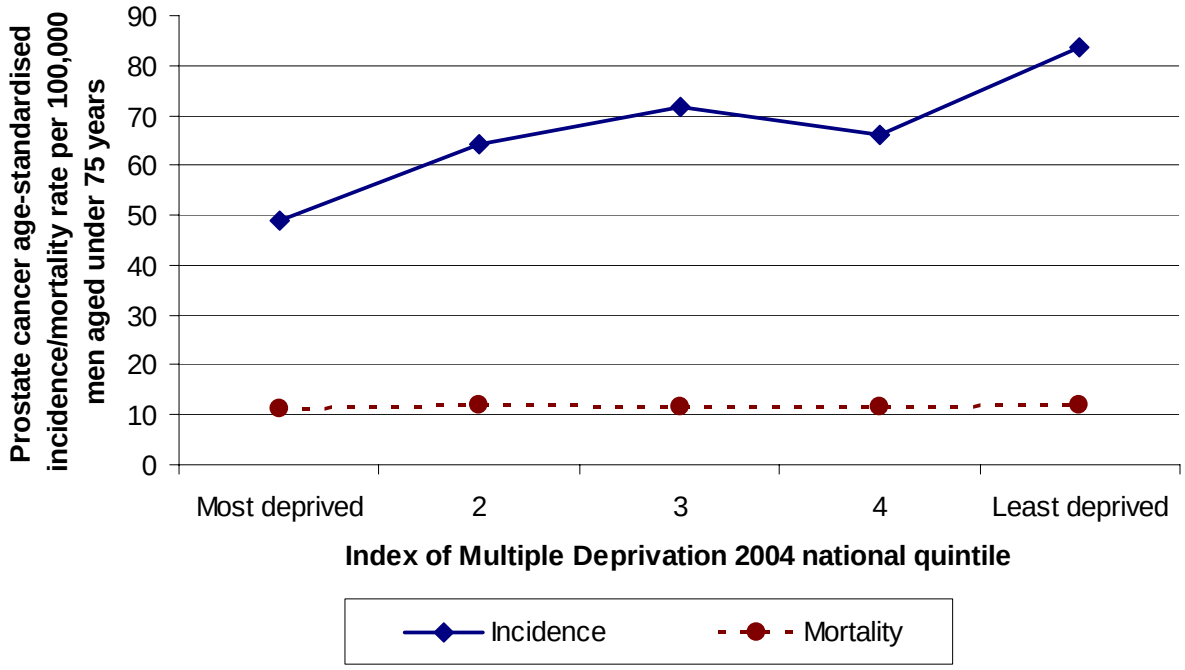
Table 39 illustrates the incidence to mortality ratio for men with prostate cancer. There is a relatively large difference between the ratio between the most deprived and least deprived quintiles, but relatively little differences in the ratio for the middle three deprivation quintiles. However, it should be borne in mind that the number of deaths of men under the age of 75 years for prostate cancer is relatively small and therefore that the mortality rates may be quite variable. Incidence rates for prostate cancer go "the other way" from the mortality rates, being highest for the least deprived areas. These two effects combine in the ratio to give a ratio for the least deprived areas which is 36% lower than the most deprived.

Table 39: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of prostate cancer by deprivation for men aged under 75 years

IMD 2004 national quintile	Annual incidence and mortality rate per 100,000 men aged under 75 years during 2001 to 2003 for prostate cancer			
	Incidence rate	Mortality rate	Ratio	Percentage
Most deprived	49	11	0.23	
2	64	12	0.18	–18
3	72	11	0.16	–29
4	66	12	0.18	–22
Least deprived	84	12	0.14	–36

Figure 24 illustrates the information provided in ***Table 37*** graphically.

Figure 24: Annual age-standardised incidence rate compared to mortality rate during 2001 to 2003 with a primary diagnosis of prostate cancer by deprivation for men aged under 75 years



As was seen in ***Tables 32 and 33***, the incidence rate for skin cancer including malignant melanoma showed a decreasing trend with higher levels of deprivation. The mortality rates from skin cancer and malignant melanoma are very low (approximately 0.6 to 2.3 per 100,000 persons for the different deprivation quintiles for males and females). Therefore, the incidence to mortality ratio can not be examined due to small number of deaths and the unreliability of these mortality rate estimates. However, it is possible that inequity could be present as the mortality rates are similar across the five deprivation quintiles for both males and females despite the much higher incidence rates for the

least deprived groups. We do know that the relatively high incidence of skin cancer in "well-off" areas will affect the mortality/incidence ratio in ***Tables 35 and 36***, even though the mortality ratio for skin cancer can not be validly calculated.

The incidence to mortality ratio was also examined for persons of all ages as it is possible that the pattern of the differences in the ratio among the deprivation groups could differ on whether under 75 year or all age incidence and mortality were considered. However, the pattern in the ratio over the deprivation quintiles was similar regardless of what age group was being considered.

7 Risk Factors for Cancer

There are many postulated risk factors for cancer. Some risk factors, such as cigarette smoking are well-document with much supporting evidence, particularly in relation to cancers such as lung cancer. For some other potential risk factors there is less certainty about the their effect, with some studies suggesting an association and other studies not suggesting or failing to find an association. Individual genetic makeup is an important risk factor for colorectal cancer, breast cancer, cervical cancer, and many other types of cancer. There are other occupational and environmental potential risk factors, such as air pollution, exposure to electromagnetic fields, radon exposure, etc which may be associated with an increased risk of cancer. Stainless steel welding and radon exposure have been found by some to have an association with lung cancer, and oestrogen may be linked with breast cancer. The human papilloma virus is suspected to be responsible for approximately 95% of all cases of cervical cancer. This virus is passed on through sexual intercourse and as a result a high number of sexual partners, age at first sexual intercourse and low condom use will increase the risk of obtaining the virus. ***Table 40*** details some of the risk factors and potential risk factors that have been linked to different types of cancer and the main cancers mentioned in this equity audit.

Table 40: Risk factors and potential risk factors for cancer

Risk factor or potential risk factor	All cancer	Specific cancers				
		Lung	Colorectal	Breast	Cervical	Skin
Genetics	Y		Y	Y	Y	
Asbestos		Y				
Environmental	Y	Y		Y		
Occupational	Y	Y				
Smoking	Y	Y	Y		Y	
Diet	Y		Y			
Exercise			Y			
Obesity			Y	Y		
Human papilloma virus					**Y**	
Number of sexual partners					Y	
Decreased condom use					Y	
Age at first sexual intercourse					Y	
Parity					Y	
Hormone replacement therapy				Y		
Alcohol			Y	Y		
Oral contraceptive pill					Y	
Ultraviolet light (sun)						Y

Some of these risk factors cannot be modified by the individual, such as their genetic makeup, and therefore will not be discussed further. Other potential risk factors, such as air pollution, exposure to electromagnetic fields, occupational exposure, etc are also less modifiable than individual behavioural habits.

This equity audit will focus on the potential risk factors that can be modified in order to decrease the risk of cancer. The basis for a health equity audit is to report on any potential inequalities and implement programmes that will address inequalities found. Currently, individual genetic makeup can be modified for a very small number of specific medical and physical conditions. However, this is not common practice, and not the focus of this equity audit. Programmes that address environmental or occupational exposures if these were deemed important could be put in place, but this would probably be costly. Additionally, even if the relationship between the risk factor and the risk of cancer is very strong, it is unlikely to have a large effect on the population as a whole, as it is likely that only a few people would be exposed to the risk factors within the population (for example, in the case of occupational exposures). No specific local environmental or occupational exposures have been highlighted as important in this audit. Therefore environmental and occupational risk factors will not be discussed further.

In terms of risk factors, the biggest effect on reducing cancer incidence and mortality will occur for those risk factors for which many individuals in the population are exposed and for which their risk can be reduced by modified behaviour. This section will focus on these individual risk factors and changes in behaviours that can reduce the risk of cancer incidence and mortality from cancer, such as quitting smoking, improving diet, reducing exposure to sunlight, increased condom use, attending screening programmes, etc.

The risk factors are discussed in relation to gender, age and deprivation in the next section wherever there is locally available information on their prevalence.

7.1 Confounders and Combined Risk Factors

Many of the risk factors mentioned above are associated with deprivation. A person who lives in a more deprived area is more likely to have a particular risk factor compared to a person living in a more affluent area, for example, smoking, poor diet, lack of physical exercise, etc. Therefore, those living in more deprived areas will also be more likely to have a combination of multiple risk factors. This means that associations can appear to exist between cancer incidence, prevalence or mortality and a specific potential risk factor, when the factor may be a confounder (i.e. associated indirectly through its relationship with another variable rather than directly associated) rather than a risk factor. For example, there is a strong association between smoking and the risk of lung cancer, so it is possible that an association could be present between poor diet and increasing risk of lung cancer. However, such an association could be because diet is indeed related to the risk of lung cancer (a true relationship) or it could be because diet is associated with smoking (a confounder).

The effect on cancer incidence of having two or more risk factors is not necessarily additive. For example, singly factor A might double the risk of a specific cancer and singly factor B might double the risk of the same cancer. If the effects were additive then one would expect that having both A and B present would increase the risk by four

times. However, having both factors A and B present together may increase the risk of the cancer tenfold (i.e. increase by more than expected based on the sum of the single effects) or double the risk of cancer (i.e. increase by less than expected based on the sum of the single effects). This is the case with smoking and asbestos on mesothelioma and asbestos-related lung cancer. The increase in the risk of cancer for smokers exposed to asbestos is greater than the sum of the effects of smoking only and exposure to asbestos only.

7.2 Prevalence of Risk Factors

One of the main reasons why there is a difference in incidence and mortality between different groups of people is due to their different lifestyle choices.

Information is not available on the prevalence of all the main risk factors for cancer. However, information is available on the prevalence of the following risk factors from the local adult Health and Lifestyle survey completed 2002-2003: smoking; obesity (from self-measured height and weight); alcohol consumption; exercise; and the type of fat used for frying food. Information is presented on smoking, alcohol consumption and fruit and vegetable consumption for young people (aged 11-15 years) participating in the local Health and Lifestyle survey conducted during 2002. Further information is available on the prevalence of fruit and vegetable consumption from the local 5-A-DAY survey.

The association between various risk factors and age, gender and the deprivation (using IMD 2004 national quintiles for East Riding of Yorkshire and Kingston-upon-Hull) are illustrated below.

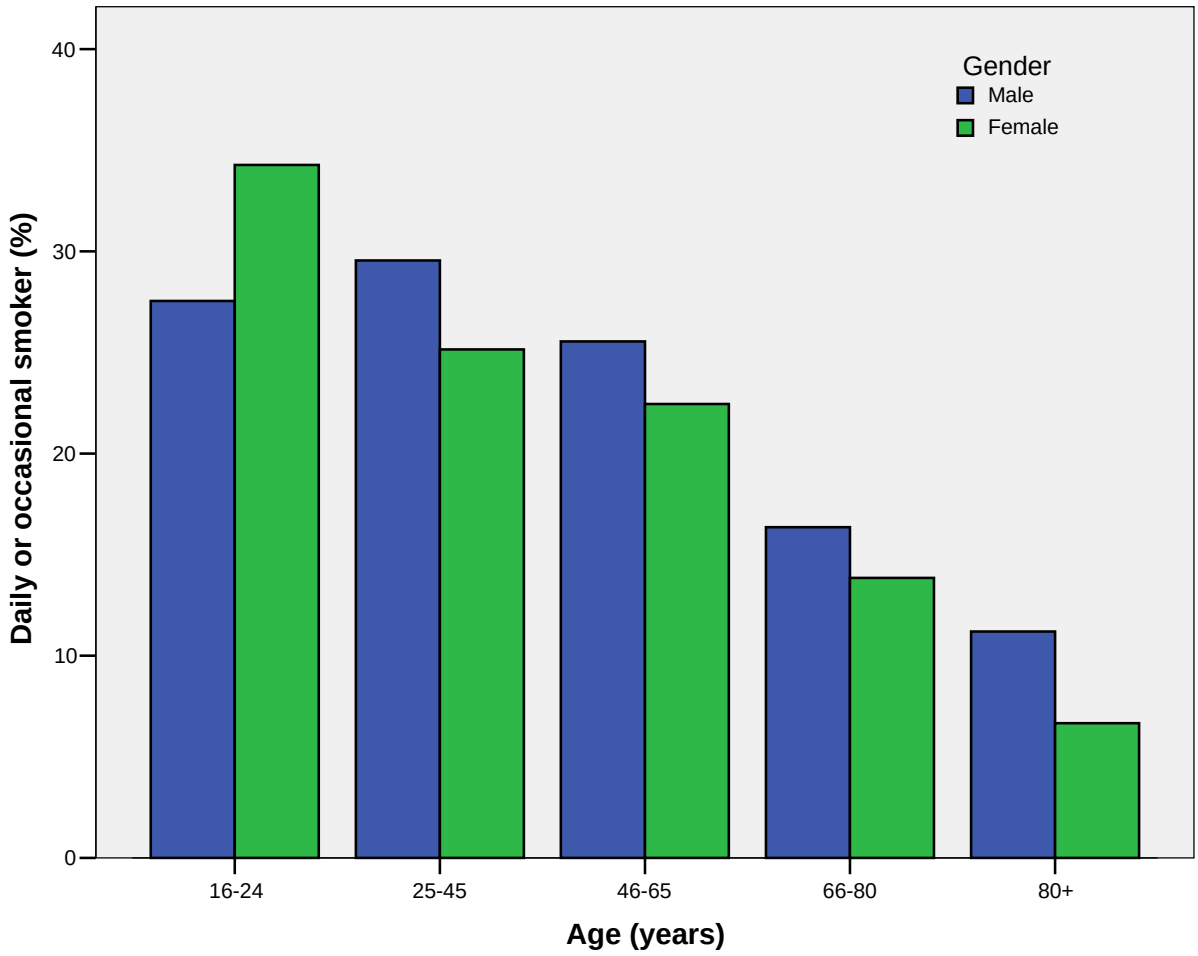
7.2.1 Smoking

Smoking is a major or contributing cause of many cancers, in particular, cancers such as lung cancer and cancers of the mouth and throat. There is a strong association between cigarette smoking and deprivation, with a much higher percentage of people living in deprived areas smoking. Therefore, one would expect an association between deprivation and the cancer in terms of incidence rate, inpatient admission rate and mortality rate (in particular, for lung cancer).

The percentage of people who smoke daily or occasionally varies between males and females and among different age groups (***Figure 25***). It can be seen that fewer women smoke compared to men for those aged 25 years or more, but more women smoke in the youngest age group. The pattern (interaction) of smoking across the age groups differs significantly among the age groups, and there is a statistically significant difference among the age groups[25].

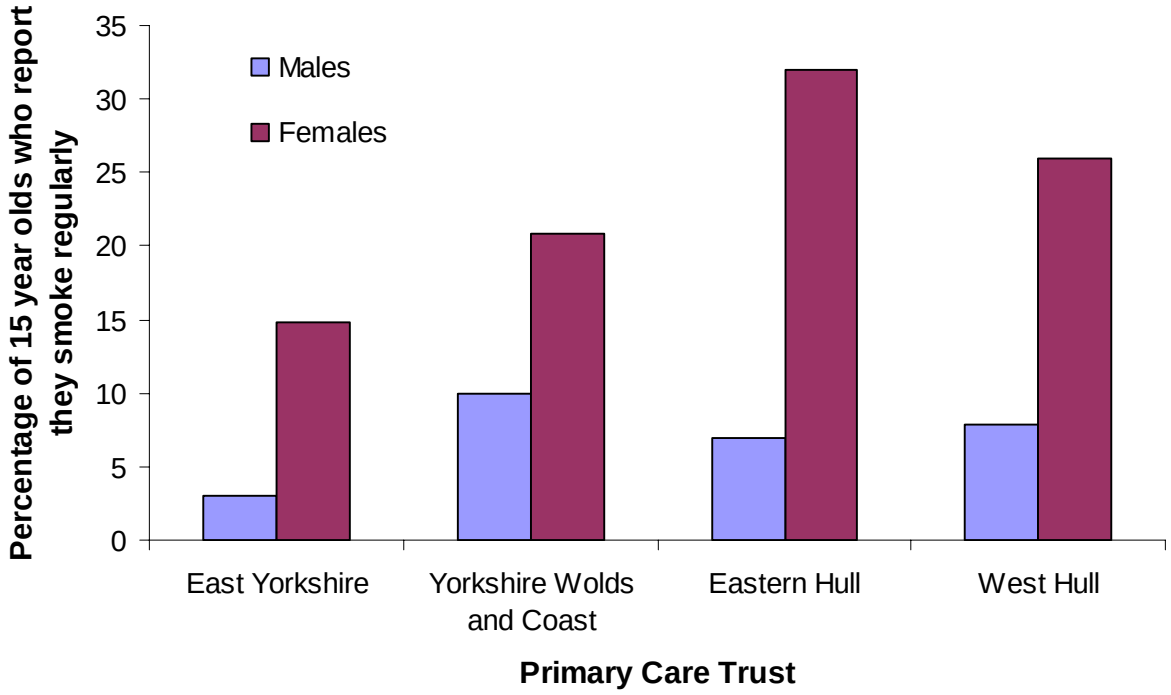
[25] Logistic regression: interaction term (p=0.027), age group (p=0.038), gender (p=0.34).

Figure 25: Percentage of daily or occasional male and female smokers by age group



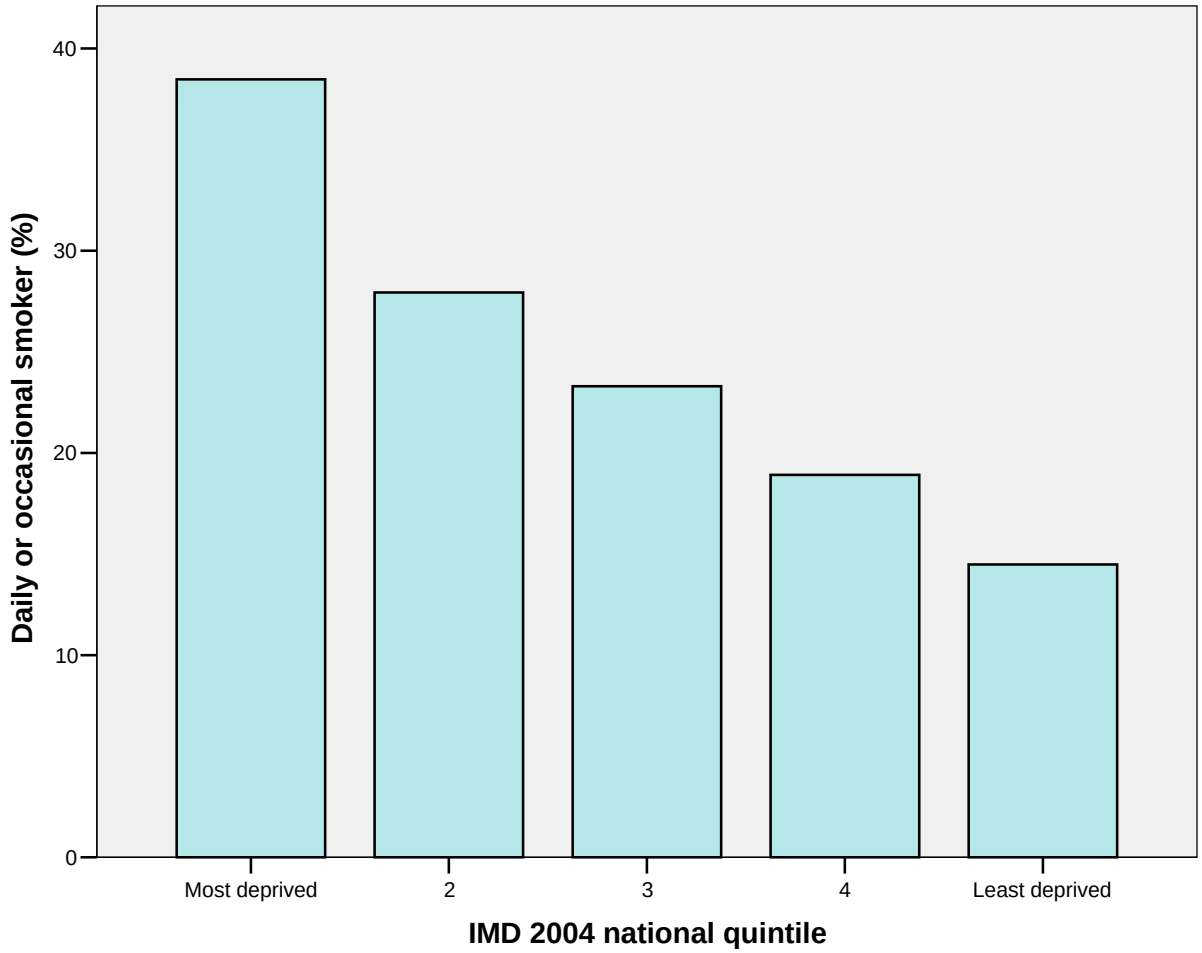
There was a high percentage of young girls who were regular smokers. Ten percent or less boys aged 15 smoked regularly. However, almost 15% of 15 year old girls from East Yorkshire were regular smokers, and over 20% in the other three local PCTs rising to 32% in Eastern Hull.

Figure 26: Percentage of 15 year olds who are regular smokers



The percentage of daily or occasional smokers varies from 38% for people living in the most deprived areas to 14% for people living in the most affluent areas (***Figure 27***), and the difference in the percentages is statistically significant (χ^2 test for trend, p<0.001).

Figure 27: Percentage of daily or occasional smokers by national deprivation quintile

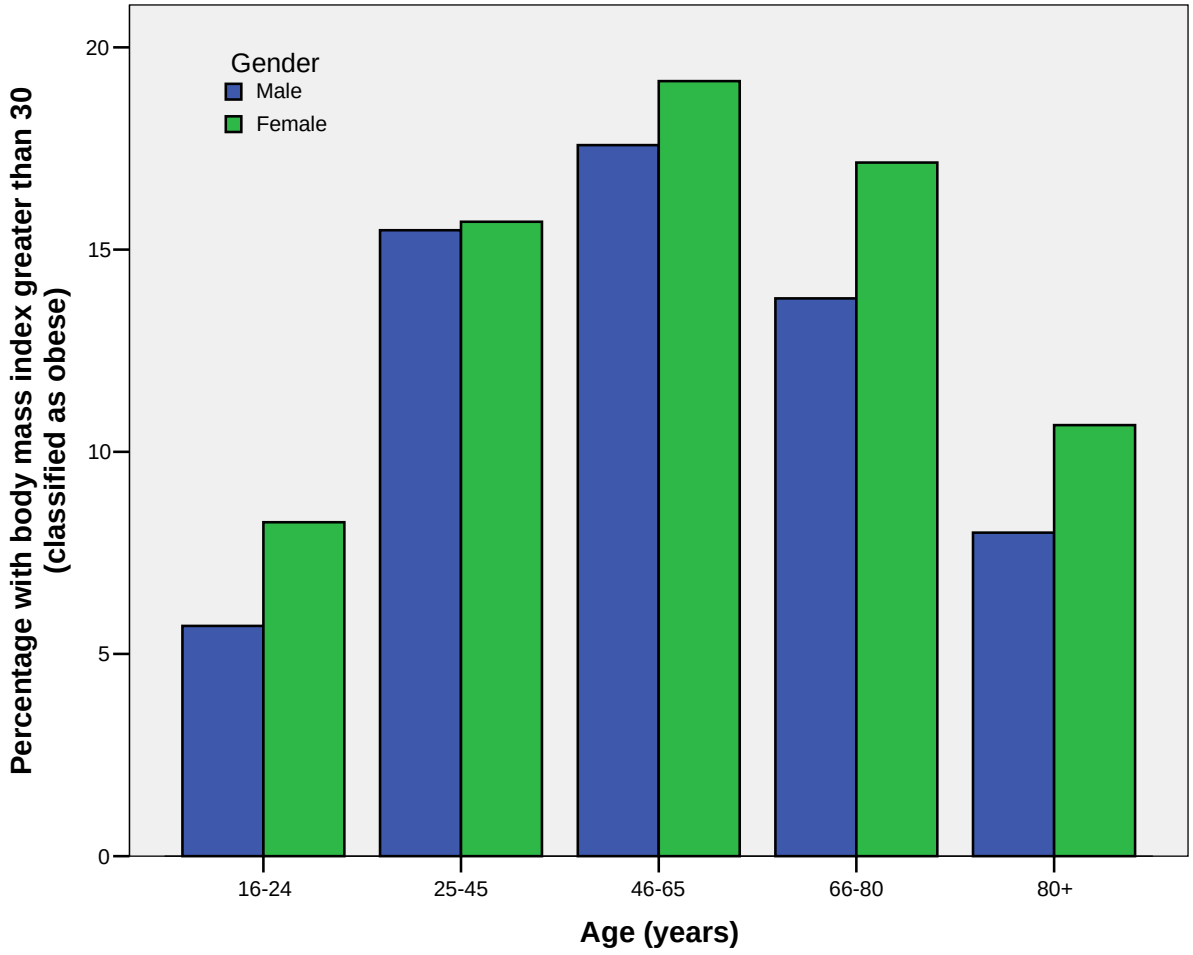


7.2.2 Obesity

There has been some research that has shown an association between obesity and breast cancer for post-menopausal women (in contrast, there is research to suggest a reduced risk of breast cancer for pre-menopausal women). Obesity or diet may also be associated with the risk of other cancers.

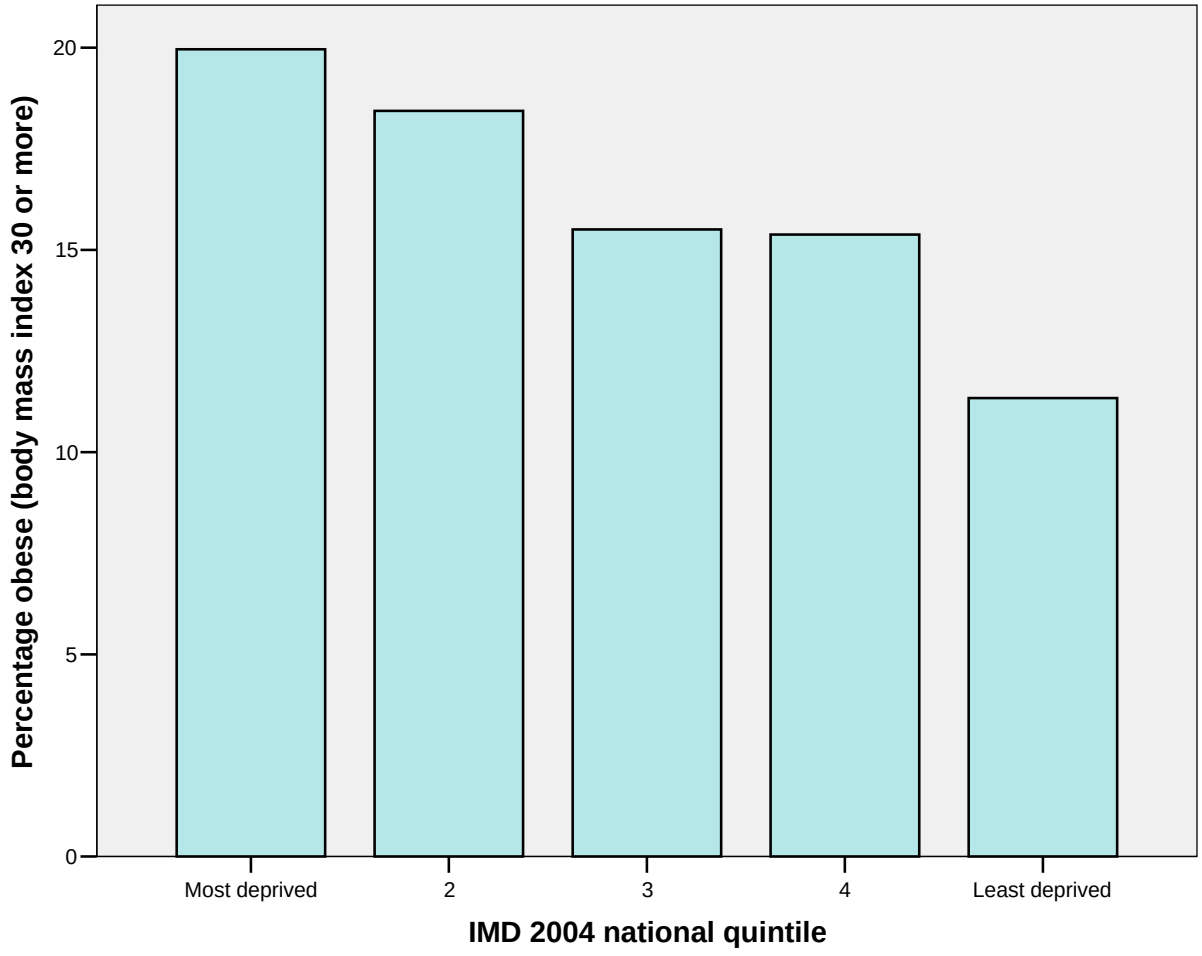
The percentage of people classified as obese (with a BMI of 30 or more) is illustrated in ***Figure 28***. The percentage differs significantly among males and females (logistic regression, p=0.025) with more females classified as obese, and also differs significantly among the different age groups (logistic regression, p<0.001).

Figure 28: Percentage of people classified as obese for males and females by age group



The percentage of those classified as obese (***Figure 29***) is statistically significant among the IMD national quintiles (χ^2 test for trend, $p<0.001$).

Figure 29: Percentage of people classified as obese by national deprivation quintile

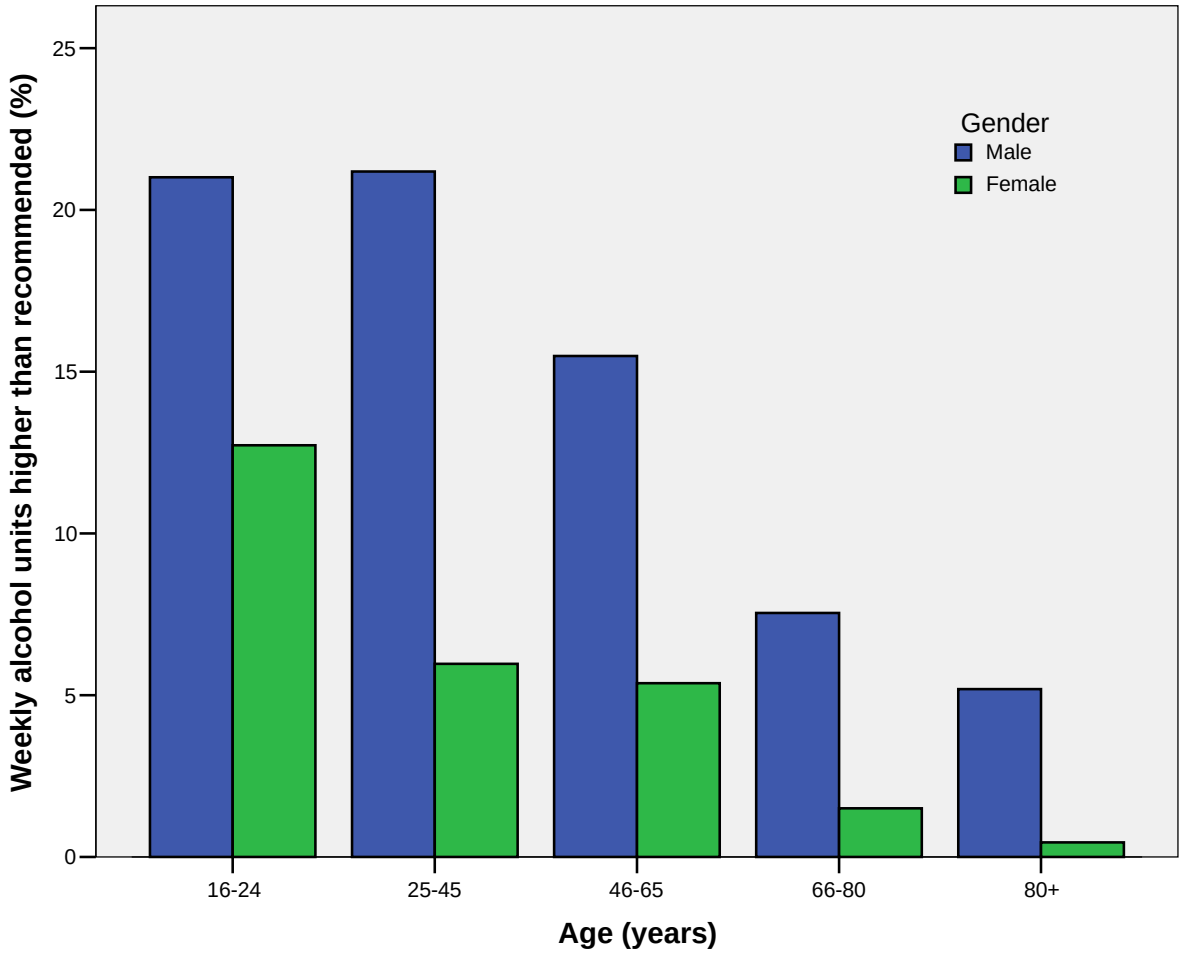


7.2.3 Alcohol consumption

Liver cancer is associated with heavy drinking of alcohol, and alcohol misuse can increase the risk of cancers of the mouth and throat. Some researchers have reported on an association between alcohol consumption and the incidence of breast cancer and colorectal cancer.

The percentage of men and women exceeding the weekly recommended units of alcohol (21 and 14 units respectively) is much higher for males than it is for females for all age groups (***Figure 30***). The difference in the percentages is statistically significant between males and females and among the age groups (and the pattern is significantly different across the age groups between males and females)[26].

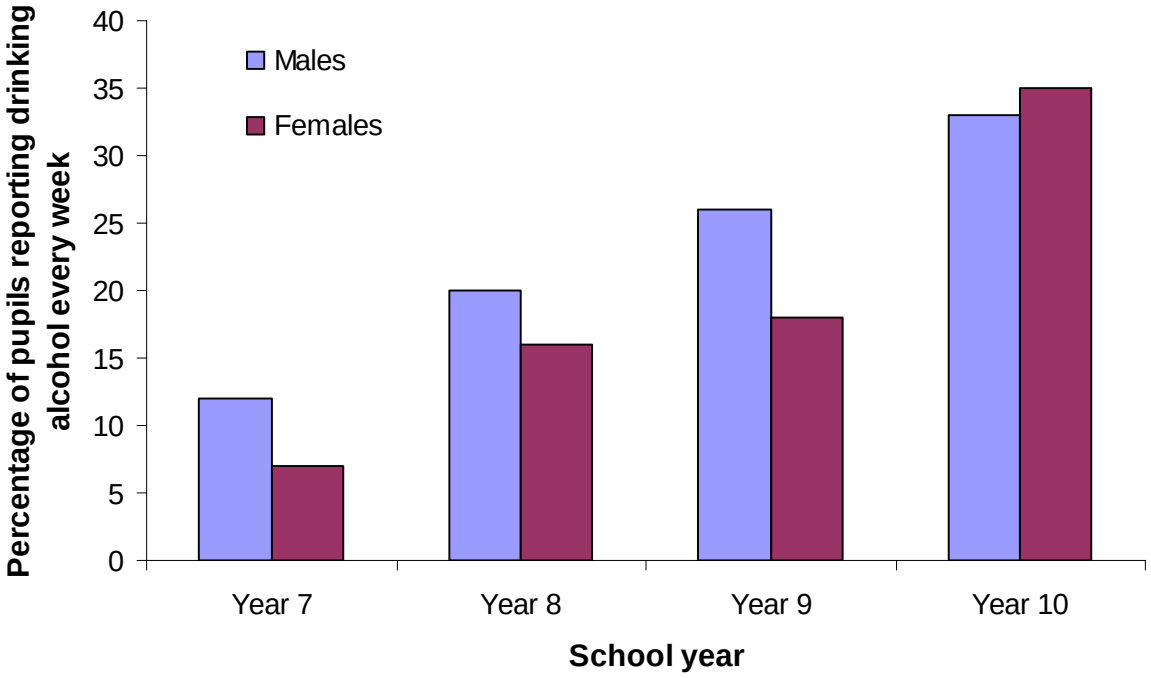
Figure 30: Percentage of men and women exceeding weekly recommended units of alcohol by age group



[26] Logistic regression: gender (p<0.001), age group (p=0.030), interaction term (p=0.009).

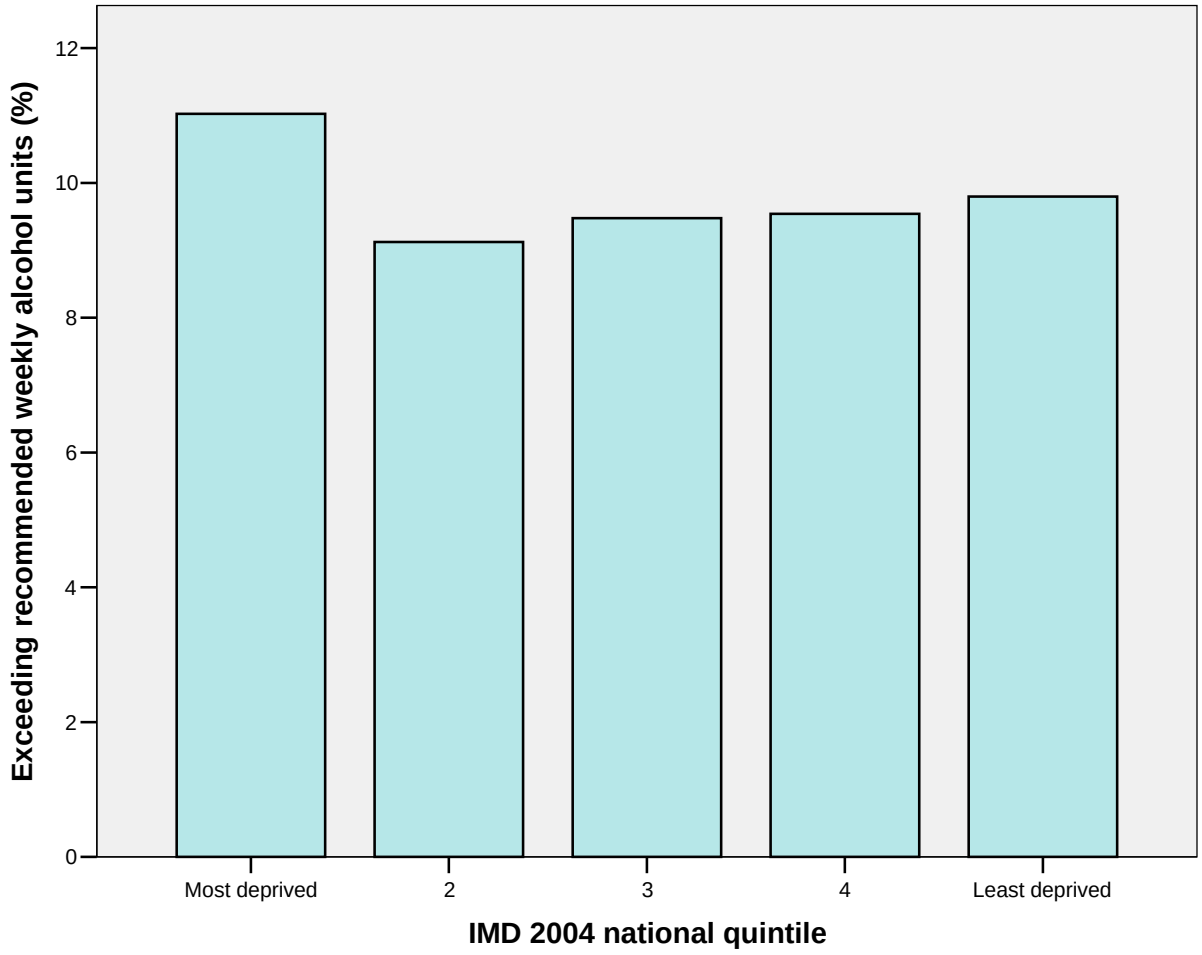
For young persons, the percentage reporting drinking alcohol every week depending on their age (***Figure 31***). Year 7 pupils were aged 11-12 years and year 10 pupils were aged 14-15 years.

Figure 31: Percentage of school pupils drinking alcohol every week



The percentages exceeding the weekly recommended units of alcohol vary little over the national deprivation quintiles (***Figure 32***). In the most deprived 20% of areas nationally, 11% of people exceed the recommended weekly units of alcohol, but there is little difference between the remaining four quintiles which vary between 9.1% and 9.8% (χ^2 test for trend, p=0.28).

Figure 32: Percentage of people exceeding weekly recommended units of alcohol by national deprivation quintile

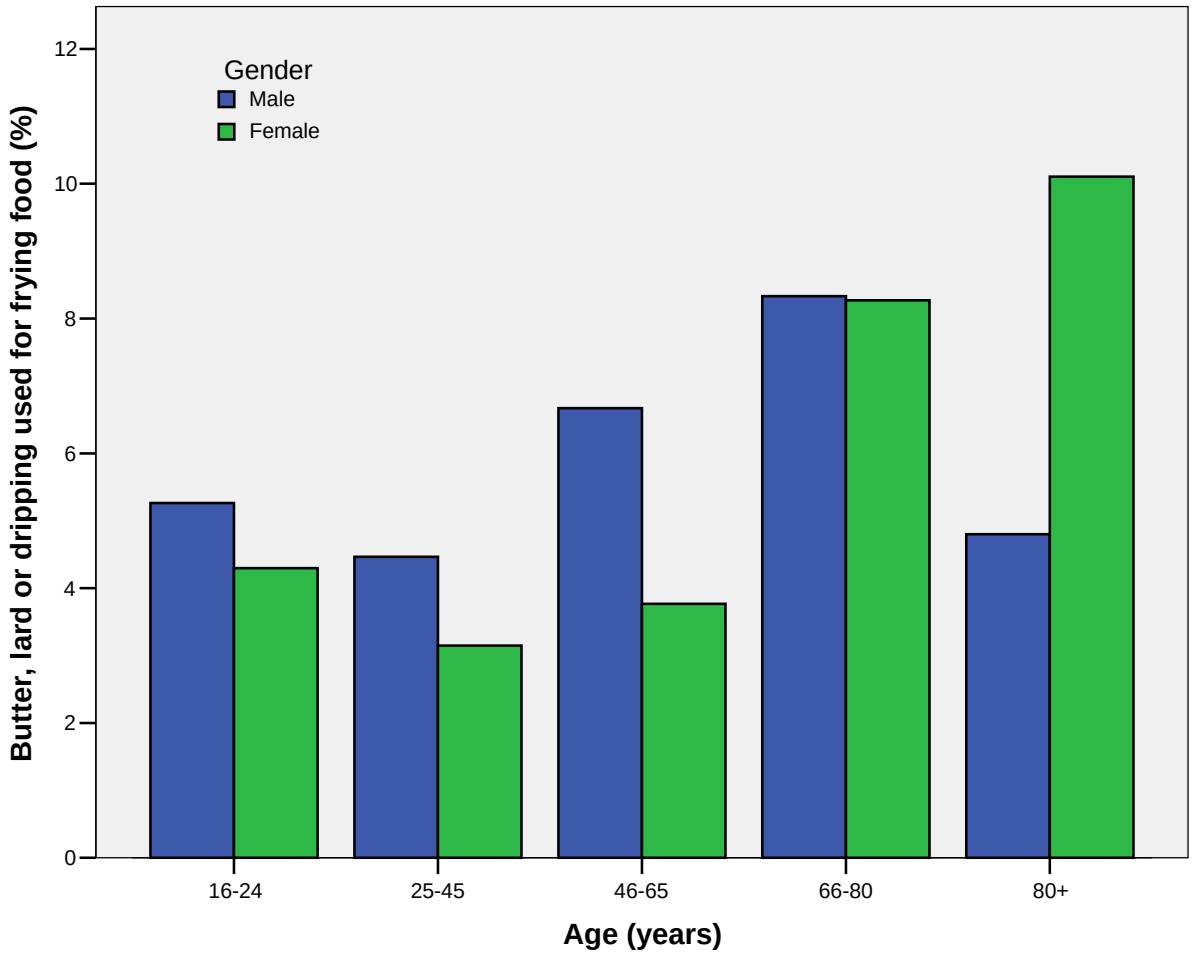


7.2.4 Diet

There is some evidence that diet is a risk factor for colorectal cancer. In general, a low fibre and high fat diet carries a higher risk of colorectal cancer than a high fibre and low fat diet. Research using case-control studies have shown the beneficial effect of fibres, but in more recent longitudinal and randomised studies, there has been less evidence of this association. An unhealthy diet may also be associated with an increased risk of other types of cancer.

The percentage of people who fry their food in butter, lard or dripping varies between men and women and among different age groups (***Figure 33***). The difference is statistically significant between males and females and among the different age groups[27]. This measure was selected as a proxy for 'poor' diet.

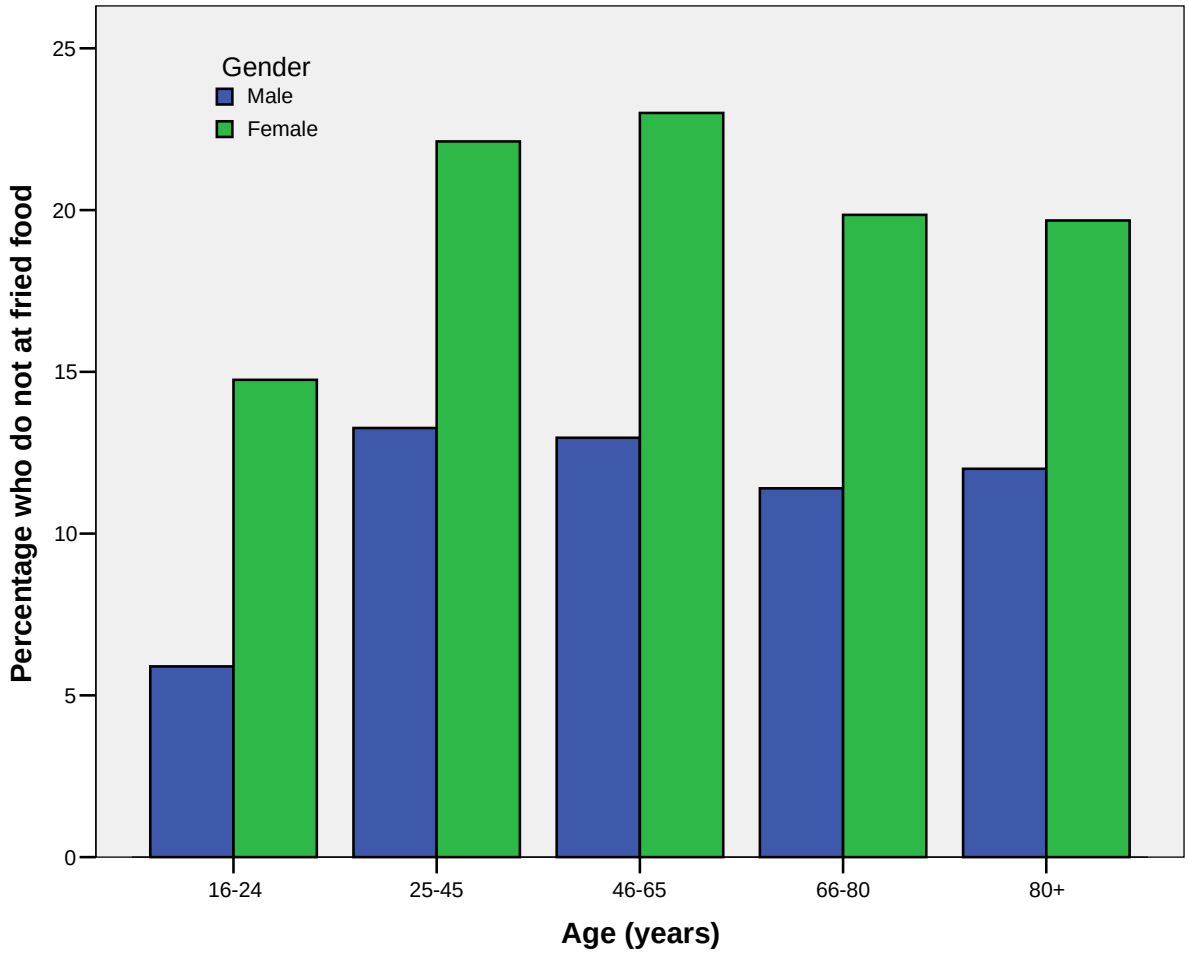
Figure 33: Butter, lard of dripping used for frying food for males and females by age group



[27] Logistic regression: gender (p=0.001), age group (p<0.001).

The percentage of people who do not eat fried food differs between men and women and among different age groups (***Figure 34***). The difference is statistically significant between males and females and among the different age groups[28].

Figure 34: Percentage of men and women who do not eat fried food by age group



[28] Logistic regression: gender (p<0.001), age group (p=0.041).

The percentage of people who fry their food in butter, lard or dripping varies from 7.6% for people living in the most deprived areas to 3.7% for people living in the most affluent areas (***Figure 35***), and the difference in the percentages is statistically significant (χ^2 test for trend, p<0.001). The percentage of people who do not eat fried food also differs across the deprivation quintiles from 15% in the most deprived areas to 19% in the most affluent areas, and the difference is also statistically significant (χ^2 test for trend, p=0.003).

Figure 35: Fat used in frying food by national deprivation quintile

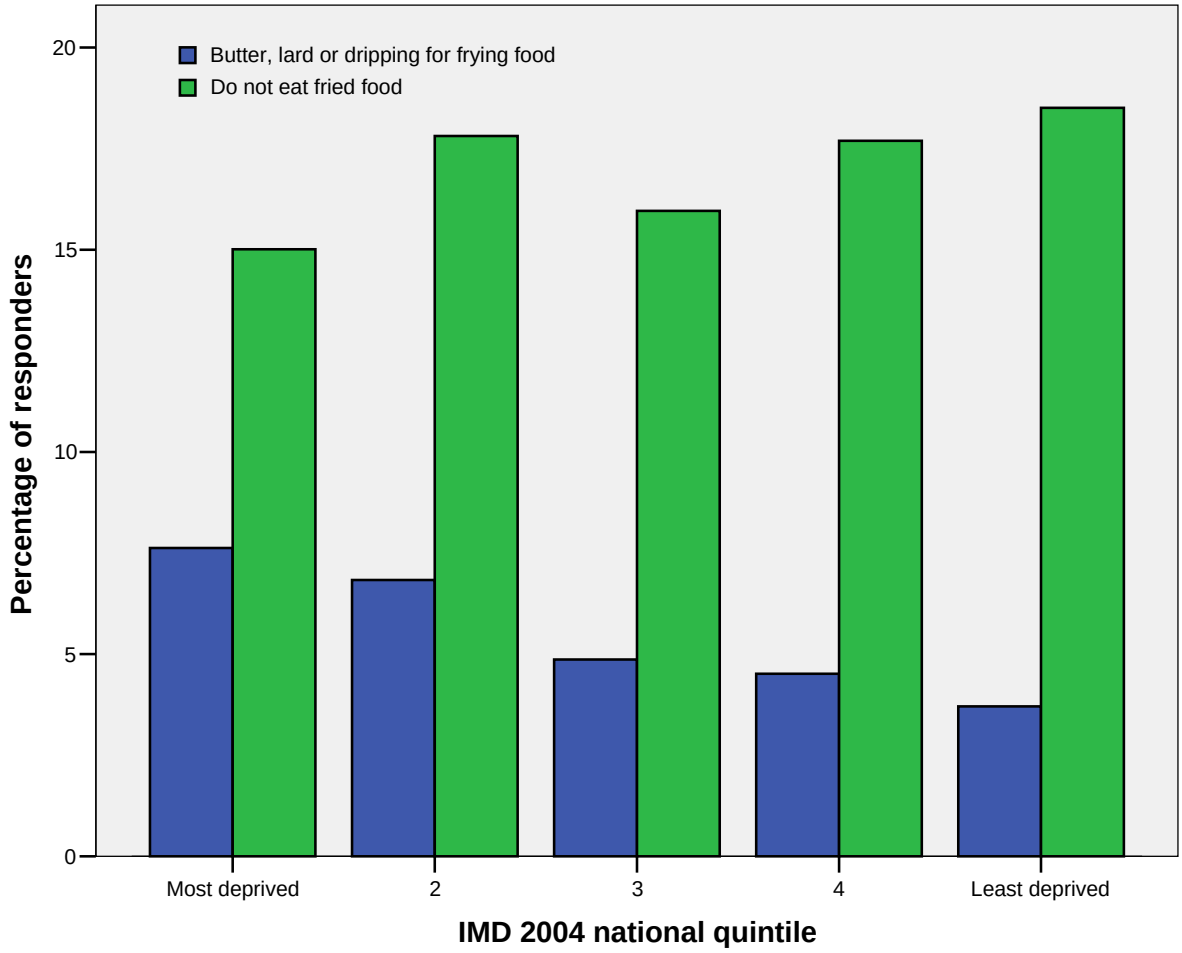
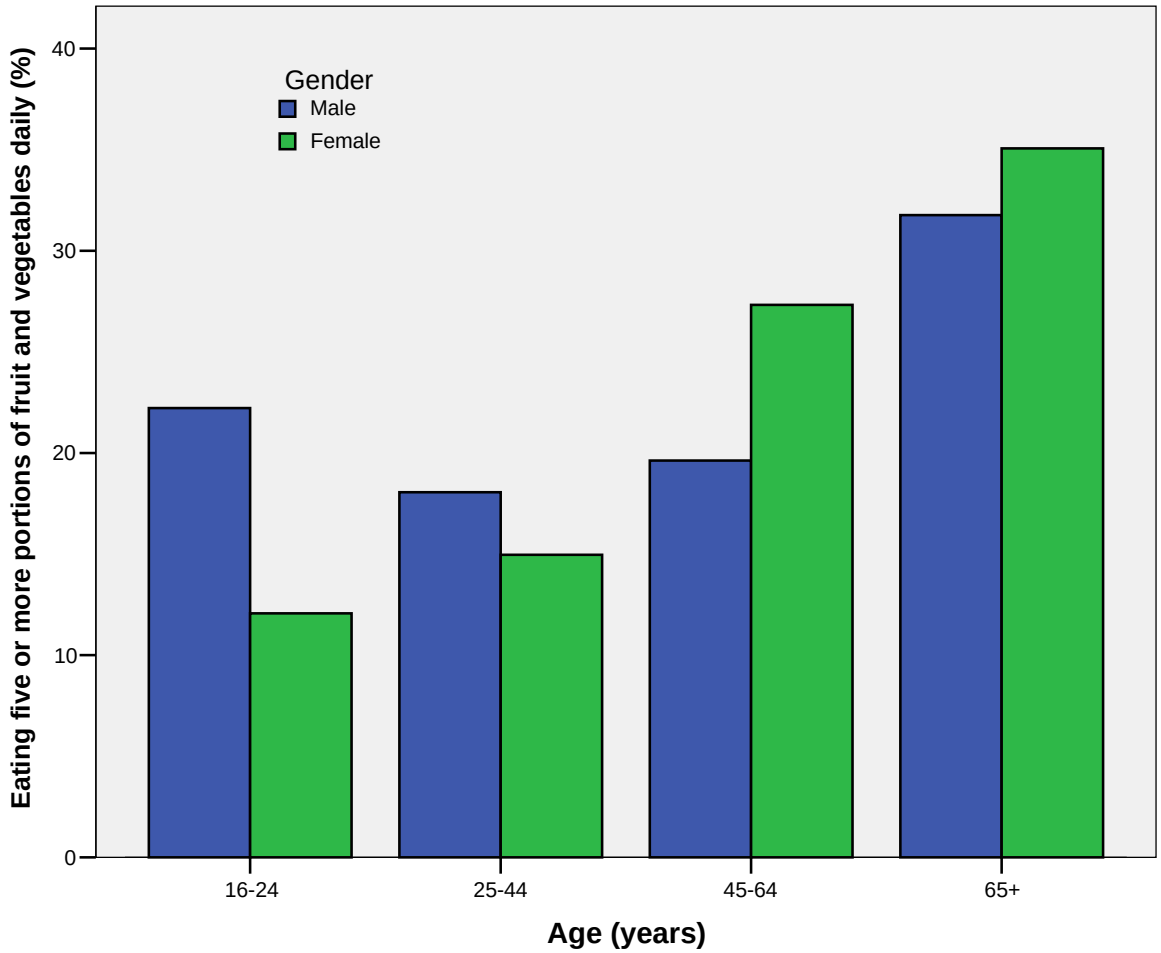


Figure 36 illustrates the relationship between the percentage of people who do not eat at least five portions of fruit and/or vegetables daily and deprivation from the local 5-A-DAY survey. The survey was only conducted in the most deprived wards within Hull and East Riding so is not a representative sample of males and females of different ages within the local area. However, within the most deprived wards, it can be used to give an idea of the variability between men and women and among the different age groups. Different age groups are used in this analysis as data comes from the 5-A-DAY survey rather than the Health and Lifestyle Survey. There was a statistically significant difference in the percentages among the age groups, but not between males and females[29].

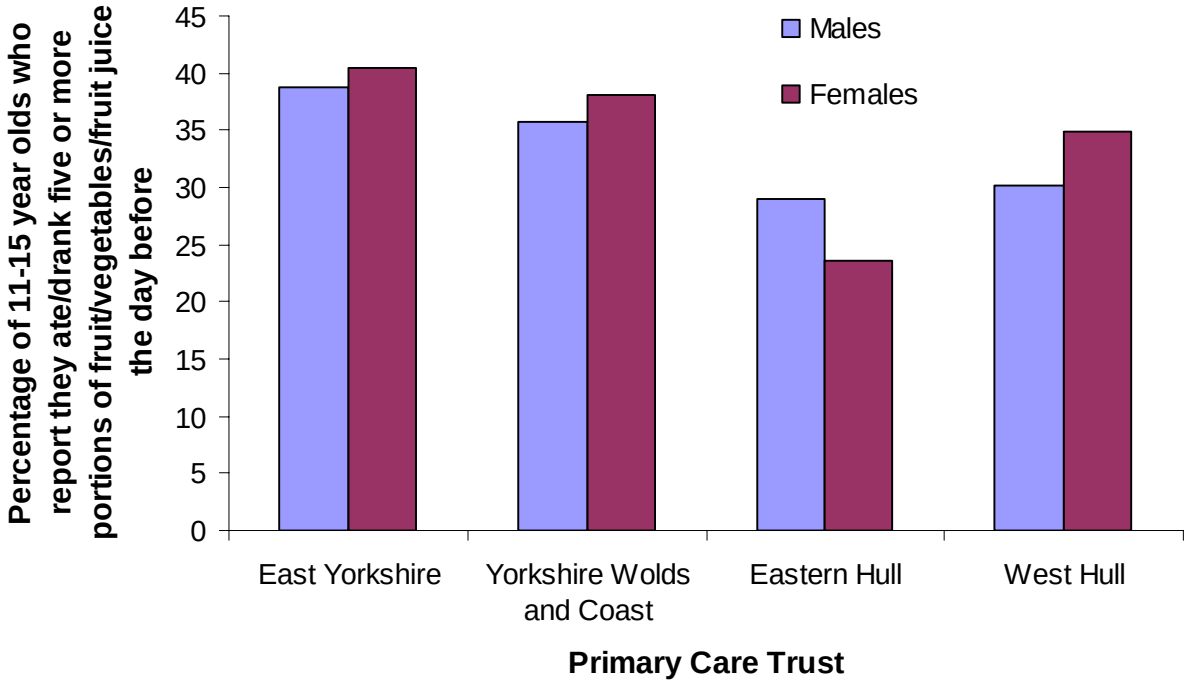
Figure 36: Percentage of men and women living in the most deprived areas who are not eating five or more portions of fruit and/or vegetables daily by age group



[29] Logistic regression: gender (p=0.48), age group (p<0.001). Whilst there appears to be quite a difference between males and females particularly in the youngest age group, the numbers of individuals taking part in the survey is relatively small in this group with only 18 men aged 16-24 and 58 women aged 16-24 years taking part in the study.

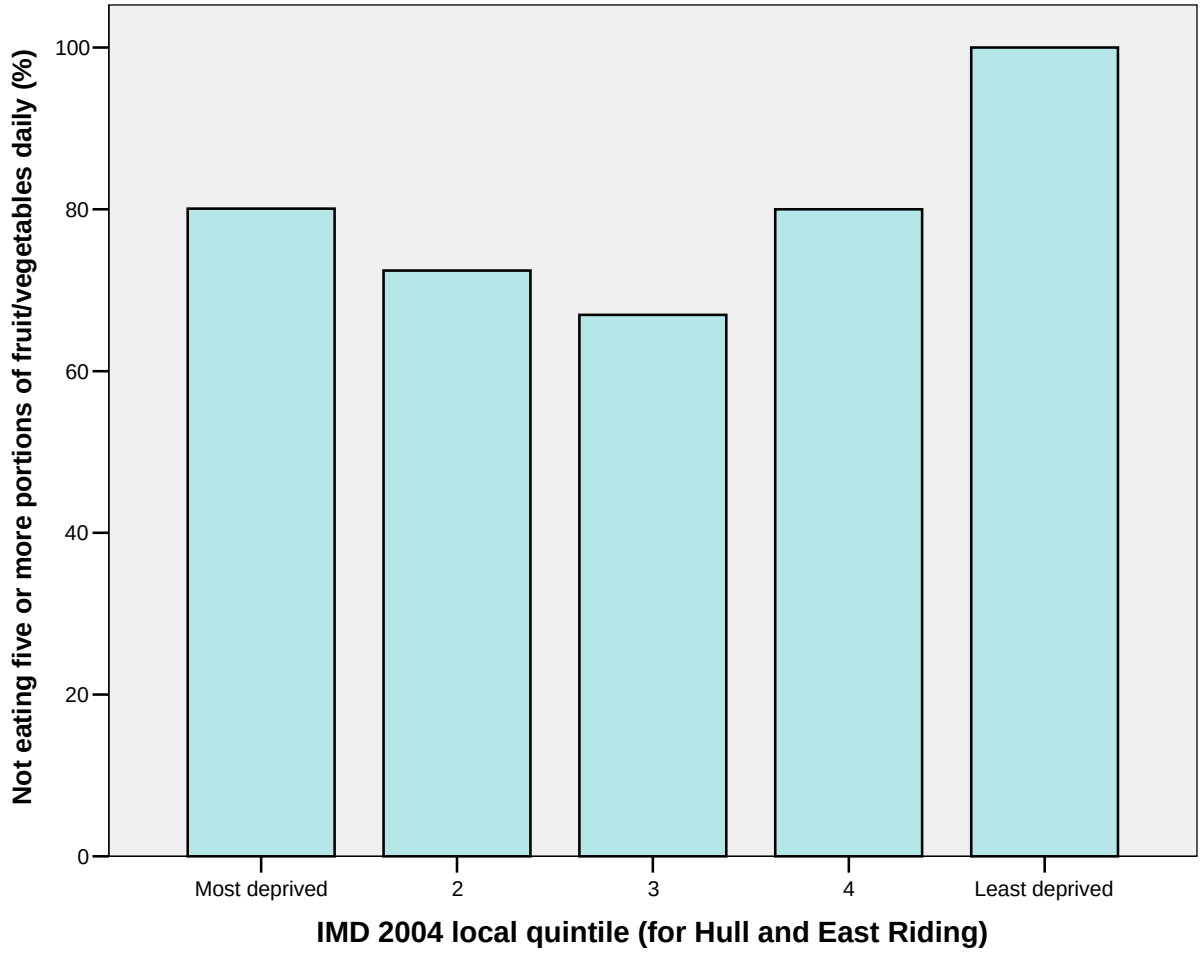
Using information from the Young Persons' Health and Lifestyle survey which is a more representative sample of the young people in East Riding of Yorkshire and Hull (compared to the 5 A DAY survey which was only conducted in deprived geographical areas), it can be seen that between 25% and 40% of males and females, depending on PCT, reported that they ate or drank five or more portions of fruit, vegetables or fruit juice the previous day (***Figure 37***).

Figure 37: Percentage of 11-15 year olds eating five or more portions of fruit and/or vegetables daily



For the 5 A DAY survey participants, the percentage of people who do not eat at least five portions of fruit and/or vegetables daily was also compared among different deprivation groups (***Figure 38***). However, since only the most deprived wards were sampled, it is not sensible to compare the percentages across the IMD 2004 national quintile groups as there are so few individuals in the least deprived groups, and local quintiles were used. There were three individuals in least deprived quintile and only 20 individuals in second least deprived quintile. Therefore, these two percentages (100% and 80%) must be interpreted with caution as they are based on only a few individuals. Nevertheless, overall the relationship between the percentages and the local deprivation quintiles is statistically significant (χ^2 test for trend, p=0.016) with the percentage of people not eating at least five portions of fruit and/or vegetables ranging from 80% in the most deprived group to 67% in the middle deprivation category (labelled '3').

Figure 38: Percentage of people not eating five or more portions of fruit and/or vegetables daily by local deprivation quintile

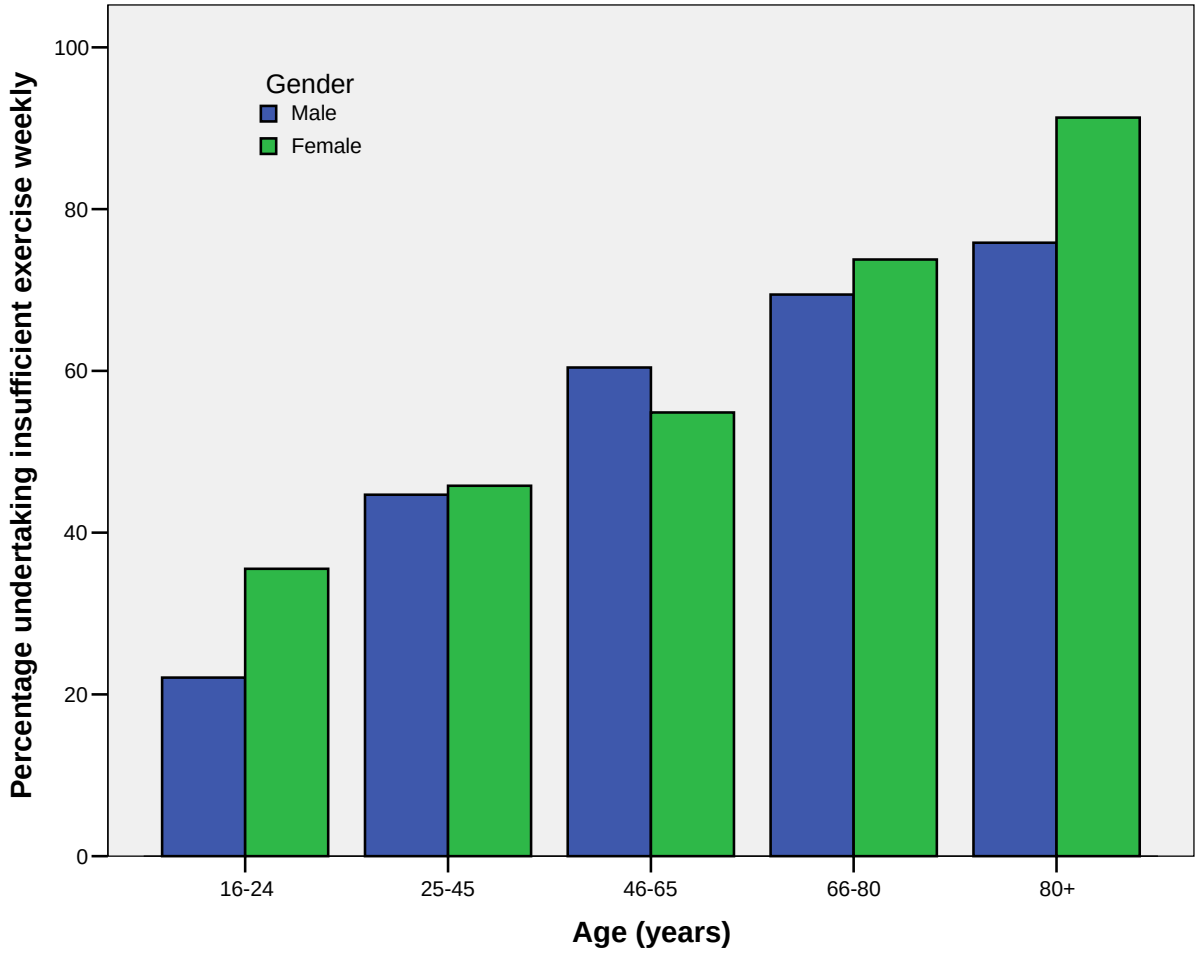


7.2.5 Exercise

Lack of exercise has been shown to be associated with colorectal cancer in some studies, and as mentioned above there may be an association between breast cancer and obesity in older women. Lack of exercise may also increase the risk of other types of cancer.

The percentage of people who do not undertake sufficient exercise weekly (***Figure 39***) was statistically significant among the different age groups but there was no statistically significant difference between men and women[30] (see 'Definitions and Classifications' for information on how sufficient exercise was classified).

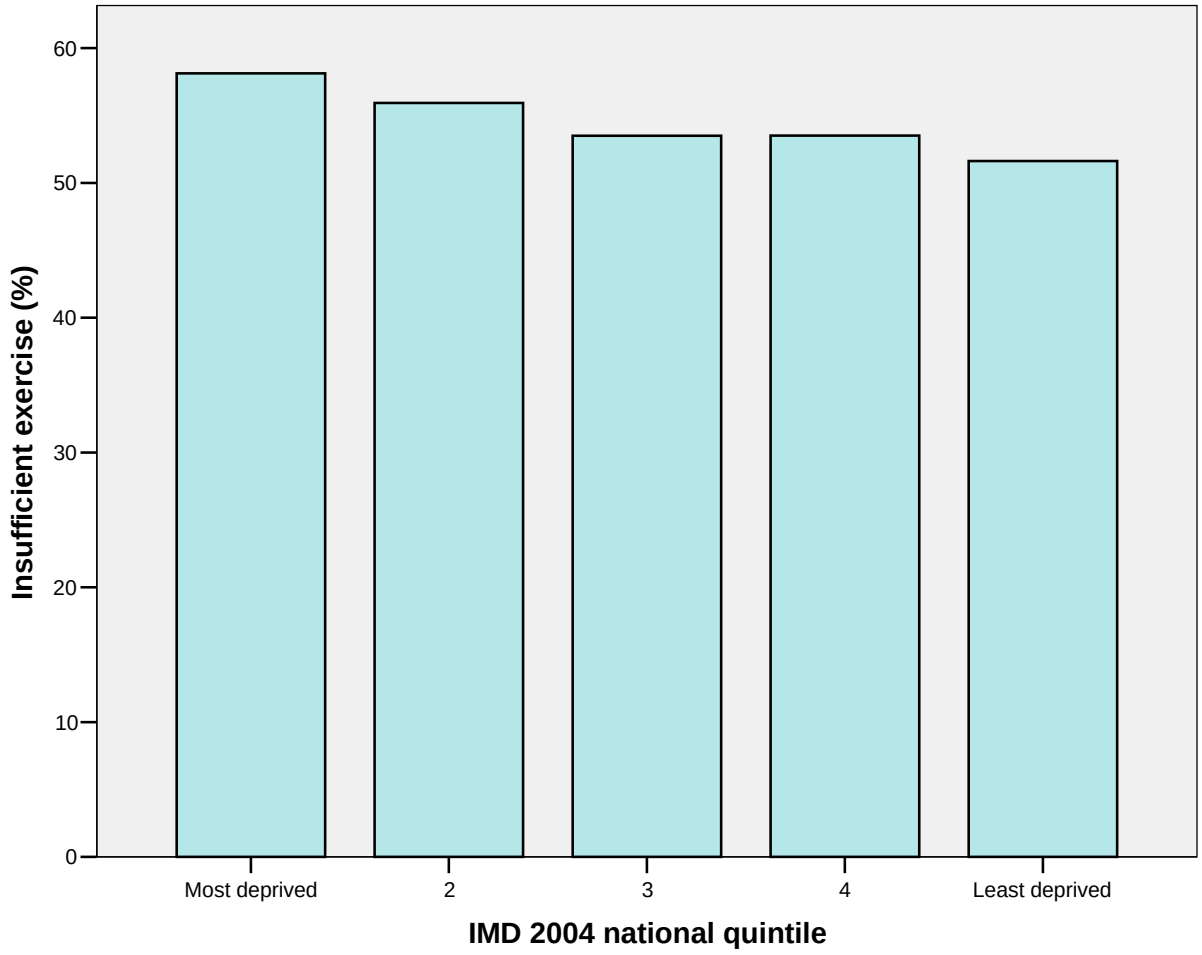
Figure 39: Percentage of men and women who undertake insufficient exercise by age group



[30] Logistic regression: gender (p=0.27), age group (p<0.001).

The percentage undertake insufficient exercise also varied across the deprivation quintiles from 58% for people living in the most deprived areas to 52% for people living in the most affluent areas (***Figure 40***), and the difference in the percentages is statistically significant (χ^2 test for trend, p<0.001).

Figure 40: Percentage of people who undertake insufficient exercise by national deprivation quintile



7.2.6 Other Factors For Which Local Equity Data is Lacking

Sexual Health

The human papilloma virus is the main causal factor in the majority of cervical cancer cases, although not all infections will result in cancer and in most cases the virus will die off naturally. The virus is passed on during sexual intercourse, and therefore there is an increased risk of cervical cancer for women who have more sexual partners and do not

used condoms. In addition, one study reports that there is also an increased risk for women who have sexual intercourse at a young age, perhaps due to damage caused to the cervix at a time when it is still developing.

Exposure to Ultraviolet light

Exposure to ultraviolet light is the major contributing cause of skin cancer and malignant melanomas.

Other Risk Factors

Other risk factors such as the use of the oral contraceptive pill and hormone replacement therapy may increase the risk of specific cancers. However, it is generally accepted that the benefits out-weight the relatively small increase in absolute risk.

8 Screening Programmes

It has been shown that properly-run screening programmes for specific cancers such as breast or cervical can reduce mortality. Therefore, it is important to have high rates of attendance for such programmes. However, if the average rate of attendance within a group or geographical area is higher than a specific target, it is still possible that some specific groups within this group or area fall below the target and inequity is present.

8.1 Cervical Screening

From the Compendium, the estimated percentage (95% CI) of women aged 25 to 64 years attending cervical screening within the last five years as at 31st March 2004 is given in ***Table 41*** for East Riding of Yorkshire and Kingston-upon-Hull. The participation rates are slightly better for locally than the national rate, with East Riding of Yorkshire having a slightly higher rate than Hull.

Table 41: Percentage of women participating in cervical screening within last five years as at 31st March 2004

Area	Cervical screening (attendance within last five years as at 31st March 2004)	
	Number eligible	Percentage participating (95% CI)
England	12,804,440	80.6 (80.6 to 80.7)
East Yorkshire PCT	37,715	83.6 (83.2 to 84.0)
Yorkshire Wolds and Coast PCT	36,649	85.6 (85.3 to 86.0)
Eastern Hull PCT	28,886	83.6 (83.2 to 84.0)
West Hull PCT	37,037	81.3 (80.9 to 81.7)

More recent information is available at GP practice level for the year ending 31st March 2005, but data collection is not complete. Patients who reside outside the East Riding of Yorkshire and Hull but are registered with GPs within the local area are not included in the information below. For the majority of GP practices, especially those in Hull and those not close to the East Riding of Yorkshire boundary; the figures presented below will be close to the final figures. For the small number of GP practices which include patients who reside outside East Riding of Yorkshire or Hull, there may be changes to their screening rates once these patients are included in the analysis. Nevertheless, the figures below will give an indication of the variability in the screening rates over the GP practices within Hull and East Riding of Yorkshire.

Women were eligible for cervical screening if they were between the ages of 20 and 64 years prior to 1st January 2005. The age of the eligible women has been changed to 25 to 64 as at 1st January 2005. However, some women who are aged 20-25 are still within the screening programme. For example, if they had a smear when they were 20 years of age, then they would be called for screening three years later, or if they had their 20th birthday early in the year 2005 then they might be already on the system as letters were sent out in advance.

Figures 41, 42, 43 and 44 illustrate the percentage of women screened aged 25-64 years in the last five years as at 31st March 2005 in East Yorkshire PCT, Yorkshire Wolds and Coast PCT, Eastern Hull PCT and West Hull PCT respectively. Four-fifths of GP practices within East Riding of Yorkshire and Hull have cervical screening rates above 80%. All 23 GP practices within East Yorkshire PCT and 14 out of 15 GP practices within Yorkshire Wolds and Coast PCT have rates that are in excess of 80%. The percentage of GP practices with cervical screening rates lower than 80% is slightly higher in Eastern Hull PCT (5 out of 28 practices; 18%) and in West Hull PCT (12 out of 27 practices; 44%). The two practices with the lowest cervical screening rates in West Hull PCT (34% and 55%) have a large percentage of students in their practice, and it is likely that these patients are swamping the services and as a result there is less focus on the eligible women within the practice in terms of cervical screening.

Figure 41: Cervical screening rates for women aged 25-64 years in East Yorkshire

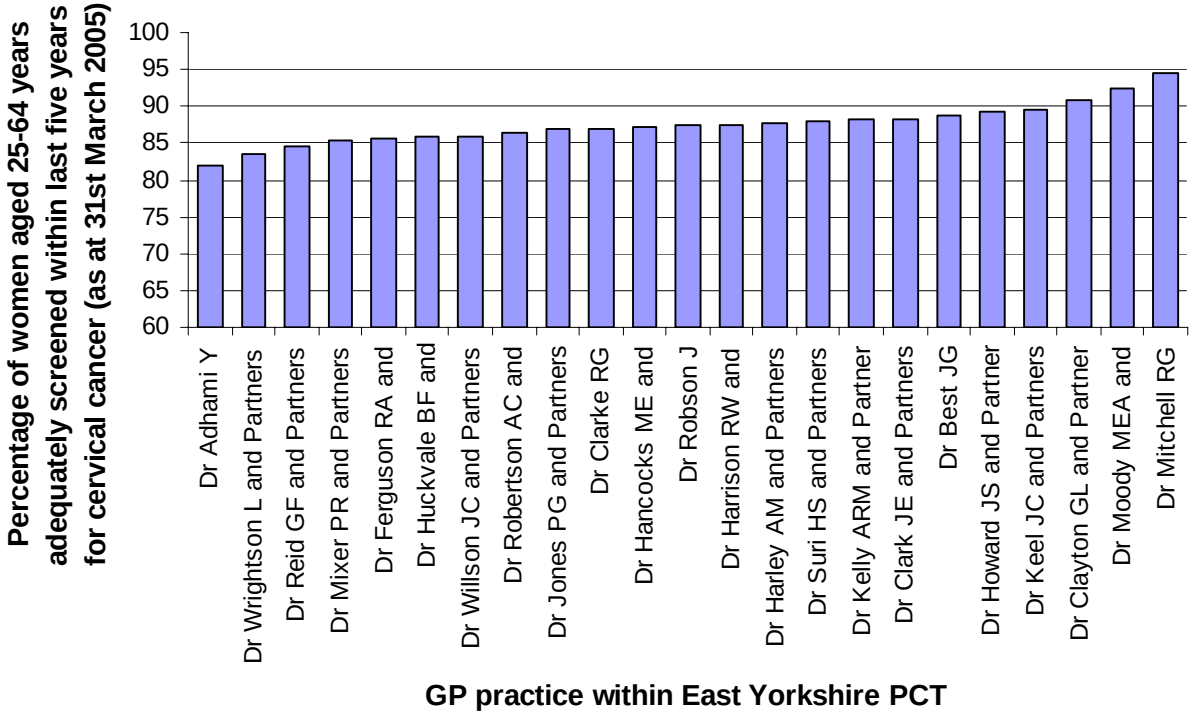


Figure 42: Cervical screening rates for women aged 25-64 years in Yorkshire Wolds and Coast

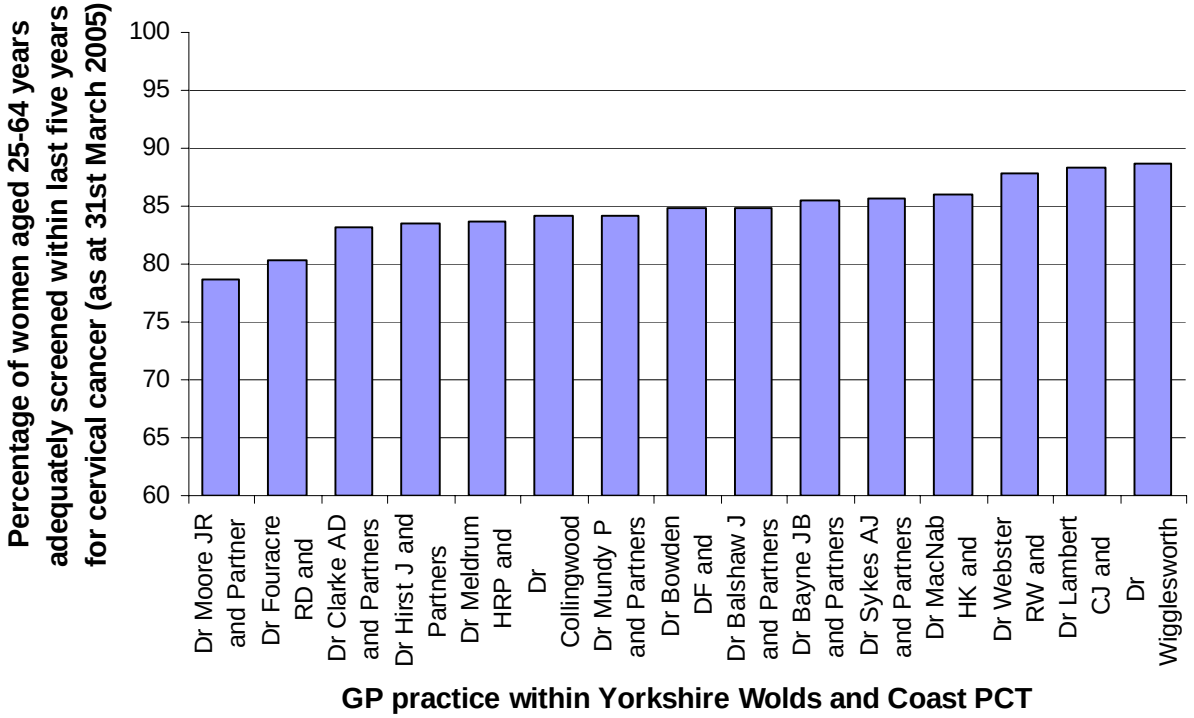


Figure 43: Cervical screening rates for women aged 25-64 years in Eastern Hull

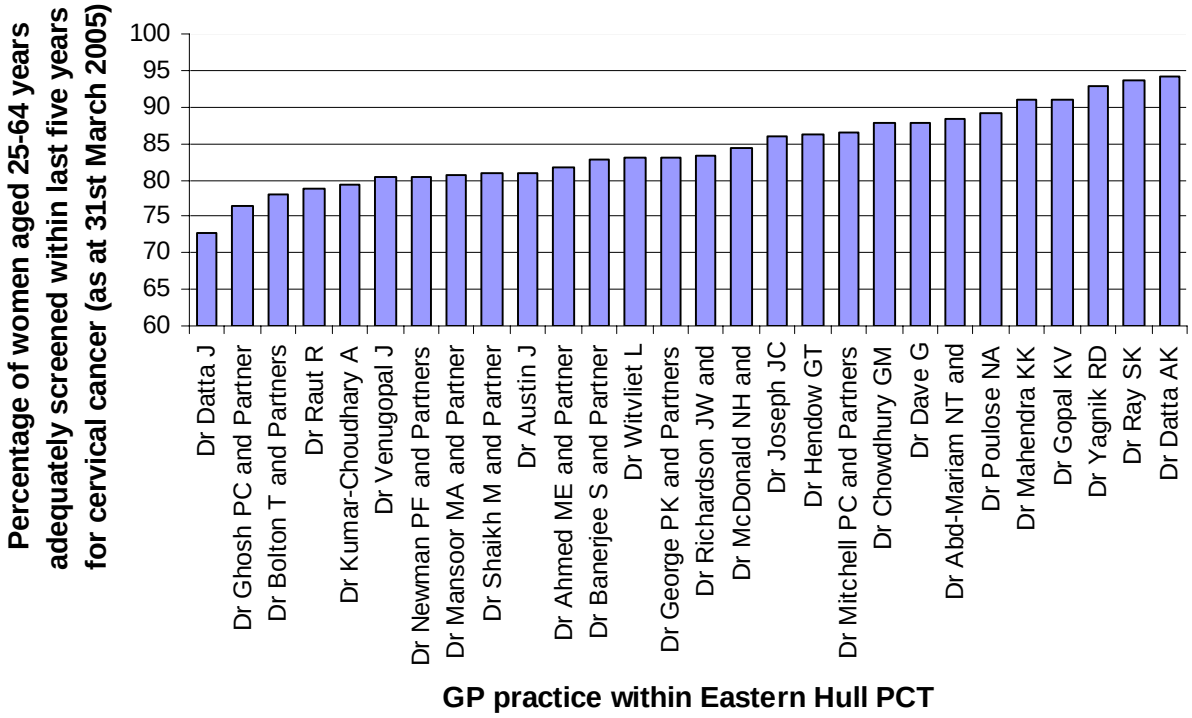
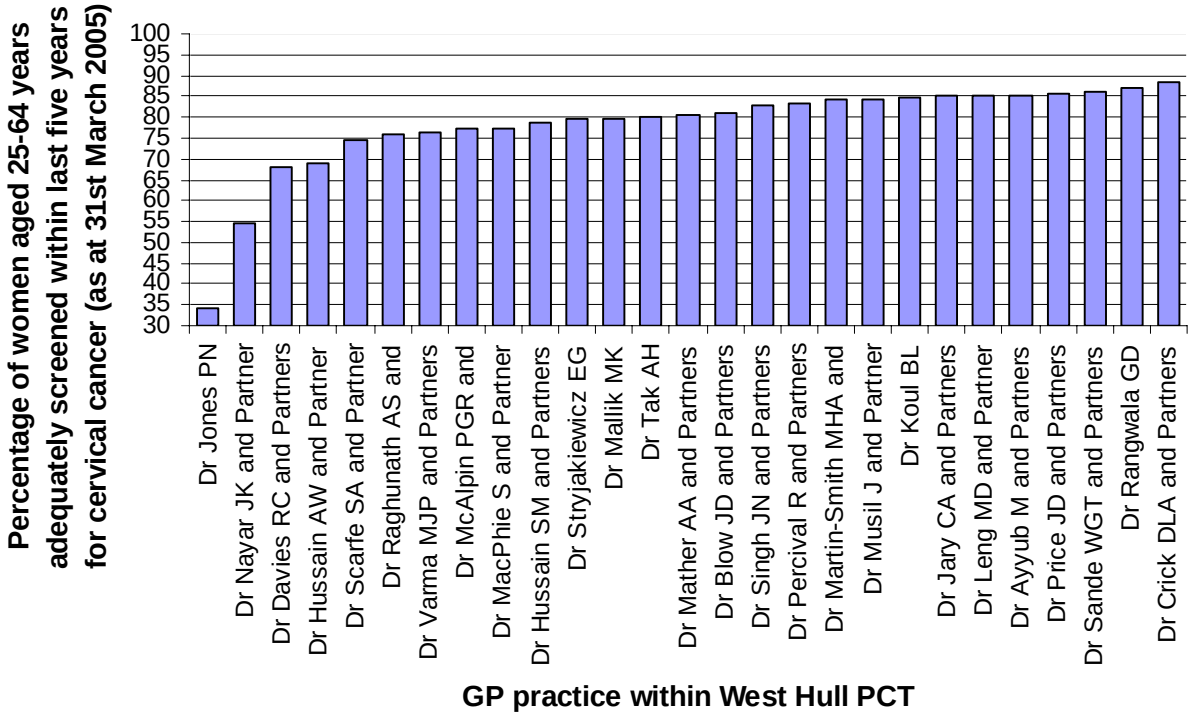


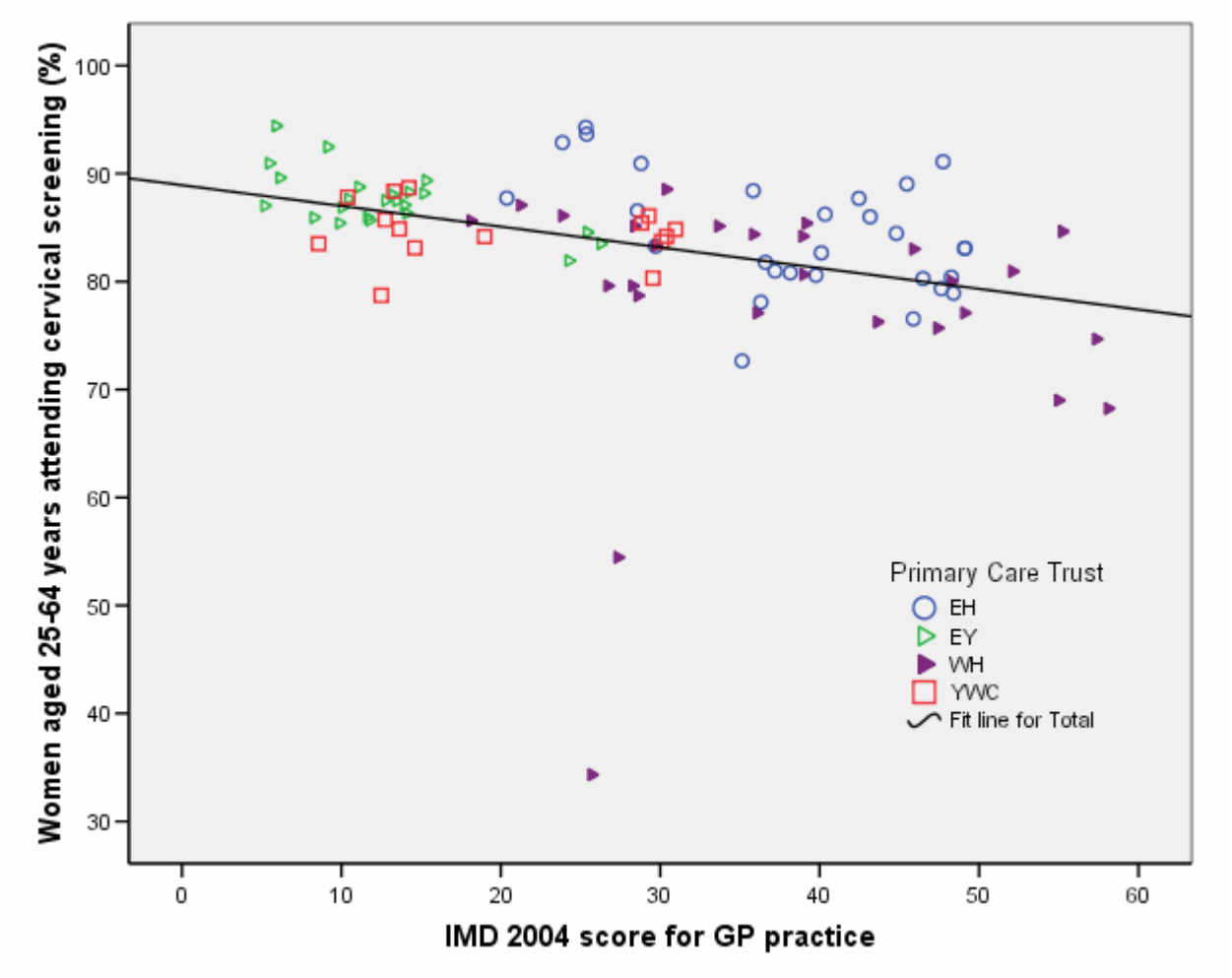
Figure 44: Cervical screening rates for women aged 25-64 years in West Hull



8.1.1 Relationship Between Cervical Cancer Screening and Deprivation

Figure 45 shows the relationship between attendance at cervical screening sessions and deprivation. It can be seen that as deprivation increases, less women attend for screening. The figure shows two outliers, both from West Hull PCT with low rates. It has been identified that these are both student practices. The majority of students will not be eligible for screening, which begins at 25. Therefore, it appears that there may be a problem in recruiting women for screening from the population sector who are not students.

Figure 45: Relationship between cervical screening and deprivation



8.2 Breast Screening

From the Compendium, the estimated percentage (95% CI) of women aged 53 to 64 years attending breast screening within the last three years as at 31st March 2004 is given in ***Table 42*** for East Riding of Yorkshire and Kingston-upon-Hull. The rate for the Hull PCTs are slightly lower than those observed nationally. East Yorkshire PCT has a better attendance rate compared to England. Yorkshire Wolds and Coast PCT has a much lower rate. The rate for the year ending 31st March 2003 was 71.6% so it has fallen considerably within one year. It is possible that this could reflect data accuracy and data collection issues, rather than such substantially differences in rates. Often breast screening is undertaken locally with health 'buses' attending different locations throughout the year. It is possible due to the travel rotas of the health 'buses', the clinics have not visited all areas within Yorkshire Wolds and Coast or only recently and the data has not been forwarded in time to update the list of attendees. This speculation regarding the quality of the data in relation to data collection is speculation. It is not known if this is the reason or not why the rates in Yorkshire Wolds and Coast are so low and have fallen considerably in a single year. Clearly this needs further investigation to assess whether this is the explanation or not, and to assess whether this means that women are being missed within this PCT or whether they are simply attending a few weeks beyond the time limit for collating and sending the data for inclusion in the Compendium.

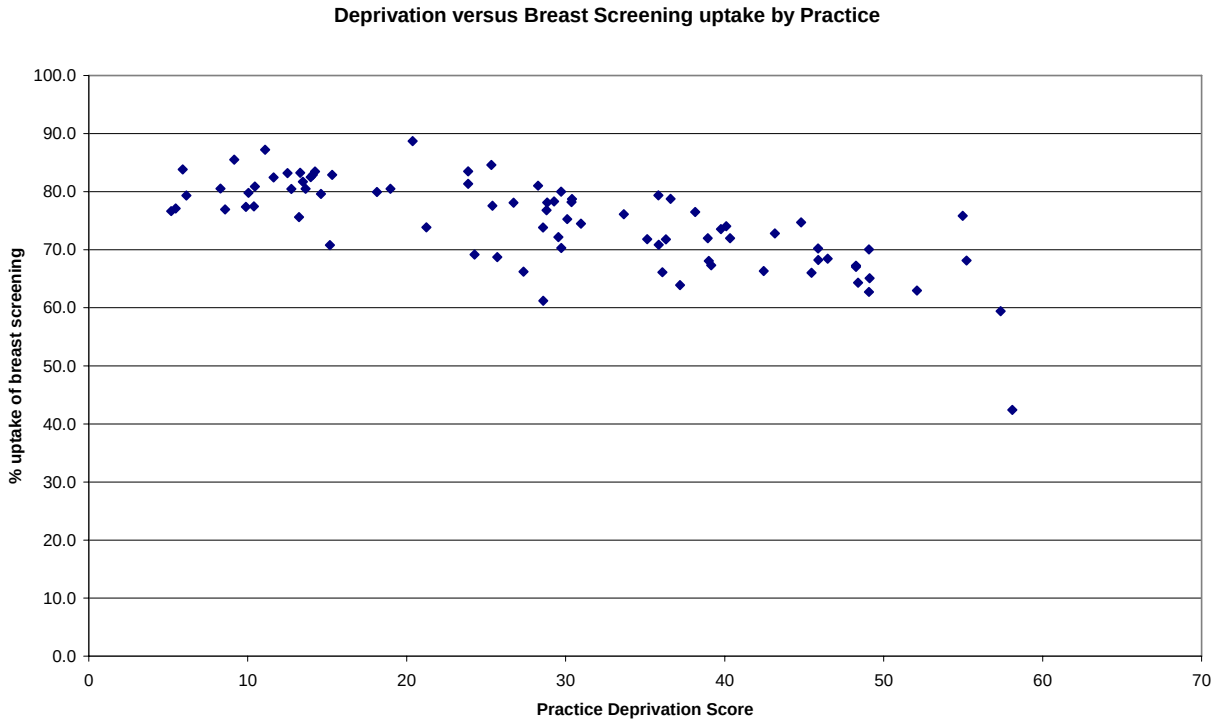
Table 42: Percentage of women participating in breast screening within last three years as at 31st March 2004

Area	**Breast screening (attendance within last three years as at 31st March 2004)**	
	Number eligible	**Percentage participating (95% CI)**
England	3,537,760	75.0 (74.9 to 75.0)
East Yorkshire PCT	11,928	83.7 (83.0 to 84.3)
Yorkshire Wolds and Coast PCT	13,705	57.4 (56.6 to 58.3)
Eastern Hull PCT	7,551	72.0 (70.9 to 73.0)
West Hull PCT	9,646	73.8 (72.9 to 74.7)

8.2.1 Relationship Between Cervical Cancer Screening and Deprivation

Figure 46 shows the breast screening uptake by practice deprivation score from the 2003 to 2005 activity. It may be seen that there is a clear linear relationship between living in a deprived area and failure to attend a screening clinic ($p<0.0001$).

Figure 46: Deprivation and breast screening uptake by practice (2003 -2005)



Further analysis showed that there was no statistically significant relationship between being recalled for further investigation and practice deprivation score.

9 Potential for Reducing Inequalities in Cancer

One of the aims of the NHS Cancer Plan was published in September 2000 (Dept of Health (2000)) was "to tackle the inequalities in health that mean unskilled workers and twice as likely to die from cancer as professionals"[31]. The Cancer Plan (see ***Appendix 2***) provided initiatives and proposed plans of action in order to achieve its aims of reducing cancer inequalities, saving lives, improving patient care and investing in cancer research.

Some of these initiatives will be discussed further as there are being implemented locally. In addition, this section of the report provides findings of an audit of further selected studies of interventions concerned with reducing cancer.

9.1 Reducing Risk Factors

9.1.1 Smoking

Details of Smoking Cessation programmes

There are sound evidence-based guidelines demonstrating the cost effectiveness of local smoking cessation programmes (Raw et al 1998). The national evaluation of these programme shows that smoking cessation services are reaching smokers who are most socially deprived; although quit rates are higher from smokers who are from non-manual occupations, compared to those from manual occupations. However, it has been estimated that since a higher proportion of smokers from manual occupational groups are accessing the service, the programme can contribute to reducing social differential in smoking prevalence (Bauld et al 2004).

It has previously been noted (***Figures 25-27***) that there is a strong association between the prevalence of smoking and age, gender and deprivation. In addition, Hull has one of the highest adult smoking prevalence rates in England with the rates in East Riding close to the national average, and there is a high percentage of school children who are regular smokers particularly for girls.

The Hull and East Riding Specialist Smoking Cessation Service was established in November 1999. The service focuses particularly on disadvantaged adults and pregnant women. A range of activities has been developed including group sessions, one-to-one appointments, telephone support, Nicotine Replacement Therapy (NRT) voucher scheme, interpretation and drop-in sessions. The type of delivery settings has been extended through training of nursing and other health professionals to provide smoking cessation support in primary care, hospitals, pharmacies, prisons and

[31] The other three aims were: to save more lives; to ensure people with cancer get the right professional support and care as well as the best treatments; and to build for the future through investment in the cancer workforce through strong research and through preparation for the genetics revolution, so that the NHS never falls behind on cancer care again.

workplaces. In addition, the ”Chuck-it” programme has been developed to provide stop smoking support to young people in conjunction with a network of trained young people’s support workers and a dedicated email address.

The impact of the service is monitored in terms of the number of smokers accessing the service who achieved non-smoking status at the four-week follow up. In 2004/2005, 5,174 smokers accessed the Service and 3,564 (69%) quit smoking at 4 weeks. In 2004/2005 the Hull and East Riding Smoking Cessation Service had the highest quit rate in the Yorkshire and Humber region. Individual client records are retained within the service and attempts made to contact all successful quitters one year after their quit date. During 2004/2005, attempts were made to contact 1,100 successful quitters by telephone; 679 clients were contacted of whom 338 (49%) were still not smoking. This confirms the contribution to long term health improvement in the population. ***Table 43*** gives a breakdown of service achievements by locality or area in 2004/2005.

Table 43: Number of people accessing Smoking Cessation Service during 2004/2005 and percentage who had stopped smoking at four weeks

Locality or area	Accessing the service and setting a quit date	Quitting at four weeks	
		N	%
North Carr	634	433	68
East	406	292	72
Park	399	288	72
Northern	245	159	65
Wyke	357	235	66
West	632	427	68
Riverside	427	284	67
Hull	**3,100**	**2,118**	**68**
Beverley	365	262	72
Goole & Howden	315	201	64
Haltemprice	335	237	71
East Yorkshire	**1,015**	**700**	**69**
Bridlington	520	379	73
Driffield	183	116	63
Leven & Beeford	52	36	69
Pocklington	85	55	65
Market Weighton & Holme on Spalding Moor	50	31	62
Hedon	78	60	76
Withernsea	48	76	35
Hornsea	43	33	76
Yorkshire Wolds & Coast	**1,059**	**746**	**70**
Total	**5,174**	**3,564**	**69**

The quit rate was highest in the older age groups reaching a quit rate of 72% for those aged 45-59 years (***Table 44***).

Table 44: Number and percentage of people who had stopped smoking at four weeks by age, 2004/2005

Age (years)	People who quit at four weeks	
	Numbers	Percentage
Under 18	41	59
18-34	821	61
35-44	757	67
45-59	1,120	72
60+	825	60
All ages	**3,564**	**68**

During 2004/2005, 31% of clients who attended the support programmes were in the 45-59 age cohort and this cohort achieved the highest quit rate of 72%. Many smokers in this age bracket had been referred to the Service via their GP or practice nurse and are highly motivated to quit as a result of deteriorating health caused by their smoking habit. Evidence shows that stopping smoking, even when well into middle age, helps to avoid most of the risk of developing cancer.

Under 18's achieved the lowest quit rate of 59% which reflects the fluctuating motivation of smokers in this age group and the influence of peer pressure. During 2004/2005, a total of 28 Young Peoples Support Workers were trained to actively support young people who wished to quit smoking as part of the 'Chuck-it' programme. In addition, 49 activities/events were attended and contact made with 5,316 young people to promote the Service and the benefits of not smoking.

The number and location of clinic venues has increased to include a variety of community venues to promote ease of access by smokers. During 2004/2005, 87 clinic sessions were available every week in 38 different community venues, in addition to smoking cessation provision in pharmacies, workplaces, prisons, hospital wards and primary care settings. ***Table 45*** summarises the community clinic provision.

Table 45: Location of Smoking Cessation Clinics

Area	Smoking Cessation Clinic location (number of clinics held at each venue per week)
Hull	
North Carr	• The Bespoke Centre (3) • Bransholme South Health Centre (6) • Highlands Health Centre (1) • Sutton Manor Surgery (1) • Sutton Methodist Church (1)
East	• Bilton Grange Clinic (2) • Ings Library (1)
Park	• Morrill Street Health Centre (12) • Child Dynamic Preston Road (1) • Surestart Marfleet (2)
Riverside	• Edinburgh Street Community Centre (1) • Marmaduke Street Health Centre (2) • Portland Hotel (3) • Quality Royal Hotel (1) • Victoria House Park Street (7) • Walton Street Community Centre (1)
West	• Warners Fitness Centre Pickering Road (1) • Gipsyville Multi Purpose Centre (2)
Wyke	• The Education Centre (1)
Northern	• 147 Ellerburn Avenue (2) • North Hull Community Centre (1)
East Yorkshire	• Anlaby Clinic (3) • Toll Gavel Methodist Church, Beverley (1) • Beverley Health Centre (2) • Beverley Leisure Centre (1) • Cottingham Clinic (4) • Goole & District Hospital (4) • Hessle Library (1) • Hessle Health Centre (1) • Marshes, Snaith (1)
Yorkshire Wolds & Coast	• Alfred Bean (3) • Bridlington Hospital (8) • Foundry, Driffield (1) • Hornsea Cottage Hospital (1) • Market Weighton Community Centre (1) • Pocklington Health Centre (1) • Rosedale Community Unit (1) • Withernsea Hospital (1)

Local monitoring data shows that the service is providing higher levels of access to lower social groups. Over half (57%) of clients accessing the service were entitled to free prescriptions, based on low income. In addition, 55% of clients accessing the service were from the most deprived wards in the Hull and East Riding area.

A comprehensive client record form and an associated database have been developed to ensure robust data collection and service monitoring. This enables specific data analysis to be undertaken including referral source for individual clients (***Table 46***). No referrals or very few referrals were received from dentists, voluntary agencies, occupational health professionals, leisure centres, physiotherapists, Sure Start, pharmacists or health visitors. Work is currently underway to increase referrals from primary and secondary care staff as it has been established that smokers referred from health care professionals are more likely to quit smoking. Local market research undertaken with the general public in 2004 and 2005 has shown an increased awareness of the service from 9% in 2004 to 22% in 2005.

Table 46: Source of referral routes in 2004/2005 for Smoking Cessation Service

Referral sources	Percentage of referrals
GP and practice nurse	40
Friend and family	19
Poster/card/leaflet	8
Drop in	5
Previous attendance	9
Newspaper	2
Television	7
National Quitline	4
Hospital	2
Midwife	2
Other	3
Total	**100**

9.1.2 School-based Approaches to Promoting Healthy Eating in Children

School-based approaches to promoting healthy eating provide an important opportunity for addressing inequalities and risks of cancer presentations in the future. A review of the evidence supported the use of multi-faceted school-based interventions to reduce obesity and overweight in school children, particularly in girls (Health Development Agency 2003). These interventions included: nutrition education, physical activity promotion, reduction in sedentary behaviour, behavioural therapy, teacher training, curricular material and modification of schools meals and tuck shops.

A range of national initiatives have provided a focus for local development of such multi-faceted school-based interventions. The Food in schools Programme is a joint venture between the Department of Health and Department for Education and skills to help

make healthier food choices an integral part of the school day. Breakfast clubs and fruit schemes are designed to provide free or subsidised healthy food.

Furthermore school meals can make a vital contribution to the dietary intake of school children in England. Every day, over 3 million school meals are served. In secondary schools, about 14% of pupils are entitled to free school meals; about 11% actually take up their entitlement.

Concern about the quality of children's diets and the contribution of school meals led to the reintroduction of National Nutritional Standards in April 2001. However a recent survey of a national sample of secondary schools in England has shown that these standards have not succeeded in changing the eating pattern of children (Nelson and et al, 2004). Overall the findings showed that the majority of children are not making healthy food choices. Moreover practices in the dining room that were intended to promote healthy eating had little positive influence on pupil choices. The report recommended that the most likely way to ensure healthy eating in schools is to constrain choice to healthy options, manipulate recipes, use modern presentation techniques with which pupils can identify (for example, the 'fast food' approach, vending machines with healthier options), and provide encouragement through rewards.

In Hull, the City Council pursues a policy of free school meals and the offer of healthy options. 'Investing in our Future: a whole school evaluation of free school meals, health and attainment of primary age children in Kingston-upon-Hull' is a three year research project which seeks to evaluate the impact of the healthy school meals programme. The programme was developed by Hull City council in partnership with the local Primary Care Trusts and is the first in the country to provide universal free healthy school meals to primary school children through school lunches, breakfast clubs and after school clubs. Nationally, children between the ages of 4 and 6 years are entitled to a free piece of fruit or vegetable every day under the Department of Health's National School Fruit and Vegetable Scheme. Hull City Council has extended this provision so that all primary school children are entitled to receive a free piece of fruit or vegetable. The strategic aims of the scheme are to raise educational achievement and to contribute to the reduction of health inequalities across the local authority area. The evaluation project intends to determine the extent to which these aims have been achieved and to investigate the relationship between school meal provision and health, education and social capital.

The Positive Health in Schools Award provides an important framework for the development and delivery of effective interventions for promoting healthy eating by accessing the approximately 50,000 children attending schools in Hull. The following local target has been set for schools participating in the award at level 3, in line with the national target.

By March 2006, all 72 schools and units in Hull with 20% or more of pupils eligible for free schools meals will achieve level 3 (plus the 18 other schools already participating in the award).

Currently 53 schools (with 20% or more pupils eligible for free school meals) and 22 other schools, are working towards or holding the award at level 3, covering a population of approximately 30,640 children. These schools have been involved in a range of schemes for promoting healthy eating such as healthy tuck shops.

However the impact of this initiative may be somewhat limited in improving the eating patterns of children, unless combined with school meals in reaching high numbers of children and providing healthy food.

9.1.3 5-A-DAY Scheme Pilot in Hull and East Riding

Studies have shown that inequities exist with respect to food and diet and nutrition. For example several studies have shown that those least able to purchase a healthy diet due to financial constraints are the most likely to be disadvantaged with regard to access to healthy food (Sooman 1993). Poorer families have been disadvantaged by changes in food retailing (DH 1996). The costs of cooking and of stocking essential items for food preparation represent an additional expenditure. This means that more deprived groups have been encouraged to use convenience items or foods such as sandwiches that require no cooking.

The national 5-A-DAY programme aims to promote the health benefits of eating five or more portions of fruit and vegetables each day. Potentially the scheme allows for the type of equity issues highlighted above to be addressed by targeting activity within deprived areas. The local 5-A-DAY initiative in Hull and East Riding was funded for 2.5 years by the Big Lottery Fund. The aims included:

- launch the local 5 A DAY initiative across the region
- develop and implement a food mapping exercise using participatory appraisal methods to engage and involve the community
- work in partnership with local communities
- work with schools and link in with the National Healthy Schools Standard, to promote positive messages about fruit and vegetables and increase the knowledge of children and young people
- develop links with partnerships such as Sure Start and Healthy Living Centres
- work with a range of local media to promote positive messages and ensure a high profile for work.
- provide 5-A-DAY training for training providers.
- explore the use of allotments, community gardens and school garden schemes to increase knowledge about growing and producing fruit and vegetables.

The first phase of implementation of the scheme was based on a targeted approach. Deprived areas were identified using the Index of Multiple Deprivation. Ten electoral wards in Hull and four in the East Riding were selected. This geographical targeting of areas, despite providing a practical and efficient approach to deploying resources, has certain limitations with respect to ‘equity of access’. Such targeting may, however, reach only some of people living in deprived circumstances, as people equally deprived

but living within more affluent areas, may be not be covered by the scheme. Furthermore the East Riding wards, although relatively deprived in the East Riding, were less deprived than a number of wards in Hull that were not selected. The East Riding wards were included in the scheme to promote partnership between the key agencies involved in implementation.

However the approach also had a number of important advantages that promote equity of access. Food mapping used the participatory appraisal approach that engaged people rather than targeting deprived areas. Community networks and organisations were involved in order to reach people living in deprived circumstances and to promote the 5-A-DAY messages and identify their views on local barriers to fruit and vegetable consumption and how they might be overcome.

The projects' monitoring reports (June 2003 to May 2004; June 2004 to May 2005; June 2005 to November 2005) documented the number of 'beneficiaries' involved in the project activities; for example: numbers of community-based workers who received 5-A-DAY training and resources, numbers (from community based organisations) involved in the participatory mapping exercise, and numbers (children and teachers) involved in initiatives with the National Healthy Schools Standard.

9.1.4 Sunburn

Whilst mortality from skin cancer and malignant melanoma is relatively low, the incidence is high compared to many other types of cancer.

Information on the dangers associated with the sun and hot weather and the preventative measures that should be taken were made widely available throughout East Riding of Yorkshire during the summers of 2004 and 2005. The 2005 campaign was launched in May at Burlington Primary School in Bridlington. Various press releases and news articles were placed in the local press, and the Director of Public Health for East Riding of Yorkshire was interviewed on local television and radio stations to increase local awareness.

Health professionals (health promotion, public health, pharmacy) and local authority staff attended various local events to promote the campaign. These included Hornsea carnival, Driffield show, the Humber Youth Games, Summer scorchas and a playday event at Longcroft Lower School in Beverley. These events were well attended with hundreds of contacts made.

Materials were also distributed at seaside resorts promenade walks. During August in Bridlington, community nurses made 1,135 contacts alone to discuss the issues with the public. Information was made available at all East Riding of Yorkshire pharmacies, at GP surgeries, through local authority premises, via deck chair attendants/lifeguards and at the Surestarts in Bridlington and Withernsea.

9.1.5 Sexual Health

Shepherd et al (Shepherd et al. 2000) conducted a review into health education interventions in relation to sexual lifestyle and cervical cancer. Ten studies were included in his review, and whilst all the studies had the primary aim of preventing HIV and other STDs, the results would apply to reducing cervical cancer through the reducing the infection of the human papillomavirus. Eight of these were randomised controlled trials and two were non-randomised trials. Factual information regarding the transmission and prevention of STDs as a feature in all ten studies. This was generally complemented by the teaching of safer sex negotiation skills (eight studies) including practising correct condom use, communications skills and refusing sex without a condom. The interventions used in the studies varied dramatically from a one-off session lasting just over an hour to a three-year peer-led community intervention. The majority of the interventions tested, provided factual information in conjunction with other activities such as skill development, motivation building and attitude change. A total of 5,089 women were targeted mainly from low socio-economic groups and mainly African-American women ranging from 11 to 54 years of age. All ten studies showed a favourable intervention effect upon sexual risk reduction outcomes. Condom use increased from between 25% to 56% depending on the study. The one study that measured clinical outcomes found that the incidence of HIV differed significantly between the intervention and control groups (0.05 and 0.16 per person-year of follow-up) and syphilis (0.08 and 0.22 per person-year of follow-up). The interventions that were multi-faceted in content were generally more effective compared to the control group. In addition, several health promotion studies have found that information provision, although a useful first step, alone is insufficient to encourage health behaviour change. It is likely that some of the interventions would also improve sexual health locally.

9.2 Increasing Participation in Screening

A review paper (Segnan, 1997) examined factors which influence cancer screening participation in particular those associated with socio-economic class. It concludes that "socio-economic differences in screening practices tend to decrease when participation is promoted, cultural and economic barriers are removed, and social support is offered". However, details of how increased participation was achieved are not given, therefore the paper only points the way towards future work

9.2.1 Cervical Screening

Local information is more readily available for cervical screening, but it could probably be improved, which would result in more knowledge about which women are not attending etc and then it would be possible to devise systematic methods to ensure they are more likely to attend in the future.

9.2.2 Breast Screening

Analysis presented in Figure 46 shows a clear linear relationship between living in a deprived area and not attending for breast screening. It was difficult to obtain this data and it is not readily available in a format which is accessible and amenable to analysis for routine PCT monitoring of screening. In order to provide the analysis in this equity audit it was necessary to enter the data manually from paper records in order to provide the analysis.

Additionally, it is necessary to accommodate women who are unable to have mammography in the mobile unit due to physical disability and not being able to get into the bus, or being obese and not being able to use the mammography machine. In addition, different cultural or ethnic attitudes to screening should be considered by PCTs and with the dearth of routine useful data, this is not possible.

Importantly, PCTs should be able to put in place initiatives to improve breast screening uptake in the more deprived groups, should they decide it is appropriate, which would necessitate better data. It appears that the breast screening unit are limited by the nationally provided data systems which they must use

10 Summary of Findings

This cancer health equity audit aims to inform the planning and delivery of services for reducing inequalities related to cancer in Hull and the East Riding of Yorkshire.

The heath equity audit assesses local equity, assesses evidence to prioritise effective actions, implements change and reviews progress, and involves an iterative approach cycling through each stage until change has occurred which had reduced or eliminated equities found.

For the purposes of this audit, health equity is defined as equity in health (the absence of systematic disparities in health) and equity of access or opportunity to services for equal need. The audit examines these factors for different groups of individuals defined on the basis of their gender, age, ethnicity, disabilities and deprivation.

10.1 Cancer Incidence and Mortality

The age-standardised incidence rates per 100,000 persons aged under 75 years in Hull and East Riding for 2001-2003 are 429 for men and 416 for women.

Over the five financial years 2000/01 to 2004/05, there were an average of just over 10,000 inpatient admissions for cancer (some of which may relate to multiple visits from the same person).

The age-standardised mortality rates standardised to the Hull and East Riding of Yorkshire population were 168 (95% CI 153 to 184) for men and 137 (95% CI 123 to 152) for women per 100,000 persons under the age of 75 years. Of all the cancer deaths in men (all ages), lung cancer accounted for the highest percentage of deaths (24% in East Riding of Yorkshire and 33% in Hull) followed by prostate cancer (13% in East Riding of Yorkshire and 9% in Hull) and colorectal cancer (11% for both). For women, lung cancer and breast cancer accounted for the most deaths in Hull (26% and 13% respectively) and East Riding of Yorkshire (17% and 18% respectively). Mortality from cancer in the under 75s differed considerably depending on where the person lived.

10.2 Potential Inequities

Whilst the intention was to examine health equity for many different groups of individuals, the data is often not available. For example, there is no readily-available accurate information on ethnicity for incidence or mortality. Therefore, it was only possible to examine a small number of groups of individuals where inequity may exist based on gender, age and deprivation.

The incidence between males and females and between different age groups differs which will reflect the different types of cancers as well as differences in the underlying determinants of cancer.

Up until the age of 60 men had a lower inpatient admission rate for cancer compared to women and within the 30-49 year age group approximately half as many men were admitted to hospital for cancer over the five year period compared to women. In the older age groups, there was an increasing trend with more men being admitted as inpatients with cancer than women. The number of men aged 60-64 admitted as an inpatient for cancer was 9% higher than females, and this gradually increased as age increased with twice as many men aged 85+ years being admitted compared to women. These differences could reflect the different types of cancer, the age these cancers generally occur, types of treatment available as well as other factors influencing admission such as the presence of co-morbidities.

Cancer mortality rates differ considerably between men and women and across different age groups. However, again this could be because of a number of factors such as type of cancer, age at diagnosis, the prevalence of risk factors and co-morbidities, survival rates, types of treatments. It does not necessarily mean that inequity is present.

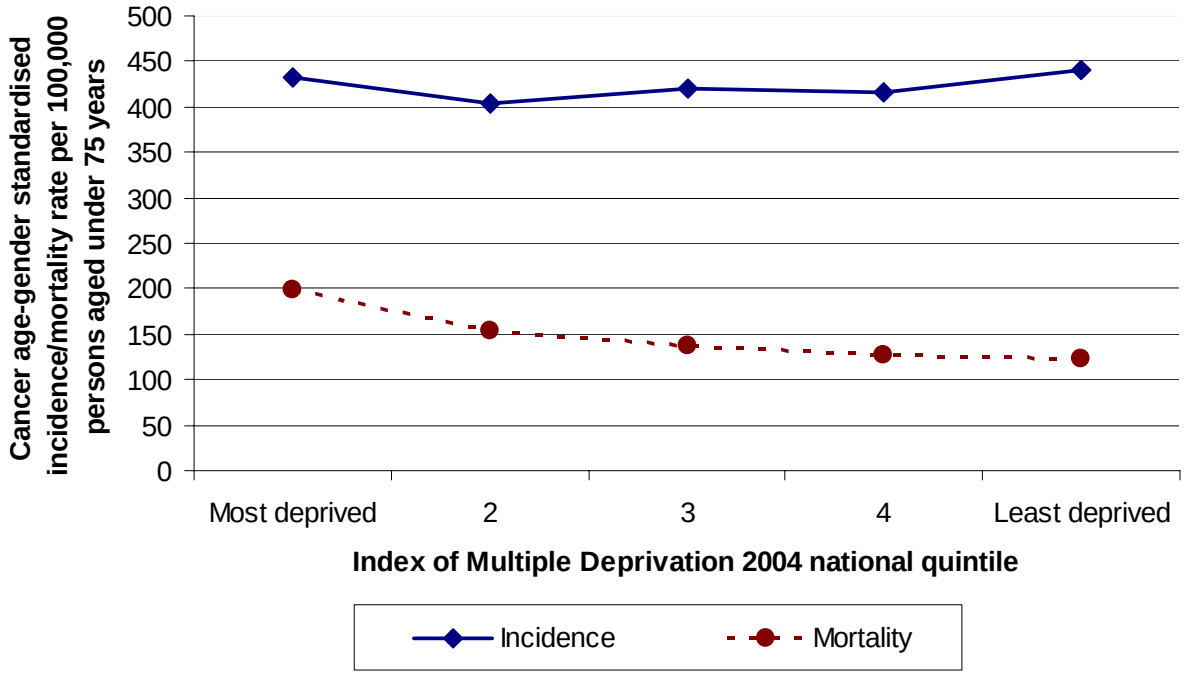
Due to the strong association between smoking and deprivation, and between smoking and the risk of lung cancer, there is a strong association between deprivation and lung cancer incidence. The relative risk of developing other types of cancer for different types of risk factors is smaller, so even if there is an association between deprivation and the prevalence of the risk factor, the resulting association between deprivation and incidence will be weaker. For colorectal cancer and breast cancer in women there is not a strong association between incidence and deprivation. For skin cancer and prostate cancer in men, there is a higher incidence in the least deprived groups. For all cancers combined, those in the most deprived national quintile have a higher inpatient admission rate compared to those in the least deprived national quintile.

It is not possible to undertake useful analysis of cancer mortality rates with respect to inequity for many types of cancer as the number of deaths is too small. For those cancers where it is possible, there is strong evidence of an association between deprivation and mortality for all cancers, lung cancer, all cancers excluding lung cancer and colorectal cancer. There is no evidence locally of an association between deprivation and breast cancer mortality.

For specific types of cancer, one would expect that the incidence would be related to mortality through survival, and if no inequalities were present one would expect that the relationship would be relatively constant over the different deprivation quintiles. The relationship is relatively constant for lung cancer as the mortality rate is high regardless of deprivation group. However, for other types of cancer there appears to be inequity present as there is a higher mortality rate relative to the incidence rate for the most deprived quintiles compared to the least deprived quintiles. This is the case for all cancers combined, colorectal cancer, breast cancer and prostate cancer. Again, it is not possible to examine incidence relative to mortality for many cancer types due to the small number of deaths. It is not know why there is a difference in the incidence to mortality ratio across the deprivation quintiles, and whether this reflects excess mortality in the most deprived group relative to incidence or under-diagnosis in the most deprived

groups (***Figure 47***). It is likely that there are many complex reasons for this difference, and the reasons may include differences in risk factors, stage at diagnosis, co-morbidity, treatment options, type of cancer, survival or other factors.

Figure 47: Incidence and mortality rates per 100,000 by deprivation quintile (age adjusted)



10.3 Risk Factors for Cancer

There are many risk factors for different types of cancer; some better documented than others. There is a clear link between smoking and the risk of lung cancer, the human papilloma virus and the risk of cervical cancer, and between exposure to ultraviolet light and the risk of skin cancer. The prevalence of risk factors in different groups where inequity may exist is unknown for many risk factors. Local surveys have collected information on smoking, obesity, exercise, alcohol consumption and fruit/vegetable consumption. In most cases, the prevalence of these risk factors differs among the genders and over different age groups, and differs by deprivation with higher prevalence of these risk factors in the most deprived groups, with the exception of alcohol consumption.

10.4 Screening Programmes

Information is available at GP practice level for cervical screening and this requires careful monitoring at an individual GP practice level in order to identify non-attendees, with the aim of increasing screening rates across all eligible groups of women.

With respect to breast screening, it has been difficult to obtain data in an appropriate format for analysis and to identify whether or not there are appropriate systems in place to allow assertive follow-up of women who do not attend.

10.5 Potential for Reducing Health Inequalities

The Hull and East Riding Smoking Cessation Service was established in November 1999, and has the highest quit rates at four weeks for 2004/2005 in the Yorkshire and Humber region, with 5,174 people accessing the service and 69% quitting at four weeks.

A range of national initiatives have provided a focus for local development of such multi-faceted school-based interventions to promote healthy eating.

The national 5-A-DAY programme aims to promote the health benefits of eating five or more portions of fruit and vegetables each day. The aims are to launch a local 5 A DAY initiative across the region, work in partnership with local communities, implement a food mapping exercise, promote positive messages about fruit and vegetables in schools and in general through the media, and explore the use of allotments and community gardens.

Whilst mortality from skin cancer and malignant melanoma is relatively low, the incidence is high compared to many other types of cancer.

Information on the dangers associated with the sun and hot weather and the preventative measures that should be taken were made widely available throughout East Riding of Yorkshire during the summers of 2004 and 2005. Awareness was raised through the local press and radio, promotion at local carnivals and shows, and information through pharmacies, GP surgeries, Sure Start and at other local authority premises.

11 Conclusions and Recommendations

11.1 The Cancer Equity Group, following lengthy discussions and consideration of the draft audit, determined that there should be a continued focus on reducing cancer inequity. This report forms a body of work which draws together the expertise and knowledge of a specialised and diverse range of partners through different organisations within Hull and East Yorkshire. The equity audit process is nominated by the Department of Health as a principle component of inequalities work throughout England and Wales.

Recommendation: - In order to ensure that cancer equity remains firmly within the PCTs agenda, there should be a Cancer Equity Implementation group, with appropriate membership, tasked to champion the recommendations of this report, together with new developments and findings.

11.2 There is a lack of timely information, particularly on incidence and prevalence of cancer and on screening uptake rates. Incidence information from NYCRIS tends to be relatively old (with information available on their website for the latest year 2002 and information available on request for the latest year 2003), and prevalence information from QOF is incomplete and not age adjusted (but will probably be more complete for the second year of data collection). Other data such as breast screening uptake are recorded on systems from which it is difficult to obtain information. This report has highlighted the need for robust and 'fit for purpose' information systems at a national, regional and local level. Assessing inequities is not possible for specific groups such as for different ethnic groups, those living in temporary accommodation or those with physical disabilities or mental illness due to the fact that these domains are not recorded in datasets. Information is therefore not available on the incidence, inpatient admission or mortality rates for any of these groups. The underlying cause of the data difficulties are due to the fact that systems are old and are not designed to produce up to date reports.

Recommendation: - This requires being addressed by investing in systems, and/or consideration of the need for funding of appropriate manual data re-entry of certain screening data. This would then facilitate a more proactive and systematic way of follow up of those groups who are less likely to attend which are those who are most deprived. It is acknowledged that major pieces of work are being undertaken with respect to information systems, but it is vital that Public Health is encouraged to participate in this agenda. Otherwise we at risk of having too much information and not enough knowledge, in effect being data rich and information poor.

11.3 The equity audit shows that there are different rates of unhealthy lifestyle choices which are systematically linked to deprivation.

Recommendation: - Within the overall agenda of health expectations, risk beliefs and health behaviour, it is important that we understand the ways in which we can influence such factors, through evidence based health promotion / public health

programs. Where understanding is sparse or incomplete, we should ensure that programmes are evaluated in a way which allows measurement of relative efficacy, efficiency and cost-effectiveness. This may require innovative use of outcome measures.

11.4 The equity audit shows that there are great disparities in the incidence/survival ratio within the geographical area and that worse outcomes as expressed by the ratio are associated with increasing deprivation.

Recommendation: - If the aim is to be the reduction in inequity of health, a position consistent with government targets, PCTs should invest in innovative services aimed at the most deprived. These should be designed within a culture of participative clinical leadership, arguably within the development of a care pathway within the current work being undertaken in this respect.

11.5 The number of inpatient admissions involving a primary diagnosis of cancer differs among men and women for different age groups. The oldest men are much more likely to be admitted than the oldest women, but younger women are much more likely to be admitted than younger men. This may simply reflect differences in the site of cancer and available treatments, etc. However, it could reflect inequity in terms of access to services for diagnosis and treatment.

Recommendation: - In order to examine these phenomena more carefully, further research should be undertaken to examine the stage of cancer when patients become confirmed by Secondary Care. This could take the form of a quantitative analysis of cancer staging by deprivation level, adjusted for lifestyle factors such as smoking, etc. A further useful strand would be to obtain qualitative information about the patient's journey up to that stage in order to draw out reasons for variations in presentation, diagnosis and treatment.

11.6 The cancer mortality rate is higher for men then women. The reason for this needs to be examined to assess if there are any interventions that can reduce this inequity. The cancer mortality rate could reflect differences in the types of cancer men and women die from, and the relative survival from different types of cancer. However, it is likely that differences reflect differences in the prevalence of risk factors and differences in the cancer stage at presentation.

Recommendation: - In order to mitigate the inequity to men, there should be interventions which could be targeted at men in particular to reduce the prevalence of risk factors and improve time to diagnosis. These may be within health promotion activities, such as smoking cessation, 5-a-day, etc, but also could be related to medical outcomes, in the form of outreach clinics, etc. Service managers should engage with this aim.

11.7 There is considerable variability in the under 75s cancer SMR among different areas with differing levels of deprivation. As expected, due to the higher prevalence of risk factors and generally less favourable health and life

expectancy, people living in areas which are more deprived have a higher under 75s cancer mortality rate compared to less deprived areas. Therefore, there need to be interventions that target areas which are more deprived to reduce the prevalence of risk factors and improve conditions in general so general health improves. However, as illustrated (in ***Figure 13***), for particular levels of deprivation, there are large differences in the under 75s cancer SMR. For example, for less deprived wards in Yorkshire Wolds and Coast PCT (IMD 2004 score 5-10) the SMRs range from approximately 60 to almost 140. For example, in the most deprived wards in West Hull PCT (IMD 2004 score approximately 70) the SMR ranges from 120 to 150.

Recommendation: - Because an inequity is evident, PCTs should continue to engage in efficient productive health promotion activity, targeted at the most deprived groups. Consideration should be given also to increase spending in the most deprived areas, in order bear down on those people most likely to suffer inequity of health. This should be supported by improvements in service provision, perhaps taking into consideration the need for innovative work, or assertive outreach, in order to engage with those who are difficult to identify, but will be more likely to suffer from Cancer.

11.8 The relationship between the annual incidence rate and the annual mortality rate is not consistent among the different deprivation quintiles. In general, there is a higher mortality rate relative to the incidence rate in the most deprived national quintile compared to the least deprived national quintile. In these cases, where this can be examined for specific cancers where the number of deaths is not too small, it appears that this trend occurs for most of the major cancers with the exception of lung cancer. This exception is likely due to the high mortality rate for lung cancer, which occurs regardless of deprivation. In contrast, other types of cancer with higher rates of survival show a relatively large difference in the incidence to mortality ratio among the deprivation quintiles. This suggests that inequity is present. However, it is difficult to know exactly what causal factors are dominant within this relationship. Possible reasons include differences in risk factors (and degree of risk factor not just presence or absence of risk factor), differences in cancer stage at diagnosis, differences in patient co-morbidity which may affect treatment options and/or survival, etc. Importantly it is not clear if this pattern is reflecting a higher mortality rate in the more deprived groups or a higher incidence in the least deprived groups due to less undiagnosed cancer cases. In order to lower smoking prevalence rates, work should be undertaken to try to reduce the numbers of young people starting to smoke.

Recommendation:- There is a need for further research to examine this phenomena, which has been identified using this novel approach to analysis. This audit recommends that this should be taken up within collaborative research with the Cancer Network, interested clinicians, health promotion professionals and Health Sciences, in order to inform commissioners through the proposed Cancer Equity group.

Recommendation:- This report recommends that PCTs mainstream the ethos of 5-a-day providing sufficient funding to continue such work as is possible within their budgetary constraints. Continuing focus should similarly continue with respect to initiatives aimed at children within schools and their homes in order to foster changes in family health related behaviours.

11.9 The initial 5-A-DAY audit work suggests that: - Achieving the scheme objectives is dependent on the participatory approach to engaging and involving local people in deprived communities, whilst at the same time raising awareness of the 5-A-DAY message, increasing knowledge and improving skills. Recruitment and training of community workers to undertake the mapping exercise has increased the potential for participatory approaches to planning services. An aspiration should be that this scheme should be rolled out to all deprived areas. Continuing robust local evidence is ongoing with activities that address inequities of food and diet experienced by deprived families and communities. Evaluation of the activities is being prepared and evidence from such evaluation should be made available to the wider health community through active dissemination where appropriate. The 5-A-DAY project should link to the Hull and East Riding Integrated Obesity Strategy in order to support its development, evaluation and funding potential.

Recommendation: - The national survey of schools meals in secondary schools, showing children are not choosing healthy school meals despite healthy options being available, suggests that a review of the local school meal policy should be undertaken with respect to its potential to contribute to promoting healthy eating and changing children's eating patterns, particularly with respect to children in poorer social circumstances.

Good partnerships already exist between Health Promotion and Hull school meals services which are already making an impact on school meals. Collaborative links should be encouraged between PCTs and Councils in order to influence healthy eating offerings.

Robust evaluation, which will allow measurements of health and lifestyle outcomes, should be built into new initiatives from the start. Retrospective evaluation should, wherever possible, be rigorous and critical in order to justify current activity and make judgments about future service configuration.

Existing funding and provision should be reviewed within the obesity strategy group and recommendations be made for future inclusion or otherwise within the planning round.

11.10 Analysis of the data suggests that there are specific groups who are more likely to develop skin cancer, and to suffer mortality. Comments from the general public clearly showed the Sun Awareness Campaign is a worthwhile activity that increases peoples' understanding of the risks involved.

Recommendation: - The Sun Awareness Campaign was well received throughout the region and working with our partners in local authority enabled increased coverage. The key messages should be continually delivered in 2006 and beyond to help reduce the levels of skin cancer for our region. In particular, people who work outside should be targeted and those who holiday abroad. In addition initiatives in local coastal resorts would be beneficial locally, but also within a wider area.

This audit does not examine prescribing rates of specific cancer drugs, due to fact that they are often specific for individual types of patient or cancer site and that the drugs may be substitutable. This does not mean that PCTs should not be concerned with inequity due to differential prescribing by socioeconomic group, deprivation, gender or ethnic grouping.

Recommendation: - As new drugs become available PCTs should be aware that certain groups may be more vocal and more demanding of new treatments. PCTs should be prepared to ensure that equity of prescribing is achieved wherever possible.

11.11 Cancer treatment is an area which is likely to be subjected to substantial innovation over the next few years. It has been noted that there are often lags in availability of newer treatments in other clinical specialties and that those who are most deprived, or are from a specific sub-group, may not in some cases receive innovative treatment, despite the fact that there is a general wish for this to not happen.

If such new treatments are cost-effective, PCTs should support their speedy introduction, but should go further by supporting the proposed Cancer Equity Implementation group in their efforts to ensure equitable service provision. Innovative health care, when it is effective and can be funded should, in principle, be available to all.

11.12 This audit has identified inequities in the incidence of certain cancers.

Recommendation: - PCTs should be prepared to fund and to generally support proven and innovative ways of promoting different health behaviours, fostering better understanding of health risks, and energetic outreach amongst the groups where incidence inequity exists. This should be a major task of the proposed Cancer Equity Implementation Task Group. Health Trainers will form part of this focus, but there will be a need to continually assess, modify and improve ways of engaging with specific subgroups, particularly where there are ethnic or cultural obstacles.

The importance of smoking cessation within this agenda should not be understated. Smoking is one of the largest contributing factors to lung cancer, and is a risk factor for other cancers. Smoking is the largest preventable cause of cancer and death and failure to invest enthusiastically in services now would heighten inequity, but

also would be a lost opportunity to bring about cost savings for the NHS in years to come. It is important, when building on the success of the Smoking Cessation Service that rigorous monitoring and evaluation of the service is strengthened. Routine reporting currently includes uptake and cessation rates at ward level at four weeks post quit date in accordance with Department of Health guidelines. Attempts are made to contact all successful quitters after three months and again after one year and this should continue with greater use made of validation by carbon monoxide testing where possible. Local initiatives focusing on the specific needs of individual communities need to continue in order to raise the profile of the service and encourage smokers to access the programme.

In line with national legislation, local initiatives should continue to promote smoke free workplaces and public places, contributing to achieving a smoke-free Humber region, which will have an impact on the local smoking prevalence rates.

11.13 This audit has identified inequities in the mortality rates of cancers, which could (in addition to different bundles of cancer incidence) be due to different levels of access to diagnosis and treatment in specific areas, different expectations amongst groups and many other factors.

Recommendation: - PCTs should actively engage in initiatives to ensure that access to services, diagnosis and treatment are consistent across the area. If this can only be achieved by outreach work, or investment in other services or clinics outside current patterns of primary care or secondary care, PCTs should invest in such initiatives. The proposed Cancer Equity Implementation groups should be concerned with developing such initiatives, providing clinical leadership and obtaining funds.

11.14 The content of this document provides an initial 'snapshot' of Cancer equity within the area at the time of writing. It is intended that the policy initiatives with regard to Cancer equity should be within an iterative process where there is firstly an establishment of the current situation, weighing up whether there are inequities of health or of access (for equal need). This document offers a substantial initial analysis of the current situation, offering suggestions for future exploration of the situation where necessary. The audit next determines areas where it would be appropriate to begin and continue initiatives to narrow the gaps which are identified within the report. The audit is intended to be used within the planning and investment process and indeed, a previous summary has been incorporated within inequalities planning within the PCTs. The audit will also inform the Integrated Obesity Strategy and the development of the Choosing Health Action Plan priorities.

Recommendation: - This report identifies priorities for audit and improvement monitoring and it is suggested that there should be a new Cancer equity audit at an appropriate future time, in order to measure the impact of resultant initiatives aimed to reduce inequity in health.

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Appendix 1: Sources of Data, Definitions and Statistical Methods

Sources of Data

National Data

Where possible, we have used sources of data that are routinely available nationally, either as published material (e.g. the Compendium of Clinical and Health Indicators or the Census) or from websites of Government Offices (e.g. Department of Health). Elsewhere we have used raw data at patient or episode level (e.g. contract minimum datasets, public health mortality files) to construct local indicators of health. Information from the 2001 Census is available from http://neighbourhood.statistics.gov.uk for different geographical areas. Local and national data is available from the Compendium from http://www.nchod.nhs.uk. Projected population estimates are available from the Office of National Statistics from http://www.statistics.gov.uk. Patient level data for out-patient visits and in-patient stays was also available from Hospital Episode Statistics via the AVOCA system (data kindly supplied by Paul Derrick, HERHIS, Health House). Data from the National Cancer Waiting Times System was used for crude incidence estimates, but the System refused to release the detailed information required to analyse equity issues through standardised rates. NYCRIS provided information on the number of new cases for each gender, five-year age group, cancer type and IMD national quintile for 2001-2003 for residents of East Riding of Yorkshire and Hull. It was not possible to obtain geographical data due to confidentiality issues, however, by providing NYCRIS with a file of local postcodes with associated IMD national quintiles allowed them to provide us with information on deprivation.

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, the data for several years are combined to obtain a more reliable picture.

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.

Health Survey for England

National data are available for some health and lifestyle issues from surveys such as the Health Survey for England, but since this covers the whole of England, relatively few people within the local area participate in the survey. However, such data can be used to compare local data with national data.

Local Surveys

Adult Health and Lifestyle Survey

Local Health and Lifestyle surveys conducted by the Public Health Development Team during 2002 and 2003 provide more detail at the local level. The aim of the survey was to provide information which could be used in the planning and evaluation of current and future services within the area, particularly those services aimed at improving public health. The survey also provides information to a much wider range of organisations and individuals who have an interest in the health and health-related lifestyle activities of the population. A random sample of peopled aged between 16 and 84 years who were registered with a General Practitioner (GP) within the PCT were sent a self-completion questionnaire. As this represents a GP practice-based sample, it means that some individuals who live beyond the PCT boundary were included in the sample.

The survey on behalf of East Yorkshire PCT was conducted during 2002 . A self-completed questionnaire was returned by 7,056 residents (out of 11,000) giving a responses rate of 64% which compares favourably to other recent general population surveys. A similar response rate was obtained for Yorkshire Wolds and Coast PCT .A self-completed questionnaire was returned by 2,180 residents during 2003 (out of 3,500) giving a responses rate of 62%.

The survey on behalf of Eastern Hull and West Hull PCTs was conducted during 2003. The questionnaire was returned by 1,716 Eastern Hull PCT and 1,560 West Hull PCT residents (out of 6,500) giving an overall response rate of 50% which compares favourably to other recent general population surveys, especially in urban areas.

Local people participating in the Health and Lifestyle survey were asked questions about specific risk factors, including questions relating to smoking, obesity, exercise and alcohol. Responders were asked if they had smoked within the last seven days and if they smoked daily or occasionally, were an ex-smoker or if they had never smoked. Participants were asked to provide the number of alcoholic drinks of specific types that they had drunk in the last seven days, from which weekly alcohol units were estimated. They were also asked to specify their height and weight from which body mass index (BMI) was calculated. Responders were also asked to specify the frequency of exercise (never, occasionally defined as once or twice, and regularly defined as three times or more) they undertook in the last seven days which lasted at least 20 minutes for each of three levels of exercise: vigorous; moderate; and light. Responders were also asked about their usage of local health services.

Young Persons Health and Lifestyle Survey

The local Health and Lifestyle survey involving secondary school pupils aged 11-15 years of age conducted by the Public Health Development Team were conducted during 2002. A self-completion questionnaire was administered to 11-15 year olds in 21 volunteer secondary schools in Hull and East Riding of Yorkshire. A total of 4,246

completed questionnaires were obtained (approximately 10% of the resident 11-15 year olds) during the first half of 2002.

Responders were asked if they had smoked any cigarettes in the last seven days and their smoking status. They were asked if they had ever drunk alcohol, and if so, how frequently they drank alcohol and the estimated number of alcoholic units they had drunk in the previous seven days. The school children were also asked the number of pieces of fruit and vegetables they had eaten and how many glasses of fruit juice they had drunk the day before they completed the questionnaire.

5-A-DAY Survey

A local postal 5-A-DAY survey was also conducted in April 2004 to assess fruit and vegetable consumption locally. A random sample of 3,500 adults (aged 16 years or above) were selected from residents in 14 target electoral wards which were the most deprived within Hull and East Riding of Yorkshire[32]. Questionnaires were sent to these addresses (with 130 returned by the Post Office as the person no longer resided at that address). Overall, 806 questionnaires were returned, giving a response rate of 24%. Responders were asked to state how many portions of fruit and vegetables are recommended, how many portions they ate and give information on what influenced their choice. The survey had a relatively low response rate and it is likely that those who did complete and return a questionnaire were more interested in their health and health-related behaviours. As such, any estimates of fruit and vegetable consumption may be over-estimated in the survey. This initiative also involved mapping access to fruit and vegetables in Hull and East Riding of Yorkshire.

Social Capital Survey in Hull

In Hull, a survey was undertaken to assess the levels of Social Capital (features of social organisation such as trust, norms and reciprocity that can improve the efficiency of society by coordinating action) and potential associations between this and health.

The survey included questions on health related behaviour and attitudes, and perceptions of health. A total of 4002 people aged 16 years and over were interviewed for the survey (quota sampling was used so that the participants were representative of the overall population of Hull in relation to gender, age, employment status and area of residence).

Further information for the Health and Lifestyle Survey, the 5-A-DAY mapping exercise and the Social Capital Survey completed in Hull are given on the internet[33].

[32] Longhill, Marfleet, Bransholme East, Bransholme West and Southcoates in Eastern Hull; Myton, Newington, Orchard Park and Greenwood, Pickering, St Andrews and University in West Hull; Goole Central and South and Minster (Swinemoor estate in Beverley) in East Yorkshire and Bridlington Old Town and Bridlington South in Yorkshire Wolds and Coast.
[33] http://www.hullpublichealth.org/

Definitions and Classifications Used

Risk Factors in Health and Lifestyle Survey

From the Health and Lifestyle survey, ***Table A1*** gives the definitions and classifications used in defining risk factors.

Table A1: Definitions and Classifications used in the Health and Lifestyle survey

Risk factor	Question	Response/Calculation	Risk factor present
Obesity	Height and weight.	Body mass index (BMI) calculated[34].	BMI > 30
Smoking	Statement best suits you.	'I smoke daily', 'I now smoke but not every day', 'I used to smoke but I do not smoke at all now' or 'I have never smoked'.	Daily or occasional smoker.
Alcohol	Number of alcohol drinks in last seven days for different types of alcoholic drinks.	Number of weekly alcohol units.	Male: >21 units Female: >14 units
Exercise	Frequency of vigorous, moderate (mod.) and light exercise classified as never, occasionally (occ.) or regularly (reg.).	Plenty = mod. exercise reg. or vigorous exercise occ. or reg. Some = mod. exercise occ. or light exercise reg. None/little = never or light exercise occ.	None/little exercise or some exercise[35].
Blood pressure	Ever been told you have high blood pressure (BP)? If yes, still have high blood pressure?	Responses to both questions: yes, no or don't know.	Still has high BP, i.e. 'yes' to both questions[36].

[34] Weight in kilograms divided by the square of height in centimetres.
[35] Not everybody could be classified as they did not answer all questions.
[36] If responders stated 'yes' or 'no' to the 'blood pressure still high' question then they were classified as having high blood pressure or not respectively, even if the response to the 'ever told blood pressure high' question was missing. Those who stated that they had been told they had high blood pressure but did not state whether it was still high (missing response) were classified as having a missing response to this risk factor.

Disease Definitions Using International Classification of Diseases

The International Classification of Disease (ICD) is the method used to diagnose and define disease status. The version currently being used is version 10. ***Table A2*** gives the ICD codes for the different cancers used in this PCT profile document.

Table A2: International Classification of Diseases: classifications used

Disease or medical condition	ICD 10 codes
Breast cancer	C50
Cervical cancer	C53
Colorectal cancer	C17 to C21
Lung cancer	C33 to C34
Skin cancer including malignant melanoma	C43 to C44
All cancers	**C00 to C97**

Statistical Methods and Terms

Standardisation

Ill-health, disease and risk factors within a particular population will depend on the age and gender structure of that population (as well as many other factors such as deprivation). Generally, standardised rates are age-standardised or age-gender-standardised, but rates can also be standardised to other differences within the populations.

In terms of the provision of resources, it is necessary to report the prevalence of ill-health, disease and risk factors in the population without taking into account the age and gender distribution of the population. As it is necessary to treat and have the provision to treat the population as it is, 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.

Direct standardisation involves applying the rates of disease observed in the study group of people to a 'standard' population. Indirect standardisation involves applying the rates of disease in a 'standard' population to the study group of people. The rates of disease are calculated for each gender and age group, for example, males aged 0-9, 10-19, 20-29 years etc and females aged 0-9, 10-19, 20-29 years etc. The standard population can be an English population, a local population for a specific time period or the European Standard population. Direct standardisation results in an age-gender standardised rate of disease, for example, 67 deaths from cancer per 100,000 people per annum. Indirect standardisation results in a standardised mortality (or morbidity)

ratio (SMR). The SMR will take the value of 100 if the sample group has the same mortality (or morbidity) rate as the 'standard' population. For example, an SMR of 125 which implies that the study group has a mortality rate which is 25% higher than the standard population.

Significance Testing

It is often useful to compare a particular summary measure, for instance, mean, median, measure of risk among different groups. Since there is natural variation associated with virtually all measurements and since we 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 difference 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. When undertaking a statistical test, we assume that there is no difference in the summary measure among the groups and then calculate the probability of obtaining the difference we observe in our sample (i.e. in the data we have). If the calculated probability, or so-called p-value, is small then this means that there is a small chance of obtaining such a result under the assumption that there is no difference. Therefore, if the probability is small enough (generally, less than one in twenty or less than 0.05) then we assume that the original assumption must be incorrect and that there really is a difference. Since this is based on probabilities and assumptions, just because a small p-value is observed, it does not necessarily mean that the original assumption of no difference between the groups is untrue. However, clearly the smaller the p-value, the more likely it is that the original assumption is untrue. Similarly, just because you obtain a large p-value and therefore have no evidence to reject the original assumption, it does not mean that it is actually true, it could be that there is simply insufficient evidence to show otherwise (for example, a small number of people or small number of people with a particular event). If a small p-value is obtained ($p<0.05$) then the difference is deemed 'statistically significant'. However, as mentioned above as it is based on probabilities, when there was no underlying difference, one would expect to obtain one 'statistically significant' result when conducted 20 statistical tests simply by chance. In addition, obtaining a 'statistically significant' difference does not necessarily mean that the result is important clinically. It is possible that 50% of those living in one area report poor health compared to another area whose residents report 49%. If the number of people involved in the survey was sufficiently large, it is possible to obtain a statistically significant difference between these areas. However, from a medical point of view it may be considered not very important and the fact that both areas report high levels of poor health may be more important.

Confidence Intervals

Since we only have a sample and have not examined data from the entire population (e.g. all residents in the PCT over all time periods of interest), we only have an estimate of the particular characteristic we wish to measure, for example, percentage of low birth-weight babies born. The 95% confidence interval (CI) gives a range of values for which we are 95% confident that the interval will contain the true, underlying statistic (e.g. percentage or mean or difference between two means) of the entire population. Having

a range of values for which the population statistic lies is much more useful than having a single value. The interval also takes into consideration the number of people for which the estimate is based, so that if there are many people surveyed the interval tends to be narrower (and therefore more useful). The 95% confidence interval for a difference in a percentage or mean between two groups that does not include the value zero (i.e. the percentage or mean is not the same for both groups) will have a p-value less than 0.05[37].

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.

For example, if there are two geographical areas both with populations of 1,200 people and one death in area A giving a mortality rate of 83 per 100,000 persons and two deaths in the area B giving a mortality rate of 167 per 100,000 persons, then the number of deaths and the mortality rate is twice as high in area B compared to area A. However, if the mortality rates only are compared the difference looks dramatic, but it is misleading as the differences in the total number of deaths is very small, only one death. Even if these two areas had exactly the same underlying mortality rate, one would not expect that exactly the same number of deaths to occur every single year in each area; there will be some natural variation over time and between the two areas. So it is reasonable to expect the number of deaths to vary over time in the two areas, and be zero, one or two in the areas for most years.

Therefore, even if a mortality rate appears to be substantially higher in one area compared to another, the number of deaths should be considered. If the numbers of deaths are relatively small, then the results should be interpreted very cautiously.

[37] In rare cases this is not the case depending on the way in which the statistical test is undertaken and the assumptions made, however, if it is not true then the p-value will be close to 0.05.

Appendix 2: The NHS Cancer Plan (2000)

Changes		Initiative and proposed action
Reducing the risk of cancer	Reducing smoking	Build on and new and effective interventions to help people who want to shop smoking.
	A healthier diet	National "five-a-day" programme to support initiatives to improve access to fruit and vegetables.
		National School Fruit Scheme to make a free piece of fruit available each school day to school children aged from four to six years.
	Tackle underlying causes of deprivation	Reduce poverty, unemployment and other broader causes of ill-heatlh.
Detecting cancer earlier	Raising public awareness	The National Cancer Director to work with voluntary organisations to review information available on all common cancers, and see what more can be done to reach those most at risk.
	Extending cancer screening	Extend breast screening programme to all women aged 65-70 years by 2004.
		Cervical screening programme to be upgraded.
		Pilots for colorectal screening were completed by 2002 and were successful. So screening will be introduced for all people aged 50-69 years commencing April 2006.
		Prostate Specific Antigen testing to detect prostate cancer will be made available.
		Trial of ovarian cancer screening is underway and a research study into lung cancer is being considered.
Improving cancer services in the community	Improve role of family doctors and community nurses	Helping people reduce risks of cancer, promoting early detection and fast referral for investigation when necessary.
	Support patients and their families in living with cancer.	New partnership between NHS and Macmillan Cancer Relief to support a lead clinician for cancer within every PCT.
		Increased investment in training and support in palliative care.

NHS Cancer Plan continued

Changes		Initiative and proposed action
Faster access to treatment	New waiting times target for diagnosis and treatment	New targets to reduce waiting times at all stages of the pathway of care.
	Investment in staff and equipment	Tackle gaps in cancer workforce and make better use of skills of existing staff, investment in extra equipment for diagnosis and treatment, and action to redesign and streamline existing services to cut out delays.
		Increase number of cancer specialists.
		Increase number of new Magnetic Resonance Imaging machines and computerised tomography (CT) scanners for diagnosis. Increase number of new linear accelerators for radiotherapy treatment.
	Redesigning services	
Ending postcode lottery	Cancer drugs	Health authorities across the country will be able to take full account of the National Institute for Clinical Excellence (NICE) guidelines due to be published on 13 new cancer drugs.
	Cancer treatment	Comprehensive package of guidance due to be commissioned by NICE.
	Assessing the standard of cancer services	Commission for Health Improvement review completed 2001.
Living with cancer		Training across professionals in communication skills.
		New partnership with the voluntary sector to expand specialist palliative care services.
		New funding and initiatives for hospices and specialist palliative care.
Looking to the future	Investment in staff	Investment in NHS staff through education and development.
	Research base strengthened	National Cancer Research Institute (NCRI) will bring together key players in research to identify where research is most needed.
		NHS will contribute to NCRI through stronger support for clinical trials.
		NCRI to coordinate research into cancer genetics.