



Public Health  
England



## **Peckfield Landfill Site**

# **Public Health Report – Summary of Analysis of Local Health Data 2015**

## **Executive Summary**

Leeds City Council, the Environment Agency and Public Health England have been working together to look at concerns raised by Micklefield residents about the possible health impact of the Peckfield landfill site on local residents.

The health information summarised in this report relates to conditions that affect the lungs, the heart, the brain, the weight of newborn babies, congenital abnormalities and some cancers. These health conditions reflect the concerns raised by the residents of Micklefield and are those most likely to be associated with a landfill site such as Peckfield.

The data presented in this report show no evidence of more ill health in the people living in Micklefield than would be expected. None of the health data shows higher levels of disease, low birth weight babies, congenital abnormalities (birth defects), deaths or hospital admissions in Micklefield compared to other nearby similar areas. The data are reassuring in that they do not find any evidence of an increase in health problems that could be attributed to the Peckfield landfill site.

## **Purpose of Report**

To summarise the health data collected by Public Health England and the Office of the Director of Public Health at Leeds City Council relating to the level / number of health conditions in the Micklefield area near the Peckfield landfill site.

## **Background**

In October 2013 Leeds City Council (LCC) and Public Health England received enquiries from residents living in the Micklefield area raising concerns about the possible health effects of the Peckfield landfill site in particular congenital abnormalities (birth defects) and endocrine (hormone) disorders.

In response, Leeds City Council, the Environment Agency and Public Health England have been working together to look at these concerns. Several meetings between these agencies and representatives of the local residents have also taken place to share information and discuss these issues further.

Data on diseases that might potentially be associated with the chemicals found at, or emitted from, landfill sites, and specific health concerns raised by residents were collected and presented at the residents' meeting on 20 February 2014. At this meeting residents identified that some local people were registered with a GP practice outside of the Leeds area that was not included in the original data collection. The data from this practice has now been added to the Leeds GP practice data in order to present the complete analysis.

## **Health Data Used**

Health data regarding the following health issues were examined and are presented in this report:

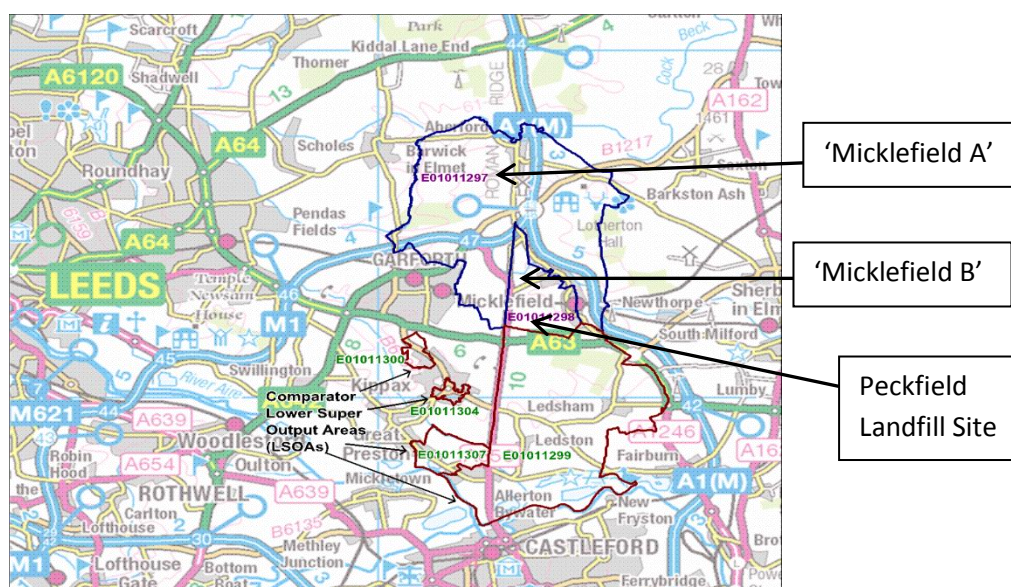
- Level of Chronic Obstructive Pulmonary Disease (COPD) (commonly known as Chronic Bronchitis), asthma and Coronary Heart Disease (CHD) (Source: GP Data)
- Number of low birth weight babies. (Source: Office of National Statistics Data)
- Number of hospital admissions for cardio vascular (heart) disease and respiratory (lung) disease. (Source: Hospital Episode statistics data)
- Number of deaths from all causes, cancer, cardio vascular (heart) disease and respiratory (lung) disease. (Source: Office of National Statistics Data)
- Number and rate of hospital admissions for congenital abnormalities (birth defects) (Source: Health and Social Care Information Centre)
- Risk of liver, bladder and brain cancers and leukaemia . (Source: Small Area Health Statistics Unit)

## About the Analysis

Lower Super Output Areas (LSOAs) are geographical areas, based on postcodes, where about 1500 people live. These areas are used in the UK national census.

Data relating to the level of health conditions in the two Lower Super Output Areas (LSOAs) that cover Micklefield were used in this analysis (see Fig. 1). These data were compared to those of four similar nearby LSOAs. The map below illustrates the LSOAs included in the analysis:

Figure 1 – The Lower Super Output Areas analysed in these data sets



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**Availability of data:** All the data used in this analysis have been made available to public health from various public sector sources. The data in this report relates to the period up to the 30<sup>th</sup> September 2014.

**Data quality:** All the data relies on the accuracy of those individuals and organisations reporting and collecting the data. Therefore, occasionally human variation may influence the quality of the data e.g. despite national guidelines for the diagnosis of asthma different doctors will interpret them slightly differently resulting in variations in the recording of the levels of asthma.

**Statistics:** In this report, graphs are used to show differences in health data between areas. Although the height of the columns on the graphs may look different, statistics experts can judge if two values are truly different by comparing what are called “confidence intervals” (sometimes known as error bars) of the numbers. These confidence intervals are represented on the graphs in this report like this:



If the confidence intervals for two areas **overlap** in values on the graph, we **cannot** be sure there is a true difference between them. The larger the population on which the calculation is based the more reliable that calculation will be and the narrower the error bars will be. So for Leeds, Yorkshire and Humber and England because the population numbers are high the error bars are narrow, for lower super output areas the population numbers are lower and the error bars are wider.

**Small numbers:** Some health conditions are rare. When looking at a population of only 1-2,000 people there will be very few who have that condition. Therefore, it is extremely difficult to draw reliable conclusions from these small numbers. The cancer data in this analysis falls into this category.

**Time periods:** It is difficult to find out how long residents have lived in the Micklefield area. Exposure to environmental chemicals is usually required for long periods at high enough levels to cause health problems. The timescales over which the landfill site may have produced various chemicals is also hard to measure precisely.

**Exposure assessment:** In order for any chemical to cause health problems, a person must come into contact with it, e.g. by breathing, eating, or drinking the substance or by skin contact. Many chemicals have the potential to cause adverse health effects, but this is dependent on the amount a person is exposed to and the length of time they are exposed, both of which are difficult to measure accurately.

**Toxicity information:** The relationship between exposure to odour and health is not completely understood; however, many chemicals can be smelt below concentrations which cause health effects.

**Cause and Effect:** Linking a possible environmental exposure (such as to a chemical or biological agent) to a health effect is very complex. This is because many diseases have a number of potential causes. Therefore identifying the contribution of a possible chemical exposure as opposed to other potential causes such as lifestyle (smoking, alcohol, diet etc.),

occupational exposure and genetic factors and conclusively linking this to a health effect over different time scales is extremely difficult.

## Results

Data in this section of the report is from GP information systems. This includes the practice outside Leeds identified by residents.

NHS Leeds South and East Clinical Commissioning Group (CCG) is the group of 43 practices that work together to design services locally. This is used in this report as a helpful local comparison.

The general health of people living in more deprived areas is worse than the general health of people living in less deprived areas. This is the case globally, across the UK and in West Yorkshire. This is because factors such as living conditions, employment and lifestyle factors all contribute to worse health in more deprived areas.

IMD 2010 is a deprivation score calculated for each LSOA based on multiple indicators of deprivation, the higher the score the more deprived an area. From the table below it can be seen that Micklefield A is the least deprived area and Micklefield B is the most deprived.

**Table 1: Deprivation Scores for Micklefield and comparable LSOAs**

Area (LSOA Code)	Deprivation Score (IMD 2010)
NHS Leeds South and East CCG	...
Micklefield A (E01011297)	13.76
Micklefield B (E01011298)	32.62
Comparator Area B1 (E01011299)	21.85
Comparator Area B2 (E01011300)	23.06
Comparator Area B3 (E01011304)	22.45
Comparator Area B4 (E01011307)	26.94

The following graphs show the data regarding the different levels of disease in these areas. Different health conditions are shown in each section that follows.

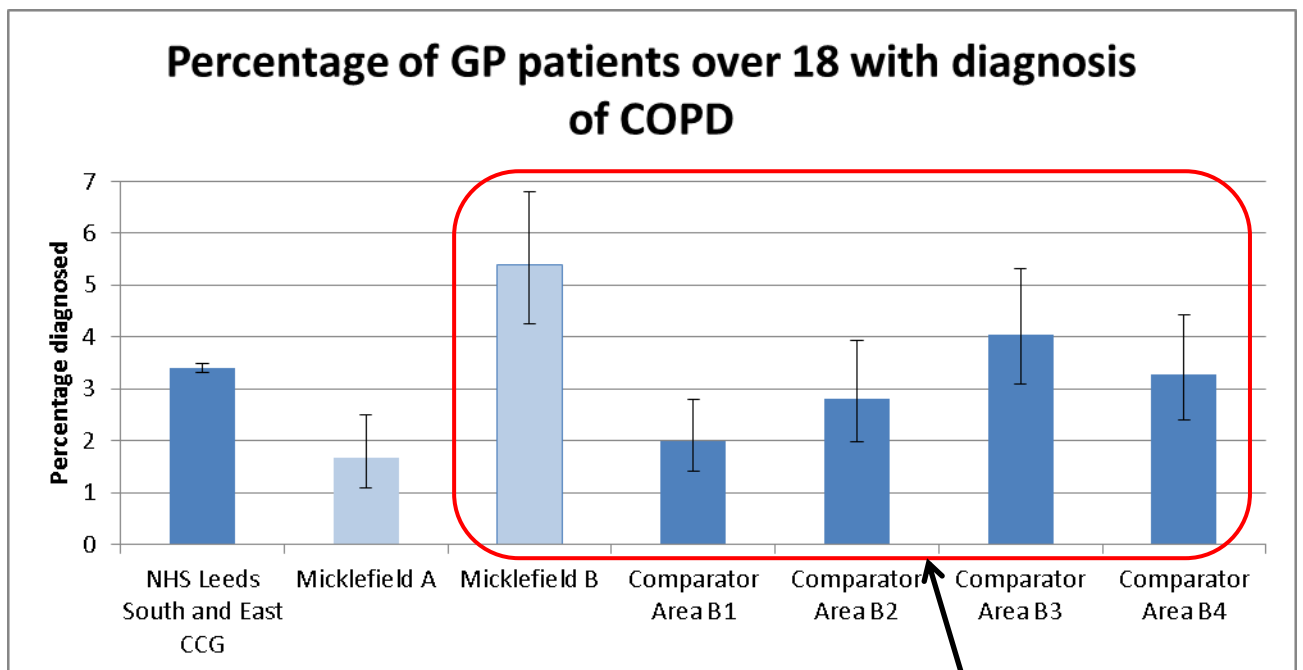


**Percentage of the Population with Chronic Obstructive Pulmonary Disease (COPD – chronic bronchitis lung disease)**

**Question** – Are more adults diagnosed with COPD in Micklefield than in other areas?

**Answer** – No, this graph shows there is not a meaningful difference.

**Graph 1**



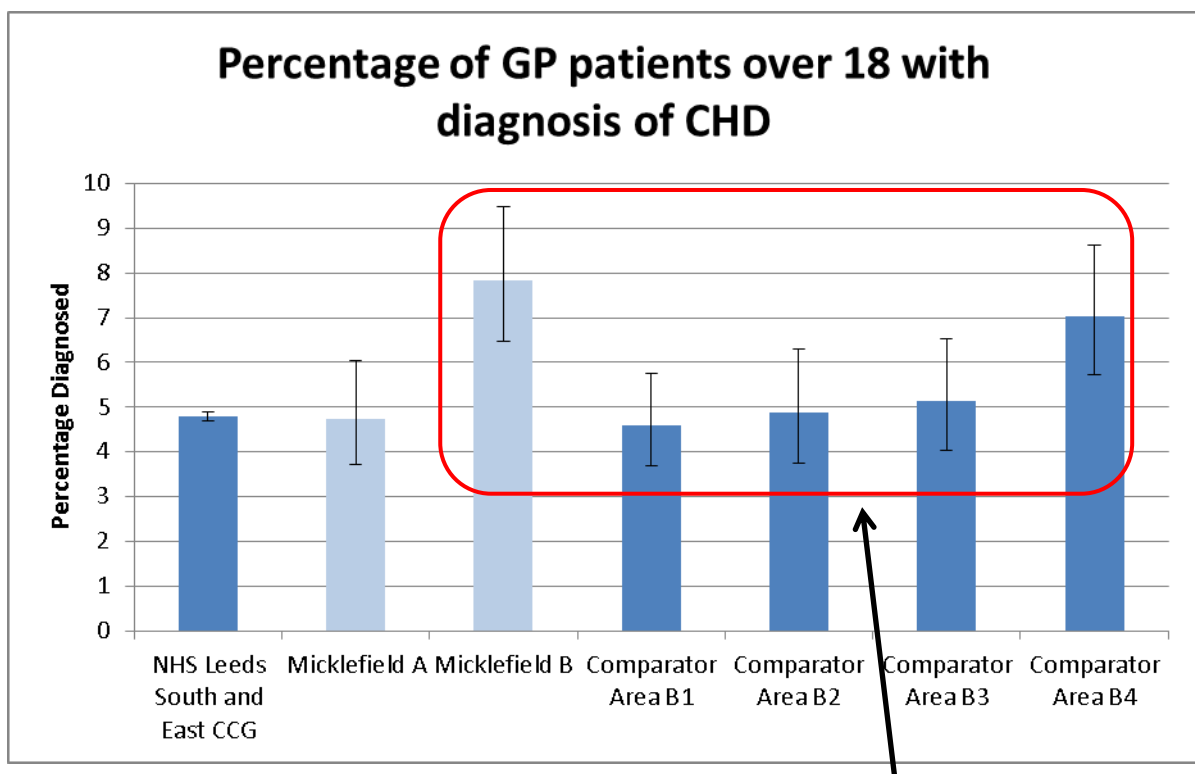
**The level in Micklefield B is higher, but the error bars cross with other areas (B3 and B4) and so we cannot be sure there is a true difference**

## Prevalence of Coronary Heart Disease (CHD)

**Question** – Are more adults diagnosed with CHD in Micklefield than in other areas?

**Answer** – No, this graph shows there is not a meaningful difference.

### Graph 2



The level in Micklefield B is higher, but the error bars cross with other areas (B3 and B4) and so we cannot be sure there is a true difference

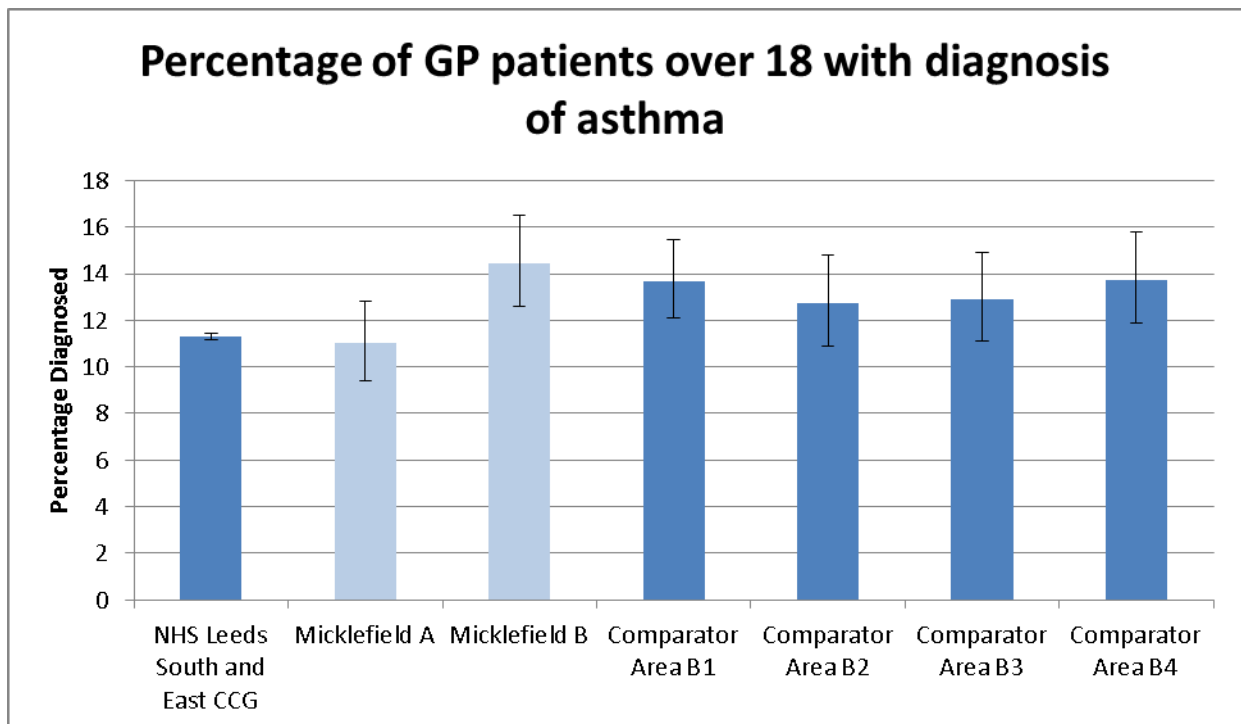


## Prevalence of Asthma – Over 18s

**Question** – Are more adults diagnosed with asthma in Micklefield than in other areas?

**Answer** – No, this data shows there is not a meaningful difference.

### Graph 3

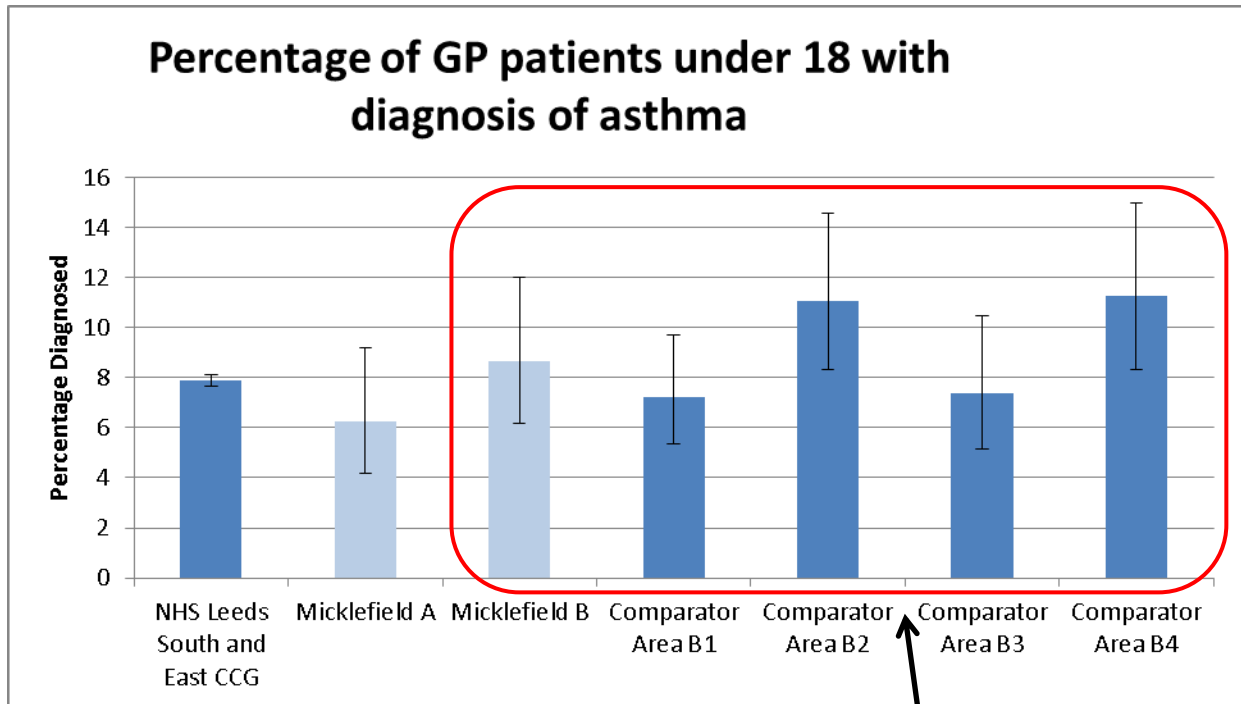


## Prevalence of Asthma – Under 18s

**Question** – Are more young people diagnosed with asthma in Micklefield than in other areas?

**Answer** – No, this graph shows there is not a meaningful difference.

**Graph 4**



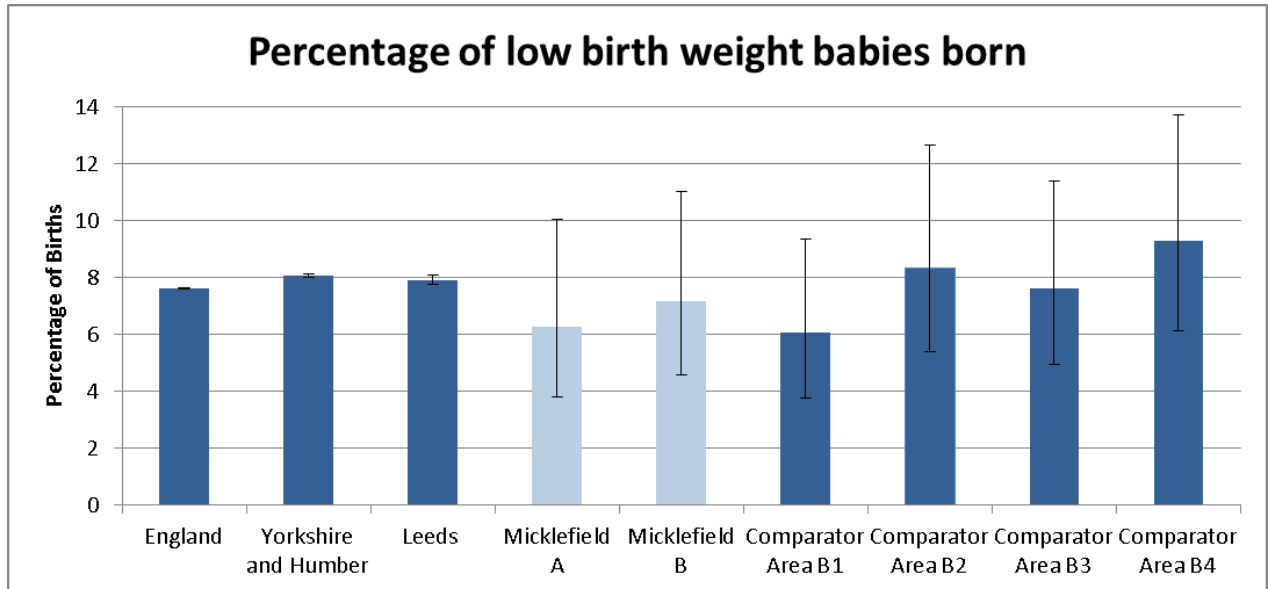
The level in Micklefield B is lower than two areas, but the error bars cross with other areas and so we cannot be sure there is a true difference

## Low Birth Weight Babies

**Question** – Are more underweight babies born in Micklefield than elsewhere?

**Answer** – No, this data shows there is not a meaningful difference.

### Graph 5



### Notes

Low birth weight (LBW) = Babies with a birth weight less than 2500g (5lb 8oz)

Data shown is babies with LBW as a percentage of all births between 2001 and 2012

## Congenital Abnormalities in Babies

As the absolute numbers of babies born with birth defects is not recorded, the next best measure of congenital abnormalities is to look at hospital admissions for these conditions. This will only include the more severe cases that require hospital admission but enable some comparison between areas.

**Question** – Are more babies with congenital abnormalities treated in Micklefield than elsewhere?

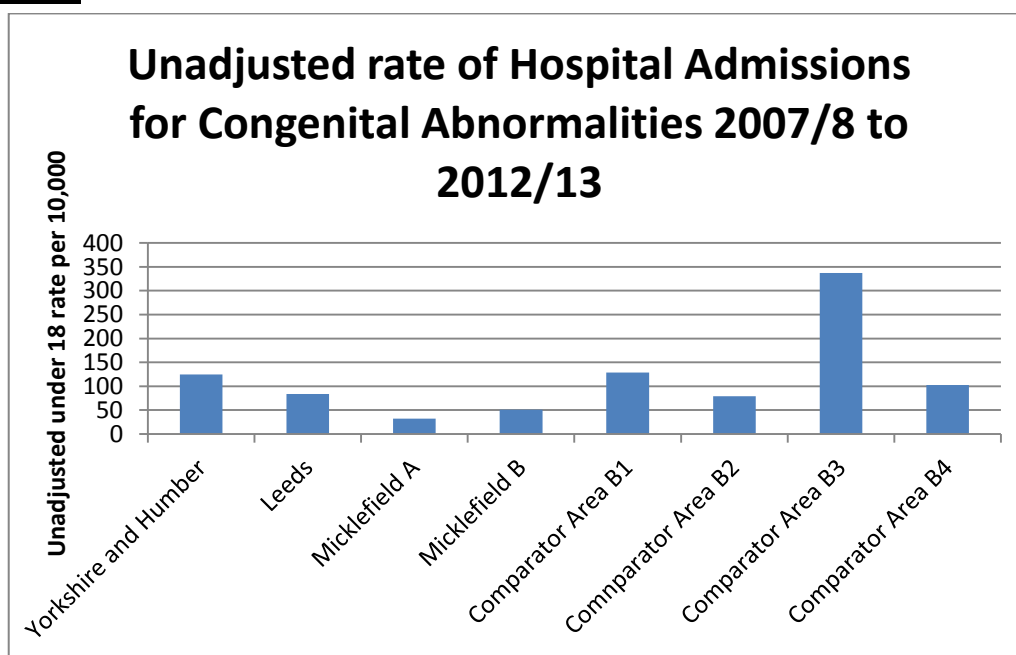
**Answer** – No, this data shows there is not a meaningful difference.

**Table 2 - Number and unadjusted rate of hospital admissions from 2007/08 to 2012/13**

Primary and secondary diagnosis	Area	No. of admissions	Unadjusted* under 18 rate per 10,000
Q00-Q99 Congenital malformations, deformations and chromosomal abnormalities	Yorkshire and Humber	84422	124.90
	Leeds	7720	83.99
	Micklefield A	7	31.93
	Micklefield B	10	51.20
	Comparator Area B1	34	128.50
	Comparator Area B2	18	79.19
	Comparator Area B3	72	336.76
	Comparator Area B4	21	102.49

\* Differences in the populations such as age and gender have not been taken into account in calculating these rates.

### Graph 6



## Hospital Admissions

This section uses national data collected from NHS hospitals to calculate the number of people being admitted to hospital from different geographical areas. As each area has different sized populations this section shows hospital admissions as an age standardised rate per 100,000 people. This means densely populated areas can still be compared with sparsely populated areas as it estimates the number of admissions if all areas had exactly 100,000 people living in them.

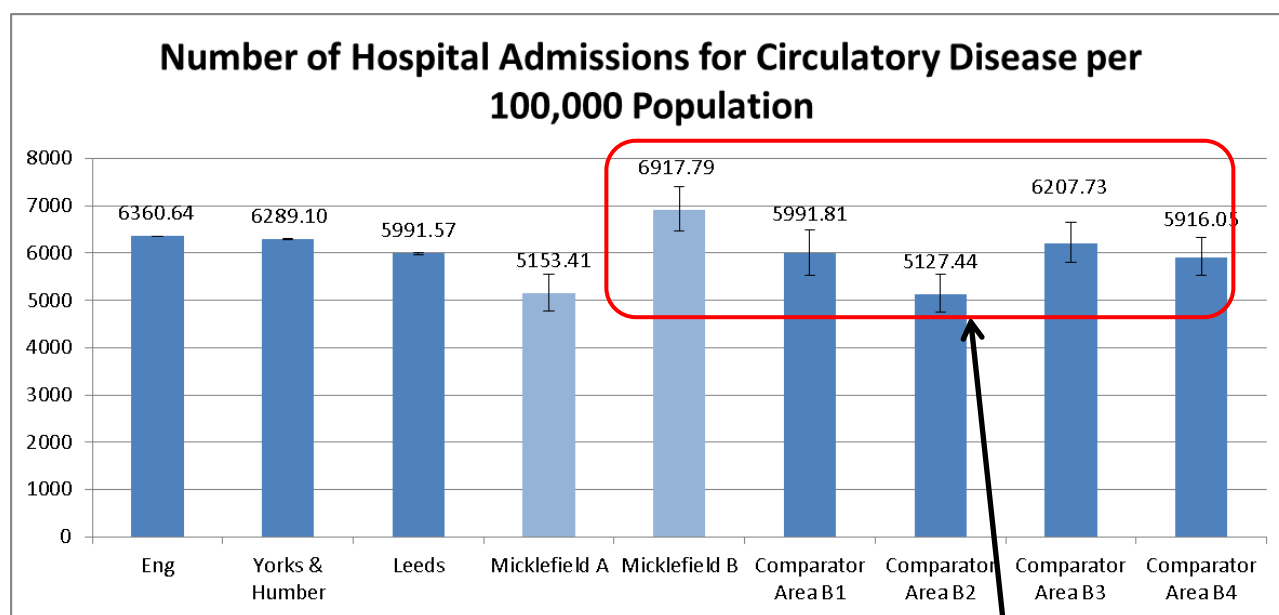
This data also takes into account the fact that some areas have more older people living in them than other areas (age standardised). This is important because older people are more likely to be admitted to hospital than younger people.

## Circulatory Disease (e.g. stroke and heart attacks)

**Question** – Do more people get admitted to hospital for health problems like stroke and heart attacks from Micklefield than from other areas?

**Answer** – No, this data shows there is not a meaningful difference. One of the Micklefield areas seems to have more admissions but this is not meaningfully higher than other similar areas because the error bars overlap (see note on ‘Statistics’ on page 3).

### Graph 7



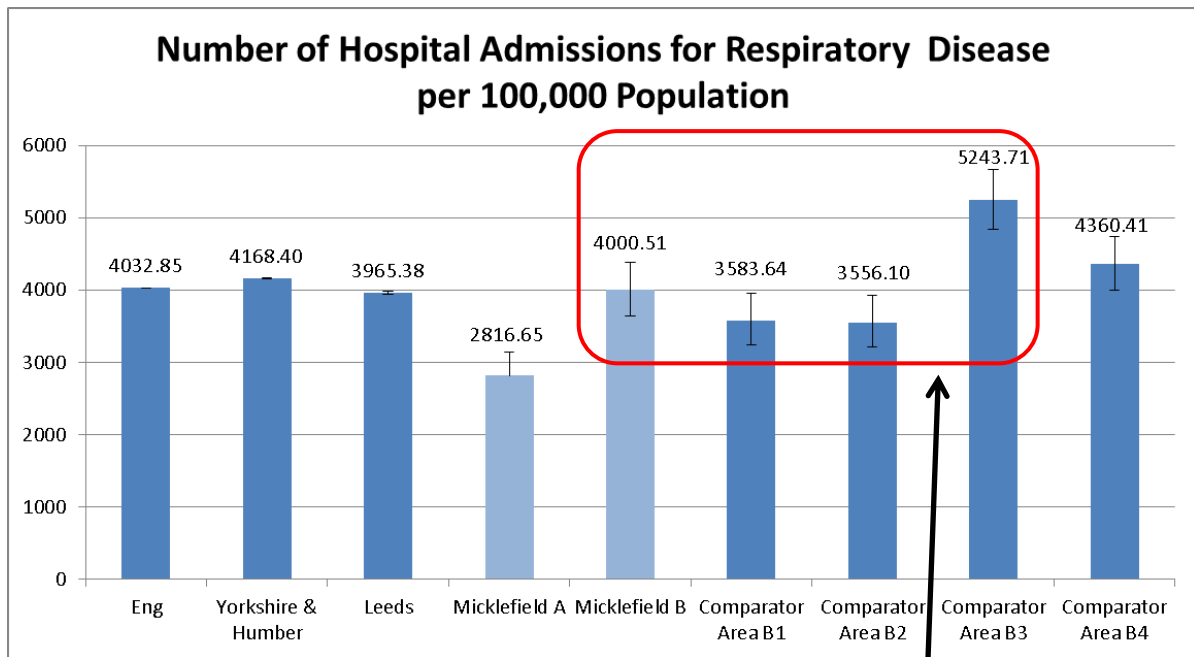
The level in Micklefield B is higher, but the error bars cross with other areas and so we cannot be sure there is a true difference

## Hospital Admissions – Respiratory (lung) Diseases

**Question** – Do more people get admitted to hospital for breathing difficulties from Micklefield than from other areas?

**Answer** – No, this data shows there is not a meaningful difference.

### Graph 8



**There are significantly higher rates of hospital admissions from lung disease in Comparator Area B3 compared with Micklefield B. The error bars do not cross.**

## Death Rates

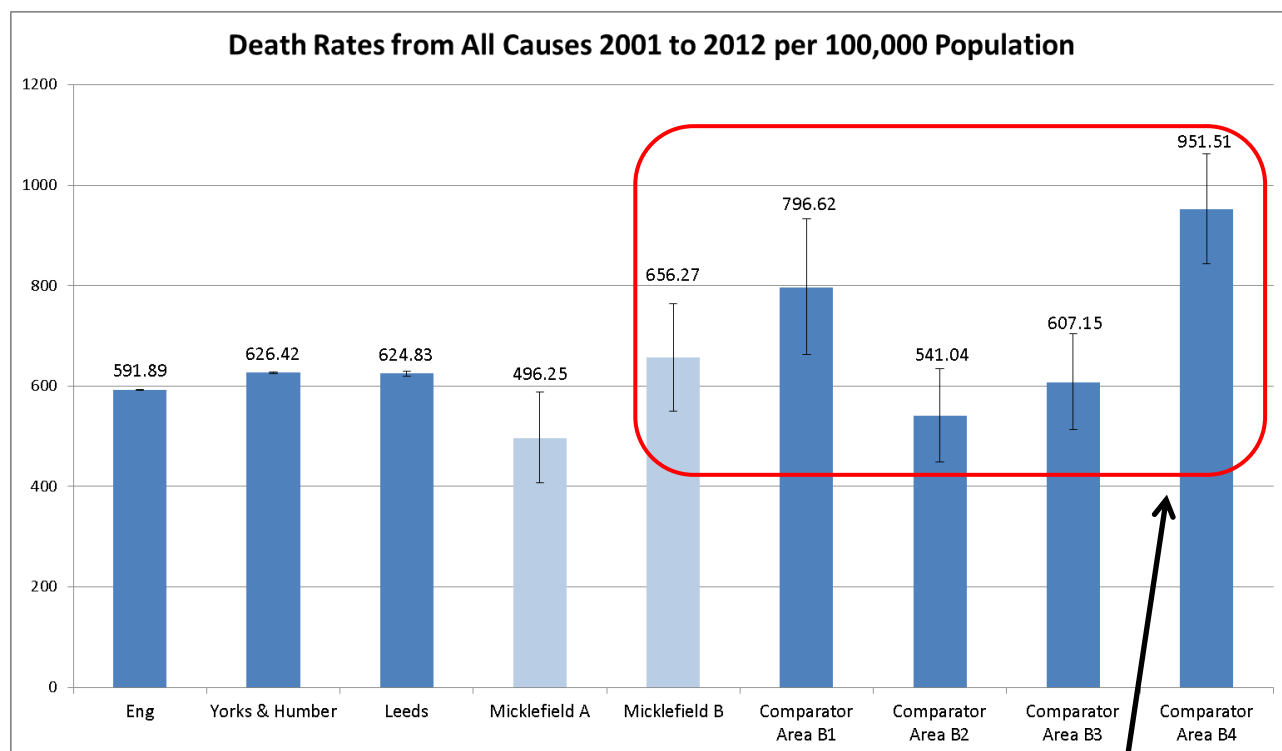
This section uses data about people dying and what health conditions led to their death. The same type of data is presented here as for hospital admissions, in that it is a rate per 100,000 population and has been age standardised (see glossary for the explanation).

### Overall Death rates

**Question** – Do more people die in Micklefield than other areas?

**Answer** – No, this data shows there is not a meaningful difference.

### Graph 9



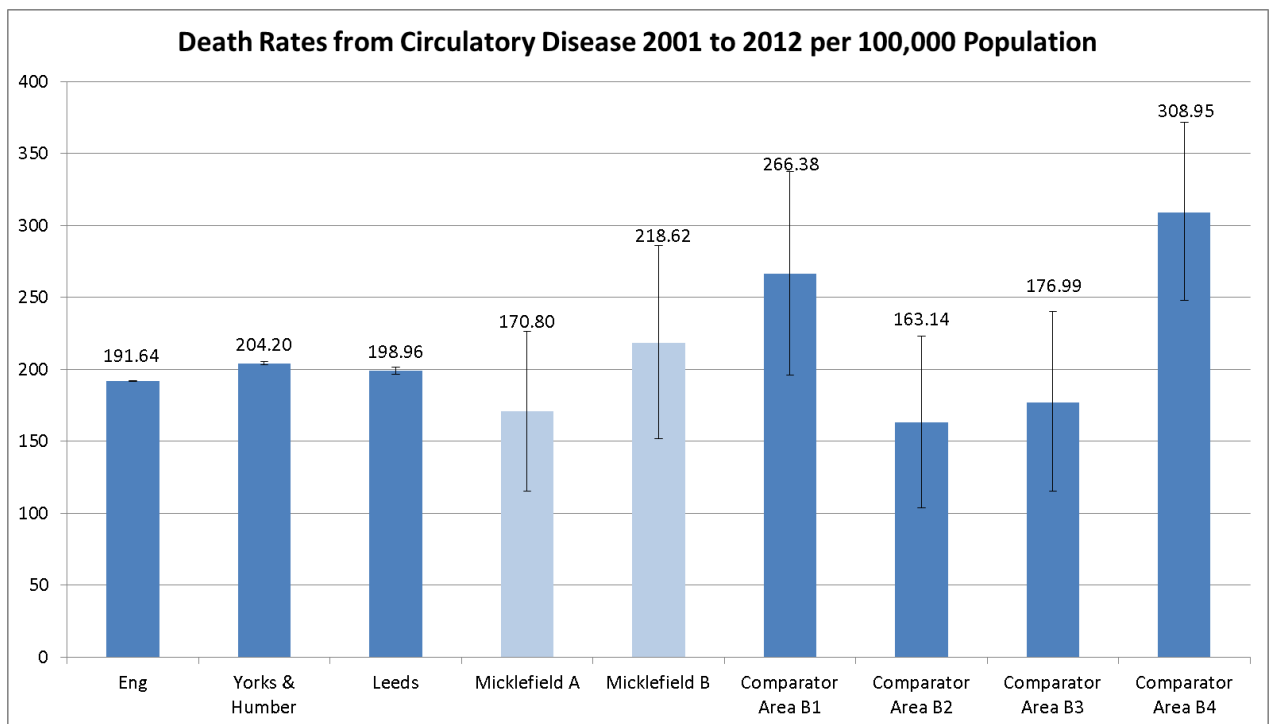
**There are significantly higher rates of deaths from all causes in Comparator Area B4 compared with Micklefield B. The error bars do not cross.**

## Death rates – Circulatory Diseases (stroke and heart attack)

**Question** – Do more people die from stroke and heart attacks in Micklefield than in other areas?

**Answer** – No, this data shows there is not a meaningful difference.

### Graph 10



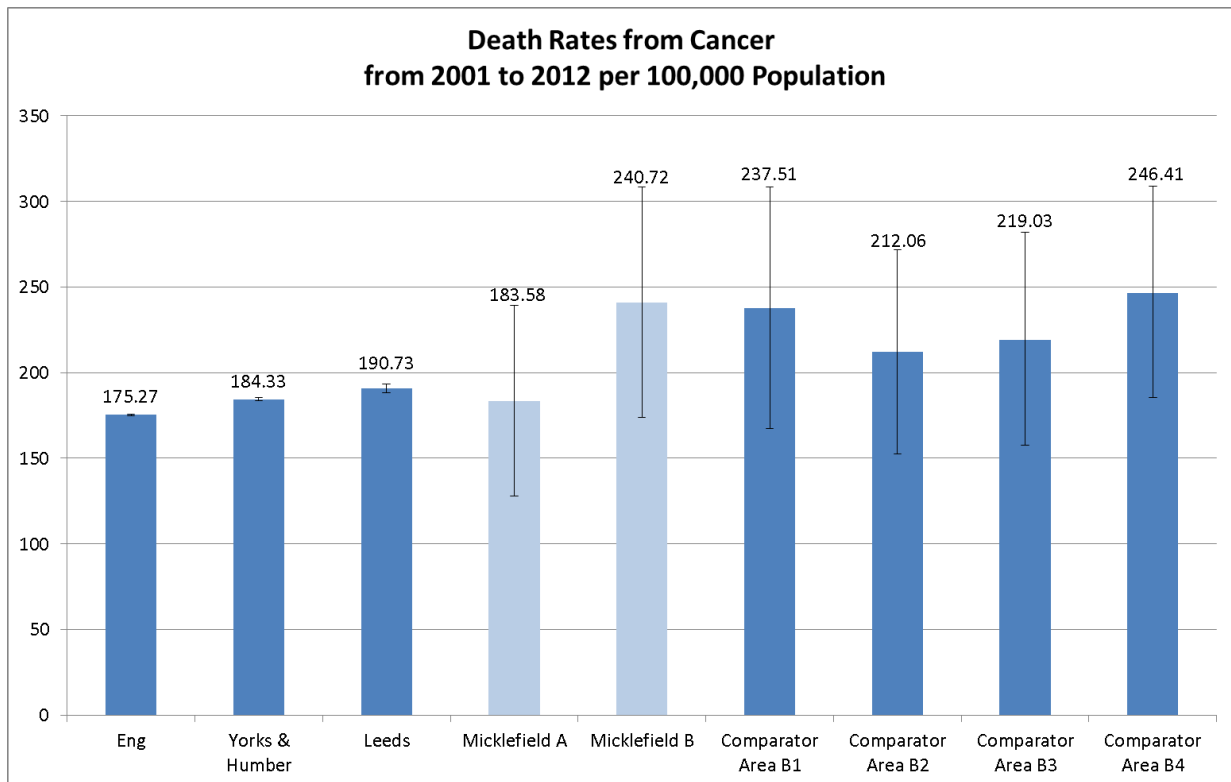


## Death rates – Cancer

**Question** – Do more people die from cancer in Micklefield than in other areas?

**Answer** – No, this data shows there is not a meaningful difference.

**Graph 11**

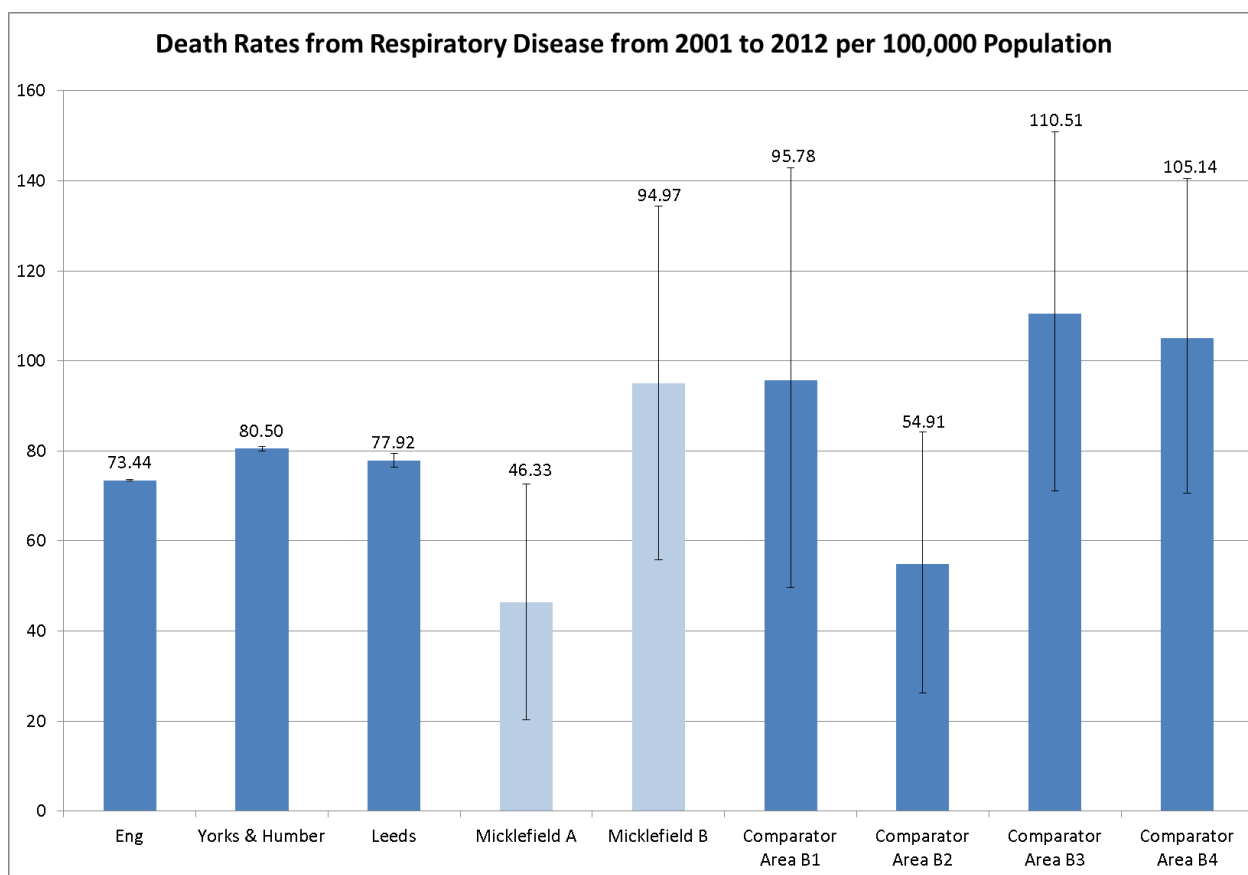


## Death rates – Respiratory (lung) disease

**Question** – Do more people die from diseases of the lungs in Micklefield than in other areas?

**Answer** – No, this data shows there is not a meaningful difference.

### Graph 12



## Cancer Data – Risk of disease

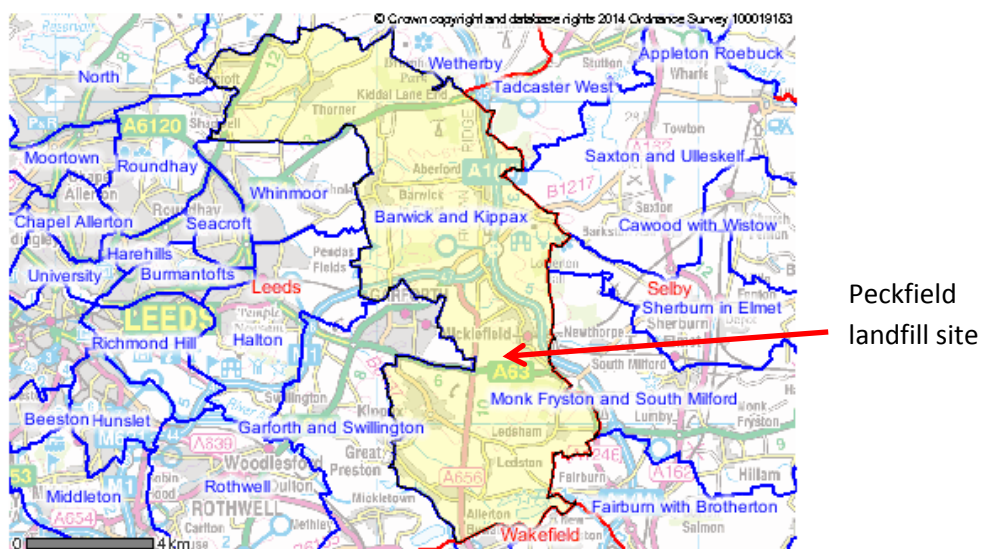
The Environment and Health Atlas for England and Wales is an independent publication produced by the Small Area Health Statistics Unit (SAHSU), an academic unit funded by the Medical Research Council and Public Health England.

The atlas provides maps of the geographical variations for a range of health conditions at a small-area scale (census wards). The maps have been developed as a resource for those working in public health and public health policy and for the general public to better understand the geographic distribution of environmental factors and disease.

The data reported below were taken from the publicly available website at <http://www.envhealthatlas.co.uk/homepage/gotoatlas.html>

Data for liver, bladder and brain cancers as well as leukaemia were analysed for this report. The geographical area used was larger than the previous analyses above due to these rare conditions having very small numbers of cases. The data analysed was based on the Barwick and Kippax census ward (see Fig. 2) which includes Micklefield and the Peckfield site. Census wards are areas defined by the Office of National Statistics for the collection of census data (differ slightly from electoral wards). They are a mid-level administrative unit and are frequently used in spatial epidemiological studies. They have an average population of 6,000 residents.

**Figure 2 – The Barwick and Kippax census ward used in this cancer data analysis**



Source: Office for National Statistics at <https://neighbourhood.statistics.gov.uk/dissemination/LeadAreaMetadata.do?a=7&b=561617&c=Barwick+and+Kippax&d=14&g=382164&i=1001x1003&m=0&r=1&s=1444831410016&enc=1&areald=561617>

The data for bladder cancer, brain cancer and leukaemia covers the period from 1985 to 2009. The data for liver cancer is from 1996 to 2009. The data presented is relative risks of disease. The relative risk is the risk of disease in an area (ward) relative to the average risk of disease in England and Wales. It helps to show if there is greater risk of the disease in one

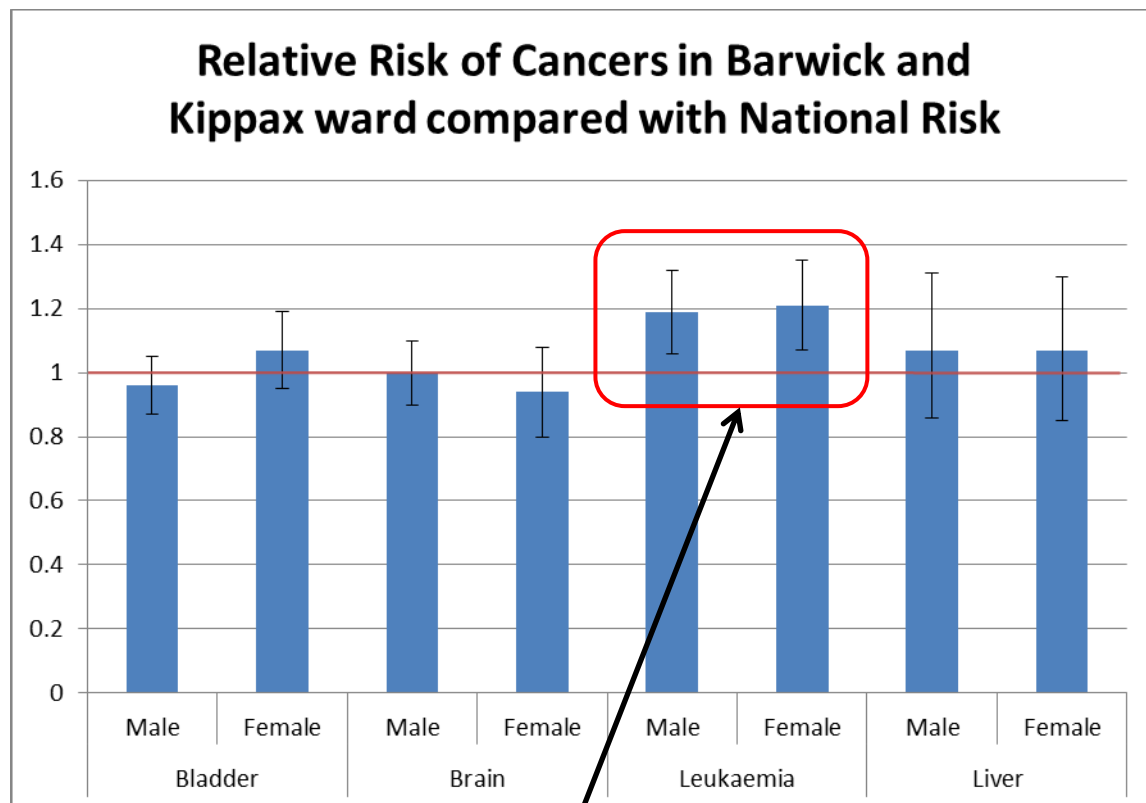
area than the average risk for England and Wales. If the relative risk is one, then the risk is similar for an area, relative to the risk in England and Wales. If the risk is below one it is lower risk and if it is above one it is higher than the average risk in England and Wales. Confidence intervals are used to indicate if the risks are truly different or not.

Further information for these data set can be found at <http://www.envhealthatlas.co.uk/homepage/faq.html>

**Table 3 – Relative Risk of various cancers by sex in Barwick and Kippax ward compared with the average risk for England and Wales**

Cancer Type	Sex	Relative Risk	Confidence Interval
Bladder	Male	0.96	(0.87-1.05)
	Female	1.07	(0.95-1.19)
Brain	Male	1.00	(0.90-1.10)
	Female	0.94	(0.80-1.08)
Leukaemia	Male	1.19	(1.06-1.32)
	Female	1.21	(1.07-1.35)
Liver	Male	1.07	(0.86-1.31)
	Female	1.07	(0.85-1.30)

**Graph 13**

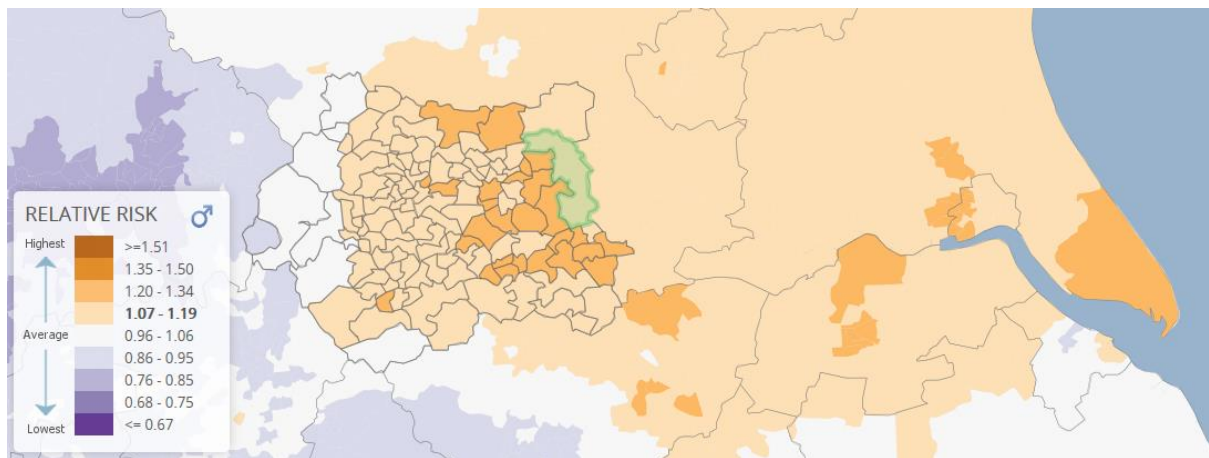


**These confidence intervals do not cross 1 and so indicate there is a statistical difference of relative risk of leukaemia**

Where the risk is greater than the value '1' and the confidence interval is completely above the value '1' (eg for Leukaemia in Graph 13) this indicates a statistically significant risk in Barwick and Kippax compared with the average risk across England and Wales.

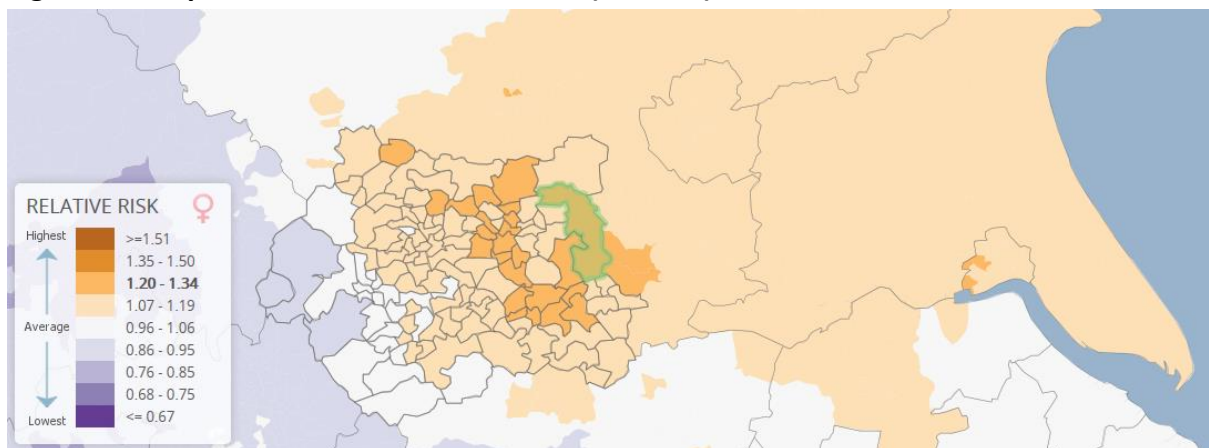
This increased risk of leukaemia in Barwick and Kippax ward compared to the national average is common across Yorkshire and the Humber. For men there are even higher risks in many other neighbouring wards (see Fig. 3). For women there are similar higher risks in many other wards in the Leeds area (see Fig. 4). Therefore, this raised risk of leukaemia is not suggestive of more cases in Micklefield than other areas.

**Figure 3 – Map of relative risk of leukaemia (males) across Yorkshire and the Humber**



Source: Small Area Statistics Unit (<http://www.envhealthatlas.co.uk/eha/Leukaemia/>)

**Figure 4 – Map of relative risk of leukaemia (females) across Yorkshire and the Humber**



Source: Small Area Statistics Unit (<http://www.envhealthatlas.co.uk/eha/Leukaemia/>)

As the confidence intervals cross the value '1' for all other types of cancer these data show there is no meaningful difference between Barwick and Kippax ward and the national average for brain, bladder and liver cancer.

## **Conclusion**

This report has summarised all the health data that has been analysed by Public Health England and Leeds City Council Office of the Director of Public Health regarding the Peckfield Landfill site. The health conditions included in this analysis were cardiovascular disease (heart), respiratory disease (lung - including asthma) and relevant cancers, as well as babies with low birth weight or congenital abnormalities.

The data presented show no evidence of more ill health in the people who live in Micklefield than would be expected. None of the health data shows higher levels of disease, low birth weight babies, congenital abnormalities, deaths or hospital admissions in Micklefield compared to other nearby similar areas. The data presented in this report are reassuring in that they show no evidence of an increase in health problems that could be attributed to the Peckfield landfill site.

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**Leeds City Council**

## Glossary of Terms

**Age Standardised Rate (ASR):** this data takes into account the fact that some areas have more older people living in them than other areas, but allows us to still compare them to each other. This is important because older people are more likely to be admitted to hospital than younger people.

**Asthma:** a common long-term condition that can cause coughing, wheezing, chest tightness and breathlessness.

**Cancer:** a condition where cells in a specific part of the body grow and reproduce uncontrollably. The cancerous cells can invade and destroy surrounding healthy tissue, including organs.

**Cardio vascular disease (CVD):** a general term that describes a disease of the heart or blood vessels.

**Census wards:** areas defined by the Office of National Statistics for the collection of census data with on average 6,000 residents (these areas differ slightly from electoral wards)

**Chronic Obstructive Pulmonary Disease (COPD):** a collection of lung diseases including chronic bronchitis, emphysema and chronic obstructive airways disease. People with COPD have difficulties breathing, primarily due to the narrowing of their airways.

**Circulatory Diseases:** (another term for cardiovascular disease) common examples include strokes, mini-strokes and heart attacks.

**Clinical Commissioning Group (CCG):** formed in 2013, a group of GP practices that work together to design health services for a local population.

**Confidence Interval:** used in statistics when there is uncertainty in the data. It indicates the range of values that the true value in the population is likely to fall within, given the data we have. Sometimes called error bars.

**Congenital abnormalities:** health conditions that are present in babies at birth having developed while in the mother's womb.

**Coronary Heart Disease (CHD):** a type of cardiovascular disease that occurs when the flow of oxygen-rich blood to your heart is blocked or reduced by a build-up of fatty material

(atheroma) in the coronary arteries. (The coronary arteries are the two major blood vessels that supply your heart with blood.)

**Deprivation:** the damaging lack of material benefits considered to be basic necessities in a society.

**Environment Agency:** A UK Government agency that protects and improves the environment and makes it a better place for people and wildlife.

**European Standardised Population:** an artificial population structure – originally published in 1976 – that is used in the weighting of mortality or incidence data to produce age-standardised rates (ASRs). Produced by Eurostat, the statistical institute of the European Union.

**Index of Multiple Deprivation (IMD):** a UK government qualitative study of deprived areas in English local councils. It incorporates seven aspects of deprivation - income, employment, health deprivation and disability, education skills and training, barriers to housing and services, crime and the living environment.

**Leukaemia (lymphoid and myeloid):** Leukaemia is a cancer of the white blood cells. Leukaemia is classified according to the type of white blood cells affected by cancer. Lymphoid refers to the lymphocytes, which are white blood cells mostly used by the body to fight viral infections. Myeloid refers to the myeloid white blood cells which fight bacterial infections, defend the body against parasites and prevent the spread of tissue damage.

**Low birth weight babies (LBW):** Babies with a birth weight less than 2500g (5lb 8oz).

**Lower Super Output Areas (LSOAs)** - a geography of small areas covering the whole country for the collection and publication of small area statistics. They are used in a lot of national statistics produced by Government agencies. LSOAs have an average of roughly 1,500 residents and 650 households. They fit within MSOAs boundaries.

**Middle Super Output Areas (MSOAs):** a geography of small areas covering the whole country for the collection and publication of small area statistics. They are used in a lot of national statistics produced by Government agencies. MSOAs have a minimum size of 5,000 residents and 2,000 households. They fit within local authority boundaries.

**Public Health England:** a Government agency linked to the Department of Health. It works to protect and improve the nation's health and wellbeing, and reduce health inequalities. It has regional offices across the country.



**Respiratory Disease:** a general term that describes a disease of the lungs and parts of the body that help with breathing.

**Standardised rate per 100,000 people:** an estimate of the number of times something happens (like an admission to hospital) if all areas had exactly 100,000 people living in them. This means densely populated areas can still be compared with sparsely populated areas.

**Toxicity:** the degree to which a substance can harm humans or animals.