Knowsley Health Advisory Group Report

Respiratory Disease and Lung Cancer in Kirkby

February 2008
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1. INTRODUCTION

Since 2002 Knowsley PCT and Council have been closely monitoring respiratory disease in Knowsley, in response to local concerns about environmental pollution.

In December 2002, we produced a report entitled “Investigating Local Concerns about the Effects on Health of the Sonae Chipboard Factory situated on Knowsley Industrial Park”. This report contained a literature review on potential health effects from chipboard factories, an assessment of environmental monitoring information, analysis of routine health data and a cross-sectional health survey. Comparisons were made between residents of Northwood ward and residents of a similar ward in another part of the Borough (Stockbridge Village), to see if any differences in health between the wards could be identified. The report indicated that there were health concerns from local residents, but there was no trend data which indicated that health was worsening since the factory had been in place. However the report did recommend that monitoring and surveillance of the health and quality of life of the residents of Northwood should be continued.

The Knowsley Public Health Team has continued to monitor health and ill-health across Knowsley, and publishes documents and routinely reports on health in Knowsley to inform the public, for example in the Public Health Annual Report.

In 2004/05 there was a statistically significant increase in hospital admissions due to respiratory disease for patients living in Northwood Ward (old boundaries). As a result the Public Health Team asked the Cheshire and Merseyside Health Protection Unit to look into this and advise whether it was likely that factors other than smoking were responsible for this.

The report from the Health Protection Unit was completed in 2006, and showed that the highest prevalence of chronic respiratory disease in Knowsley was in Northwood. However a high prevalence of chronic respiratory disease was also seen in other wards in Knowsley with similar socio-economic status and smoking prevalence. The report had four recommendations:

1. The Local Authority should undertake monitoring of air quality in Northwood.
2. More accurate assessment of smoking prevalence in Northwood wards should be determined.
3. Monitoring of the respiratory health of residents in the north of Knowsley should be continued.
4. A health advisory group should be formed to undertake more detailed study into this issue.
As a result of the recommendations from the report, the PCT worked with the Local Authority to secure funding to refurbish and redevelop the existing air quality monitoring station based at Huyton in order that it could be updated and moved to various sites across the Borough, including Northwood to measure air quality. In addition the public health team has continued to monitor the respiratory health of residents across Knowsley. Knowsley PCT also commissioned research into smoking prevalence both in Kirkby and across Knowsley, and this report was published in 2007.

The final recommendation was to form a Health Advisory Group (HAG) to bring together experts to look into this issue in more detail. The first meeting of the HAG was held in September 2006 and included representation from the PCT, the Local Authority and Health Protection Agency.

The full membership of the group is shown in Appendix C. The purpose of the group was twofold:-

- To gain a clearer understanding of any additional factors (other than smoking) which may be contributing to the high rates of lung cancer and respiratory disease in Kirkby.
- To communicate the findings to the public, through the Cancer Monitoring Forum.

In order to undertake this work, the Health Advisory Group found it was necessary to look at the trends for respiratory disease and lung cancer in all the wards in Knowsley, so that comparisons could be made. Work was also undertaken to look into the history of Kirkby residents, in terms of housing and facilities, and also employment. The data on smoking prevalence was examined, as was the available data on air quality and land pollution.

This report details the work carried out by the HAG so far, and includes conclusions and recommendations from each of the areas of investigation.

The headline issues which come out of this report are as follows:

- The increases in hospital admissions for respiratory disease which are seen in Kirkby, are mirrored also in North Huyton.
- The very high rates of lung cancer which were seen in Kirkby between 2000 and 2004 have now returned to rates similar to the Knowsley average. The factors leading to this will have occurred ten to fifteen years ago.
- Kirkby and North Huyton have similar levels of deprivation, similar levels of smoking, similar history, and similar patterns of respiratory disease. There is, however, no industrial estate in North Huyton. This would indicate that the current respiratory disease of residents in Kirkby has been affected by people’s
past history (occupation and smoking), rather than by recent air pollution.

It is important that close monitoring of the health of the residents of Kirkby continues. The Health Advisory Group will report back the contents of this report to local people, and to local stakeholders, and the work of the group will continue.

Dr Diana Forrest
Director of Public Health
Knowsley PCT / KMBC

February 2008
2. RESPIRATORY DISEASE DATA

Epidemiology

Chronic respiratory diseases are long-lasting diseases of the airways and other structures of the lung. Some of the most common are asthma, chronic obstructive pulmonary disease (COPD), respiratory allergies, occupational lung diseases and pulmonary hypertension.

The most important risk factors for preventable chronic respiratory diseases are:

- Tobacco smoking
- Indoor air pollution
- Outdoor pollution
- Allergens
- Occupational

Data Analysis

Knowsley Informatics Team extracted respiratory hospital admissions data from the Hospital Episode Statistics (HES) database and the data was categorised as follows:

- Respiratory Disease (ICD-10 J00-J99)
- COPD (ICD-10 J40-J44)
- Asthma (ICD-10 J45-J46)
- Pneumonia (ICD-10 J12-J18)

The Public Health Intelligence Team then analysed this data alongside population data to produce age-standardised hospital admission rates for each component above by Borough, Area Partnership Board and Electoral Ward.

Relevant mortality data was also analysed, to assess the trends, and to relate this to the hospital admission data.

Also included was data on prescribing for respiratory diseases, to see if there have been any trends in an increase in prescribing in primary care.

We first consider respiratory disease as a whole, and then look in more detail at specific respiratory diseases.
(i) Respiratory Disease as a whole

Hospital Admissions

The Borough of Knowsley experiences significantly higher levels of hospital admissions for respiratory disease than nationally and regionally (see figure 1 below). However, levels of hospital admissions vary across the Borough.

Figure 1 – Hospital Admission Rates for Respiratory Disease, 1997-2006

Figure 1 shows that Knowsley experiences significantly higher levels of respiratory disease than regionally and nationally, 19% and 61% respectively. The Knowsley trend shows that hospital admissions have increased each year since 1999 and as a result, the gap between Knowsley and England is widening.

Figure 2 – Hospital Admission Rates for Respiratory Disease by Area Partnership Board
A map showing the Area Partnership Board boundaries in the borough is shown in Appendix A.

North Huyton and South Kirkby area partnership boards have significantly higher hospital admission rates for respiratory disease than Knowsley as a whole.

Figure 3 – Areas with the Highest Hospital Admission Rates for Respiratory Disease

Figure 3 shows the trends for the three Area Partnership Boards with higher respiratory disease hospital admission rates than Knowsley as a whole. Over the seven-year period, hospital admission rates in North Huyton have been significantly higher than Knowsley as a whole in each year and has increased in each of the last five years. Rates in North Kirkby have also increased for the last five years, but in 2004-06 they were not deemed significantly higher. South Kirkby has shown the largest increase since 2000-02 and now has rates which are significantly higher than Knowsley as a whole.
Six electoral wards in Knowsley have a hospital admission rate for respiratory disease that are significantly higher than the Borough as a whole. One of these wards is in the North Kirkby area, Northwood. Figure 4 shows that Northwood rates have been significantly higher than the Knowsley average since 1997-99 and have increased in each of the last three years.

In South Kirkby, two electoral wards have a significantly higher hospital admission rate for respiratory conditions than Knowsley as a whole, Whitefield and Kirkby Central (Figure 5). Whitefield has increased
relatively sharply since 2000-02 and now has the highest rate in South Kirkby. Kirkby Central has consistently had a rate higher than the Borough, but the rate decreased in 2004-06.

North Huyton has three electoral wards with a significantly high hospital admission rate for respiratory conditions: Longview (highest in Knowsley), Page Moss and Stockbridge.

**Mortality Rates for Respiratory Disease**

![Graph](image)

Figure 6 – Directly Standardised Mortality Rates for Respiratory Disease, 1995-2006

Mortality from respiratory disease in Knowsley has fallen by 12% from its peak in 1998-00 from 57.6 deaths per 100,000 population to 50.7 per 100,000. However, the Knowsley rate is 49% higher than it is in the North West as a whole and 97% higher than nationally.
Figure 7 – Respiratory Disease Mortality in North Kirkby, 2001-2006

Mortality from respiratory disease in North Kirkby is higher than Knowsley as a whole but not significantly so, and the rates have reduced in the past four years.

Figure 8 – Respiratory Disease Mortality in South Kirkby, 2001-2006

Mortality from respiratory disease in South Kirkby is higher than Knowsley as a whole but not significantly so.
Reducing Health Inequalities between Neighbourhoods and the District
Directly age standardised mortality rates per 100,000 resident population for Respiratory Disease
for persons aged under 75
Source: ONS Annual Registered District Death Extracts

Figure 9 – Respiratory Disease Mortality in North Huyton, 2001-2006

Mortality from respiratory disease in North Huyton is higher than Knowsley as a whole but not significantly so.

Figure 10 – Respiratory Disease Mortality in South Huyton, 2001-2006

Mortality from respiratory disease in South Huyton is lower than Knowsley as a whole but not significantly so.
Reducing Health Inequalities between Neighbourhoods and the District
Directly age standardised mortality rates per 100,000 resident population for Respiratory Disease
for persons aged under 75
Source: ONS Annual Registered District Death Extracts

Figure 11 – Respiratory Disease Mortality in PWCKV, 2001-2006
Mortality from respiratory disease in Prescot, Whiston, Cronton & Knowsley Village is around the Knowsley average.

Figure 12 – Respiratory Disease Mortality in Halewood, 2001-2006
Mortality from respiratory disease in Halewood is lower than Knowsley as a whole but not significantly so.
Prescribing for Respiratory Conditions

Figure 13 shows the prescribing patterns for people in Knowsley for respiratory conditions between 2002 and 2007. The analysis is shown by practice based commissioning group and shows that the Kirkby area shows a consistently higher prescribing rate than the rest of the Borough over the period, but there has not been any increase since 2002. The fluctuations in prescribing rates are likely to be responses to extremes of weather, which tend to exacerbate respiratory problems in those with respiratory disease.

Conclusions

- The increase in hospital admissions due to respiratory disease is not only being seen in Knowsley; it is happening across the North West Region.

- Hospital admission rates for respiratory disease are highest in North Huyton and South Kirkby.

- Hospital admission rates for respiratory disease are increasing significantly in North Huyton and North Kirkby.

The following sections of this chapter will look into respiratory disease in more detail.
(ii) Chronic Obstructive Pulmonary Disease (COPD)

Epidemiology

Chronic Obstructive Pulmonary Disease (COPD) is not one single disease but an umbrella term used to describe chronic lung diseases that cause limitations in lung airflow. The more familiar terms ‘chronic bronchitis’ and ‘emphysema’ are no longer used, but are now included within the COPD diagnosis.

The most common symptoms of COPD are breathlessness, or a ‘need for air’, excessive sputum production, and a chronic cough.

However, COPD is not just simply a “smoker’s cough”, but an under-diagnosed, life threatening lung disease that may progressively lead to death.

The most important risk factors for COPD are:

- Tobacco smoking
- Indoor air pollution (such as biomass fuel used for cooking and heating)
- Outdoor air pollution
- Occupational dusts and chemicals (vapours, irritants, and fumes)
National ‘hotspots’ for COPD

Map 1 shows the areas across the country which the British Lung Foundation has identified as “hotspots” for COPD.

Knowsley is included as a “hotspot” area, along with Liverpool and Manchester in the North West.
**Hospital Admission Rates for COPD**

Figure 14 – Directly Standardised Hospital Admission Rates for COPD, 1997-2006

Figure 14 above shows that Knowsley has a significantly higher hospital admission rate for COPD than the North West and England. Since 2001-03, COPD admission rates have increased by more than 15% in Knowsley and are twice the rate in the North West and 175% higher than England.

Figure 15 – Hospital Admission Rates for COPD by Area Partnership Board, 2004-06

Figure 15 shows that three area partnership boards in Knowsley have a hospital admission rate for COPD that is significantly higher than Knowsley as a whole (North Kirkby, South Kirkby and North Huyton). Conversely, the remaining three area partnership boards are significantly lower than the Knowsley rate. The highest rate is found in North Kirkby and is more than twice the lowest rate in South Huyton.
Figure 16 – Areas with the Highest Hospital Admission Rates for COPD

Figure 16 shows the trends for the three Area Partnership Boards with a significantly higher hospital admission rate than Knowsley as a whole. North Kirkby had the highest hospital admission rate for COPD in 2004-06, however, the hospital admission rate for COPD has fallen in each of the last two reporting periods and the gap between North Kirkby and Knowsley has reduced by 45% since 1997-99. South Kirkby also showed a reduction in 2004-06 after three consecutive increases, but North Huyton continued to increase, further widening the gap between the area and Knowsley as a whole.

Figure 17 – Hospital Admission Rates for COPD in North Kirkby’s Electoral Wards

There are seven wards in Knowsley with a significantly higher rate of hospital admissions for COPD than Knowsley as a whole, with four of these being in Kirkby: Cherryfield, Northwood, Park and Whitefield (Figures 17 and 18). Two electoral wards in North Kirkby are significantly higher than Knowsley, namely Northwood and Park. Figure
17 shows that Northwood has the highest rate of hospital admissions for COPD in North Kirkby (760.0 admissions per 100,000 population) although the rate fell in 2004-06. Park electoral ward has seen an increase in hospital admission rates in each year since 2001-03 and as a result has become significantly higher than Knowsley as a whole.

In South Kirkby, all three electoral wards have higher hospital admission rates for COPD than Knowsley as a whole with two being significantly higher, Whitefield and Cherryfield. Whitefield had the highest rate in 2004-06 but decreased for the first time since 1997-99. Cherryfield ward has seen an increase in each of the last five years, but Kirkby Central’s rate fell markedly in 2004-06 and it is now not significantly high.

The other three electoral wards with a significantly high rate of COPD hospital admissions can be found in Huyton: Longview, Page Moss and Stockbridge – all in North Huyton.

There is a large industrial estate in Kirkby, and local people have been concerned that this may be the cause of the high rates of COPD in the area. However, hospital admission rates for COPD have reduced in North Kirkby and South Kirkby, but increased in North Huyton. North Huyton has similar levels of deprivation and smoking rates to Kirkby, but there is no industrial estate in North Huyton. This would indicate that the high rates in Kirkby are less likely to be due to environmental factors coming from the industrial estate, and more likely to be due to people’s past working or smoking history.
**COPD Mortality Trends**

![Graph showing COPD mortality trends](image)

**Figure 19 – COPD Mortality Trends in Knowsley, 1995-2006**

*Note: it was not possible to calculate national and regional COPD trends prior to 2001 due to the change from ICD-9 to ICD-10 codes.*

COPD mortality in Knowsley is approximately the same in 2004-06 as it was in 1995-97. In the meanwhile, the mortality rate has peaked at a high of 66.3 deaths per 100,000 in 1998-2000 and fallen by 17% to 55.1 deaths in 2004-06. Knowsley has significantly higher mortality from COPD compared with the North West and nationally. Since COPD can take 20 or more years to develop within a person’s lungs, these high rates reflect people’s working and living conditions (and smoking rates) in the 1980’s and earlier.

### Conclusions

- Knowsley is a national ‘hotspot’ for COPD
- Hospital admission rates for COPD in Knowsley are much higher than the national and regional rates. They have increased in the past four years and are now higher than they were in 1997.
- Hospital admission rates for COPD are highest in North Kirkby, South Kirkby and North Huyton. However, rates have reduced in North Kirkby and South Kirkby but increased in North Huyton. This would indicate that the factors leading to the high rates in Kirkby are less likely to be current environmental factors coming from the industrial estate, and more likely to be due to people’s past working or smoking history.
- Mortality trends for COPD in Knowsley have not reflected these increasing hospital admission rates. This may indicate improving hospital care for people with COPD, and/or that more people are being admitted to hospital with COPD, when in the past they would have been treated at home. The new intermediate care service for people with COPD may reduce hospital admission rates.
**Epidemiology**

Asthma is an inflammatory disorder of the airways which causes attacks of wheezing, shortness of breath, chest tightness, and coughing. When an asthma attack occurs, the muscles surrounding the airways become tight and the lining of the air passages swells. This reduces the amount of air that can pass by, and can lead to wheezing sounds.

In sensitive individuals, asthma symptoms can be triggered by breathing in allergy-causing substances (called allergens). These can include pet hair, dust mites, cockroaches, moulds and pollens. Asthma symptoms can also be triggered by respiratory infection, exercise, cold air, tobacco smoke and other pollutants, stress, food or drug allergies.

Asthma is the most common chronic disease of children.

**Hospital Admissions for Asthma**

![Graph showing hospital admissions for asthma in Knowsley, All Persons, All Ages, 1997-99 to 2004-06](image)

**Figure 20 – Directly Standardised Hospital Admission Rates for Asthma, 1995-2006**

Hospital admissions for asthma in Knowsley have increased since 1999-2001 by 37%, compared with 11% in the North West and 6% in England. Knowsley’s hospital admission rate is now 44% above that of the North West and 91% above that of England as a whole. According to Asthma UK the North West Region has the highest hospital admission rates for asthma in the country, and Knowsley has the third highest admission rate in the region, after Oldham and Liverpool.
Figure 21 – Hospital Admission Rates for Asthma by Area Partnership Board, 2004-06

Figure 21 shows that three Area Partnership Board areas have a hospital admission rate for asthma that is higher than the Knowsley rate: South Kirkby, North Kirkby and North Huyton. In 2004-06, South Kirkby had a rate significantly higher than Knowsley as a whole.

Figure 22 – Areas with the Highest Hospital Admission Rates for Asthma

Hospital admission rates for asthma in South Kirkby have increased since 1999-2001 and are now significantly higher than the rates for Knowsley as a whole. North Kirkby and North Huyton also have rates that are higher than Knowsley as a whole, although not significantly so.
Figure 23 – Hospital Admission Rates for Asthma in North Kirkby Electoral Wards

There are only three electoral wards, all in Kirkby, in the whole of Knowsley with a hospital admission rate for asthma that are significantly higher than the Borough rate: Kirkby Central, Northwood and Whitefield. Northwood is in North Kirkby and has a similar rate in 2004-06 compared with 1997-99. The hospital admission rate for asthma in Northwood has increased in each of the last three years from a low in 2001-03.

Figure 24 – Hospital Admission Rates for Asthma in South Kirkby Electoral Wards

Two of the three electoral wards with a significantly higher hospital admission rate for asthma are in the South Kirkby area: Whitefield and Kirkby Central. Whitefield electoral ward has the highest asthma hospital admission rate at 481.8 per 100,000 population and has
increased each year since 2000-02. Similarly, Kirkby Central’s hospital admission rate for asthma has increased each year since 1999-01.

Other wards in the Borough where hospital admission rates for asthma are increasing include Page Moss, Longview, St Bartholomew’s, Roby, St Gabriels, Prescot West and Halewood North.

**Asthma deaths**

![Asthma Deaths in Knowsley, 1995-2006](image)

Figure 25 – Asthma Deaths in Knowsley 1995-2006

The number of deaths from asthma each year is small, varying between two and six a year. There is no trend of an increase in deaths.

**Childhood Asthma Admissions**

![Childhood Hospital Admissions for Asthma in Kirkby per 1,000 Population](image)

Figure 26 – Childhood Asthma Admissions in Kirkby and PWCKV
If there is a specific environmental factor leading to respiratory disease, this is most likely to show up in exacerbations of childhood asthma.

Childhood asthma admissions in Knowsley have remained relatively steady over the period shown in figure 26, but increased in 2004-06.

Childhood asthma admission rates in South Kirkby have steadily increased since 2000-2002, while they have remained about the same in North Kirkby. Both areas in Kirkby show lower rates than the Knowsley average (North Kirkby is significantly lower), whereas the rate for Prescot, Whiston, Cronton & Knowsley Village has been consistently higher than the Knowsley average over the period shown in the chart, and has been increasing.

**Conclusions**

- Hospital admission rates for asthma have increased by 37% in Knowsley, since 1999-2001. The rates are highest in North Kirkby, South Kirkby and North Huyton. The rates have increased most markedly in Northwood, Whitefield and Kirkby Central wards. They have also increased in North Huyton.

- There has been a steady increase in hospital admissions for asthma in children in the South Kirkby wards since 2000-2002, but not in North Kirkby. The highest hospital admission rates for asthma in children in the Borough are in Prescot, Whiston, Cronton and Knowsley Village, and these have also been increasing, at a similar rate as in South Kirkby. The factors causing this need further investigation.
(iv) Pneumonia

Epidemiology

Pneumonia is an inflammatory disease of the lungs. It can result from a variety of causes including infection with bacteria, viruses, fungi or parasites, and chemical or physical injury to the lungs. Typical symptoms include cough, chest pain, fever and difficulty in breathing.

Pneumonia is a common illness which occurs in all age groups and is a leading cause of death among the elderly and people who are chronically or terminally ill.

People with chronic respiratory disease are more likely to get pneumonia. It is not likely to be caused by air pollution.

Hospital Admissions

![Graph showing hospital admissions rates for pneumonia in Knowsley, North West England, and England from 1997-99 to 2004-06.](image)

Figure 27 – Directly Standardised Admissions for Pneumonia, 2004-06

Hospital admission rates in Knowsley for pneumonia have steadily increased since 1999-01 and have risen by 71% since 1997-99. However, they reduced slightly in 2004-06. Regionally, hospital admission rates for pneumonia have also increased by 71% since 1997-99 which has led to the rate surpassing the England rate which has increased less quickly (32%) since 1997-99.
South Kirkby has the highest hospital admission rate for pneumonia in Knowsley out of the six area partnership boards. In contrast, South Huyton experiences a hospital admission rate for pneumonia that is significantly lower than Knowsley as a whole.

Figure 29 shows that in South Kirkby the hospital admission rate for pneumonia had increased for 3 consecutive years from 2000-2002, but fell in 2004-06. Similarly, rates in North Kirkby and North Huyton are now decreasing.
In Knowsley, four electoral wards have a significantly higher rate of hospital admissions for pneumonia than the Borough as a whole. Three electoral wards are located in Kirkby (Kirkby Central, Northwood and Whitefield) and the other is in Huyton (Longview). Northwood electoral ward has been consistently higher than the Knowsley as a whole, but decreased in 2004-06.

Trends for Kirkby Central and Whitefield can be seen in figure 31. This shows that hospital admission rates for Kirkby Central have increased each year since 1997-99 but rates for Whitefield have fallen in 2004-06 after three years of increases.
Mortality Rates

Figure 32 – Mortality Rates for Pneumonia for Persons of All Ages

Although hospital admission rates have been rising for pneumonia, figure 32 shows that between 1995-97 and 2004-06, mortality from pneumonia in Knowsley has fallen by 36%. As a result, the mortality rate in Knowsley is now not significantly different to the rate regionally or nationally. This must reflect improved management of the disease.

Conclusions

- Hospital admission rates for pneumonia in Knowsley reflect the Regional pattern of an increase of 71% since 1997-99. The highest rates are in South Kirkby and South Huyton. The rates showed a decrease in most Kirkby wards in 2004-06, except Kirkby Central, where they continued to increase.

- Mortality rates for pneumonia have decreased down to regional levels, which must reflect improved management of the disease.

- There is no need to continue to monitor levels of pneumonia, as part of the work of the Health Advisory Group.
3. LUNG CANCER

*Epidemiology*

The commonest form of lung cancer is a malignant growth of the lining of the airways.

Around 90% of all lung cancer cases are caused by tobacco smoking. Research has consistently shown that non-smokers are put at risk by exposure to other people’s smoke.

Lung cancer has one of the lowest survival outcomes of any cancer because over two-thirds of patients are diagnosed at a late stage when curative treatment is not possible.

The most important risk factors for lung cancer are:

- Tobacco smoking
- Radon gas (not an issue within Knowsley housing)
- Family history (close relatives with lung cancer)
- Industrial exposure to carcinogens
- Nitrogen oxides from traffic increase the risk slightly

It takes at least ten years for lung cancer to develop in the body after exposure to a cancer-causing agents such as tobacco smoke. Any lung cancer currently being diagnosed will be the result of either smoking, or exposure to other cancer-causing agents in the 1990s or earlier.

*Mortality rates*

![Figure 33 – Lung Cancer Mortality Trends in Knowsley, 1995-2006](image-url)
Lung cancer mortality in Knowsley has decreased by 28% over the nine-year period between 1995-97 and 2004-06. In addition to this, the gap between the mortality rate of Knowsley and England has reduced by 35%. However, the mortality rate for lung cancer increased slightly in 2004-06 and is still significantly higher than nationally.

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Figure 34 – Lung Cancer Mortality Trends for Areas in Knowsley, 1995-2006

Lung cancer mortality in Kirkby has decreased by 39% in four years between 2001-03 (a peak of 93.2 deaths per 100,000 population) and 2004-06. The latest data in 2004-06 shows that the lung cancer mortality rate in Kirkby is not significantly different to the rest of the Borough for the first time since 1999-2001. The reason for the sharp increase is unclear, since it would be due to factors experienced by Knowsley residents ten to fifteen years ago. The Liverpool Lung Project (see below) may be able to provide more information on this in the future, based on analysis of people’s occupational and smoking histories.
Lung cancer mortality for males in Kirkby has decreased by 51% between 1995-97 and 2004-06. The Kirkby rate is only slightly higher than the rest of the Borough and has fallen in each of the last three years. It is therefore not statistically significant.

From a peak of 87.2 deaths per 100,000 population in 2000-02, lung cancer mortality for females has fallen by 39% in Kirkby over the intervening four years. The mortality rate is markedly higher than that for the rest of the Borough but is not significantly so.
Standardised Mortality Ratios (SMRs)

Figure 37 – Standardised Mortality Ratios in Knowsley for Lung Cancer, 2004-06

Ten Knowsley electoral wards have SMRs for lung cancer significantly higher than the national average, although only one ward, Page Moss, is significantly higher than the whole of Knowsley. Of these ten wards, five are in Kirkby (Cherryfield, Kirkby Central, Northwood, Park and Whitefield), three are in Huyton (Longview, Page Moss and Stockbridge) and two are in Halewood (Halewood South and Halewood West).

Liverpool Lung Project

The Roy Castle Lung Cancer Foundation is undertaking an ambitious research project looking into the causes of lung cancer in Liverpool and Knowsley.

The main objectives of the Liverpool Lung Project are as follows:-

- Increase understanding of interactions between different risk factors for lung cancer
- Develop an individual molecular-epidemiological risk assessment model for identification of high-risk individuals
- Identify early detection markers for lung cancer

Approximately 1,000 primary lung cancer cases have been used in the pilot in Knowsley and the population has been matched for age and gender. The Borough has been split into three distinct areas: North (Kirkby), Central (Huyton & Knowsley Village) and South (Prescot, Whiston, Halewood and Cronton).

The data collected showed the following significant differences (at the 95% level of significance) between the areas in Knowsley: -
• **Education** – Significantly higher proportions of people with no qualifications in North and Central Knowsley, 68.1% and 68.5% respectively, compared with the South (56.2%).

• **Socioeconomic Status** – Significantly higher proportions of people in “Managerial and professional” professions in the South (21.2%) compared with the North (9.8%) and Central (13.9%) areas. Similarly, the South area of Knowsley has a significantly low proportion of people in “Semi-routine & routine” professions (37.7%) compared with the rest of the Borough (44.7% in the North and 52.7% in the Central area).

• **Smoking Status** – Significantly low proportion of smokers in the South (9.6%) compared with the North and Central areas, 25.1% and 18.6% respectively. Similarly, a significantly high proportion of people who have never smoked in the South, 40.3% compared with 27.7% in the North and 30.2% in the Central area.

• **Smoking duration** – Significantly higher proportion of people who have smoked for more than 20 years in the North (53.7%) and Central (53.3%) areas compared with the South of the Borough (37.2%).

• **Smoking pack years** – Significantly lower proportion of people who have 30+ smoking pack-years (i.e. number of packs smoked per day times number of years smoked) in the South of the Borough (18.4%) compared with the North (29.5%) and Central (29.0%) areas.

• **Self-reported bronchitis** – Significantly higher proportion of people in North Knowsley (28.7%) who reported having bronchitis compared with the rest of the Borough: 21.6% in Central Knowsley; 22.0% in South Knowsley.

There will be more detailed information coming from the results of this project in future years.

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**Conclusions**

- Mortality rates for lung cancer in Knowsley are very high. The highest rates are in Page Moss, Stockbridge Village and Kirkby Central. There was an unexplained sharp increase in lung cancer deaths in Kirkby between 2002-04 and 2003-05. Rates in Kirkby are now no longer significantly higher than the Borough average.

- The Liverpool Lung Project should in the future provide a wealth of data on the factors causing lung cancer in Knowsley.
4. SMOKING PREVALENCE

Introduction

The Knowsley Smoking Prevalence Survey was carried out in Kirkby during August 2006 and then across the rest of the Borough during April / May 2007. In total, 8,564 street interviews were undertaken with Knowsley residents using a questionnaire that was developed from the Tobacco Control Research Center (Pierce, 2006).

Results

Overall the survey showed that 32.6% of (adult) Knowsley residents currently smoke. This compares with a national average of 24%. Smoking prevalence across the Borough varies greatly by electoral ward with the highest numbers occurring in Page Moss (46.5%) and Shevington electoral wards (46.4%) and the lowest in Roby electoral ward (12.6%).

The following maps indicate the similarities between the areas with high rates of smoking, and the areas with high rates of COPD and lung cancer. It must be borne in mind that COPD and lung cancer take a number of years to develop after a person has exposure to tobacco smoke, and the smoking rates in a particular area will have changed over the past 20 years.
Map 2: Smoking Prevalence in Knowsley, 2007

Map 3: Directly Standardised Hospital Admission Rates for COPD in Knowsley, 2004-06

Map 4: Lung Cancer Standardised Mortality Ratios in Knowsley, 2004-06

Source: Hoshin
Figure 38 – Smoking Prevalence by Electoral Ward in Knowsley, 2007

Figure 38 shows that the areas of highest smoking prevalence occur in the areas that tend to be the most socially deprived, e.g. Kirkby and North Huyton. Conversely, the areas with lowest prevalence can be found in South Huyton and North Halewood. Smoking is related to social class, with managers and professionals smoking the least. The survey found that there was a strong relationship between high levels of smoking and economic inactivity.

In contrast to the national picture, women are more likely to smoke than men and on average they smoke more cigarettes per day.

55.5% of residents in Knowsley have smoked at some stage during their lives, i.e., they are current smokers or ex-smokers. The highest proportion of residents who have ever smoked (70.6%) can be found in Stockbridge electoral ward in North Huyton. Overall, 22.9% of the adult population are ex-smokers in Knowsley.

Of the adult population who smoke daily in Knowsley, 41.5% are considered as heavy smokers, i.e., they smoke 20 or more cigarettes per day.

Conclusions

- The areas with high levels of respiratory disease and lung cancer in Knowsley are the areas with high levels of smoking. These also reflect high levels of people who are economically inactive.

- Levels of smoking are still much higher than the national average, particularly in women, which is a concern in relation to future patterns of respiratory disease.
5. ENVIRONMENTAL HEALTH

Air Pollution

Background Air Pollution Data Maps contained within the UK Air Quality Archive have been used to estimate pollution levels in the Borough in areas where monitoring data is not available.

<table>
<thead>
<tr>
<th>Pollutant</th>
<th>Pollutant Concentrations ug/m3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nitrogen Dioxide</td>
<td>21.3</td>
</tr>
<tr>
<td>PM10</td>
<td>20.9</td>
</tr>
</tbody>
</table>

Table 1 Average Annual Mean Pollutant Concentrations for Kirkby from Background Maps based on 2005 predicted data

Table 1 details some of the information available for the Kirkby area from the review and assessment of air quality. From the table it is evident that the Annual Mean Air Quality Standards for Nitrogen Dioxide and PM10 (40 ug/m3 respectively) are unlikely to be breached in the Kirkby area.

A number of methods are used to obtain accurate pollutant estimates and these include: construction of emissions inventories and computer modelling of emissions using the inventory as a base. The inventory is regularly updated to take account of for example traffic growth and changes to industrial processes. Based on this work traffic emissions are shown to be the dominant source of pollution in the Borough. Location of monitoring equipment has reflected the need to investigate potential “hot spots” of traffic pollutants (PM 10, Nitrogen dioxide).

KPCT and KMBC have been working to develop the air quality monitoring capability in Kirkby using a variety of monitoring methods and provide environmental data. Work has progressed in providing a greater degree of monitoring capability across the Kirkby area and in the near future reliable and accurate environmental data will become available as a result of the purchase of new monitoring equipment to replace existing equipment which was coming to the end of its useable life.

The refurbished station now monitors Nitrogen Dioxide, Particulate Matter (PM10 and PM2.5*) and a variety of metrological parameters. The station is in the process of being moved from its current base at Page Moss One Stop Shop in Huyton to Northwood House, Briery Hey Avenue, and Kirkby. Useful comparative background data have been collected over the 6 months April to September particularly with regard to PM10 and PM2.5 which are the pollutants most closely associated with respiratory health issues. This data will act as a baseline to compare future monitoring information gained for the Northwood area.

Evidence suggests that PM 2.5 might better represent the toxic fraction of particulate air pollution, and that a PM 2.5 standard may be a
desirable objective. The European Commission has proposed the adoption of a PM 2.5 air quality objective to be achieved by 2010. The installation of equipment to measure the fine particulate matter (PM2.5) means that Knowsley will be able to gather data ahead of the Air quality Standard and Objective for PM 2.5 coming into force. Little is known about the concentrations of PM 2.5 because currently there is only an Air quality objective for PM 10. Data gathered at the urban background site in Huyton will provide a comparator for results from Kirkby.

The standards permit a number of exceedences to occur however provided the specified number is not exceeded the results are reported as meeting the standard. In Knowsley’s case there has never been a number of exceedences that amount to a breach of the standards although there have been some short term periods of elevated levels of pollutants.

**Regulation of Industrial Air Pollution in Kirkby**

Integrated Pollution Prevention and Control (IPPC) is a regulatory system used by the Environment Agency and the Local Authority to ensure that particular industries take action to ensure "an integrated approach to pollution control" in order to achieve "a high level of protection for the environment as a whole".

The IPPC Regulations came into force in September 1996. There are currently 14 processes located in Kirkby which are subject to this regulatory regime and permitted by the Council. The Environment Agency currently regulates 13 installations in Kirkby, two of which are waste facilities. The majority of these processes are located on the Kirkby Industrial Estate. The Environmental Health and Consumer Protection Service hold a public register of information relating to all authorised IPPC processes located in the borough. The information contained within the register covers the application for authorisation to operate, the authorisation itself, information on the level of compliance with emissions standards and any monitoring data specific to the process.

Emission monitoring results are required to be reported and the results are kept on the public register. Any breach of standards is investigated and appropriate action is taken by the regulator to ensure that the reasons for the breach are determined and measures are put in place by the operator to bring the process back into compliance.

The responsibility for the control of industrial air pollution in the U.K. is divided between the Environment Agency and local authorities. The Environment Agency is responsible for controlling the larger industrial processes which have the greatest potential to cause pollution (Part A processes). Local authorities control what could be classed as the medium potentially polluting processes (Part B processes). Operators of both Part A and Part B processes must obtain the relevant permit
from the appropriate enforcing authority. To do this they must demonstrate that they are using the best available techniques to minimise emissions.

The tables and map below show the locations of Part A and Part B processes in Kirkby. It can be seen that most are on the Knowsley Industrial Estate.
### Part A Process List - Kirkby

<table>
<thead>
<tr>
<th>No.</th>
<th>Company Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Baker Hughes</td>
<td>Kirkby Bank Road Kirkby Industrial Park, L33 7SY</td>
</tr>
<tr>
<td>2</td>
<td>Contract Chemicals (Knowsley) Ltd</td>
<td>Penrhyn Road Kirkby Industrial Park, L34 9HY</td>
</tr>
<tr>
<td>3</td>
<td>Kiddie Kerr</td>
<td>Ashcroft Road Kirkby Industrial Park, L33 7TS</td>
</tr>
<tr>
<td>4</td>
<td>Kodak Ltd</td>
<td>Acornfield Road Kirkby Industrial Park, L33 7UF</td>
</tr>
<tr>
<td>5</td>
<td>Rentokil</td>
<td>Webber Road Kirkby Industrial Park, L33 7SR</td>
</tr>
<tr>
<td>6</td>
<td>Syntor Fine Chemicals Ltd</td>
<td>Woodward Road Kirkby Industrial Park, L33 7UZ</td>
</tr>
</tbody>
</table>

Table 2

### Part B Process List - Kirkby

<table>
<thead>
<tr>
<th>No.</th>
<th>Company Name</th>
<th>Address</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Rockfield Engineering</td>
<td>Gale Road, Kirkby. L33 7YE.</td>
</tr>
<tr>
<td>2</td>
<td>First Choice Concrete &amp; Skip Hire Ltd</td>
<td>Arbour Lane, Kirkby. L33 7XB.</td>
</tr>
<tr>
<td>3</td>
<td>North West Fencing Products</td>
<td>Bradman Road, Knowsley Ind. Est., Kirkby. L33 7UL.</td>
</tr>
<tr>
<td>4</td>
<td>DAMS International,</td>
<td>Gores Road, Kirkby. L33 7YB.</td>
</tr>
<tr>
<td>5</td>
<td>DAMS International</td>
<td>Marl Road, Kirkby. L33 7UH.</td>
</tr>
<tr>
<td>6</td>
<td>Eldapoint Ltd</td>
<td>Charleywood Road, Kirkby. L33 7SG.</td>
</tr>
<tr>
<td>7</td>
<td>Sonae (UK) Ltd</td>
<td>Moss Lane, Kirkby. L33 1AA</td>
</tr>
<tr>
<td>8</td>
<td>Boundary Plant</td>
<td>Bradman Road, Kirkby. L33 7YB.</td>
</tr>
<tr>
<td>9</td>
<td>Product Release</td>
<td>Cusson Road, Kirkby. L33 7UD</td>
</tr>
<tr>
<td>10</td>
<td>Stackright Building Systems</td>
<td>Charleywood Road, Kirkby. L33 7SG.</td>
</tr>
<tr>
<td>11</td>
<td>Texaco</td>
<td>Gale Road, Kirkby. L62 7ET.</td>
</tr>
<tr>
<td>12</td>
<td>Total Westvale Service Station</td>
<td>Whitefield Drive, Westvale, Kirkby. L32 0UX</td>
</tr>
<tr>
<td>13</td>
<td>Shell Service Station</td>
<td>Longmoor Lane, Fazakerley L18 1LF.</td>
</tr>
</tbody>
</table>

Table 3
Contaminated Land

Members of the public have raised the potential for exposure to pollutants in land to be a further potential cause of ill health. Kirkby has a very short history in terms of industrial development and was a sparsely populated farming community until the Second World War. During the wars years the industrial estate we now know as Knowsley Industrial Park was developed as a Royal Ordnance Factory which manufactured munitions for the war effort. At the end of the war the estate was taken over by a number of industrial and commercial uses.

As land becomes available for redevelopment or when alterations are made to existing premises the Council requires site investigations and risk assessments to be carried out to demonstrate that the land is suitable for the proposed use. These investigations take into account not only the Royal Ordnance Factory use but any subsequent potentially contaminative use the land has been put to. The estate has not been subject to a systematic inspection however the body of information built up from site investigations during development has shown that the land is capable of use for commercial and industrial purposes. No site has so far been deemed too difficult to deal with that redevelopment cannot take place.

The housing areas are generally situated on land that has not had a previous contaminative use. Although there is the potential for contamination to remain on industrial sites that have yet to be investigated or developed, in order for those contaminants to present a threat there has to be a source, pathway and receptor relationship. What this means is that the contaminant has to be in a form that can reach the person/s it could cause harm to. In general for the contaminants to present a risk there would have to be contact with the substances through disturbance of the ground they are present in. As this type of exposure is only likely to occur to construction workers or others excavating the industrial land the risk to the general public is very low. The relevance of work history and occupational exposure are discussed elsewhere in this report.

Summary

The work in the field of Environmental Health provides information on the potential for factors in the environment other than “lifestyle” factors to impact on respiratory health. Location of an air quality monitoring station in Kirkby makes it possible to test the accuracy of the data relied upon in previous reviews and assessments of air quality and helps in the detection of pollution episodes. All previous information is encouraging in that air quality in Kirkby is good and there has been no need to declare any Air Quality Management Areas. This data does not however assist in assessing the historic situation which is dealt with in other sections of this report.
A systematic approach to the assessment of contaminated land will help to identify any past and current pollution of land that may have had/be having an influence on health. Kirkby is fortunate in that the majority of it was rural until relatively recently (in contaminated land terms) and the population is generally located on land that has not had a previous contaminative use.

**Conclusions**

- Any industries which could potentially cause pollution in Knowsley are closely regulated, either by the Environment Agency or by the Council. Extra environmental monitoring is now being developed in Kirkby.
6. HISTORY OF KIRKBY

Introduction

Kirkby was the second ‘complete community unit’ planned by Liverpool City Council to address housing shortages in the city centre. This chapter provides an overview of the development of Kirkby in relation to some of the broader determinants of health, including housing and environment. The chapter is based on information from a range of records, reports and other documents.

While the development of Kirkby had much in common with that of other overspill estates and formally designated New Towns, there were also a number of significant differences. All of the new housing, for example, was public sector, with almost the entire stock allocated by Liverpool City Council. In addition, the population was comparatively homogenous in terms of social class and skills levels.

This led to what A.G. Plant (The History of Kirkby, 1988) described as an ‘unfortunate’ social structure, with few middle class residents to provide the ‘leadership and social balance’ needed for a new town.

According to another report, there was an element of truth in the description of Kirkby in the 1960s as a prime example of ‘mistaken overspill development’. For example, vandalism was committed by ‘large numbers of teenagers with no inner city distractions’ and no respect for the bleak environment. (Kirkby Joint Study, 1982, p16)

A timeline of the history and development of Kirkby is contained in Appendix B.

Population Profile

In the 10 years between 1951 and 1961, the population of Kirkby rose rapidly from 3,145 to 52,088. Children and young people made up a high proportion of the population. In the early 1960s, 50% of the population were under 15. The population peaked at 59,918 in 1971, since when it has declined, with slight fluctuations, to the current estimate of 42,900 (Figure 39).
A large proportion of migrants to Kirkby came from two distinct districts of Liverpool: the Crown Street area of Abercromby, Low Hill and Smithdown wards and Vauxhall. Both areas were close to the city centre and were reported to have close-knit communities. Married children often lived with or very near their parents. The Vauxhall area also included a high proportion of descendents of Irish immigrants.

**Housing and Community Facilities**

The original plan was for three roughly equal neighbourhoods around a town centre. Building began in Southdene in 1952. Westvale and Northwood followed, with a total of 10,000 dwellings completed by 1959.

A relatively small number of houses were allocated to key workers from across the country, who were needed for the developing industries. All other allocations were made by Liverpool City Council to families on their waiting list. In the early years, allocation was on the basis of housing need, such as overcrowding, rather than specifically for slum clearance.

As the population grew, it became clear there was a risk of overcrowding on the new estates. In the 1960s an additional estate was built at Tower Hill, on the northern edge of the town.

By the 1970s, many homes across the area were suffering from the effects of the building methods used. In particular, many were cold and damp with condensation problems. Over the years, some of the original housing has been demolished and existing homes improved.

Sixteen new schools were needed for the large number of children and young people in the original new town. At the peak of development, the town also had 15 churches, 13 pubs, 12 doctors’ surgeries, 3 clinics and 6 banks. There had been criticism, however, that the provision of amenities did not keep pace with the rate of housing development and
population influx. For example, the first permanent shops were not opened until 1955. Daily food needs were often met by mobile shops on the estates, while residents returned to Liverpool for other shopping.

**Development of North Huyton**

Earlier chapters have identified North Huyton as also having higher levels of deaths from respiratory disease and cancer than Knowsley as a whole. There are similarities in the way North Huyton and Kirkby were developed to provide housing for people from Liverpool. Development in North Huyton started earlier – in the 1930s- and was at a slower pace, partly because of World War Two. Stockbridge Village was added in the 1960s. Many of the residents who moved to North Huyton came from the same parts of Liverpool as those who moved to Kirkby.

**Employment in Kirkby**

Prior to World War II, employment in Kirkby was almost entirely linked to agriculture. At the start of the War, a Royal Ordnance Factory was built in the area to manufacture munitions. The large complex included 1,000 buildings, 18 miles of road and 23 miles of railway lines. There were 32,000 workers when production was at its height. The majority commuted from surrounding towns, although a small number of houses were built alongside the factory for administrative and senior staff.

Waste materials were burned and/or buried on site and the resulting ash/clinker spread on the site. Materials on site included explosives (e.g. TNT, cordite, Tetryl) asbestos and metals.

When the factory closed, Liverpool City Council began to develop an industrial estate on the site. In 1947, industries on the site included paint manufacture, kitchen cabinets, aluminium products and engineering works. It was the presence of these employment opportunities which helped identify Kirkby as the location for housing development. However, many migrants either chose to continue working in Liverpool – often in the docks or heavy industry near their old homes - or did not have the skills to get jobs in the new Kirkby industries.

In the late 1950s, industries in Kirkby were mainly heavy metal and traditional engineering. As the industrial estate developed and extended beyond the Royal Ordnance Factory site, the range of businesses grew to include lighter engineering, electrical, food processing, warehousing, storage, transport and sales. Employment opportunities on the estate peaked in 1971 (Table 4), although new jobs were created through the development of other business and industrial estates on the edges of the town.
Kirkby Industrial Estate (former Royal Ordnance Factory site only)

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of Firms</th>
<th>Number of Employees</th>
</tr>
</thead>
<tbody>
<tr>
<td>1953</td>
<td>130</td>
<td>7,500</td>
</tr>
<tr>
<td>1958</td>
<td></td>
<td>12,000</td>
</tr>
<tr>
<td>1971</td>
<td>145</td>
<td>26,458</td>
</tr>
<tr>
<td>1976</td>
<td></td>
<td>22,903</td>
</tr>
<tr>
<td>1988</td>
<td></td>
<td>14,529</td>
</tr>
</tbody>
</table>

Table 4 (Plant, 1988)

A recent reminiscence project with men in Knowsley recorded some of the working conditions experienced in and around the Borough. Some processes included use of asbestos, others produced metal filings. Workers were not always given protective clothing or equipment. It is possible many of the unskilled Kirkby workers undertook tasks such as cleaning machinery and manufacturing areas, increasing their exposure to potentially health damaging materials.

According to the 1961 Census, the largest occupational group for Knowsley residents was engineering and electrical goods, followed by metal manufacture and food, drink and tobacco. The 10% sample from the 1971 Census gave the largest employment group as manufacturing.

In the early 1970s, there were more jobs in Kirkby (34,000) than there were economically active residents (26,000). Fewer people were returning to Liverpool to work: 45% in 1971, compared with 57% in 1961. Yet at the same time, unemployment was increasing. It was particularly high among young people, with reports of whole cohorts of school leavers unable to get jobs (Kirkby Reporter 26/7/1972). By the end of the decade, unemployment for all ages was increasing, reaching almost 4,000.

At the 1981 Census, there were 7,155 unemployed. Five years later, unemployment was at 27.4%, with the rate in the 16-24 age group at 80%. Unemployment was high nationally as a result of economic decline, but the situation was exacerbated in Kirkby. While this was due in part to the population age profile, it was also the result of major job losses from factory closures in the town. Among the first to close were Cadbury Schweppes and Fisher Bendix in the 1970s. More closures followed in the 1970s and 1980s, including Birds Eye, Williams Harvey, Albright and Wilson, Hygena, Massey Ferguson and Pendletons.

Over the next 10 years the unemployment count was more than halved, although the population also reduced by 15% during the same period. Since then unemployment has continued to decline (Figure 40). However, an increasing number of residents have moved out of the labour market onto other benefits such as Incapacity Benefit. In
In 2007, there were 1238 Kirkby residents receiving Jobseekers Allowance and 4440 on incapacity benefit.

![Kirkby Unemployment Count](image)

Figure 40 – Kirkby Unemployed Count

Of those residents in work, the main occupations are in Elementary & Process, Plant & Machine operative employment. Approximately 9605 Kirkby residents continue to travel out of the Borough to work.

**Employment in North Huyton**

Residents in North Huyton have also experienced high levels of unemployment for many years. Unlike Kirkby, however, the area has never had its own industrial estate. Many residents again returned to Liverpool to work at the docks and in heavy industry. Some travelled in the opposite direction to work as miners.

In 2007, there were 1,075 North Huyton residents receiving Jobseekers Allowance and 3,118 on Incapacity Benefit. Of those in work, the main occupations are in the retail and motor trade (14.3%) and manufacturing (13.6%). Just over half of residents (55%) continue to travel out of the Borough to work.

**Conclusion**

- Many Kirkby residents who are now suffering from respiratory disease have lived through the period of unsuitable housing in the 1970s and economic decline in the 1980s in the area. A combination of poor living conditions and unemployment will have contributed to more people having an unhealthy lifestyle. There is a similar history in North Huyton, where levels of respiratory disease are also high.
7. DISCUSSION

The Health Advisory Group was set up because of a recommendation from the 2006 Health Protection Unit report, investigating the high incidence of respiratory disease and lung cancer in Kirkby.

Having now examined the situation in more detail, it is clear that there is a problem with respiratory disease in Knowsley, but that this is not just a problem in Kirkby; there are also concerns in other parts of the Borough, notably North Huyton for COPD and asthma, and Prescot, Whiston, Cronton and Knowsley Village for asthma in children. Despite increasing hospital admissions, deaths from respiratory diseases are not increasing. Death rates are reducing for pneumonia and for lung cancer, and they are staying about the same for COPD and asthma. Increasing hospital admission rates may reflect changes in patterns of management of COPD. There is now a new intermediate care service for COPD in the Borough; this should improve management of COPD in the community, and reduce hospital admissions. This needs to be closely monitored.

We now have detailed information on smoking prevalence for each ward across the Borough. This helps to make it clear that the areas with the worst problems with respiratory disease (Kirkby and North Huyton) are also the areas where smoking levels are the highest, and where there has been a history of high levels of smoking in the past. These are also the areas which have suffered most through the economic decline of the 1970s and 1980s. Many of the people who are now suffering badly with chronic respiratory problems are those who would have been of working age during that time.

It is of concern that hospital admission rates for asthma are increasing in the Borough at a faster rate than they are nationally or regionally. The areas where this problem is worst are in Kirkby and in North Huyton. It is possible that improved management of this condition within the community could help to reduce these hospital admissions. According to Asthma UK\(^8\), national and international guidelines for asthma state that:

- People with asthma should expect their condition to be adequately controlled by their medicine
- They should expect to be free from symptoms and restrictions on their lives
- They should not need emergency treatment if appropriate routine care is given

Hospital admission rates for **childhood** asthma seem to be increasing across the Borough, and they are particularly high in the Area Partnership of Prescot, Whiston, Cronton and Knowsley Village. It is unclear whether this is due to external factors causing exacerbations of asthma, or whether it indicates a need for improved community care and patient education.
The data viewed does not indicate that recent environmental factors are the cause of the high rates of respiratory disease in Kirkby. Similar patterns of disease are being seen in other parts of the Borough (eg North Huyton) which are not close to an industrial estate, but which have similar levels of smoking and of deprivation. The causes are much more likely to be due to occupational factors in the past, along with the high smoking rates.

Local people who live in Kirkby, however, will say that we do not have evidence that air pollution from the industrial estate will not affect people’s health in the future. It is important that we continue to monitor both air pollution and respiratory disease in the area.
8. SUMMARY OF CONCLUSIONS

Respiratory Disease

- The increase in hospital admissions due to respiratory disease is not only being seen in Knowsley; it is happening across the North West Region.

- Hospital admission rates for respiratory disease are highest in North Huyton and South Kirkby.

- Hospital admission rates for respiratory disease are increasing significantly in North Huyton and North Kirkby.

Chronic Obstructive Pulmonary Disease

- Knowsley is a national 'hotspot' for COPD.

- Hospital admission rates for COPD in Knowsley are much higher than the national and regional rates. They have increased in the past four years and are now higher than they were in 1997.

- Hospital admission rates for COPD are highest in North Kirkby, South Kirkby and North Huyton. However, rates have reduced in North Kirkby and South Kirkby but increased in North Huyton. This would indicate that the factors leading to the high rates in Kirkby are less likely to be current environmental factors coming from the industrial estate, and more likely to be due to people's past working or smoking history.

- Mortality trends for COPD in Knowsley have not reflected these increasing hospital admission rates. This may indicate improving hospital care for people with COPD, and/or that more people are being admitted to hospital with COPD, when in the past they would have been treated at home. The new intermediate care service for people with COPD may reduce hospital admission rates.

Asthma

- Hospital admission rates for asthma have increased by 37% in Knowsley, since 1999-2001. The rates are highest in North Kirkby, South Kirkby and North Huyton. The rates have increased most markedly in Northwood, Whitefield and Kirkby Central wards. They have also increased in North Huyton.

- There has been a steady increase in hospital admissions for asthma in children in the South Kirkby wards since 2000-2002, but not in North Kirkby. The highest hospital admission rates for asthma in children in the Borough are in Prescot, Whiston, Croniton and...
Knowsley Village, and these have also been increasing, at a similar rate as in South Kirkby. The factors causing this need further investigation.

**Pneumonia**

- Hospital admission rates for pneumonia in Knowsley reflect the Regional pattern of an increase of 71% since 1997-99. The highest rates are in South Kirkby and South Huyton. The rates showed a decrease in most Kirkby wards in 2004-06, except Kirkby Central, where they continued to increase.

- Mortality rates for pneumonia have decreased down to regional levels, which must reflect improved management of the disease.

- There is no need to continue to monitor levels of pneumonia, as part of the work of the Health Advisory Group.

**Lung Cancer**

- Mortality rates for lung cancer in Knowsley are very high. The highest rates are in Page Moss, Stockbridge Village and Kirkby Central. There was an unexplained sharp increase in lung cancer deaths in Kirkby between 2002-04 and 2003-05. Rates in Kirkby are now no longer significantly higher than the Borough average.

- The Liverpool Lung Project should in the future provide a wealth of data on the factors causing lung cancer in Knowsley.

**Smoking Prevalence**

- The areas with high levels of respiratory disease and lung cancer in Knowsley are the areas with high levels of smoking. These also reflect high levels of people who are economically inactive.

- Levels of smoking are still much higher than the national average, particularly in women, which is a concern in relation to future patterns of respiratory disease.

**Environmental Health**

- Any industries which could potentially cause pollution in Knowsley are closely regulated, either by the Environment Agency or by the Council. Extra environmental monitoring is now being developed in Kirkby.

**History of Kirkby**

- Many Kirkby residents who are now suffering from respiratory disease have lived through the period of unsuitable housing in the
1970s and economic decline in the 1980s in the area. A combination of poor living conditions and unemployment will have contributed to more people having an unhealthy lifestyle. There is a similar history in North Huyton, where levels of respiratory disease are also high.
9. **RECOMMENDATIONS**

- That the findings from this report are summarised, and shared with key stakeholders and local people.

- That the impact of the new intermediate respiratory care service on hospital admissions for COPD is closely monitored.

- That improved management of asthma in both adults and children, and the education of parents and patients about asthma, is given higher priority within Knowsley.

- That the high rates of hospital admission for asthma in children in Prescot, Whiston, Cronon and Knowsley Village are explored further.

- That continued high priority is given to supporting people to give up smoking, especially in Kirkby and North Huyton.

- That air monitoring in Kirkby should continue for at least one full year.

- That the Health Advisory Group should continue to monitor respiratory disease in Kirkby.
References


2. “Analysis of Routine Health Data to Assess the Respiratory of Health of Residents of Northwood, Knowsley”, Cheshire and Merseyside Health Protection Unit, 2006


4. Invisible Lives Chronic Obstructive Pulmonary Disease (COPD) – finding the missing millions. British Lung Foundation


APPENDIX A

Knowsley Electoral Wards and Area Partnership Boards
## History of Kirkby

<table>
<thead>
<tr>
<th>Century</th>
<th>Event</th>
</tr>
</thead>
<tbody>
<tr>
<td>c10th Century</td>
<td>Chapel and Settlement</td>
</tr>
<tr>
<td>11th Century</td>
<td>Population c70 - 200</td>
</tr>
<tr>
<td>16th Century</td>
<td>Molyneux family (later the Earls of Sefton) buy surrounding farm land</td>
</tr>
<tr>
<td>19th Century</td>
<td>• Liverpool – Bolton/Bury railway opened – passed through Kirkby</td>
</tr>
<tr>
<td></td>
<td>• Waterworks built to serve St. Helens</td>
</tr>
<tr>
<td>early 20th Century</td>
<td>• Rural - no industry other than farming</td>
</tr>
<tr>
<td></td>
<td>• Population c 1,000</td>
</tr>
<tr>
<td>1930s</td>
<td>• 1939 Royal Ordnance Factory built on site of 12 farms</td>
</tr>
<tr>
<td>1940s</td>
<td>• 1940 – 1946 Royal Ordnance Factory in operation</td>
</tr>
<tr>
<td></td>
<td>• 1944 – two major explosions at factory</td>
</tr>
<tr>
<td></td>
<td>• Liverpool City Council leased ROF site for trading estate</td>
</tr>
<tr>
<td></td>
<td>• 1947 – Molyneux land bought by Liverpool Corporation for housing</td>
</tr>
<tr>
<td>1950s</td>
<td>• Agricultural parish in Whiston Rural District</td>
</tr>
<tr>
<td></td>
<td>• Population c 3,000</td>
</tr>
<tr>
<td></td>
<td>• Housing estates built at Southdene, Westvale and Northwood</td>
</tr>
<tr>
<td></td>
<td>• 1958 – Kirkby Urban District Council created</td>
</tr>
<tr>
<td>1960s</td>
<td>• Population at 1961 Census 52,207</td>
</tr>
<tr>
<td></td>
<td>• Housing Estate built at Tower Hill</td>
</tr>
<tr>
<td></td>
<td>• 11,000 dwellings</td>
</tr>
<tr>
<td></td>
<td>• 120 factories</td>
</tr>
<tr>
<td></td>
<td>• Workforce c 15,000</td>
</tr>
<tr>
<td>1970s</td>
<td>• Unemployment reaches almost 4,000</td>
</tr>
<tr>
<td></td>
<td>• Factory strikes, closures and sit-ins</td>
</tr>
<tr>
<td></td>
<td>• High youth unemployment</td>
</tr>
<tr>
<td></td>
<td>• Poor housing conditions</td>
</tr>
<tr>
<td></td>
<td>• Families in crisis</td>
</tr>
<tr>
<td></td>
<td>• Frequent reports of pollution</td>
</tr>
<tr>
<td></td>
<td>• 1974 – Knowsley MBC created</td>
</tr>
<tr>
<td>1980s</td>
<td>• Population at Census 51,111</td>
</tr>
<tr>
<td></td>
<td>• Unemployed at Census 7,155</td>
</tr>
<tr>
<td></td>
<td>• More factory closures</td>
</tr>
<tr>
<td></td>
<td>• Unemployment peaks at 27.4%</td>
</tr>
<tr>
<td>1990s</td>
<td>• Population at Census 43,341</td>
</tr>
<tr>
<td></td>
<td>• Unemployed at Census 5,014</td>
</tr>
<tr>
<td>2000 onwards</td>
<td>• Population at Census 40,371</td>
</tr>
<tr>
<td></td>
<td>• Unemployed average less than 2,000</td>
</tr>
</tbody>
</table>
### APPENDIX C

#### MEMBERS OF THE HEALTH ADVISORY GROUP

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diana Forrest</td>
<td>Director of Public Health (Chair)</td>
</tr>
<tr>
<td>Matt Ashton</td>
<td>Public Health Development Specialist</td>
</tr>
<tr>
<td>Mary Farrell</td>
<td>Public Health Development Manager</td>
</tr>
<tr>
<td>Paul Langton</td>
<td>Public Health Intelligence Manager</td>
</tr>
<tr>
<td>Ben O’Brien</td>
<td>Assistant Director of Marketing &amp; Communications</td>
</tr>
<tr>
<td>Anne Crabtree</td>
<td>Arts in Health Officer</td>
</tr>
<tr>
<td>John Baxter</td>
<td>Environmental Protection Manager, Public Health and Consumer Protection, KMBC</td>
</tr>
<tr>
<td>Richard Jarvis</td>
<td>Consultant in Communicable Disease Control, Health Protection Agency</td>
</tr>
<tr>
<td>Alex Keenan</td>
<td>Epidemiology and Surveillance Analyst, Health Protection Unit</td>
</tr>
<tr>
<td>Vinay Bothra</td>
<td>Specialist Registrar in Public Health, Health Protection Unit</td>
</tr>
<tr>
<td>Anjila Shah</td>
<td>Specialist Registrar in Public Health, Health Protection Unit</td>
</tr>
<tr>
<td>Adrian Cassidy</td>
<td>Roy Castle Lung Cancer Research Programme, LJMU</td>
</tr>
<tr>
<td>Gordon Whitaker</td>
<td>Environment Agency</td>
</tr>
<tr>
<td>Keith Osborn</td>
<td>Chief Scientist – United Utilities</td>
</tr>
</tbody>
</table>
ACKNOWLEDGMENTS

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Thanks also to Dr Lisa Davies and Dr Rob Angus, respiratory consultants from Aintree hospital, for their advice on the report.