Executive Summary
The data and information collated in this needs assessment have raised a number of issues around the clinical pathway for people in Luton with Chronic Obstructive Pulmonary Disease (COPD). This needs assessment does not look at other respiratory diseases such as asthma.

Respiratory diseases (which includes COPD) are responsible for a similar number of deaths in Luton and more admissions to hospital compared to England many of which could be prevented by a change in lifestyle. Mortality due to respiratory disease however is decreasing in Luton.

The main risk factor for respiratory disease is smoking. Stopping smoking can reduce the risk of developing a respiratory disease or reduce the risk of hospital admissions in patients who already have a respiratory disease.

Disease management in people with respiratory disease in Luton is worse than in England and in Luton’ statistical neighbours. Uptake of flu vaccine in at risk groups e.g. the elderly and pregnant women is quite low and could be improved.

Prevention and risk factors
- Data around prevention shows that the most cost effective interventions are; annual flu vaccinations, smoking cessation support and pulmonary rehabilitation
- Luton’s uptake of flu vaccines is significantly lower for COPD patients than England and most comparator neighbours
- When this is broken down into at-risk groups, Luton fails to meet the target of 75% uptake in the 65+ age group and has an uptake of between 41% and 51% for all other at-risk groups

Prevalence
- In 2014/15 recorded prevalence of all cancers in Luton (1.5%) was significantly lower than England (2.3%)
- There are large differences in prevalence between GP practices
Hospital admissions

- Figure 25 shows the emergency admissions for respiratory conditions by age and gender. Most concerning are the high rates of emergency admissions in the 0-4 years age group. Rates decrease after the 5-9 age group and then begin to increase again for the 65+ age group.

Disease management

- Forced expiratory volume (FEV1) checks for patients with COPD in the last 12 months was 81% in 2013-14. This is significantly lower than England and all other statistical neighbours.

Mortality

- Premature mortality due to COPD in Luton is similar in males and females to national figures.
- Trend data for Luton from 2001-2003 to the most recently available 2011-13 shows that overall, the rate of premature death from respiratory disease has decreased from 49 per 100,000 population to 36 per 100,000 population.

Recommendations

Prevention

Physical activity, health eating, reducing tobacco use and alcohol misuse plan will have significant impact on reducing prevalence- these actions would be taken forward in those strategies.

Primary care should use Make Every Contact Count (MECC) to provide brief advice and support to have an impact on these i.e. referral onto lifestyle interventions, smoking, weight loss etc. (again address through the above) and Audit C alcohol screening.

Primary care increase both “flu” and pneumococcal vaccinations in at-risk patients and learn methods of best practice from practices that are achieving or exceeding the Luton target.

Diagnosis and Screening

Public campaign to raise awareness of signs and symptoms of COPD.

Increase the number of patients diagnosed using spirometry in primary care.
Target practices with low prevalence and focus on at-risk groups to help identify undiagnosed patients and those not recorded on the COPD register.

Improve exception reporting by encouraging patients to attend scheduled appointments.

**Disease Management**

Strive to ensure all patients on the disease register attend a regular/annual COPD review to include assessment of breathlessness using MRC dyspnoea scale, lung function and assessment of inhaled therapy technique if appropriate.

Pulmonary rehabilitation is also shown to be a cost effective intervention. There are two services provided in Luton. One based in the community and ones based at the Luton & Dunstable Hospital. It has been noted in section 8.2 that 249 places (95%) of the 262 places available are being utilised. The target for Luton is 406 places and it is also noted that the drop-out rate for patients is high. GPs therefore need to increase the number of patients they refer to the service and, in turn, the service will need to increase the capacity to ensure that it is equipped to cope with the increase in workload.

Ensure all patients have personalised care plans to effectively manage their COPD and any other comorbidities. Bundle of care plan would be beneficial to patients especially complex case patients or those having left hospital.

Ensure patients have support of respiratory specialist nurse to help manage acute exacerbations.

Ensure that triple therapy is reserved for patients for whom it is appropriate: for people with severe disease who have persistent exacerbations despite using either inhaled corticosteroids (ICS)/long-acting bronchodilator (LABA) or long-acting muscarinic antagonist (LAMA).

Address the management of asthma in young children through the appropriate respiratory team. Ensure that children’s illness is appropriately managed with correct treatment to reduce the number of emergency admissions. Work to reduce all admissions to hospital for COPD related conditions.

**Training and Education**

Learn methods of best practice from practices that are achieving well, develop nurse forums to enable sharing of best practice develop a system wide training plan to support the delivery of improved patient outcomes.

Self-care is important and COPD patients need to be made aware that they are also responsible for attending reviews.

The high admission rate for young children will be related to respiratory conditions such as asthma and need to be addressed within the paediatric respiratory team.
1. Respiratory Disease

Respiratory tract diseases are diseases that affect the air passages, including the nasal passages, the bronchi and the lungs. They range from acute infections, such as pneumonia and bronchitis, to chronic conditions such as chronic obstructive pulmonary disease (COPD), asthma, tuberculosis (TB), pulmonary hypertension and occupational lung diseases (World Health Organisation (WHO) 2013). Respiratory Disease affects one in five people in the UK and is responsible for around a million hospital admissions and is the third biggest cause of death in the UK (ONS 2012).

The objectives of this respiratory disease Health Needs Assessment for Luton are to:

- Provide a profile of respiratory disease risk, prevalence, hospital admissions, mortality, interventions and outcomes in Luton, comparing available local data and analyses with national and similar local authority/CCG benchmarks
- Highlight any issues that warrant further investigation
- Makes recommendations which are likely to help improve outcomes of the issues surrounding respiratory disease in the future

2. Demographics

The health of the population of Luton tends to be slightly poorer than the England average. The poorer health outcomes are linked primarily to the levels of socioeconomic deprivation experienced by a significant segment of the population. This section will describe the numbers and projected growth of the population; demographics (e.g. age, gender, and ethnicity); population movement in and out of the borough; deprivation and poverty.

2.1. Population

The latest (2014) Office for National Statistics (ONS) Mid-Year Population Estimate for Luton was 211,000. In recent years, there has been convergence between the ONS figures and those of the Council due, in the main, to improved accuracy of ONS data as a result of increased enumeration in the 2011 Census and the subsequent rebasing of population figures.

Figure 1 shows the most densely populated areas of Luton are in the centre of the town. With an area of 4,336 hectares, the official (ONS) population figure translates into a population density of 48 people per hectare. This figure is greater than many London Boroughs.
2.2 Population projections

Luton’s population is projected to grow significantly between 2011 and 2031, with the latest forecasts projecting growth of 25% in the next 20 years (LBC 2015). Key drivers for this are high levels of natural growth (more births than deaths) and international in-migration. Luton also has high population churn and a study found that 70% of the population in Luton in 2010 was either not born or not living in Luton at the time of the 2001 Census (Mayhew and Waples 2011).

Table 2 shows a summary of population projections for Luton. Key changes over the next 20 years are:

- Population of Luton is projected to increase by 50,400, a rise of 25%
- School age population (5-15 year olds) is projected to increase by 7,850, a rise of 26%
- Those aged 65-89 is projected to increase by 10,750 people, a rise of 47%
- Very elderly population (90+) is projected to increase by 1,450 people, a rise of 153%
Table 2.: Luton population projections by age from 2011 to 2031

<table>
<thead>
<tr>
<th>YEAR</th>
<th>0-4</th>
<th>5 to 15</th>
<th>16-17</th>
<th>18-64</th>
<th>65-89</th>
<th>90+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>16,700</td>
<td>30,150</td>
<td>5,400</td>
<td>127,400</td>
<td>23,050</td>
<td>950</td>
<td>203,650</td>
</tr>
<tr>
<td>2021</td>
<td>18,050</td>
<td>36,050</td>
<td>5,650</td>
<td>142,600</td>
<td>27,150</td>
<td>1,450</td>
<td>231,000</td>
</tr>
<tr>
<td>2031</td>
<td>18,650</td>
<td>38,000</td>
<td>6,600</td>
<td>154,550</td>
<td>33,800</td>
<td>2,400</td>
<td>254,050</td>
</tr>
</tbody>
</table>

2011-21 Change:
- 1,350
- 5,900
- 250
- 15,200
- 4,100
- 500
- 27,350

2011-31 % Change:
- 8.1%
- 19.6%
- 4.6%
- 11.9%
- 17.8%
- 52.6%
- 13.4%

2011-31 % Change:
- 11.7%
- 26.0%
- 22.2%
- 21.3%
- 46.6%
- 152.6%
- 24.7%

Proportions:

<table>
<thead>
<tr>
<th>YEAR</th>
<th>0-4</th>
<th>5 to 15</th>
<th>16-17</th>
<th>18-64</th>
<th>65-89</th>
<th>90+</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>8.2%</td>
<td>14.8%</td>
<td>2.7%</td>
<td>62.6%</td>
<td>11.3%</td>
<td>0.5%</td>
<td>100%</td>
</tr>
<tr>
<td>2021</td>
<td>7.8%</td>
<td>15.6%</td>
<td>2.5%</td>
<td>61.7%</td>
<td>11.8%</td>
<td>0.6%</td>
<td>100%</td>
</tr>
<tr>
<td>2031</td>
<td>7.3%</td>
<td>15.0%</td>
<td>2.6%</td>
<td>60.8%</td>
<td>13.3%</td>
<td>0.9%</td>
<td>100%</td>
</tr>
</tbody>
</table>

Source: Luton Borough Council using POPGROUP software and a ten year migration average. Components may not sum to totals due to rounding.

2.3 Ethnicity and migration

Figure 3 shows the board ethnic groups in the Luton population, with approximately 45% of the population being of Black and Minority Ethnic Origin (BME) or non-white. The ethnic composition of Luton fits a model known as ‘super-diversity’ in which there is an increasing number of BME communities within the population each with its own needs and cultures. Luton has a long history of migration into the area both from elsewhere in the UK and overseas. There have been long-standing African-Caribbean, Bangladeshi, Indian, Irish and Pakistani communities in Luton as a result of international migration. More recently, the migration patterns have become more complex. In the mid-1990s, the opening of the University of Luton (now the University of Bedfordshire) caused a rapid growth in the student population of the town. This growth has been sustained with an increase in numbers of overseas students.

In the mid-2000s, the expansion of the European Union led to a significant increase in migration from eastern European countries, particularly Poland and Lithuania. 7% of Luton’s population is classed as ‘other white’ which is the group for non-British or Irish Europeans (but this group also includes people from other parts of the world including Americas and Australasia) (England has 4.6% of the population in this category). There has also been in-migration from African countries such as the Congo, Ghana, Nigeria, Somalia and Zimbabwe. There is also a Turkish population in Luton. More recently, National Insurance Registration data has demonstrated further increases in international migration with Romanians moving to the town after the change in law allowing them the right to work in the UK at the beginning of 2014. Analyses of translation service data also highlighted the levels of diversity in the town by identifying over 120 languages or dialects being spoken by residents. This provides corroborating evidence of Luton being super-diverse.

5% of the total population of Luton are Black African or Black African heritage (England 2.1%) and 5.9% Black Caribbean or Black Caribbean heritage (England 1.9%). 14.4% of the population are Pakistani (England 2.1%), 6.7% Bangladeshi (England 0.8%) and 5.2% Indian (England 2.6%).
2.4 Deprivation

There is no single generally agreed definition of deprivation. Deprivation is a concept that overlaps, but is not synonymous with, poverty. Absolute poverty can be defined as the absence of the minimum resources for physical survival, whereas relative poverty relates this to the standards of living of a particular society at a specific time.

The Index of Multiple Deprivation 2015 produced by Communities and Local Government (CLG) combines a number of indicators, chosen to cover a range of economic, social and housing issues, into a single deprivation score for each small area in England. This allows each area to be ranked relative to each other according to their level of deprivation.

Luton is ranked as the 59th (out of 326) most deprived local authority. In 2010 Luton was ranked as the 69th most deprived local authority in 2007 as the 87th (out of 354 authorities) and in 2004 the 101st most deprived local authority. This indicates that Luton is becoming relatively more deprived in comparison to the other local authorities of England and the trend of has been happening since 2004. (Figure 4). Luton has nine output areas in the top ten per cent most deprived areas in the country. Three of these are in Northwell, two in Farley and South wards and one in Biscot and Dallow wards.
With the expected increase in older population, high deprivation and ethnic diversity in the borough, these are all risk factors that increase the likelihood of CVD.

3. Risk factors for Chronic Respiratory Disease
The identification of risk factors is an important step toward developing strategies for prevention and treatment of any disease. In the UK the most important risk factor for respiratory diseases is smoking.

Major risk factors for COPD include:
- tobacco smoke
- second hand tobacco smoke
- other indoor air pollutants
- outdoor air pollutants
- allergens
- occupational agents

Possible risk factors for COPD include:
- diet and nutrition
- post infectious chronic respiratory diseases

3.1 Global Burden of Respiratory Disease
The morbidity and mortality related to lung diseases is incredibly high (Table 1) (FIRS 2012). Hundreds of millions of people are burdened with chronic respiratory conditions; four million people
die prematurely from chronic respiratory diseases each year (Ferkol, 2013). Respiratory infections are the leading cause of death in developing countries.

Table 1: The big five global respiratory conditions 2013

<table>
<thead>
<tr>
<th>Disease</th>
<th>Major Preventable Risk Factors</th>
<th>Estimated Global Disease Frequency (millions)</th>
<th>Global Deaths Per Year (millions)</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>COPD</td>
<td>Cigarette smoking; indoor smoke; occupational gases and particles; outdoor air pollutants; asthma</td>
<td>200 (prevalence)</td>
<td>Unavailable</td>
<td>The 4th leading cause of death worldwide.</td>
</tr>
<tr>
<td>Asthma</td>
<td>Genetic predisposition; environmental allergens; air pollutants; dietary factors; abnormal immunological responses</td>
<td>235 (prevalence)</td>
<td>0.18</td>
<td>Increasing in prevalence worldwide.</td>
</tr>
<tr>
<td>Acute respiratory infections</td>
<td>Low immunization rates; poor nutrition; overcrowding; HIV infection.</td>
<td>Unavailable</td>
<td>4</td>
<td>The most common chronic disease of children. The leading overall cause of death in developing countries. Pneumonia is the leading cause of death of children under 5 yr of age. The greatest single contributor to the overall burden of disease in the world as measured by DALY lost.</td>
</tr>
<tr>
<td>TB</td>
<td>HIV infection; overcrowding.</td>
<td>8.7 (incidence)</td>
<td>1.4</td>
<td>Approximately 80% of global HIV-TB cases occur in Africa. Multidrug-resistant tuberculosis is increasing globally.</td>
</tr>
<tr>
<td>Lung cancer</td>
<td>Cigarette smoking; passive exposure to cigarette smoke; biomass fuel smoke; inhaled radon and asbestos</td>
<td>1.6 (incidence)</td>
<td>1.37</td>
<td>The most common cause of cancer death.</td>
</tr>
</tbody>
</table>

Source: Forum of International Respiratory Societies 2013

Although the Global Burden of Disease Study 2010 revealed fewer deaths related to lower respiratory tract infections than 2 decades ago, deaths are still high (Lim et al 2010). Tuberculosis infected an estimated 8.6 million and killed 1.3 million people in 2012, primarily in sub-Saharan Africa, where the human immunodeficiency virus epidemic continues unabated (WHO 2013). Infants and young children are especially susceptible to developing severe or disseminated tuberculosis. Multidrug-resistant tuberculosis is a growing problem, with about 450,000 new cases in 2012 that contributed to 170,000 deaths (Bryce et al 2005). Respiratory illnesses (including tuberculosis) account for one-quarter of all deaths in the world.

Asthma affects 235 million people worldwide and accounts for over 30% of all paediatric hospitalisations in the United States but impacts on the Quality of Life of many more. Its incidence is growing in both developed and developing countries (WHO 2013). It affects all ages, races, and ethnicities, although wide variation exists between countries and within different demographic groups. The burden of asthma is greatest in urban communities, related in part to environmental exposures and lack of access to care and effective medications, especially in low-income countries (WHO 2013).

Tobacco smoke, including passive smoke exposures, is a leading cause of the respiratory disease burden, along with air pollution and workplace exposure to unsafe air. Over two billion people are regularly exposed to the toxic effects of indoor and outdoor air pollution, which is responsible for 3.5 million premature deaths each year (WHO 2005).
Chronic obstructive pulmonary disease and lung cancer are leading causes of death worldwide, and their numbers are rising. Respiratory cancers cause 1.5 million deaths annually, which account for over 15% of all cancer related deaths (WHO 2006).

Respiratory illnesses are frequently avoidable, and prevention costs only a fraction of treatment. The ability to control and eliminate respiratory diseases worldwide relies on public health measures, which include increasing awareness, education, and capacity. Research is essential and improves understanding of disease processes, which then allows for better diagnoses, treatment, and prevention.

3.2 Chronic Obstructive Pulmonary Disease (COPD)

3.2.1 What is COPD
COPD is an umbrella term used to describe chronic lung disease that is characterised by airflow obstruction or limitation. It is now the most widely used term by clinicians for conditions previously known as having chronic bronchitis or emphysema or chronic unremitting asthma. The airflow obstruction is usually progressive, not fully reversible (unlike asthma) and does not change markedly over several months. It is treatable, but not curable; early diagnosis and treatment can markedly slow decline in lung function and hence lengthen the period in which someone can enjoy an active life (WHO 2012).

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 (WHO 2012).

3.2.2 Global burden of COPD
COPD is the fourth leading cause of death in the world and represents an important public health challenge that is both preventable and treatable (Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2014).

According to WHO estimates, 65 million people have moderate to severe chronic obstructive pulmonary disease (COPD). More than 3 million people died of COPD in 2012, which corresponds to 6% of all deaths globally. Most of the information available on COPD prevalence, morbidity and mortality comes from high-income countries. Even in those countries, accurate epidemiologic data on COPD are difficult and expensive to collect. It is known that almost 90% of COPD deaths occur in low- and middle-income countries (WHO 2012).

At one time, COPD was more common in men, but because of increased tobacco use among women in high-income countries and the higher risk of exposure to indoor air pollution (such as biomass fuel used for cooking and heating) in low-income countries, the disease now affects men and women almost equally (British Thoracic Society (BTS) 2016).

In 2002 COPD was the fifth leading cause of death. Total deaths from COPD are projected to increase by more than 30% in the next 10 years unless urgent action is taken to reduce the underlying risk factors, especially tobacco use. Estimates show that by 2030, COPD will be the third leading cause of death worldwide (BTS 2016).

3.2.3 National burden of COPD
In the UK, COPD leads to more than 27,000 deaths per year approximately 16% of patients admitted to hospital for COPD will die within three months, and almost a quarter will die within a year after admission (Groenwegen et al 2003).

There are currently an estimated 3 million people suffering from COPD in the UK (Stang et al 2000), and only about 900,000 of these patients have been diagnosed and are receiving treatment (Healthcare Commission 2006). Therefore, over 2 million patients are undiagnosed and unaware of a disease which could eventually kill them after years of substantial disability.
3.3 Prevention and Risk Factors

The risks of COPD are related to environmental exposures in combination with the genetic makeup of the individual. Key risk factors associated with COPD are listed below:

- The main risk factor for COPD is smoking. Between 80% and 90% of people with COPD are or used to be smokers (Mannino 2002). Being around others who smoke also plays a role in individuals developing COPD.
- There is also a strong association with deprivation (Hansall 2004). This is largely because of the link between increasing deprivation and increasing smoking rates.
- COPD is also linked to industrial exposure, such as gases, dust and vapours at work. This is estimated at 15% of attributable risk (Rushton 2004).
- In a very small number of cases, COPD is associated with particular genetic conditions. People who lack a protein called Alpha-1 Antitrypsin (AAT) may be more likely to develop the disease (Barnes 1999).
- There is debate about whether ethnicity is also a risk factor (Chantila 2004).

There are a number of risk factors associated with COPD, including those which we cannot change such as; genes and age. The HNA will focus on modifiable risk factors.

3.3.1 Smoking

Smoking is the primary cause of COPD and is thought to be responsible for up to 90% of cases. The lining of the airways becomes inflamed and permanently damaged by smoking and this damage cannot be reversed. The likelihood of developing COPD increases the more you smoke and the longer you’ve been smoking (NHS Choices 2015). Up to 25% of smokers develop COPD.

Prevalence of adult smoking in Luton in 2013 was 19.98%. The rate remained above the national average (18.5%) but was not significantly different. The number of smoking quitters recorded in 2014/15 was 761 from a total of 1,589 who set a quit date. The figure was the same for both males and females (48%). Although the number of smokers that set a quit date was low (17), the most successful intervention setting was the workplace with 65% successfully quitting compared to 53% in a GP setting, 45% in both pharmacy and community settings and 35% in a hospital setting.

Prevalence amongst routine and manual occupations is considerably higher than the rest of population in Luton at 29.1%, which is a contributing factor to health inequality. The rate is similar to comparator areas and the national average.

There is currently no data available for the number of patients who have a diagnosis of COPD that smoke. It is therefore not possible to identify the number of smoking COPD patients who have been signposted to smoking cessation services. Given the strong association between smoking and COPD, it would be useful to monitor this information. Figure 5 below, shows the percentage of patients with a recorded smoking status during the previous 12 months who have been diagnosed with selected conditions, these include; COPD, asthma, stroke, transient ischemic attack (TIA), hypertension, psychosis and other conditions. It shows that Luton patients have a statistically significant lower smoking rate than comparator areas. It is still a high figure, showing that 95% of patients with one or more of the conditions mentioned above are classed as smokers.

Figure 5: Smoking among patients with selected conditions
3.3.2 Obesity

Sedentary lifestyles pose a major challenge to the prevention of both obesity and chronic respiratory diseases such as asthma and COPD. Obesity is an important risk factor for respiratory diseases and generally, weight loss is associated with improved symptoms.

Once the disease progresses, it becomes more of a challenge to find effective weight loss strategies as patients with COPD are prone to sedentary lifestyles imposed by shortness of breath. It is therefore important that preventive measures are taken to refer all patients diagnosed with COPD or other respiratory diseases who are obese or at-risk of obesity to appropriate lifestyle management services (Poulain 2006).

3.3.3 Pneumococcal and Influenza Immunisations

Influenza is a serious disease that can lead to hospitalization and sometimes even death. Every flu season is different and the flu vaccine should be offered to at-risk groups on an annual basis. In Luton, almost 95% of COPD patients were administered with a flu vaccine (figure 6). This figure is significantly lower than England and comparator areas with the exception of Wolverhampton. Evidence suggests that COPD patients who receive the flu vaccine experience significantly fewer episodes of influenza-related acute respiratory illness. They also had fewer admissions to hospital, although this difference was not significant (Sehatzedah 2012).
The rate of influenza immunisation amongst 65 years and over is an average of 71.3% (figure 7). This falls just below the target of 75% and is slightly lower than the previous year’s average of 72%. There is huge variation between practices, which range from 44% to 96%. It may be beneficial to learn methods of best practice from practices that are achieving and exceeding the Luton target.
Immunisation uptake in both the at-risk population aged 16-64 years was 51% 2014/15 (figure 8) and 47% for uptake in pregnant women (figure 9). Again, there is huge variation between practices from 33-73% and 26-86% respectively.
Uptake of influenza immunisation amongst carers is also extremely low, with a Luton average of 41% for 2014/15 (figure 10), which is a decrease of 4% from the previous year.
There is also variation across practices for the pneumococcal immunisation (figure 11). The uptake of pneumococcal immunisation ranges from 26.5% to 90.5% of the eligible population. Some practices would benefit from learning methods of best practice from practices that are exceeding the Luton average of 67.5%.

Source: ImmForm, PHE, 2014-15 October 2014 to January 2015
A pneumococcal infection can affect anyone but some people are at higher risk of serious illness, including those aged 65 years and over. Those considered to be at-risk are eligible for NHS pneumococcal vaccination. People over-65 usually only need a single pneumococcal vaccination, which will protect for life, however, those with a long-term health condition may require a five-yearly vaccination depending on their underlying health problem (NHS Choices).

Figure 12 shows that the uptake of pneumococcal immunisations in Luton has continued to rise from 61.7% on 2010/11 to 67.5% in 2014/15. This is compared to a decrease in England uptake from 70.5% to 68.9% in 2013/14. Again, it is necessary for GP Practices to use a targeted approach to increase the uptake of pneumococcal immunisations.
4. Burden of Disease in Luton

4.1 Prevalence
In 2013/14, there were 2,626 people recorded on the primary care COPD disease register. This is a recorded prevalence of 1.20% (figure 13). The prevalence is ranked within the lowest fifth of all CCGs across the country (33 of 211). The rate of change in prevalence from 2009-10 to 2013-14 has increased at a slightly faster pace than England (19% compared to 17%). Modelling of prevalence suggests that there are almost 1,987 people with undiagnosed COPD across Luton.
Table 2 below shows the recorded prevalence of COPD over expected prevalence by GP practice. There remains a wide variation between practices ranging from 0.2 to 2.12, which suggests that some practices are better at identifying or coding COPD patients than others. The table shows that there are potentially, 1,995 patients who have COPD but are not diagnosed. Therefore, it is important to look at all practices and carry out a pro-active case finding exercise to identify patients that are at-risk of developing COPD and those that may already have COPD but have not been picked up in the system. Diagnosing patients appropriately will lead to fewer emergency admissions as the patient’s condition will be better managed with a personalised care plan.

A “Missing Thousand” exercise was recently carried out, which initially found that there were 1,967 patients on the QOF COPD register with 354 possible missing COPD patients. After a follow-up, the number of patients on QoF COPD registers increased to 2,162, which was an increase of 195 patients added to the register. The prevalence figures and the expected prevalence are lower than those stated in a PHE tool. This could be due to differences in analysis and also that the Missing Thousands didn’t include all practices in Luton. Therefore, for the purpose of this report, data shown in
Table will be used as the expected and registered prevalence.
The exception rate for some practices is high (figure 14). Exception rate is defined on QOF as:

- they could be patient or carer refusal of treatment
- a patient cancels or does not attend a consultation appointment
- a GPs advice that two types of medication or treatment methodology should not be administered simultaneously
- Patients can be excepted for a number of reasons and are usually the result of a patient or a GP decision at a personal level
Exceptions are only measured at indicator level, not condition level, as a patient could be excepted from more than one indicator within a condition, but would be counted more than once if these exceptions were summed.

Figure 14: Exception rate for all COPD indicators 2013-14 (Statistically different to Luton)

Source: HSCIC QOF

5. Management of Acute Exacerbations

Emergency admission rates are a useful process measure that reflects the quality of chronic disease management in the community. All patients with COPD are exposed to risk of acute exacerbations, requiring hospital admission, but ideally there should be developed plans in place in the community for when exacerbations takes place, so that patients either have pre-prescribed medication available, or have rapid access to primary care including the support of respiratory specialist nurses. Higher rates of emergency admission suggest poorer management of the disease in the community.

5.1 A&E Attendances

Data are available for 2012/13, 2013/14 and 2014/15. There were 167,737 attendances in total for Luton residents across the 3 years. Of these, 8,084 (4.8%) had a diagnosis code related to
respiratory issues. Diagnosis coding is not usually a mandatory field for A&E data and an unknown/not classifiable diagnosis equates to almost 9% of all A&E attendances for Luton residents. The data are shown in table 3.

Table 3: Proportion of Attendances Coded as Relating to Respiratory Disease

<table>
<thead>
<tr>
<th></th>
<th>2012-13</th>
<th>2013-14</th>
<th>2014-15</th>
</tr>
</thead>
<tbody>
<tr>
<td>All</td>
<td>52,612</td>
<td>54,382</td>
<td>60,743</td>
</tr>
<tr>
<td>Respiratory</td>
<td>2,643</td>
<td>2,594</td>
<td>2,847</td>
</tr>
<tr>
<td>% Respiratory</td>
<td>5.00%</td>
<td>4.80%</td>
<td>4.70%</td>
</tr>
</tbody>
</table>

Source: A&E Attendance Data, Luton CCG/CSU

Admissions for respiratory conditions has increased in 2014/15 by 7.7% from 2012-13 and by 9.8% from 2013-14 (2013-14 saw the lowest number of attendances for respiratory conditions) however the proportion of all attendances to A&E for respiratory conditions has fallen each year the data that are available.

The most common age for attendance for respiratory conditions is between 70 and 79 years. This is shown in figure 15. It is unclear what the reasons are for the rise in A&E attendances in persons aged 70-79 years so further exploration of the data is required. Traditionally, slightly more men than women attended A&E with respiratory conditions but this changed in 2014-15 when slightly more women than men attended, however, proportionally, the figure was the same for both male and females. This increase in the proportion of women attending A&E for respiratory conditions may reflect historic changes in smoking habits when smoking became more prevalent in women. This can be seen in figure 16.
Figure 15: Luton A&E attendances for Respiratory Conditions by age group 2012/13 - 2014/15 (All persons)

Source: A&E Attendance data, Luton CCG/CSU

Figure 16: Luton A&E attendances by gender 2012/13 - 2014/15

Source: A&E attendance data, Luton CCG/CSU
Nearly 90% of attendances were self-referrals and the arrival mode by ambulance was about two thirds of all attendances for respiratory conditions. This can be seen in and table 4 and table 5.

Table 4: Source of A&E Attendance for respiratory disease

<table>
<thead>
<tr>
<th>Source</th>
<th>2012-13</th>
<th>Percentage</th>
<th>2013-14</th>
<th>Percentage</th>
<th>2014-15</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Self referral</td>
<td>2,353</td>
<td>89.0%</td>
<td>2,290</td>
<td>88.3%</td>
<td>2,539</td>
<td>89.2%</td>
</tr>
<tr>
<td>General medical practitioner</td>
<td>212</td>
<td>8.0%</td>
<td>208</td>
<td>8.0%</td>
<td>218</td>
<td>7.7%</td>
</tr>
<tr>
<td>Local authority social services</td>
<td>46</td>
<td>1.7%</td>
<td>42</td>
<td>1.6%</td>
<td>50</td>
<td>1.8%</td>
</tr>
<tr>
<td>Other</td>
<td>13</td>
<td>0.5%</td>
<td>26</td>
<td>1.0%</td>
<td>21</td>
<td>0.7%</td>
</tr>
<tr>
<td>Emergency services</td>
<td>5</td>
<td>0.2%</td>
<td>12</td>
<td>0.5%</td>
<td>7</td>
<td>0.2%</td>
</tr>
<tr>
<td>Health care provider: same or other</td>
<td>5</td>
<td>0.2%</td>
<td>7</td>
<td>0.3%</td>
<td>6</td>
<td>0.2%</td>
</tr>
<tr>
<td>Police</td>
<td>2</td>
<td>0.1%</td>
<td>4</td>
<td>0.2%</td>
<td>5</td>
<td>0.2%</td>
</tr>
<tr>
<td>Work</td>
<td>5</td>
<td>0.2%</td>
<td>5</td>
<td>0.2%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>(blank)</td>
<td>2</td>
<td>0.1%</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
</tr>
<tr>
<td>Educational establishment</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td>1</td>
<td>0.04%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,643</strong></td>
<td><strong>2,594</strong></td>
<td><strong>2,847</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: A&E Attendances Data, Luton CCG/ CSU

Table 2: Method of Arrival to A&E for respiratory disease

<table>
<thead>
<tr>
<th>Arrival Method</th>
<th>2012-13</th>
<th>Percentage</th>
<th>2013-14</th>
<th>Percentage</th>
<th>2014-15</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brought in by ambulance</td>
<td>1,787</td>
<td>67.6%</td>
<td>1,818</td>
<td>70.1%</td>
<td>1,809</td>
<td>63.5%</td>
</tr>
<tr>
<td>Other</td>
<td>856</td>
<td>32.4%</td>
<td>776</td>
<td>29.9%</td>
<td>1,038</td>
<td>36.5%</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,643</strong></td>
<td><strong>2,594</strong></td>
<td><strong>2,847</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: A&E Attendances Data, Luton CCG/ CSU

Attendances were reasonably evenly spread across days of the week although for 2014-15 Wednesday was the most common day for an attendance to A&E. Friday for 2013-14 and Sunday during 2012-13.

More than 40% of attendances were seen for an initial assessment within 10 minutes and nearly 70% within 20 minutes. Over 99% were seen within 4 hours of arrival time. The data are shown in table 6. Over 85% spent less than 4 hours in A&E in total. There are some patients with no time of assessment or departure time and some patients have an assessment or departure time exactly 24 hours after the arrival time which suggests a coding issue.
Table 6: Wait Time in A&E to Initial Assessment

<table>
<thead>
<tr>
<th>Wait Time</th>
<th>2012-13</th>
<th>Percentage</th>
<th>Number</th>
<th>2013-14</th>
<th>Percentage</th>
<th>Number</th>
<th>2014-15</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>No Assessment time</td>
<td>32</td>
<td>1.2%</td>
<td>12</td>
<td>0.5%</td>
<td>13</td>
<td>0.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Less than 10 minutes</td>
<td>1,034</td>
<td>39.1%</td>
<td>1,293</td>
<td>49.8%</td>
<td>1,213</td>
<td>42.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 to 19 minutes</td>
<td>765</td>
<td>28.9%</td>
<td>726</td>
<td>28.0%</td>
<td>820</td>
<td>28.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 to 29 minutes</td>
<td>361</td>
<td>13.7%</td>
<td>282</td>
<td>10.9%</td>
<td>364</td>
<td>12.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 to 44 minutes</td>
<td>266</td>
<td>10.1%</td>
<td>171</td>
<td>6.6%</td>
<td>265</td>
<td>9.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 to 59 minutes</td>
<td>90</td>
<td>3.4%</td>
<td>57</td>
<td>2.2%</td>
<td>96</td>
<td>3.4%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 to 89 minutes</td>
<td>68</td>
<td>2.6%</td>
<td>27</td>
<td>1.0%</td>
<td>51</td>
<td>1.8%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 minutes to 2 hours</td>
<td>4</td>
<td>0.2%</td>
<td>2</td>
<td>0.1%</td>
<td>7</td>
<td>0.2%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 to 3 hours</td>
<td>3</td>
<td>0.1%</td>
<td>0</td>
<td>0.0%</td>
<td>2</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 to 4 hours</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 to 10 hours</td>
<td>1</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td>0</td>
<td>0.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 hours</td>
<td>19</td>
<td>0.7%</td>
<td>24</td>
<td>0.9%</td>
<td>16</td>
<td>0.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,643</strong></td>
<td></td>
<td><strong>2,594</strong></td>
<td></td>
<td><strong>2,847</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: A&E attendances data, Luton CCG/CSU

Time calculated from arrival time and time to initial assessment

Table 7: Total Time in A&E

<table>
<thead>
<tr>
<th>Total Time in A&amp;E</th>
<th>2012-13</th>
<th>Percentage</th>
<th>Number</th>
<th>2013-14</th>
<th>Percentage</th>
<th>Number</th>
<th>2014-15</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>Less than 10 minutes</td>
<td>161</td>
<td>6.1%</td>
<td>255</td>
<td>9.8%</td>
<td>72</td>
<td>2.5%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10 to 19 minutes</td>
<td>6</td>
<td>0.2%</td>
<td>17</td>
<td>0.7%</td>
<td>8</td>
<td>0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>20 to 29 minutes</td>
<td>9</td>
<td>0.3%</td>
<td>17</td>
<td>0.7%</td>
<td>8</td>
<td>0.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>30 to 44 minutes</td>
<td>22</td>
<td>0.8%</td>
<td>21</td>
<td>0.8%</td>
<td>21</td>
<td>0.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>45 to 59 minutes</td>
<td>20</td>
<td>0.8%</td>
<td>37</td>
<td>1.4%</td>
<td>25</td>
<td>0.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 to 89 minutes</td>
<td>102</td>
<td>3.9%</td>
<td>66</td>
<td>2.5%</td>
<td>86</td>
<td>3.0%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>90 minutes to 2 hours</td>
<td>112</td>
<td>4.2%</td>
<td>130</td>
<td>5.0%</td>
<td>133</td>
<td>4.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2 to 3 hours</td>
<td>488</td>
<td>18.5%</td>
<td>415</td>
<td>16.0%</td>
<td>500</td>
<td>17.6%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 to 4 hours</td>
<td>1369</td>
<td>51.8%</td>
<td>1279</td>
<td>49.3%</td>
<td>1676</td>
<td>58.9%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4 to 10 hours</td>
<td>215</td>
<td>8.1%</td>
<td>209</td>
<td>8.1%</td>
<td>277</td>
<td>9.7%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>10+ hours</td>
<td>11</td>
<td>0.4%</td>
<td>2</td>
<td>0.1%</td>
<td>4</td>
<td>0.1%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24 hours</td>
<td>128</td>
<td>4.8%</td>
<td>146</td>
<td>5.6%</td>
<td>37</td>
<td>1.3%</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>2,643</strong></td>
<td></td>
<td><strong>2,594</strong></td>
<td></td>
<td><strong>2,847</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: A&E attendances data, Luton CCG/CSU

Time calculated from arrival time and departure time

Table 8 shows how patients were discharged from A&E and over 60% were admitted to a hospital bed. The proportion of patients that were discharged with no follow up treatment has increased each year. This may indicate that more patients are utilising A&E as a primary care service and perhaps for episodes would be more appropriate to be dealt with by their GP.
Table 8: Discharge Method from A&E

<table>
<thead>
<tr>
<th>Discharge Method</th>
<th>2012-13</th>
<th></th>
<th>2013-14</th>
<th></th>
<th>2014-15</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
<td>Number</td>
<td>Percentage</td>
</tr>
<tr>
<td>Admitted to hospital bed / became a lodged patient</td>
<td>1,664</td>
<td>63.0%</td>
<td>1,644</td>
<td>63.4%</td>
<td>1,741</td>
<td>61.2%</td>
</tr>
<tr>
<td>of the same health care provider</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Discharged - did not require any follow-up treatment</td>
<td>890</td>
<td>33.7%</td>
<td>903</td>
<td>34.8%</td>
<td>1,039</td>
<td>36.5%</td>
</tr>
<tr>
<td>Discharged - follow-up treatment to be provided by</td>
<td>27</td>
<td>1.0%</td>
<td>18</td>
<td>0.7%</td>
<td>29</td>
<td>1.0%</td>
</tr>
<tr>
<td>general practitioner</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Left department before being treated</td>
<td>41</td>
<td>1.6%</td>
<td>9</td>
<td>0.3%</td>
<td>12</td>
<td>0.4%</td>
</tr>
<tr>
<td>Other discharge method</td>
<td>21</td>
<td>0.8%</td>
<td>20</td>
<td>0.8%</td>
<td>26</td>
<td>0.9%</td>
</tr>
<tr>
<td>Total</td>
<td>2,643</td>
<td></td>
<td>2,594</td>
<td></td>
<td>2,847</td>
<td></td>
</tr>
</tbody>
</table>

Source: A&E attendances data, Luton CCG/CSU

5.2 Respiratory Hospital Admissions

Figure 17 shows that of all hospital admissions related to COPD, in 2013/14, 17% of these were emergency admissions. This figure is higher than the England average and higher than each of Luton’s comparator areas. High rates of emergency admissions are associated with poorer management of the disease in the community and therefore highlights that improvements need to be made in both community and primary care.

Figure 17: Emergency admissions for COPD per 100 patients on the disease register 2013-14

Source: NHS England: Medicine’s Optimisation dashboard

Data are available for A&E respiratory admissions for the period 2012/13, 2013/14 and 2014/15. During the time between April 2012 and March 2015, there were 11,543 admissions for respiratory conditions.

Most emergency admissions (non-elective) for respiratory conditions occur in the winter months November to January each year as shown in figure 18.

Figure 18: A&E Admissions for Respiratory Conditions by Month 2012-2015
Figure 19 shows the emergency inpatient hospital stays for respiratory disease by age group. The population has been added to the hospital data. The largest of the 5 year age bands in terms of activity were the 0 to 4 year olds. Nearly half of all these admissions in this age group are aged less than one year. Although these will not be related to COPD, the high level of emergency admissions will need addressing by the paediatric respiratory team. Admissions then increase for the population over the age of 65 in males and 75 in females. There are more admissions for men than women in nearly all age groups until the 85+ population.

**Figure 19: Emergency Admissions for Respiratory Conditions by Age and Gender**

Monday is the most common day for admission for respiratory disease as seen in figure 20, it is Monday for COPD (figure 21). However when we look at the day of the week for admission for
asthma Wednesday is the most common day (figure 22) and Tuesday for pneumonia (figure 23). (N.B. based on 2014-15 data.) The days of an emergency admission for respiratory disease differ to the days of A&E attendances.

**Figure 20: Respiratory Admissions by Day of Week**

![Graph showing respiratory admissions by day of week](image)

**Figure 21: COPD Admissions by Day of Week**

![Graph showing COPD admissions by day of week](image)

**Figure 22: Asthma Admissions by Day of Week**

![Graph showing asthma admissions by day of week](image)
Table 8 shows the respiratory admissions by GP practice. The 4 practices with the smallest admission rates are the 4 largest populations. The 5 practices with the highest emergency admission rate for respiratory disease. The two practices with the highest rates are the same for each category of asthma, COPD and pneumonia. Practice populations and the number of admissions over the 3 years of data analysed are also shown.
Table 8: Practices with the Most Emergency Admissions for Respiratory Disease

<table>
<thead>
<tr>
<th>Practice</th>
<th>Total Population</th>
<th>Population Less than 18</th>
<th>Over Population</th>
<th>Respiratory Disease DMR</th>
<th>Asthma DMR</th>
<th>COPD DMR</th>
<th>Pneumonia DMR</th>
</tr>
</thead>
<tbody>
<tr>
<td>LEE GRAVE SURGERY</td>
<td>7776</td>
<td>1,503</td>
<td>1,775</td>
<td>3,456.1</td>
<td>237</td>
<td>22</td>
<td>329.0</td>
</tr>
<tr>
<td>THE BLenheim MEDICAL CENTRE</td>
<td>11,498</td>
<td>3,177</td>
<td>835</td>
<td>6,266.2</td>
<td>92</td>
<td>20</td>
<td>640.5</td>
</tr>
<tr>
<td>GARDINIA SURGERY</td>
<td>10,596</td>
<td>2,647</td>
<td>1,480</td>
<td>5,023.8</td>
<td>195</td>
<td>20</td>
<td>679.6</td>
</tr>
<tr>
<td>CONWAY MEDICAL CENTRE</td>
<td>8,020</td>
<td>2,871</td>
<td>979</td>
<td>8,775.8</td>
<td>287</td>
<td>30</td>
<td>597.3</td>
</tr>
<tr>
<td>HOWELL RING MEDICAL PRACTICE</td>
<td>5,888</td>
<td>1,679</td>
<td>469</td>
<td>9,523.4</td>
<td>350</td>
<td>26</td>
<td>282.8</td>
</tr>
<tr>
<td>LEE GRAVE ROAD MEDICAL PRACTICE</td>
<td>1,640</td>
<td>496</td>
<td>127</td>
<td>5,941.2</td>
<td>923</td>
<td>27</td>
<td>604.3</td>
</tr>
<tr>
<td>MALERBRO ROAD MEDICAL PRACTICE</td>
<td>2,858</td>
<td>1,084</td>
<td>189</td>
<td>5,545.5</td>
<td>565</td>
<td>23</td>
<td>428.3</td>
</tr>
<tr>
<td>NEVILLE ROAD SURGERY</td>
<td>2,766</td>
<td>874</td>
<td>195</td>
<td>4,851.1</td>
<td>483</td>
<td>7</td>
<td>182.4</td>
</tr>
<tr>
<td>PHOENIX PRIMARY CARE (SOUTH) LTD - KINGSWAY</td>
<td>8,464</td>
<td>2,710</td>
<td>513</td>
<td>6,252.0</td>
<td>654</td>
<td>28</td>
<td>692.0</td>
</tr>
<tr>
<td>THE TOWN CENTRE PRACTICE</td>
<td>5,680</td>
<td>1,972</td>
<td>67</td>
<td>3,855.8</td>
<td>558</td>
<td>6</td>
<td>450.3</td>
</tr>
<tr>
<td>MADEIRA MEDICAL CENTRE</td>
<td>2,299</td>
<td>811</td>
<td>135</td>
<td>8,007.7</td>
<td>362</td>
<td>31</td>
<td>381.5</td>
</tr>
<tr>
<td>WHIPPERLEY MEDICAL CENTRE</td>
<td>2,295</td>
<td>857</td>
<td>167</td>
<td>3,855.8</td>
<td>706</td>
<td>8</td>
<td>485.5</td>
</tr>
</tbody>
</table>

Source: Emergency Admissions 2012-15; Luton CCG, CCG, European Standard Population

Figure 24 shows COPD prevalence from 2013/14 and 3 years pooled emergency admissions data for 2012/13 to 2014/15. It shows that there is some correlation between the diagnosed and recorded prevalence and the number of emergency admissions for COPD. The correlation shows that around 23% of emergency admissions due to COPD can be explained by recorded prevalence of COPD.

Figure 24: Correlation of COPD prevalence and Emergency Admissions to Hospital for COPD

6. Disease Management

6.1 Diagnosis

Forced Expiratory Volume over 1 second (FEV1) is a key test for diagnosis of COPD. Figure 25 highlights that 90% of patients have had their diagnosis of COPD confirmed by using post bronchodilator spirometry between the 3 months prior or the 12 months after being placed onto the disease register. Luton is not significantly different to England or any comparator area. According to the Health and Social Care Information Centre, where patients have a long standing diagnosis of COPD and the clinical picture is clear, it would not be essential to confirm the diagnosis by spirometry. However, where there is doubt about the diagnosis, spirometry may be carried out for confirmation.
Regular monitoring of respiratory function for patients with COPD is important in order to identify patients that may benefit from pulmonary rehabilitation or continuous oxygen therapy. A record of FEV1 checks in the previous 12 months shows that Luton has a significantly lower rate of checks than England and comparator areas (figure 26): Only 80.3% of patients in Luton had a FEV1 check in the previous year. This is significantly lower than the England average (86.3%) and significantly lower than all comparator areas.

Source: Health and Social Care Information Centre Indicator Portal (P00987).

Figure 25: Percentage of patients diagnosed with COPD using post bronchodilator spirometry 2014/15

Source: Health and Social Care Information Centre Indicator Portal (P00987).

Figure 26: FEV1 checks for patients with COPD in the last 12 months 2013-14.

Source: Health and Social Care Information Centre Indicator Portal (P00988).
A COPD review should include an assessment of breathlessness using the Medical Research Council dyspnoea scale. The percentage of patients with COPD who have had a review in the preceding 12 months is 85%, which is significantly lower than England and all comparator areas figure 27. In order to help prevent deterioration of patients on the disease register, it is important that they regularly attend a thorough review of their COPD including; lung function, assessment of breathlessness and training or review of inhaled therapy if appropriate.

Figure 27: COPD review among patients with chronic obstructive pulmonary disease 2014/15.

There is no cure for chronic obstructive pulmonary disease (COPD), but treatment can help slow the progression of the condition and reduce the symptoms.

Spirometry is considered the gold standard for accurate and repeatable measurement of lung function. Making a diagnosis of COPD relies on clinical judgement based on a combination of history, physical examination and confirmation of the presence of airflow obstruction using spirometry. Diagnosis of COPD should be considered in any patient who has symptoms of a chronic cough, sputum production, dyspnoea (difficult or laboured breathing) and a history of exposure to risk factors for the disease (NICE 2010).

Evidence is emerging that when spirometry confirms a COPD diagnosis, doctors initiate more appropriate treatment. Spirometry is also helpful in making a diagnosis in patients with breathlessness and other respiratory symptoms and for screening in occupational environments.

Although the use of spirometers in primary care is increasing, uptake in some areas is still low. Epidemiologic studies confirm that both late diagnosis and under-diagnosis of COPD are common problems that wider use of spirometry could help to address (GOLD 2014).

Airflow obstruction is defined as a reduced FEV₁ (forced expiratory volume in 1 second) and a reduced FEV₁/FVC ratio (where FVC is forced vital capacity), such that FEV₁ is less than 80% predicted and FEV₁/FVC is less than 0.7. A low peak flow is consistent with COPD but may not be specific to COPD because it can be caused by other lung diseases and by poor performance during testing. Because COPD develops slowly, it is most frequently diagnosed in people aged 40 years or over.
6.2 Oxygen Therapy
As the COPD progresses patients often become hypoxemic. Many patients tolerate mild hypoxaemia well, but once the resting Partial pressure of oxygen in arterial blood (PaO2) falls below 8 kPa (kilopascal) patients begin to develop signs of right sided heart failure (otherwise known as cor pulmonale), which principally is peripheral oedema. Once this occurs the prognosis is poor and if untreated the 5 year survival is less than 50% (NICE 2010).

Oxygen should be used with caution in patients with COPD as some patient’s respiratory drive depends on their degree of hypoxia rather than the usual dependence on hypercapnia. Uncontrolled oxygen therapy can result in suppression of respiratory drive, carbon dioxide narcosis and ultimately respiratory arrest.

In stable COPD oxygen can be administered for long periods during the day and night (long term oxygen therapy (LTOT)), as ambulatory oxygen (either as part of LTOT or on its own to facilitate exercise) or as short burst therapy to relieve symptoms.

Long term oxygen therapy aims to improve survival in patients with COPD who have severe hypoxaemia (PaO2 < 8kPa) as well as reducing the incidence of polycythaemia, reducing the progression of pulmonary hypertension and improving neuropsychological health.

6.3 Pulmonary Rehabilitation
Pulmonary rehabilitation (PR) is a multidisciplinary programme of care for people with chronic respiratory impairment, individually tailored and designed to optimise each participant’s physical and social performance and autonomy. People with COPD make up the largest proportion of those referred to pulmonary rehabilitation.

Pulmonary rehabilitation is an increasingly popular and effective option for patients with moderate to severe COPD. There is good evidence about the benefits that pulmonary rehabilitation can produce. Published NICE guidance (2010) and a Cochrane meta-analysis (WHO 2014) have evidenced that pulmonary rehabilitation demonstrates improvements in health-related quality of life, reduces dyspnoea and increases exercise tolerance, reduces admissions to hospital and decreases the high re-admission rate seen in people with COPD.

Traditionally pulmonary rehabilitation courses have been run in secondary care settings, usually on an out-patient basis. Community based programmes also exist and there is good evidence on the content of the programme, but less information on the optimum duration or comparative efficacy in different settings. Luton currently offer a pulmonary rehabilitation service in both settings.

A recent report on Pulmonary Rehabilitation (PR) for Luton concluded that the capacity for the both of the pulmonary rehabilitation services (262 places) equates to only 64.5% of the local target of 406 places. In 2014/15, of the 262 places, 249 were being utilised (95%). The report recognised that although this figure is above the East of England average, access and referral rate to rehabilitation services needs to be improved. It is acknowledged that as PR is one of the most cost-effective treatments for COPD, that increasing the number of patients receiving PR will go towards demonstrating the benefits set out by NICE (2010) and the Cochrane Review and also potentially reducing the need for oxygen therapy and pharmacological treatments.

The report also found that the drop-out rate for the community rehabilitation service is considerably low. This is an area which needs to be addressed.
7. Local Burden of Respiratory Disease Mortality

Reducing premature mortality is part of the NHS planning guidance (NHS England 2013) and has the aim of supporting commissioners to reduce the number of potential years of life lost (PYLL) from potentially avoidable causes. Locally, in Luton, the Health and Wellbeing Strategy sets out to reduce health inequalities across the town and to prioritise prevention and early detection of conditions most strongly related to health inequalities including respiratory disease.

Figure shows that in Luton, premature deaths from respiratory disease for all persons are higher than the England average, although the difference is not statistically different. Similarly, the rate of premature mortality is not significantly different from comparator areas.

**Figure 28: Premature (less than 75 years) Deaths from Respiratory Disease 2011-13 All persons**

When broken down by gender, it can be seen that premature deaths for males (figure 29) in Luton is similar to the England average and that of all comparator areas with the exception of Redbridge, which is slightly lower. For females (figure 30), Luton’s rate of premature death (died before 75th birthday) from respiratory disease is similar with that of the England’s average and all of the comparator areas. The trend of premature mortality is shown in figure 31. Trend data for Luton from 2001-2003 to the most recently available 2011-13 shows that overall, the rate of premature death from respiratory disease has decreased from 49 per 100,000 population to 36 per 100,000 population, which is an improvement (}
Figure). In 2006-08, there was a peak for males at 67 per 100,000 but overall, the rate has declined. The rate of decline for England over the period from 2001-03 to 2011-13 was 18% compared to a rate of 27% for Luton, showing that, on average, the rate has decreased more steeply for Luton than it has for England overall. However,
Figure shows that the overall trend in premature deaths has started to increase again in Luton since 2010-12, which highlights the need for further preventative work.
Figure 29: Premature (less than 75 years) Deaths from Respiratory Disease 2011-13 Males

Source: PHE Fingertips, PHOF 4.07i

Figure 30: Premature (less than 75 years) Deaths from Respiratory Disease 2011-13 Females

Source: PHE Fingertips, PHOF 4.07i
8. Costs and Treatment

There are a number of treatment options for COPD depending on the severity and the nature of the disease. The treatments act to provide symptom relief rather than cure, or reversal of pathology. Pharmacological therapies include inhaled bronchodilators, inhaled or oral corticosteroids and theophylline. These are often given in combination. For patients with more severe disease, long term oxygen therapy and pulmonary rehabilitation are also an important component of treatment. Patients with COPD should also be offered pneumococcal and annual influenza vaccination.

Acute exacerbations of the illness, often caused by bacterial co-infection, require specific management measures, including the use of antibiotics. Guidance for both stable management of the condition and management of exacerbations is described by NICE.

The pyramid below (
Figure 8.0.1 provides an overall picture of the costs, which outlines the cost-effectiveness of interventions for COPD. It can be seen that Pulmonary Rehabilitation, Smoking Cessation and Flu Vaccinations offer good value for money.

Triple therapy for COPD consists of a long-acting anti-cholinergic bronchodilator, a long-acting beta-agonist bronchodilator, and an inhaled corticosteroid. Figure 8.0.1 suggests a huge difference between the cost per quality adjusted life year (QALY) from £35,000 to £187,000. Evidence suggests that triple therapy is only cost effective in those patients with an FEV1 <50% predicted and repeated exacerbations despite other treatment. It is important for both clinical and financial benefits that triple therapy is carefully considered prior to initiation (Williams et al 2012).
Figure 32: Costs associated with Respiratory Care in London

![Costs associated with Respiratory Care in London](image)

\[\text{Flu Vaccination £1,000/QALY in 'at-risk' population}\]

\[\text{Stop Smoking Support with Pharmacotherapy £2,000/QALY}\]

\[\text{Pulmonary Rehabilitation £2,000-8,000/QALY}\]

\[\text{Tiotropium or LABA £5,000-8,000/QALY}\]

\[\text{Triple Therapy £35,000-£187,000/QALY}\]

Source: NHS London. London Respiratory Team 2010

NHS England Programme Budgeting Tool provides financial information across disease areas and enables an estimate of NHS expenditure across these areas for the whole care pathway. They also provide benchmarking information to enable a comparison of expenditure with other areas and to enable evidence based investment and prioritisation decisions.

Figure 33 shows that in 2013/14 primary prescribing for problems of the respiratory system costs around £1.6m per 100,000 population in Luton and non-elective admissions cost around £2.5m per 100,000 population. These are the two highest areas of expenditure for this respiratory disease but total costs for problems of respiratory exceed £7m per 100,000 population for Luton when other categories such as Community Integrated care (£655,344), unscheduled care: emergency transport (£563,774) and Scheduled Care: day-case and elective (£564,654) are taken into account.

Figure 33: Expenditure per 100,000 population, Problems of the respiratory system

![Expenditure per 100,000 population, Problems of the respiratory system](image)

Source: NHS England Budgeting Tool
Figure 34 shows a breakdown of the two main areas of expenditure for obstructive airways disease in 2013/14; Primary Prescribing and Unscheduled Care: Non-elective admissions compared to statistical neighbours. Luton spends between £0.4m per 100,000 population. This figure is third highest for Primary Prescribing and second highest when compared to other areas. Total spend for Luton on Obstructive Airways Disease was just over £1m per 100,000 population for 2013-14.

**Figure 34: Expenditure per 100,000 population, Obstructive airways disease**

Source: NHS England Budgeting Tool
9. COPD service pathway in Luton

9.1 Current Service Pathway
Luton and Bedfordshire have a joint pathway for people with COPD produced by the Bedfordshire and Luton joint Prescribing Committee (JPC) and used by the Bedfordshire and Luton Respiratory Implementation Group (RIG). It has been developed to assist healthcare professionals diagnose and manage patients with COPD and intended to support the local implementation of NICE Clinical Guidelines on the Management of COPD in adults in Primary and Secondary Care (NICE 2010). However the services differ slightly between the two CCG’s.

9.2 Evidence based guidance

9.2.1 NICE Guidance
Standards of Care for COPD in primary care have been established, in the form of NICE guidance (NICE 2010). This guidance includes a number of factors, including the initial diagnosis and management of the disease, going on to cover management of acute exacerbations.

Diagnose COPD
- A diagnosis of COPD should be considered in patients over the age of 35 who have a risk factor (generally smoking) and who present with exertional breathlessness, chronic cough, regular sputum production, frequent winter ‘bronchitis’ or wheeze
- The presence of airflow obstruction should be confirmed by performing spirometry. All health professionals managing patients with COPD should have access to spirometry and be competent in the interpretation of the results

Stop smoking
- Encouraging patients with COPD to stop smoking is one of the most important components of their management. All COPD patients still smoking, regardless of age, should be encouraged to stop, and offered help to do so, at every opportunity
- NICE have produced a number of guidance related to smoking cessation

Effective inhaled therapy
- Long-acting inhaled bronchodilators (beta₂-agonists or anticholinergics) should be used to control symptoms and improve exercise capacity in patients who continue to experience problems despite the use of short-acting drugs
- Inhaled corticosteroids should be added to long-acting bronchodilators to decrease exacerbation frequency in patients with an FEV₁ less than or equal to 50% predicted who have had two or more exacerbations requiring treatment with antibiotics or oral corticosteroids in a 12-month period

Manage exacerbations
- The frequency of exacerbations should be reduced by appropriate use of inhaled corticosteroids and bronchodilators, and vaccinations
- The impact of exacerbations should be minimised by:
  - giving self-management advice on responding promptly to the symptoms of an exacerbation
  - starting appropriate treatment with oral steroids and/or antibiotics
  - use of NIV when indicated
  - use of hospital-at-home or assisted-discharge schemes.

9.2.2 NICE Commissioning guide for COPD
NICE has also produced a guide to assist commissioners for COPD services with specific objectives and outcomes in mind (NICE 2011).
10. References


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