This report

This report has been prepared jointly by Knowsley Council, the Clinical Commissioning Group (CCG) and partners of the Knowsley Health and Wellbeing Board (HWB).

Its purpose is to provide an analysis of health protection in order to determine the following:

- How much impact does this issue have on local people?
- Can this impact be reduced through local action?
- Can local action reduce health inequalities?
- Will local action on this help address other issues too?

Understanding these things helps the HWB determine the level of priority that this issue should be given in the Borough’s Health and Wellbeing Strategy.

This is one of a series of reports that comprise Knowsley’s Joint Strategic Needs Assessment (JSNA).

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Further information

For a PDF copy of this report, and other research intelligence products, visit Knowsley Knowledge – the website of Knowsley’s JSNA
### Glossary of acronyms / abbreviations contained within the JSNA:

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMR</td>
<td>Antimicrobial Resistance</td>
</tr>
<tr>
<td>APC</td>
<td>Pan-Mersey Area Prescribing Committee Antimicrobial Prescribing Guidelines</td>
</tr>
<tr>
<td>C. diff/C. difficile</td>
<td>Clostridium difficile</td>
</tr>
<tr>
<td>CCG</td>
<td>Clinical Commissioning Groups</td>
</tr>
<tr>
<td>COMAH</td>
<td>Control of Major Accident Hazards</td>
</tr>
<tr>
<td>COPD</td>
<td>Chronic Obstructive Pulmonary Disease</td>
</tr>
<tr>
<td>CPE</td>
<td>Carbapenemase-producing Enterobacteriaceae</td>
</tr>
<tr>
<td>CRI</td>
<td>Crime Reduction Initiative</td>
</tr>
<tr>
<td>Defra</td>
<td>Department for Environment, Food and Rural Affairs</td>
</tr>
<tr>
<td>DTaP/IPV</td>
<td>Diphtheria, tetanus, pertussis and polio</td>
</tr>
<tr>
<td>DTaP/IPV/Hib</td>
<td>diphtheria, tetanus, whooping cough, polio &amp; haemophilus influenza (type b)</td>
</tr>
<tr>
<td>E. coli</td>
<td>Escherichia coli</td>
</tr>
<tr>
<td>EWD</td>
<td>Excess Winter Deaths</td>
</tr>
<tr>
<td>EWM</td>
<td>Excess winter mortality</td>
</tr>
<tr>
<td>HBV</td>
<td>Hep B Virus</td>
</tr>
<tr>
<td>HCAI</td>
<td>Healthcare-associated infections</td>
</tr>
<tr>
<td>Hib</td>
<td>Haemophilus Influenza (type B)</td>
</tr>
<tr>
<td>HPV</td>
<td>Human Papillomavirus</td>
</tr>
<tr>
<td>HTM</td>
<td>Health Technical Memorandum</td>
</tr>
<tr>
<td>IPC</td>
<td>Infection Prevention and Control</td>
</tr>
<tr>
<td>JCVI</td>
<td>Joint Committee on Vaccination and Immunisation</td>
</tr>
<tr>
<td>JSNA</td>
<td>Joint Strategic Needs Analysis</td>
</tr>
<tr>
<td>LHRP</td>
<td>Local Health Resilience Partnership</td>
</tr>
<tr>
<td>LRF</td>
<td>Local Resilience Forum</td>
</tr>
<tr>
<td>MenACWY</td>
<td>Meningococcal groups A, C, W and Y disease</td>
</tr>
<tr>
<td>MenB</td>
<td>Meningococcal group B</td>
</tr>
<tr>
<td>MenC</td>
<td>Meningococcal group C</td>
</tr>
<tr>
<td>MMR</td>
<td>Measles, mumps and rubella (German measles)</td>
</tr>
<tr>
<td>MRF</td>
<td>Merseyside Resilience Forum</td>
</tr>
<tr>
<td>MRSA</td>
<td>Methicillin-resistant Staphylococcus aureus</td>
</tr>
<tr>
<td>MSSA</td>
<td>Methicillin-sensitive Staphylococcus aureus</td>
</tr>
<tr>
<td>NBS</td>
<td>New-born blood spot screening</td>
</tr>
<tr>
<td>NICE</td>
<td>National Institute for Clinical Excellence</td>
</tr>
<tr>
<td>NPSA</td>
<td>National specifications for cleanliness in the NHS &amp; care homes</td>
</tr>
<tr>
<td>ONS</td>
<td>Office of National Statistics</td>
</tr>
<tr>
<td>PCV</td>
<td>Pneumococcal Conjugate Vaccine</td>
</tr>
<tr>
<td>PHE</td>
<td>Public Health England</td>
</tr>
<tr>
<td>PHOF</td>
<td>Public Health Outcomes Framework</td>
</tr>
<tr>
<td>PIR</td>
<td>Post Infection Review</td>
</tr>
<tr>
<td>PPV</td>
<td>Pneumococcal poly-saccharide vaccine</td>
</tr>
<tr>
<td>RCA</td>
<td>Root Cause Analysis</td>
</tr>
<tr>
<td>STAR-PU</td>
<td>Specific Therapeutic Group Age-Sex Related Prescribing Units</td>
</tr>
<tr>
<td>TB</td>
<td>Tuberculosis</td>
</tr>
<tr>
<td>TD/IPV</td>
<td>Tetanus, diphtheria and polio</td>
</tr>
<tr>
<td>UTI</td>
<td>Urinary tract infection</td>
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Health Protection

1. WHY HEALTH PROTECTION IS IMPORTANT

Health Protection is one of the three core elements of public health practice (along with Health Improvement and Healthcare). Health protection seeks to prevent or reduce the harm caused by communicable diseases and minimise the health impact from emergencies, environmental hazards such as poor air quality, chemicals and radiation. Under the banner of health protection we also include national screening programmes for cancer as well as communicable and non-communicable diseases / conditions.

A robust health protection system requires multi-agency joint working in order to comprehensively understand the risks to health locally and to ensure that plans are in place to reduce risks.

Health Protection Structures

Under the Health and Social Care Act (2012) the responsibilities for health protection, previously undertaken by Primary Care Trusts, were shared between many organisations including Local Authorities (and Directors of Public Health acting on their behalf), NHS England and Clinical Commissioning Groups (CCGs). Health and social care provider organisations also have responsibilities under Civil Contingencies legislation to plan and respond to emergencies and major incidents. Furthermore, Health and Safety legislation, as well as contractual obligations, such as infection control ensure that organisations have appropriate policies and procedures in place to assess and address risks to employees and the public. Public Health England (PHE) provides support to organisations to fulfil these responsibilities and work as a united system with local public health to lead responses to outbreaks. PHE is also responsible for the surveillance of communicable disease and provides expertise on health threats from chemical, biological, radiological and nuclear agents¹.

Existing structures, such as the Local Resilience Forum (LRF), hold responsibilities for emergency preparedness, resilience and response, which incorporate health emergencies. New structures also emerged under the Health and Social Care Act, such as the Local Health Resilience Partnership (LHRP) which leads in health related emergency planning.

NHS England, and the teams working with them from PHE, commission routine immunisation and screening programmes and support the responses to significant incidents and quality assurance in these programmes.

Environmental Health provides a key role in protecting the health of the population through ensuring regulatory compliance to a diverse range of health issues including air quality, contaminated land, food safety, housing conditions and pest control. They have a key role in responding to local incidents and outbreaks of food poisoning.

Within such a complex system there is a need for oversight of the health protection system as a whole and a mechanism for providing challenge and support at a local level. In order to fulfil these obligations a Health Protection Forum has been formed as a subgroup of the Knowsley Health and Wellbeing Board.

**Health Protection Outcomes**

Under the Health and Social Care Act (2012) delivering the health protection function is the responsibility of different partner organisations across the system and joint working is required on health protection issues. This is reflected in the health protection related indicators which are included within the Public Health, NHS and CCG Outcome Frameworks.

**The Public Health Outcomes Framework**:

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
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</thead>
<tbody>
<tr>
<td>3.1</td>
<td>Fraction of mortality attributable to particulate air pollution</td>
</tr>
<tr>
<td>3.2</td>
<td>Chlamydia diagnoses 15-24 year olds</td>
</tr>
<tr>
<td>3.3</td>
<td>Population Vaccination coverage (all sub-indicators)</td>
</tr>
<tr>
<td>3.4</td>
<td>People presenting with HIV at a late stage of infection</td>
</tr>
<tr>
<td>3.5i</td>
<td>The percentage of people completing treatment for tuberculosis within 12 months prior to 31st December, of all those whose case was notified the previous year</td>
</tr>
<tr>
<td>3.5ii</td>
<td>TB incidence per 100,000 population</td>
</tr>
<tr>
<td>3.6</td>
<td>Public sector organisations with a board approved sustainable development management plan</td>
</tr>
<tr>
<td>3.7</td>
<td>Comprehensive, agreed inter-agency plans for responding to public health incidents and emergencies (Placeholder)</td>
</tr>
<tr>
<td>4.5</td>
<td>Under 75 mortality rate from cancer* (NHSOF 1.4)</td>
</tr>
<tr>
<td>4.8</td>
<td>Mortality from communicable diseases</td>
</tr>
</tbody>
</table>

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NHS Outcomes Framework³:

<table>
<thead>
<tr>
<th>1.4</th>
<th>Under 75 mortality rate from cancer* (PHOF 4.5)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>i <em>One-and</em> ii <em>Five-year survival from all cancers</em></td>
</tr>
<tr>
<td></td>
<td>iii <em>One-and iv Five-year survival from breast, lung and colorectal cancer</em></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>5.2</th>
<th>Incidence of healthcare associated infection (HCAI)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>i MRSA</td>
</tr>
<tr>
<td></td>
<td>ii <em>C. difficile</em></td>
</tr>
</tbody>
</table>

CCG Outcome Indicator Set⁴:

<table>
<thead>
<tr>
<th>One &amp; five year survival from breast, lung &amp; colorectal cancers (NHS OF 1.4 iii &amp; iv) **</th>
</tr>
</thead>
<tbody>
<tr>
<td>Incidence of healthcare associated infection: MRSA (NHS OF 5.2.i) **</td>
</tr>
<tr>
<td>Incidence of healthcare associated infection: <em>C difficile</em> (NHS OF 5.2.ii) **</td>
</tr>
</tbody>
</table>

* Indicator shared with Public Health Outcomes Framework and NHS Outcome Framework
** Indicator shared between CCG Outcome Dataset and NHS Outcome Framework

**Related chapters of JSNA**

Health protection is a broad subject and a number of elements are contained in other chapters of the JSNA, these are referenced below:

- Cancer screening – Cancer JSNA
- Diabetic retinopathy screening – Diabetes JSNA
- Air quality – Environment JSNA, and Respiratory JSNA
- Environmental hazards – Environment JSNA
- Sexually transmitted infections and HIV – Sexual Health JSNA


2 VACCINATION AND IMMUNISATION IN ADULTS AND CHILDREN

Immunisation is the safest and most effective way of giving protection against disease. The Joint Committee on Vaccination and Immunisation (JCVI) is the independent national body responsible for advising the Government on the provision of vaccination and immunisation services for the prevention of illness. The body examines the evidence from disease surveillance, vaccine effectiveness and safety and cost-effectiveness in order to make its recommendations.

The Department of Health national schedule for vaccination across the life course is detailed below:

Table 1: The Routine Immunisation Schedule from summer 2015

<table>
<thead>
<tr>
<th>Age Due</th>
<th>Diseases protected against from summer 2015</th>
</tr>
</thead>
<tbody>
<tr>
<td>Two months old</td>
<td>Diphtheria, tetanus, pertussis (whooping cough, polio and <em>haemophilus influenza</em> type b (Hib)</td>
</tr>
<tr>
<td></td>
<td>Pneumococcal (13 serotypes)</td>
</tr>
<tr>
<td></td>
<td>Meningococcal group b (MenB)(^1)</td>
</tr>
<tr>
<td></td>
<td>Rotavirus gastroenteritis</td>
</tr>
<tr>
<td>Three months old</td>
<td>Diphtheria, tetanus, pertussis, polio and Hib</td>
</tr>
<tr>
<td></td>
<td>Meningococcal group C (MenC)</td>
</tr>
<tr>
<td></td>
<td>Rotavirus</td>
</tr>
<tr>
<td>Four months old</td>
<td>Diphtheria, tetanus, pertussis, polio and Hib</td>
</tr>
<tr>
<td></td>
<td>MenB(^2)</td>
</tr>
<tr>
<td></td>
<td>Pneumococcal (13 serotypes)</td>
</tr>
<tr>
<td>Twelve months old</td>
<td>Hib and MenC</td>
</tr>
<tr>
<td></td>
<td>Pneumococcal (13 serotypes)</td>
</tr>
<tr>
<td></td>
<td>Measles, Mumps and rubella (German measles)</td>
</tr>
<tr>
<td></td>
<td>MenB(^1)</td>
</tr>
<tr>
<td>2 to 6 years old (inc children in school yrs 1 &amp; 2)</td>
<td>Influenza (each year from September)</td>
</tr>
<tr>
<td>Three years four months old</td>
<td>Diphtheria, tetanus, pertussis and polio</td>
</tr>
<tr>
<td>Girls age 12-13</td>
<td>Cervical cancer caused by human papillomavirus (HPV) types 16 &amp; 18 (&amp; genital warts caused by types 6 &amp; 11)</td>
</tr>
<tr>
<td>Fourteen years old (school year 9)</td>
<td>Tetanus, diphtheria and polio</td>
</tr>
<tr>
<td></td>
<td>Meningococcal groups A, C, W and Y disease</td>
</tr>
<tr>
<td>65 years old</td>
<td>Pneumococcal (23 serotypes)</td>
</tr>
<tr>
<td>65 years of age and older</td>
<td>Influenza (each year from September)</td>
</tr>
<tr>
<td>70 years old</td>
<td>Shingles</td>
</tr>
</tbody>
</table>

\(^1\) Only for infants born on or after 1 May 2015
In addition to the routine programmes, some selective immunisation programmes are delivered to at-risk groups as detailed below.

**Table 2: Selective Immunisation Programmes**

<table>
<thead>
<tr>
<th>Target Group</th>
<th>Age and schedule</th>
<th>Disease</th>
<th>Vaccines required</th>
</tr>
</thead>
<tbody>
<tr>
<td>Babies born to hepatitis B infected mothers</td>
<td>At birth, 1 and 2 months old. Boost at 12 months old</td>
<td>Hepatitis Bb</td>
<td>Hepatitis B vaccine (Engerix B/HPvax PRO)</td>
</tr>
<tr>
<td>Infants in areas of the country with TB incidence &gt;= 40/100,000</td>
<td>At birth</td>
<td>Tuberculosis</td>
<td>BCG</td>
</tr>
<tr>
<td>Infants with a parent or grandparent born in a high incidence country²</td>
<td>At birth</td>
<td>Tuberculosis</td>
<td>BCG</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>During flu season. At any stage of pregnancy</td>
<td>Influenza</td>
<td>Inactivated flu vaccine</td>
</tr>
<tr>
<td>Pregnant women</td>
<td>28 – 32 weeks of pregnancy</td>
<td>Pertussis</td>
<td>dTaP/IPV (Boostrix-IPV or Repevax)</td>
</tr>
</tbody>
</table>

**2.1 Childhood Immunisations**

Immunisations help protect children (and the general population) against serious diseases such as measles and meningitis. 'Herd immunity' is created when a high proportion of the population are immunised and this helps prevent the outbreak of disease. A number of immunisations are given during childhood as part of the national immunisation programme. These immunisations are given to children from two months of age onwards, with multiple doses given for some vaccines.

Routine childhood vaccinations are delivered, in the large part, by Primary Care with some delivered by the local specialist immunisation service.

**2.1.1 Age 1**

**2.1.1a DTaP/IPV/Hib Vaccine**

The 5-in-1 vaccine, also known as the DTaP/IPV/Hib vaccine, aims to protect against five different childhood diseases – diphtheria, tetanus, whooping cough, polio and Haemophilus influenza (type b). The vaccine is given on three separate occasions, when babies are two, three & four months old.

The uptake of the ‘5 in 1’ immunisation in Knowsley was 93.5% in 2014/15. Uptake during 2014 was slightly lower than the England (94.2%) and the North West Region (95.0%). There has been a 2.5% increase in uptake of the DTaP/IPV/Hib vaccine since 2006/07 in Knowsley.

**2.1.1b Pneumococcal Conjugate Vaccine**

The PCV vaccine protects against pneumococcal infections, which can cause a number of different conditions such as ear infections, chest infections as well as serious septicaemia (blood poisoning), pneumonia and meningitis.

The uptake of the PCV vaccine in those aged up to 12 months in Knowsley was 94.1% in 2014/15. Uptake of the PCV vaccine in Knowsley was higher than England (93.9%) but slightly lower than the North West region (94.4%) in 2014/15. There has been a 12.9% increase in uptake of the PCV vaccine since 2007/08 in Knowsley.
2.1.2 Age 2

2.1.2a Hib/MenC booster

The Hib/MenC booster is given to children between 12 and 13 months of age. The uptake for the Hib/MenC booster was 97.8% in Knowsley during 2014/15. Uptake for the Hib/MenC booster in Knowsley was higher than England (92.1%) and the North West region (93.2%) during 2014/15. Since 2008/09 there has been an increase of 20.1% in the uptake of the Hib/MenC booster in Knowsley.

2.1.2b Pneumococal Conjugate Vaccine Booster

The third dose of the PCV vaccine is given to children between the ages of 12 and 13 months. The uptake of the PCV vaccine during 2014/15 was 95.6% in Knowsley. Uptake for the PCV vaccine was higher than England (92.2%) and the North West region (93.3%) in 2013/14. Since 2008/09 there has been a 19.6% increase in the uptake of the PCV vaccine in Knowsley.

2.1.2c Measles, Mumps and Rubella (MMR)

The MMR is a combined vaccine that protects against three separate illnesses; measles, mumps and rubella (German measles) in a single injection. The full course of MMR vaccination requires two doses. The first dose of the MMR vaccine is given to children between 12 and 13 months of age and protects against mumps, measles and rubella.

Measles, mumps and rubella are common highly infectious conditions that can have serious and potentially fatal complications, including meningitis, encephalitis and deafness. They can also lead to complications in pregnancy that affect the unborn baby, and can lead to miscarriage.

Since the MMR vaccine was introduced in 1988, it is rare for children in the UK to develop these serious conditions. However outbreaks happen, as in Merseyside in 2013 when there was a measles outbreak, so it is important that parents ensure their child is up-to-date with the MMR vaccination.
The uptake of the MMR vaccine in Knowsley was 95.2% during 2014/15. Uptake of the MMR vaccine in Knowsley was higher than England (92.3%) and the North West region (94.0%) in 2014/15. Since 2005/06, the uptake of the MMR vaccine in Knowsley has increased by 15.4%.

Figure 2: Childhood Immunisations at Age 2, 2005/06 to 2014/15
Source: Health & Social Care Information Centre

2.12d Meningitis B Vaccine

Meningococcal infection – caused by the bacterium Neisseria Meningitides can cause meningitis (inflammation of the brain lining) and septicaemia (blood poisoning). There are several “strains” of the bacteria and the strains causing disease at any one time may change. A new vaccine, given as an addition to the primary infant schedule, commenced September 2015. It is given at 2 month and 4 months with a 12 month booster programme. There is a limited catch up cohort for babies born from 01 May 2015 through to 30 June 2015, who will be part way through their primary immunisation schedule as 01 September 2015. These cohorts will receive a booster at age 12 months in 2016.

2.1.3 Age 5

2.1.3a DTaP/IPV/Hib Vaccine

The 4-in-1 pre-school booster vaccine is offered to three-year-old children to boost their protection against diphtheria, tetanus, whooping cough (pertussis) and polio.

The uptake of the '4-in-1' vaccine in Knowsley during 2014/15 was 95.7%. Uptake of the '4-in-1' vaccine in Knowsley was higher than England (92.4%) and the North West region (93.2%) during 2014/15. Since 2004/05, the uptake of the '4-in-1' vaccine has increased by 19.6% in Knowsley.
2.1.3b Measles, Mumps and Rubella (MMR) Booster

A second dose of the MMR vaccine is given to children after 3 years and 4 months. The uptake of the MMR vaccine in Knowsley for this age group during 2014/15 was 91.5%. Uptake of the vaccine in 2014/15 in Knowsley was higher than England (88.6%) and the North West region (90.7%). Since 2005/06, the uptake of the MMR vaccine has increased by 21.0% in Knowsley for children aged 5.

Figure 3: Childhood Immunisations at Age 5, 2005/06 to 2014/15
Source: Health & Social Care Information Centre

2.1.4 HPV Vaccination

Human papilloma virus (HPV) is the name for a group of viruses that affect the skin and the membranes lining the body, for example in your cervix, mouth and throat. HPV is a common and highly contagious infection, with over three quarters of sexually active women acquiring it at some time in their lives. The HPV infection can cause abnormal tissue growth and other changes to cells within the cervix, which can lead to cervical cancer.

The human papilloma virus (HPV) vaccine is administered to females aged 12-13 (year 8 school age) to protect against cervical cancer. The vaccination is delivered locally by the specialist community immunisation team who work with local schools.

Figure 4: Human Papilloma Virus Vaccine Coverage (3 Doses), 2008/09 to 2013/14
Source: Public Health England
Coverage of the HPV vaccine in Knowsley during 2013/14 was 94.4%, higher than the national target of 90%. Coverage in Knowsley during 2013/14 was higher than England (86.7%), the North West region (89.1%), the Liverpool City Region (90.2%) and Knowsley’s Statistical Neighbour Group (89.8%).

Since 2008/09, coverage has increased by 14.1% in Knowsley.

![Diagram showing coverage of the HPV vaccine in different areas and time periods.]

**Figure 5: Human Papilloma Virus Vaccine Breakdown of Doses, 2013/14**
*Source: Public Health England*

Until September 2015 the vaccine required three doses. From this time only two doses are now required.

### 2.1.5 Meningococcal Vaccination – Freshers

There have been recent amendments to the immunisation schedule to take into account the changing epidemiology of meningococcal infection across the country. The “W” strain of meningococcal meningitis is emerging as a threat in England, affecting all age groups but more common in infants and young adults. As a result, JCVI recommended a change of vaccine to the adolescent and university fresher’s vaccination and from summer 2015 the Meningitis ACWY vaccine is offered to the current school year 13 cohort via their GP. In addition, the fresher cohort for first year university entrants up to age 25 years will also be offered the immunisation.

Due to the changing epidemiology the teenage booster will also include the routine TdIPV booster and a switch from the Men C vaccine booster to Men ACWY.

The chart below from Public Health England illustrates the rationale and shows the rising number of cases of Meningitis W in England.
What works?

Reducing Differences in Uptake in Under 19s (PH21, NICE 2009) gives a number of recommendations to improve immunisation uptake in communities, including:

- Providers e.g. Primary Care should take a comprehensive approach to vaccination coverage including nominated leads and the use of recall and reminders. Robust IT systems which include timely recording of status on patient records and active follow up and tailored reminders.
- Access to immunisation services should be developed to meet need through, for example, extended clinic times, child-friendly settings, home visits for non-attendees where appropriate.
- Tailored information and support to parents and young people should be given, including opportunities to explore and discuss concerns.
- Ensure contacts with children and young people are used to check immunisation status and offer vaccination.

2.1.6 Adults and children - seasonal flu vaccination

Influenza (flu) is a viral infection affecting the lungs and airways which occurs most often in winter in the UK and peaks between January and March. There are 2 types of influenza affecting people; influenza A and influenza B. Influenza B usually causes a milder illness, and is most seen in children.

Symptoms can appear very quickly and include:

- headache,
- fever,
- cough,
- sore throat,
- aching muscles / joints.
Complications include bacterial pneumonia, and can be life threatening especially in older people and those with certain underlying health conditions.

Numbers for emergency admissions for Knowsley registered residents with a primary diagnosis of influenza from 2012 to 2015 totalled sixteen, however, this is likely to hide the true impact of flu on admissions as influenza is more likely to be a secondary diagnosis, for example, with pneumonia.

**What works?**

The national annual flu plan\(^5\) aims to minimise the health impact of flu through effective monitoring, prevention and treatment. The national plan in 2015/2016 aims to:

- provide public health information and guidance to prevent infection from flu;
- actively offer flu vaccination to 100% of all those in eligible groups;
- vaccinate at least 75% of those aged 65 years and over;
- vaccinate at least 75% of healthcare workers with direct patient contact;
- improve uptake for those in clinical risk groups, particularly for those who are at the highest risk of mortality from flu but have the lowest rates of vaccine uptake, such as those with long-term liver and neurological disease, including people with learning disabilities;
- achieve a minimum uptake of 40% for universal child programmes.

The plan also aims to successfully monitor flu activity, severity of the disease, vaccine uptake and impact on the NHS. Through adherence to NICE guidance the plan also activates guidance on prescribing of antiviral medicines in primary care for patients in at-risk groups and other eligible patients, ensures the NHS is well prepared and has appropriate surge and resilience arrangements in place during the flu season and supports local action on outbreaks.

Because some individuals are more at risk of the severe complications of flu, a free vaccination programme targets these at risk groups. For the season 2015/2016 this includes:

- people aged 65 years or over (including those becoming age 65 years by 31 March 2016);
- people aged from 6 months to less than 65 years of age with a serious medical condition such as:
  - chronic (long-term) respiratory disease, such as severe asthma, chronic obstructive pulmonary disease (COPD) or bronchitis;
  - chronic heart disease, such as heart failure;
  - chronic kidney disease at stage three, four or five;
  - chronic liver disease;
  - chronic neurological disease, such as Parkinson’s disease or motor neurone disease, or learning disability;
  - diabetes;

o splenic dysfunction;
o a weakened immune system due to disease (such as HIV/AIDS) or treatment (such as cancer treatment).

- all pregnant women (including those women who become pregnant during the flu season);
- all children aged two, three, and four years (but not five years or older) at 31 August 2015 (i.e. date of birth on or after 1 September 2010 and on or before 31 August 2013), through general practice;
- all children in school years 1 and 2;
- people living in long-stay residential care homes or other long-stay care facilities where rapid spread is likely to follow introduction of infection and cause high morbidity and mortality. This does not include, for instance, prisons, young offender institutions, or university halls of residence;
- people who are in receipt of a carer’s allowance, or those who are the main carer of an older or disabled person whose welfare may be at risk if the carer falls ill;
- consideration should also be given to the vaccination of household contacts of immunocompromised individuals, specifically individuals who expect to share living accommodation on most days over the winter and therefore for whom continuing close contact is unavoidable.

The national plan makes a number of recommendations to ensure good uptake, including:

- Primary care practices should take a systematic approach to the programme and have a named lead. Accurate, regularly updated practice registers of eligible groups should be reviewed throughout the season, in particular for pregnant women;
- Ensure early ordering of appropriate quantities of vaccine;
- Ensure accurate submission of eligible population figures and timely entry of vaccination onto IT system;
- Implementation of robust call and recall systems, with follow up of non-attendees;
- System-wide working e.g. with midwives to improve access.

The local implementation of the flu plan requires partnership work across Primary Care, health and social care community services, Hospital Trusts, Public Health, the voluntary sector and NHS commissioners. Gaining the trust of the public is essential in encouraging uptake and a comprehensive communications plan accompanies the local implementation of the vaccination programme. Supporting practices where uptake is low and sharing best practice are also mechanisms used during the programme.
Local picture

Annual seasonal influenza immunisation uptake for those aged 65 and over in Knowsley was 76.9% in the winter of 2014/15. Uptake in Knowsley during 2014/15 was higher than the North West region (75.4%) and England (72.8%) but although uptake was higher than the national target, there has been a slight decrease since 2012/13 when uptake was 78.2%. There is some variation seen at practice level and the range of uptake in Knowsley general practices was 65.7% - 84.9%

Uptake in Knowsley during 2014/15 was higher than the 75% national target and has been since 2010/11. Since 2002/03, uptake of the annual seasonal influenza immunisation has increased by 11.8% in Knowsley.

Figure 7: Seasonal Influenza Vaccination Uptake - Over 65’s, 2002/03 to 2014/15
Source: Public Health England

Uptake in the population deemed 'at risk' and aged under 65 years of age was 57.6% in the winter of 2014/15. Uptake in the 'at risk' group was higher than England (50.3%) during 2014/15 and also the North West region (53.9%). Indeed, uptake in Knowsley for under 65s in at-risk groups was the highest in Merseyside. At practice level, uptake varied between 33.3% and 70.1%. Since 2004/05, uptake in the 'at risk' group has increased by 18.9% in Knowsley.
Uptake in Knowsley for all pregnant women in 2014/2015 was also the highest in Merseyside at 51.7%. This compares with the England figure of 44.1%.

Uptake for children aged two years and in a clinical risk group reached 63.8% and for all children aged two was 40.5%. For children aged three years in a clinical risk group the uptake was 58.2% and for all children aged three 41.7%. Uptake for all children aged four years was 36.1% and for those in a clinical risk group was 58.9%. A 30% uptake of children receiving the vaccine is enough to break transmission within the population and reduce the overall risk to the general public.

One of the actions from the 2013/14 campaign was to increase vaccine uptake in at risk groups and patients with liver disease who were highlighted as being at risk of serious illness following influenza infection. Data from previous years indicated that there was low uptake of the influenza vaccine in this group. The Knowsley substance misuse service - Crime Reduction Initiative (CRI) vaccinated 75 service users with chronic liver disease locally.

Vaccination of healthcare workers is an important element of the national programme and reduces the risk of infection to vulnerable patients. Uptake in staff in Merseyside trusts varies widely from 44.5% in 2014 at 5 Boroughs Partnership NHS Foundation Trust to 83.5% at St Helens and Knowsley Hospital NHS Trust. Work should be undertaken to improve uptake in low performing trusts and they should ensure easy access and the promotion of key important messages regarding vaccination.
### Table 3: Merseyside Healthcare Worker Influenza Vaccination Uptake

<table>
<thead>
<tr>
<th>Provider Trusts</th>
<th>No. Staff</th>
<th>No vaccinated</th>
<th>%</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Hospital &amp; Mental Health Trusts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5 Boroughs (plus KIPs)</td>
<td>2929</td>
<td>1302</td>
<td>44.5</td>
<td>44.3%</td>
</tr>
<tr>
<td>Aintree University Hospital NHS Foundation Trust</td>
<td>3708</td>
<td>2850</td>
<td>76.9</td>
<td>82.9%</td>
</tr>
<tr>
<td>Alder Hey Children's NHS Foundation Trust</td>
<td>1690</td>
<td>1358</td>
<td>80.4</td>
<td>77.7%</td>
</tr>
<tr>
<td>Liverpool Women's NHS Foundation Trust</td>
<td>979</td>
<td>758</td>
<td>77.4</td>
<td>73.6%</td>
</tr>
<tr>
<td>Liverpool Heart and Chest NHS Foundation Trust</td>
<td>1179</td>
<td>885</td>
<td>75.1</td>
<td>68.8%</td>
</tr>
<tr>
<td>Mersey care NHS Trust</td>
<td>2432</td>
<td>1807</td>
<td>74.3</td>
<td>42.0%</td>
</tr>
<tr>
<td>Royal Liverpool and Broadgreen University Hospitals NHS Trust</td>
<td>4190</td>
<td>3198</td>
<td>76.3</td>
<td>80.5%</td>
</tr>
<tr>
<td>Southport and Ormskirk Hospital NHS Trust (plus integrated care services)</td>
<td>2337</td>
<td>1903</td>
<td>81.4</td>
<td>80.4%</td>
</tr>
<tr>
<td>St Helens and Knowsley Hospitals NHS Trust</td>
<td>3431</td>
<td>2864</td>
<td>83.5</td>
<td>76.9%</td>
</tr>
<tr>
<td>The Walton Centre NHS Foundation Trust</td>
<td>973</td>
<td>743</td>
<td>76.4</td>
<td>77.7%</td>
</tr>
<tr>
<td><strong>Community Provider Trusts</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liverpool Community Health (Sefton and Liverpool community providers added together)</td>
<td>2008</td>
<td>1347</td>
<td>67.1</td>
<td>69.8%</td>
</tr>
<tr>
<td>Bridgewater (Halton and St Helens)</td>
<td>2347</td>
<td>1240</td>
<td>52.8</td>
<td>44.9%</td>
</tr>
<tr>
<td><strong>Primary Care</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liverpool Primary Care</td>
<td>925</td>
<td>594</td>
<td>64.2</td>
<td>63.1%</td>
</tr>
<tr>
<td>Sefton Primary Care</td>
<td>183</td>
<td>143</td>
<td>78.1</td>
<td>76.1%</td>
</tr>
<tr>
<td>Southport and Formby Primary Care</td>
<td>128</td>
<td>96</td>
<td>75%</td>
<td>80.8%</td>
</tr>
<tr>
<td>Knowsley Primary Care</td>
<td>256</td>
<td>176</td>
<td>68.8</td>
<td>72.1%</td>
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<tr>
<td>Halton Primary Care</td>
<td>266</td>
<td>148</td>
<td>55.6</td>
<td>56.0%</td>
</tr>
<tr>
<td>St Helens Primary Care</td>
<td>434</td>
<td>296</td>
<td>68.2</td>
<td>68.9%</td>
</tr>
<tr>
<td>Merseyside</td>
<td>2192</td>
<td>1453</td>
<td>66.3</td>
<td></td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>25119</strong></td>
<td><strong>19116</strong></td>
<td><strong>76.1</strong></td>
<td><strong>72.8%</strong></td>
</tr>
</tbody>
</table>

### 2.1.7 Adult – Shingles vaccination

Shingles is caused by the reactivation of the chickenpox virus in people who have previously been infected. The virus may be reactivated, or reawakened, due to other factors such as age, stress, other illnesses or medication. Around one in five people who have had chickenpox will get shingles at some point. Shingles causes a rash and pain which can persist. The shingles vaccine was launched in September 2013 and is routinely offered to those attaining their 70th birthday. In addition there are catch up cohorts from age 79 yrs and downwards. The year September 2013 – September 2014 showed an uptake in the aged 70 year cohort of 56% in
Knowsley, this compared to uptake of 57.7% in Merseyside and 61.8% in England. For the aged 79 cohort uptake was 56.6% in Knowsley, 54.3% in Merseyside and 59.6% in England. The success of the flu vaccination programme for over 65s may offer opportunities to improve shingles vaccination uptake through linking the offer for the two together.

2.1.8 Pertussis

Whooping cough (pertussis) is a highly infectious, serious infection that causes coughing and choking which can make breathing difficult. The pregnancy pertussis (whooping cough) vaccine (first launched in 2012) is offered during pregnancy, between 28 to 32 weeks gestation, following an increase in cases nationally and some deaths. The vaccine maximises the antibody response transferred to the unborn baby. New-born babies will then have the gift of natural protection to greatly reduce their risk of contracting whooping cough infection as a young baby. Young babies, who have not yet received protection from whooping cough through the routine vaccination, may be at risk of developing the infection and this can result in severe illness and death.

The uptake of the vaccine is measured in women who receive the vaccine in the 14 weeks prior to delivery. In Knowsley between August 2014 and February 2015 uptake varied between 45.4% and 60.4%. Uptake in Merseyside was 58% in February 2015, in line with national average, however more work should be done across the entire maternity pathway to promote the vaccine and improve uptake rates.

2.2 Communicable diseases

2.2.1 Healthcare Associated Infections (HCAI)

Healthcare-associated infections (HCAIs) develop either as a direct result of healthcare interventions or treatment, or from being in contact with a health or social care setting. HCAIs pose a serious risk to patients and service users and can cause significant morbidity and even death. They disproportionately affect vulnerable groups with co-morbidity.

The most well-known HCAIs include those caused by Methicillin-resistant Staphylococcus aureus (MRSA), Methicillin-sensitive Staphylococcus aureus (MSSA), Clostridium difficile (C.diff) and Escherichia coli (E. coli). Other infections include emerging threats such as Carbapenemase-producing Enterobacteriaceae (CPE), and even Norovirus (winter vomiting virus) and influenza.

Since April 2013, CCGs have held accountability for delivering on national targets related to HCAIs, on behalf of their responsible patients. For CCGs this represents all infections acquired in and out of hospitals.

The Knowsley Director of Public Health (DPH) is responsible for providing oversight of the health protection system and ensuring that the population is protected from threats to health. The Local Authority Public Health service also directly commissions the community Infection Prevention and Control (IPC) service via an agreed specification. This service faces outwards to support primary, community and social care settings by audit, training and ad-hoc advice. The community infection control service is also responsible for supporting the management of outbreaks and incidents and following up patients for specific infections, such as Hepatitis B. The community infection control service works in close collaboration with Public Health England, the CCG and Local Authority Public Health.
Each case of C. difficile and MRSA is investigated by a multi-disciplinary team to identify the root cause, determine whether the infection was avoidable, lessons learnt and advice required. The investigation may also identify the need to oversee, as appropriate, implementation of recommendations. A framework has been developed to facilitate CCG oversight of all C. difficile cases applied to Knowsley residents. This supports the identification of common themes to inform action.

**What works?**

There are many national, regional and local guidance drivers around infection control in the health and social care sector including:

- The MRSA Post Infection Review (PIR) Process;
- Updated guidance on the diagnosis and reporting of Clostridium difficile (DH 2012);
- Health Technical Memorandum (HTM) 01-05: Decontamination in primary care dental practices (DH 2008);
- National specifications for cleanliness in the NHS, Care homes and primary care (NPSA 2010);
- Infection: prevention and control of healthcare associated infections in primary and community care (NICE CG 139, 2012);

NICE CG139 recommendations include:

- Education of everyone involved in care regarding the principles of infection prevention and control, hand hygiene and decontamination standards, personal protective equipment and the importance of appropriate and adequate supplies;
- Education of patients and carers regarding hand decontamination;
- Appropriate use of long term catheters, with strict adherence to guidance for risk assessment, insertion procedures, review and changing;
- Vascular access procedures.

**2.2.2 C Difficile**

A C. difficile infection is a type of bacterial infection that can affect the digestive system. It most commonly affects people who have been treated with antibiotics, especially people who are susceptible through chronic illness or older age. Infection is classified according to where it is most likely to have been acquired – community or hospital, although root cause analysis of cases often shows complicated patient histories of interaction with social care, community care and acute care.

During 2014, there were 56 reported cases of C. difficile in Knowsley. This was lower than the number of reported cases in 2013 (63). Since 2008 there has been a 72% decrease in the reported cases of C. difficile in Knowsley when there were 199 reported cases.
2.2.3 MRSA

MRSA is a type of bacterial infection that is resistant to a number of widely used antibiotics. This means it can be more difficult to treat than other bacterial infections. Its full name is Methicillin-resistant staphylococcus aureus and is known as a "superbug".

The number of reported cases of MRSA recorded since 2007 has been relatively low since that time. In 2014, there were six cases reported in Knowsley. The NHS now has a zero-tolerance policy on this infection and thus monitoring and investigation into the factors that may have caused infection needs to continue. Figure 9 depicts the trends in HCAI from 2007.

![Figure 9: Cases of Healthcare Associated Infections (12-month rolling average), 2007-2015](source: HCAI Monitoring System)

MSSA

Staphylococcus aureus is a bacterium that commonly colonises human skin and mucosa (e.g. inside the nose) without causing any problems. It can also cause disease, particularly if there is an opportunity for the bacteria to enter the body, for example through broken skin or a medical procedure. Most strains of S. aureus are sensitive to the more commonly used antibiotics, and infections can be effectively treated. Some S. aureus bacteria are more resistant. Unlike MRSA, those that bacteria which are sensitive to methicillin are termed methicillin-sensitive Staphylococcus aureus (MSSA).

There are no current targets attached to this reporting and it is being used to gain additional information on the background and causes of the infection.

E coli

Most strains of Escherichia coli form part of the normal intestinal microorganism in humans and animals. However, some strains have the ability to cause disease in humans through the presence of specific virulence factors. These diseases include infections outside the intestinal tract such as urinary tract infections (UTIs), and bacteraemia.

As part of on-going information gathering the all health care organisations are required to submit data on E coli bacteraemia. In a similar way to MSSA it is then hoped to provide further information on the incidence and causes of the bacteraemia.
CCG, Public Health England and Local Authority with the collaboration of infection control services, review the infection trends and support management of outbreak and develops preventive measures.

HCAI is a health inequalities issue which increases hospital stays and cost. It can have a profound effect on quality of life, patient outcomes, and potential costs of care.

HCAI disproportionately affects the more vulnerable members of the population who may be ageing, or have long term conditions. It is essential that the health and social care system works together to optimise infection control and to ensure that when cases of HCAI do occur the lessons from gaps in care are learnt and addressed throughout the whole system. Action is also required on appropriate prescribing of antibiotics and proton-pump inhibitors (a medicine used to provide protection for the stomach against other medications or stomach symptoms). Antibiotic prescribing is covered elsewhere in this JSNA report.

2.2.4 Gastrointestinal Infections

2.2.4a Campylobacter Infections

Campylobacter is the most common cause of food poisoning in the UK, affecting 280,000 people a year, resulting in more than 100 deaths. Around four in five cases of campylobacter infection come from poultry and it is estimated that 65% of the chicken sold in the UK carry the bacteria.

Campylobacter poisoning can cause abdominal pain, severe diarrhoea, fever and vomiting. Symptoms usually develop two to five days after eating the contaminated food, but most people recover without treatment within two to five days.

The number of laboratory confirmed campylobacter infections in Knowsley during 2014 was 29, a 78% reduction from the 131 reported in 2013. The number of laboratory confirmed cases in Knowsley during 2014 was the lowest in the last 10 years.

The rate of infection for campylobacter in Knowsley during 2014 was 19.9 cases per 100,000 populations, the 6th lowest in the North West region (out of 39 areas).

2.2.4b Salmonella

Salmonella bacteria can cause food poisoning. Symptoms include diarrhoea, stomach cramps and sometimes vomiting and fever. On average, it takes from 12 to 72 hours for the symptoms to develop after swallowing an infectious dose of salmonella. Symptoms usually last for four to seven days and most people recover without treatment. Anyone can get salmonella, but young children, the elderly and people who have immune systems that are not working properly (including people with cancer, AIDS or alcoholism) have a greater risk of becoming severely ill.

The number of laboratory confirmed salmonella infections in Knowsley during 2014 was 8. This was the lowest number of reported cases between 2005 and 2014. There has been a 79% decrease in the number of laboratory confirmed salmonella infections since 2005 when there were 39 confirmed cases. In 2014, the rate of laboratory confirmed salmonella cases in Knowsley was 5.5 cases per 100,000 population, the highest out of 39 areas in the North West region. The rate of salmonella infection in Knowsley was higher than the North West region in 2014 (3.0 cases per 100,000) but lower than England as a whole (12.4 cases per 100,000 population).
2.3 Respiratory Illnesses

2.3.1 Tuberculosis

Tuberculosis (TB) is an infection caused by a bacterium belonging to the Mycobacterium tuberculosis complex, which includes M. tuberculosis.

TB usually affects the lungs but can also affect almost any other area of the body. Most transmissions occur from some people with pulmonary or laryngeal TB, which can cause symptoms such as coughing, blood in sputum, weight loss and fatigue. Left undiagnosed, a patient with infectious TB can infect 10 to 15 other close individuals over a year. Furthermore, ensuring that when TB is diagnosed, patients receive the right treatment and are supported to complete the full course of treatment – which can take months, is vital to ensuring recovery and reducing the risk of the development of multi-drug resistant strains.

Latent TB occurs when a person is infected with the TB bacteria but does not have any symptoms of active disease. Treatment may be required to reduce the risk of active disease. Latent TB testing is a current national focus.

What works?

The Collaborative Tuberculosis Strategy for England 2015 to 2020 was published in January 2015 (NHS E and PHE). The strategy aims to develop a stronger approach to TB control in England to reduce the incidence and harm caused by the disease by:

- The development of local TB Control Boards to strengthen the co-ordination and oversight of all aspects of TB control.
- Clear, evidence-based model service specifications and assessment of services against standards.
- Additional services to address specific gaps in current TB control arrangements, such as latent TB testing and treatment for new migrants, and
- Strengthened national support for local TB control arrangements

The North West Control Board was established in 2015. A local Cheshire and Merseyside TB network is in development.

A total of 6,520 cases of TB were notified in England in 2014, a rate of 12.0 per 100,000 populations, which is a reduction since the peak of 8,276 cases in 2011 (15.6 per 100,000). The rate of TB in the non-UK born population was fifteen times higher than in the UK born population. 72% of cases were non-UK born. The number of cases and rate of TB in the non-UK born population in England have declined year on year since 2011, with a decrease of more than 10% each year in the past two years. The decline in non-UK born cases has mainly occurred among new migrants who have been in the country for less than six years; the majority (60%) of non-UK born cases now occur among those who have lived in the UK for more than six years.

Other than country of origin or travel, other risk factors for TB include substance misuse, homelessness, poverty and a weakened immune system. The rate of TB in the UK born population has not declined, remaining stable at 4 per 100,000 population over the past decade. The majority (62%) of UK born cases were from the White ethnic group.
TB is largely centred in a few high prevalence areas. Knowsley is historically a low prevalence area. During 2012/14, TB incidence per 100,000 population in Knowsley was 2.3, a reduction when compared to 2011/13, when TB incidence per 100,000 population was 2.7. However, it is vital that surveillance continues within at-risk groups. Work should continue with the local TB service to ensure all front-line staff are aware of TB and understand its risk factors and where to seek help.

2.4 Hepatitis B and C

Hepatitis B is a viral infection that attacks the liver and can cause both acute and chronic disease. The virus is highly contagious and is transmitted through contact with the blood or other body fluids of an infected person. Hepatitis B virus can survive outside the body for at least 7 days and can be spread by:-

- sharing or use of contaminated equipment during injecting drug use;
- vertical transmission (mother to baby) from an infectious mother to her unborn child;
- sexual transmission;
- horizontal transmission (non-sexual contact between individuals, for example household contact with an infected person);
- receipt of infectious blood (via transfusion) or infectious blood products (for example clotting factors) in countries where screening of blood donors and donations is not performed;
- needle stick or other sharps injuries (in particular those sustained by hospital personnel);
- tattooing and body piercing.

The incubation period from infection to the appearance of symptoms is around 12 weeks (range 40-160 days). Symptoms during acute infection can include tiredness, abdominal pain, a “flu-like illness”, nausea, vomiting, joint pains, loss of appetite and jaundice. Children rarely develop acute symptomatic hepatitis B infection, whereas up to a third of adults do. Individuals are infectious to others and mortality during the acute phase of infection is estimated to be less than 1%.

If the virus persists for more than 6 months, the person has developed chronic (persistent) hepatitis B infection. During chronic infection many people have no symptoms but will remain persistently infected and infectious to others. Chronic hepatitis B infection is more likely to develop if the infection is acquired in childhood. Up to 10% of adults will develop chronic hepatitis B infection if the infection is acquired in adulthood. Progressive chronic infection is characterised by ongoing liver disease. The long term complications of chronic hepatitis B infection include cirrhosis and primary liver cancer.

Hepatitis C is a virus that also infects the liver. If left untreated it can cause serious and potentially life-threatening damage to the liver over many years. Injecting drug use remains the most important risk factor for HCV infection in the UK and it is estimated that around half of those who inject drugs have the infection. However, there are other ways in which the infection can be spread;

- sharing razors or toothbrushes;
- from a pregnant woman to her unborn baby;
- through unprotected sex – although this is very rare.
80% of Hepatitis C infections do not cause any noticeable symptoms until the liver has been significantly damaged. This means many people have the infection without realising it. When symptoms do occur, they may be vague e.g. flu-like illness, tiredness, loss of appetite and can be mistaken for other conditions. 80-85% of those infected will develop chronic Hepatitis C, which can cause fatigue and in around 10-20% of cases can lead to serious liver disease such as cirrhosis and liver cancer.

**Knowsley picture**

Reports of acute hepatitis B from laboratories in England provide the main information source on the incidence of hepatitis B. Estimation of the true incidence of hepatitis B infection requires adjustment for under-reporting (which is estimated at around 25%) and for the proportion of infections that are asymptomatic.

In 2013, Knowsley had a hepatitis B (both acute and chronic) incidence of 6.8 per 100,000, a decline when compared to 2012 (11.0 per 100,000). In 2012, Knowsley’s incidence rate was higher than the North West and England incidence of 0.61 and 1.04 per 100,000 respectively. Prior to this the numbers were lower and could not be published for Knowsley. In a local sampling exercise on people with a history of injecting drugs in treatment services 24% of samples showed a previous exposure to Hep B.

New Hepatitis C infections among people who inject drugs and infection in both young adults and recent initiates to drug use suggest that incidence has remained relatively stable in the UK over recent years. Figures from PHE indicate that between 2009 and 2013 there were 2,373 notified cases of Hep C in Cheshire and Merseyside. 11% of cases were in Knowsley. The estimated total number of cases in Cheshire and Merseyside is around 11,000 due to the high levels of undetected disease. In a local sampling exercise on people with a history of injecting drugs in treatment services 64% of samples showed a previous exposure to Hep C.

**What works?**

Testing for both Hep B and C and vaccination for Hep B is recommended in certain high risk groups, and where intervention can be of benefit. Guidance exists around the promotion of testing in at-risk groups. Testing is currently recommended in primary care, sexual health clinics, drug services, prisons and immigration removal centres, and for people from medium-high prevalence areas, men who have sex with men, people diagnosed with a sexually transmitted infection, prisoners, and close contacts of someone with the disease. Pregnant women are routinely offered testing in order to reduce the risk of transmission to the newborn. Hepatitis B can be preventable with safe and effective vaccines currently available.

In 2014/15, 56% of adults who were new to treatment at the local substance misuse service were offered and accepted for a Hep B vaccination. In comparison, 40% of adults were offered and accepted nationally. Of those in Knowsley who were offered a HBV vaccination, 49% completed a course of the vaccination (22% nationally) and a further 20% started a course of vaccination (22% nationally). Figure 10 shows the recent increase in take up of Hep B offer in the local service.

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6 Unlinked anonymous monitoring survey of people who inject drugs. Report on the results obtained from the samples and questionnaire received during 2014. Centre for Infectious Disease Surveillance and Control and Microbiology Services. PHE 2014

7 Hepatitis B and C testing: people at risk of infection (PH43, NICE 2012).
Figure 10: Hep B vaccination offer and take up within CRI, June 14-June 15

The service continues to work to increase uptake of vaccination and screening with incentive schemes in place to encourage uptake and completion of vaccination as well as uptake of testing.

2.5 Antimicrobial Prescribing Trends

Antibiotics are medications used to treat and, in some cases, prevent bacterial infections. They can be used to treat relatively mild conditions such as acne, as well as potentially life-threatening conditions such as pneumonia. Antibiotics are used in humans and in animals.

There are now hundreds of different types of antibiotics, but most of them can be broadly classified into six groups. These are outlined below.

- **penicillin** – widely used to treat a variety of infections, including skin infections, chest infections and urinary tract infections;

- **cephalosporins** – can be used to treat a wide range of infections, but are also effective for treating more serious infections, such as septicaemia and meningitis;

- **aminoglycosides** – tend to only be used to treat very serious illnesses such as septicaemia, as they can cause serious side effects, including hearing loss and kidney damage; they break down quickly inside the digestive system, so they have to be given by injection, but are also used as drops for some ear or eye infections;

- **tetracyclines** – can be used to treat a wide range of infections; commonly used to treat moderate to severe acne and rosacea, which causes flushing of the skin and spots;
• **macrolides** – can be particularly useful for treating lung and chest infections; can also be a useful alternative for people with a penicillin allergy or to treat penicillin-resistant strains of bacteria;

• **fluoroquinolones** – broad-spectrum antibiotics that can be used to treat a wide range of infections.

Whilst antimicrobials include not only antibiotics but also antiprotozoal (effective against parasites), antiviral (effective against viruses) and antifungal (effective against fungal infections), antibiotics are a key area for action.

Antimicrobial resistance is becoming a key concern within the UK and across the world. Antimicrobial Resistance arises when the micro-organisms which cause infection are able to survive exposure to a medicine that would normally eliminate them. This occurs through natural processes but is becoming increasingly common as more and more antibiotics are used in health and veterinary care. It’s essential to finish taking a prescribed course of antibiotics, because if a course is stopped and some bacteria survive, this increases the risk that they become resistant to the antibiotic.

The Chief Medical Officer highlighted this risk in her 2011 annual report and stressed that without effective antibiotics, simple infections could become a serious risk to the population and many of the medical advances in recent years, for example organ transplantation and cancer chemotherapy, could not be undertaken.

Antibiotics also increase the risk of healthcare associated infections and are almost always a factor when root cause analysis is undertaken locally for C. difficile cases.

**What works?**

The Department of Health, Department for Environment, Food and Rural Affairs (Defra) and Public Health England (PHE), have developed a UK 5 year Antimicrobial Resistance strategy\(^8\) with three key aims to improve knowledge and understanding of AMR, converse and steward effectiveness of existing treatments and stimulate the development of new antibiotics, diagnosis and novel therapies.

Public Health England locally has also developed a 5 year plan alongside the national strategy and is working with partners, including Knowsley CCG and Public Health around five key areas

- Education and training;
- Intelligence surveillance (prescribing trends and antibiotic resistance);
- Point of care testing (technology not yet ready for roll out in primary care);
- Role of back up (delayed) prescriptions;
- Development stewardship program in community settings.

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Local trends

Data on prescribing is complex and needs to take into account the different needs of a population. The STAR-PU is a weighted system which takes into account the different population needs based on the therapeutic group the drug belongs to. Antimicrobial prescribing volume trends (items per 1000 antibacterial item based Star PU) for Knowsley are higher than Liverpool and England, peaking during quarter four in Knowsley, Liverpool and England. Quarter four notably encompasses the winter months; October, November and December (See Figure 11).

![Figure 11: Antimicrobial Prescribing Volume Trends (Items per 1000 antibacterial item based Star PU)](image)

Improvements have been made and comparing quarter 1 2014/2015 antimicrobial prescribing rates for Knowsley, Liverpool and England to quarter 1 2016 it can be seen that whilst all rates have fallen, Knowsley rates were higher when compared to Liverpool and England (See Figure 12).

![Figure 12: CCG Comparison Antibacterial Drugs Prescribing (Items per 1000 antibacterial item based Star PU)](image)
The top prescribed antimicrobials for Knowsley, Liverpool and England were; Nitrofurantoin, Phenoxymethylpenicillin, Trimethoprim, Flucloxacillin Sodium and Lymecycline. Nitrofurantoin had the highest costs when compared to the top 10 antimicrobials and Knowsley had the highest cost associated when compared to Liverpool and England (See Figure 13).

Figure 13: Quarter 1 2015/16 (Cost per 1000 antibacterial cost based Star PU)

Relative to neighbouring CCGs, Knowsley’s growth rate in antibiotic prescribing volume over the last 12 months is lower.
Prescribing at practice level varies within Knowsley and reducing variation should be a focus for action.

Figure 15 below shows an example of this variation for the quarter ending August 2015.
What works?

The Knowsley CCG Medicines Management Team continues to work with GP Practices and prescribers in adhering to good practice and following the Pan-Mersey Area Prescribing Committee Antimicrobial Prescribing Guidelines. Audits of antibiotic prescribing have been conducted in several practices to review overall prescribing volume, prescribing of cephalosporins, fluoroquinolones and co-amoxiclav. There has been a notable reduction in the prescribing of cephalosporins and fluoroquinolones in many practices in the last two years.

The CCG discourages prescribing of antibiotics for simple non-bacterial sore throats. In this circumstance GPs are requested to think about and ask the patient to wait 24-48 hours to see if the condition resolves rather than issue an antibiotic prescription for immediate dispensing. If symptoms do not improve or worsen the patient should have the prescription dispensed or speak with their GP. This delayed prescription allows time for the patient’s symptoms to resolve whilst giving some power to the patient to be able to take further action without a repeat appointment if an antibiotic may be required. This has been shown to reduce antibiotic usage.
GPs are encouraged to refer to the Centor Criteria, which is a diagnostic tool that helps GP with diagnosis of a bacterial infected sore throat. The four Centor criteria are:

- Presence of tonsillar exudate;
- Presence of tender anterior cervical lymphadenopathy or lymphadenitis;
- History of fever;
- Absence of cough;

Looking ahead, the CCG plans to work closely with practices and incentivise adherence to good practice in the prescribing of antimicrobials.

Key messages for good practice in the use of antimicrobials are as follows:

- Don’t prescribe antibiotics for viral sore throats, simple coughs and colds.
- Use the agreed Pan-Mersey Formulary as the guideline to reduce the risk of antimicrobial resistance.
- Avoid unnecessary use of broad spectrum antimicrobials such as cephalosporins, quinolones, clindamycin and co-amoxiclav.
- Limit prescribing for uncomplicated cystitis to three days in non-pregnant, otherwise fit women of child-bearing age.
- Avoid widespread use of topical antibiotics, especially when available systemically.
- Don’t prescribe antibiotics over the telephone, other than in exceptional cases.
- Don’t put antibiotics on repeat prescription other than in exceptional cases.
- Consider using a back-up or ‘delayed’ prescription where this has been shown to be effective.
- Using patient information leaflets can reduce antibiotic use.
- Always check previous positive microbiology results prior to starting antibiotics. If the patient has a history of multi-resistant organisms not covered by the Pan-Mersey guideline, please contact a microbiologist.
Patients’ views

Work with practices and other prescribers is being undertaken to support them, including the dissemination of insight work undertaken with the Knowsley population to explore their behaviours regarding prescribing antibiotics. Focus groups were undertaken with individuals who were identified by their attitudes to their health and looked at two groups in particular: “health conscious realists” who were seemingly knowledgeable and actively seek out advice on health and lead a healthy lifestyle. This type of person tends to only goes to the doctor if they really need to, but does tend to respect the advice of said doctor and are willing to listen. The “live for todays” tend to see getting ill as an inconvenience, but something they have to put up with. They may see going to the doctor is an irritation, because they never know what to expect. They may perceive that doctors are always changing their mind about things GPs were also interviewed for their perspectives.

Key findings from the research are useful for professionals to understand their patients’ beliefs and motivations during consultations and also are useful to inform the development of patient facing communications. During this research we found:

- There is a willingness from patients to learn and some respondents were well informed and actively seek health information.

- Patients were keen to work to prevent the spread of ‘superbugs’ (resistant bacteria) but wanted to understand why things like this occur.

- Whilst campaign materials can be useful, the recurring answer from GP and patients alike was that the GP plays possibly the most significant role in managing the conversation around prescribing and addressing the use of antibiotics. Both recommended that more time is taken to discuss why patients are/are not prescribed antibiotics.

- However GPs feel times pressured but want to explore issues with patients in depth and take time to explain the prescribing/non prescribing rationale. Admittedly sometimes a prescription may be a way of ending a consultation and doctors are conscious they want to keep good relationships with patients, which may mean they “give in” to patients’ expectations around prescribing. Some may be over cautious due to past experiences.

- Increased use of prophylaxis has contributed to recent volume – urinary tract infections (UTIs), and COPD rescue packs, keeping patients out of hospital – admissions avoidance and so on.

- GPs may prescribe preventatively, for example when a secondary infection is likely, particularly in patients with co-morbidities and a history of medical problems.
3 SCREENING

3.1 Antenatal and New-born Screening Tests

Pregnant women are offered screening tests during pregnancy, and for their new-born, to try to identify at an early stage health problems that could affect the mother or baby. This can enable early action and support for families to ensure they make the right decisions for them about the pregnancy and care of their child.

During pregnancy women are offered screening tests for infectious diseases such as hepatitis, HIV, rubella and syphilis. They are also offered screening for Thalassaemia and in some cases Sickle Cell Disease. Chromosomal abnormalities such as Downs Syndrome may be detected by testing in pregnancy. Mid pregnancy ultrasound scanning can detect physical abnormalities.

New-born babies are offered screening tests for abnormalities of the heart, eyes, hips and testes via physical examination. They also are tested for hearing loss and metabolic conditions through the new-born blood spot test.

Bloodspot

The NHS new-born blood spot (NBS) screening programme involves a health professional taking blood from a child’s heel when the baby is 5 days old (the first day of life being day 0). The sample is then sent for testing which aims to identify rare conditions that can lead to serious illness, development problems and even death.

The NBS programme screens for 9 conditions. Each condition is chosen on the basis that the benefits of screening outweigh the risks. Currently those conditions are:

- Sickle Cell Disease (SCD);
- Cystic Fibrosis (CF);
- Congenital Hypothyroidism (CHT);
- Inherited Metabolic Diseases (IMDs). These are genetic diseases that affect the metabolism.
  - Phenylketonuria (PKU);
  - Medium-Chain Acyl-CoA Dehydrogenase Deficiency (MCADD);
  - Maple Syrup Urine Disease (MSUD);
  - Isovaleric Acidaemia (IVA);
  - Glutaric Aciduria type 1 (GA1);
  - Homocystinuria (HCU).

Parents must verbally agree to the NBS test. This consent must be noted by the health professional in the baby’s child health record.
Over 92% of new born blood spot tests in Knowsley in 2014/15 were completed before the baby was 17 days old. This was a big improvement (6.5%) on the previous year’s achievement. Parents received reassurance sooner, and in the very few babies where something was wrong, it was picked up sooner.

3.2 Excess Winter Deaths

Excess winter mortality (EWM) is defined as ‘the extra numbers of deaths during the winter months in relation to the other seasons of the year’ and is thought to be a direct consequence of the cold weather. The Office of National Statistics (ONS) method is used to calculate EWM and defines the winter period as December to March and compares it with the average number of deaths occurring in the preceding August to November and the following April to July. Understanding seasonal changes in temperature is important especially in winter months so that additional help can be made available for those that are most at risk from these cold conditions. At risk groups such as the elderly, children, and those with long term conditions such as respiratory disease are particularly vulnerable during this period, especially those on lower incomes and those not living in energy efficient housing. A recent study found that there is a greater risk of EWDs in colder housing than warmer housing, with EWDs in the coldest 25% of houses three times higher than the warmest 25% of houses. There is also a strong relationship between cold temperatures, cardio-vascular and respiratory diseases. Mental health can also be negatively affected by fuel poverty and cold housing for any age group, although particularly children and adolescents. Indirect impacts of cold homes and fuel poverty include reduced educational attainment, emotional well-being and resilience within children; reduced dietary opportunity and choice; and reduced dexterity leading to an increased risk of falls, accidents and injuries in the home.

Knowsley picture

Figure 16 highlights that the number of excess winter deaths in Knowsley has varied over the fourteen years since the baseline in 2001/02 where there were 47 extra winter deaths. Incidentally, the highest recorded number of EWD occurred in 2012/13 (120 EWD), and the lowest occurring in the 2003/04 winter period (31 EWD). Since 2001/02, there has been an average of 70 excess winter deaths per year in Knowsley meaning that the number of EWDs in 2014/15 was 45% above average.
The Excess Winter Deaths Index is the excess of deaths in winter compared with non-winter months expressed as a percentage. This indicator measures excess winter deaths expressed as the EWD Index, in order that comparisons can be made easily between different geographies. It indicates whether there are higher than expected deaths in the winter compared to the rest of the year. Figure 17 highlights excess winter mortality index in Knowsley from 2001/02 through to 2014/15. As can be seen, the index has fluctuated over the years with the current EWM index being 20.1%. Traditionally, Knowsley’s index has been similar or lower than the North West and England with the exception of 2005/06, 2010/11 and 2012/13. EWDs are calculated using the date of death, however as these figures have not been published for the North West and England for 2014/15, the monthly figures have been calculated using the date of registration, therefore they are not a direct comparison but should be similar.
Figure 18 highlights excess winter mortality and the EWM index by age group in Knowsley over a fourteen year period. EWM increased in all of the age bands in 2014/15, however the greatest increase in the number of excess deaths was seen in the 65-84 age group (170% increase from 2013/14). Not surprisingly, the highest proportion of winter deaths was observed in those 65-84 years and those 85+. The number of winter deaths for 85+ year olds was approximately 26% higher than both non-winter periods. The EWD index significantly increased between 2013/14 and 2014/15 for all age groups. The EWD index was at its highest level in 2014/15 for 85+ group.

![Figure 18: EWD by Age Group and the EWD Index](image)

Figure 19 highlights a seasonal variation in the number of deaths within the borough, with more taking place within the winter months compared to the non-winter months (the light blue shading in figure 19 represents the core winter months). Although there is a spike in the number of deaths during the winter of 2008/09, the high level of excess winter deaths within this period can also be attributed to the relatively low number of deaths during the non-winter months. There was also a similar number of winter deaths observed in 2012/13 (145 winter deaths) as in 2008/09 (144 winter deaths), however winter deaths during 2014/15 are the highest at 151. The deaths during the winter and non-winter months have both increased. As can be seen in most of the years, a trend occurs in the winter months (Dec – March) when compared to the months prior and post EWD period.
What works?

NICE guidelines for multi-agency partners recommend a strategic joined up approach to address issues regarding poor housing and cold homes with single-point of contact services and tailored solutions for resolution of issues of cold homes. The recommendations also focus on the identification of vulnerable groups and the importance of a multitude of professional groups who are aware of cold weather/cold homes issues and risks and where to get support.

Action to reduce EWD involves many partners and overlaps with actions regarding increasing flu vaccination uptake in the at risk population, and ensuring NHS services are accessible and used appropriately, with sufficient preventative measures in place, e.g. for those with long term conditions such as respiratory and heart disease.

Furthermore an extreme weather group which consists of health, social care, council, public health, housing, and voluntary sector partners has been formed and meets to ensure that front-line professionals are aware of the risks of cold weather and cold homes and are able to provide clear messages to individuals and signpost to support for housing repairs and energy efficiency.

Warm Homes

Since 2012 the Council has operated an annual Warm Homes scheme, which is aimed at assisting vulnerable residents to achieve affordable warmth and reduce fuel poverty. Warm Homes provides improvement works which vary from routine gas servicing right through to full boiler replacements and central heating installations. The scheme also provides behaviour

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Excess winter deaths and illness and the health risks associated with cold homes. NICE guidelines [NG6] Published date: March 2015.
change and energy efficiency advice. This allows vulnerable residents to make the most of their income and any new measures that they have had installed.

The qualification criteria for financial assistance are that the applicant is:

- in receipt of certain income related benefits, or on a low income (a test of their resources applies if not in receipt of benefits);
- an occupant residing in the property aged under five years of age, over 60 years of age or aged five to seventeen who suffers with a long term health condition (a letter from their GP will be required as evidence of their condition); and
- owner-occupier or a private tenant of the property for which assistance is sought. In the case of private tenants the landlord will have to agree to the full terms and conditions before assistance is given.

Healthy homes

‘Healthy Homes in Knowsley’ is a two year public health funded initiative which targets areas of poor quality housing and health for intervention via a team of trained advocates who visit every home within an identified area. A structured conversation is held with residents in relation to the condition of their property and a range of other issues affecting their health and wellbeing.

During the life of the initiative half the properties in Knowsley will be door knocked (approx 32,500 homes) and any residents visited who requests an appointment.

Progress so far:

By mid-October 2015; 14,948 properties have been visited by the Healthy Homes Advocates. 1,174 full surveys have been completed resulting in 3,258 referrals to partners and services, shown below. It should be noted that 387 referrals have been made regarding energy efficiency.

Table 4: Healthy Homes Advocate referrals

<table>
<thead>
<tr>
<th>Partner Agency/Service</th>
<th>Number of referrals</th>
<th>Partner Agency/Service</th>
<th>Number of referrals</th>
</tr>
</thead>
<tbody>
<tr>
<td>Strategic Housing &amp; Environmental Health</td>
<td>469</td>
<td>Debt and Welfare Advice via Citizens Advice Bureau</td>
<td>231</td>
</tr>
<tr>
<td>Children Centre</td>
<td>138</td>
<td>Merseyside Fire Service</td>
<td>702</td>
</tr>
<tr>
<td>Knowsley Works</td>
<td>59</td>
<td>Merseyside Police</td>
<td>240</td>
</tr>
<tr>
<td>Benefits Team</td>
<td>78</td>
<td>Health Trainers</td>
<td>226</td>
</tr>
<tr>
<td>Knowsley Access Team (KAT)</td>
<td>25</td>
<td>Energy Efficiency Advice</td>
<td>387</td>
</tr>
<tr>
<td>IKAN</td>
<td>181</td>
<td>Care &amp; Repair Service</td>
<td>126</td>
</tr>
</tbody>
</table>
Work has already taken place to sustain the legacy of the initiative beyond its two year funding and continue the good work that is taking place. A full and comprehensive end of year 1 evaluation report is almost complete, which will demonstrate emerging trends, early benefits data and progress made.

3.3 Emergency Preparedness Resilience and Response

Emergencies can happen at any time, and often happen without notice. While emergency preparedness is a wide-ranging discipline extending far outside the health arena, many of the main recognised emergency risks arise from threats to health, while the consequences of all emergencies potentially have both physical and mental health dimensions. Whilst we cannot predict them, Knowsley services are able to respond to emergencies and limit their impact on health in Knowsley. Emergencies disproportionately affect those with existing health conditions and those with a low income, so taking action on these issues will reduce their impact.

A major incident or an emergency is any event or occurrence that requires organisations to put in place special arrangements in order to continue to meet the needs of the population. During an emergency, the existing needs of the population continue, as detailed elsewhere in this JSNA, but additional needs arise as a direct consequence of the incident. Different groups of people across Knowsley are vulnerable to the impact of different incidents. In addition, people not previously considered as vulnerable may become so as a result of an emergency.

Knowsley Council has its own emergency arrangements and also prepares for and responds to incidents through the Merseyside Resilience Forum (MRF), which brings together the Police, Fire and Rescue Service, Ambulance Service, the NHS, Local Authorities and a large number of other partners including voluntary agencies. This partnership forum works to ensure a coordinated response to any incident, and is the focus for preparedness activity across Merseyside. MRF work dovetails with the business of the Merseyside Local Health Resilience Partnership (LHRP) which is a separate partnership forum for the oversight and coordination of NHS Emergency Planning, Resilience and Response.

The MRF has a robust system for the identification of risks. The UK National Risk Register of Civil Emergencies sets the context from which the Merseyside Community Risk Register is developed. The Community Risk Register identifies pandemic influenza / emerging infectious diseases, severe weather, flooding, industrial accidents / environmental pollution and loss of critical infrastructure as the five highest risks. These also apply to Knowsley. For example, the borough has significant industry which includes five businesses which are governed by the Control of Major Accident Hazards (COMAH) Regulations and classified as ‘Upper Tier’ COMAH Sites. In addition, the threat of terrorist attack is a national risk which requires preparedness across all areas.

In response to the above and other risks the MRF has a continuous programme of developing, reviewing and testing emergency plans. These include generic response plans, plans for specific threats or risks, and plans for major consequences such as humanitarian support.
which cut across most or all emergencies. Individual MRF partners have their own emergency plans and this includes Knowsley CCG, health and social care providers and Knowsley Council.

4. FUTURE CHALLENGES

Health protection covers a wide range of very different topics and threats to health but all of them require partnership working across wide partnership organisations along with the public. Some of the key challenges this report identifies include:

- Ensuring the wider health protection system works together with a joint understanding of key risks and issues, control measures and roles and responsibilities.

- The reduction in budgets and allocations of organisations and services across the health protection system in future years will mean a greater need for robust risk assessments and joint working to mitigate threats to health.

- Addressing healthcare associated infection rates locally including ensuring lessons from root cause analysis and PIRs are taken forward across the health and social care system.

- Improving antibiotic prescribing and reducing variation across clinicians. There is a need to monitor local resistance patterns, feed into surveillance systems and remain vigilant for emerging infections and threats.

- Improving seasonal flu vaccination uptake in under-65 at-risk groups, including children and pregnant women and ensuring the new universal children’s programme is implemented locally. Improving uptake of seasonal flu vaccination in front-line health and social care staff.

- Increasing the uptake of Hepatitis B vaccination injecting drug users.

- Identifying opportunities to promote energy efficiency interventions and prompt reaction of front-line staff across all areas of practice to promote cold weather warnings and support residents accessing support for warmer homes.