HSC Public Health Agency

Transmit

Health protection service bulletin

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Foreword

In this edition, we have included articles on three infectious diseases and also an article on the important public health issue of air pollution. The article on Hepatitis A highlights the importance of good hand hygiene in preventing the spread of the infection and also the importance of Hepatitis A vaccine for those in the recommended groups.

Tuberculosis remains an important local public health problem with around 70 cases each year. It has been estimated that without treatment each person with Active Pulmonary TB may infect 10-15 people every year and historic data suggests that 70% of people with smear positive pulmonary TB died within 10 years as the disease progressed.

Lyme disease is caused by a specific group of *Borrelia burgdorferi* bacteria, which can be transmitted to humans through a bite from an infected tick. While the local incidence of confirmed Lyme disease is relatively low, awareness is important to highlight measures which can be taken to prevent infection and also to allow early diagnosis and treatment.

The final article includes useful tips for reducing individual exposure to air pollution which is the fourth greatest risk to public health after cancer, heart disease and obesity.

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Hepatitis A

Hepatitis A is a notifiable disease in Northern Ireland. It is a disease affecting the liver caused by the Hepatitis A virus. The infectious period is taken from two weeks before onset of first symptoms and until one week after the onset of jaundice. Infectivity is maximal just before jaundice develops. There is no chronic carrier state.

The disease is usually mild; however, severity worsens with increasing age. Asymptomatic disease is more common in children. Patients may experience a range of illnesses, from non-specific nausea and vomiting to fulminant hepatitis (Liver inflammation which can cause liver failure caused by cell death). Jaundice occurs in over 70% of those infected as adults.

The virus is usually spread through the faeco-oral route, through person-to-person spread or contaminated food and drink. Foodborne outbreaks have been reported following ingestion of certain foods, including shellfish and vegetable salads. Transmission of Hepatitis A through blood products has been reported.

Improved standards of living and hygiene have led to a fall in Hepatitis A incidence. This has led to an increased susceptibility in adults in the UK, causing an increased shift in the average age of infection.

In recent years, there have been several reported outbreaks of Hepatitis A in men who have sex with men (MSM). The most recent outbreak started in July 2016. Two thirds of these cases were in the greater London area; however, there have been some sporadic cases reported outside of this area.

Outbreaks of Hepatitis A have been reported in individuals with a history of injecting drugs, and also homeless people living together in hostels and shelters.

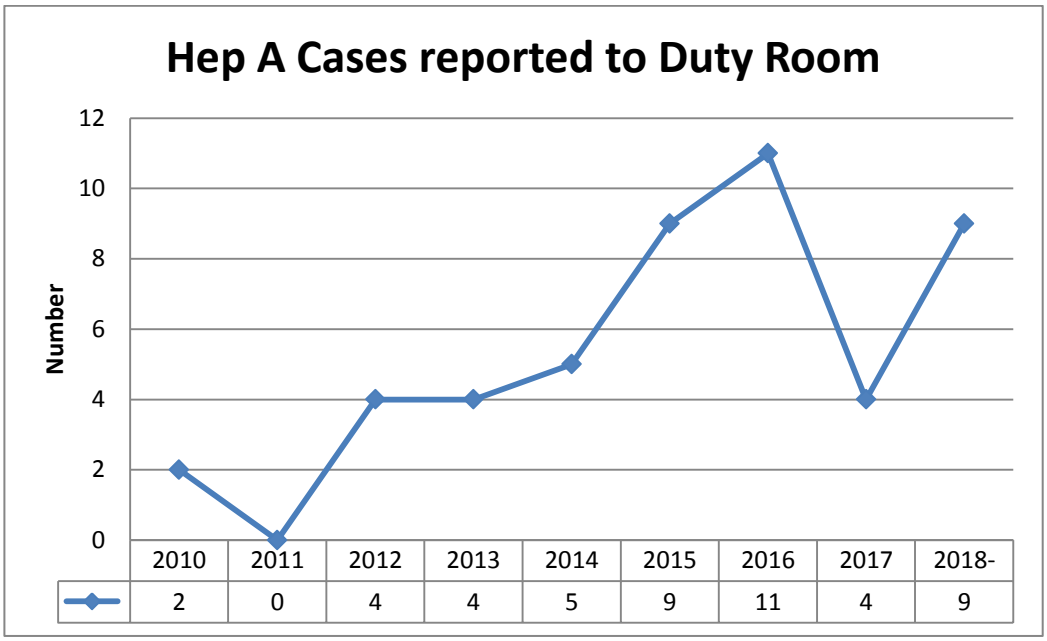
Travel abroad is a common factor for sporadic cases of Hepatitis A, with the highest risk to UK travellers occurring in the Indian Subcontinent and the Far East.

A typical health protection response to a reported case of Hepatitis A includes completion of an enhanced questionnaire, identification of and post-exposure vaccination of household contacts or treatment with immunoglobulin for contacts thought to be at increased risk of complications from Hepatitis A (including people over 65 years of age or people with chronic liver disease).

Prevention of spread is primarily by provision of hygiene advice and exclusion from work or school. Hepatitis A vaccination is also highly effective in preventing infection if given prior to exposure.

In Northern Ireland, usually fewer than ten cases of Hepatitis A are reported to the Duty Room each year. England and Wales had 444 reported cases in 2017. The local incidence based on statutory notifications is shown in Figure 1.

Figure 1



Medical practitioners have a statutory duty to notify cases of Hepatitis A to the Health Protection Duty Room in order to assist with the monitoring and early detection of clusters or outbreaks.

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Tuberculosis: past, present and future

The formation of the NHS in 1948 coincided with the first randomised control trial of the treatment of Tuberculosis (TB) using Streptomycin which had been discovered a few years previously. Before effective treatment, TB had a dreadful impact on the local population causing 932 deaths in Northern Ireland in 1948.[1,2] It has been estimated that without treatment each person with Active Pulmonary TB may infect 10-15 people every year and historic data suggests that 70% of people with smear positive pulmonary TB died within 10 years as the disease progressed.[3,4] There were great hopes when Streptomycin was first discovered but experience showed limited effectiveness of the drug when used alone and it was only when additional drugs were developed that effective treatment was possible (Isoniazid 1951, Pyrazinamide 1952, Rifampicin 1957 and Ethambutol 1962). It is salutary to note that we still rely on these drugs today sixty years later. Successful treatment for TB usually requires at least six month's treatment with anti-tuberculous drugs under the supervision of a physician with expertise in the management of TB. One of the challenges we face with treatment of TB is the emergence of drug resistant strains of the infection which are much more difficult to treat successfully. Thankfully the occurrence of drug resistant TB (MDRTB and XDRTB) is relatively uncommon in Northern Ireland but constant vigilance is essential to ensure early detection, treatment and prevention of spread. The development of new effective drug treatment for TB remains an ongoing challenge.

At the outset of the NHS, the control of TB in Northern Ireland was coordinated locally through the Northern Ireland Tuberculosis Authority established in 1947.[5] According to the Tuberculosis Authority Report in 1950, there were 10,173 patients on the tuberculosis register at the end of 1948, all of whom were considered to be ill or to have been recently ill with Tuberculosis.[6] The organisational activities of the Tuberculosis Authority to provide treatment for people diagnosed with TB along with improved social conditions undoubtedly helped to reduce the incidence of TB and resultant mortality. One of the measures undertaken by the Tuberculosis Authority was to establish sufficient inpatient beds to accommodate the most severe cases to ensure access to treatment, including laboratory and X-ray facilities, and also to achieve segregation of the infectious persons. There is no doubt that improvements in environmental and social conditions also played an important part in the successful reduction in TB rates. The incidence of TB caused by *Mycobacterium bovis* as a result of drinking contaminated milk from diseased animals was reduced by veterinary interventions to stop milk from affected cows being presented for human consumption alongside better standards in milk production including sterilisation (pasteurisation).

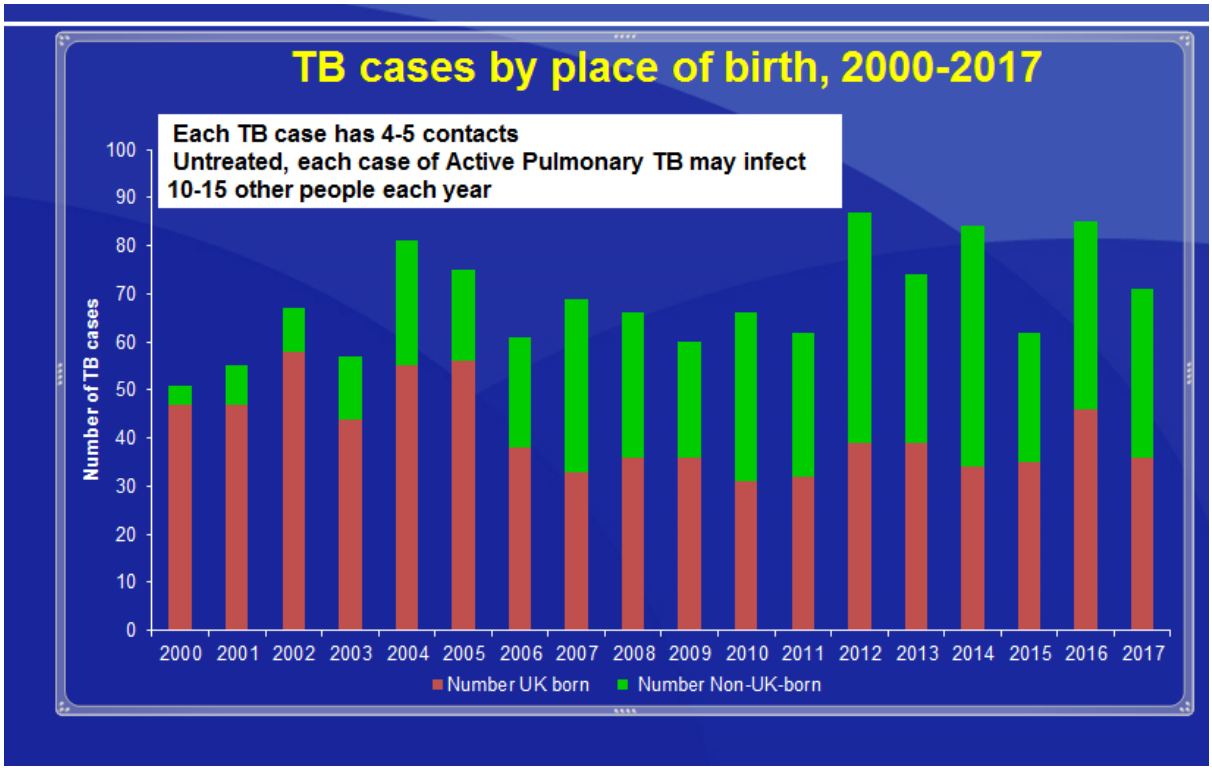
The Tuberculosis Authority had an important educational role and was as an advocate for better social support and improved housing for people affected by TB, working along with other organisations, such as the Northern Ireland branch of the National Association for the Prevention of Tuberculosis which had been set up as a voluntary organisation in 1946 to support people affected by TB (became Northern Ireland Chest, Heart and Stroke in 1976).

The Tuberculosis Authority also coordinated the introduction of a BCG (Bacillus Calmette-Guérin) immunisation programme which was introduced in 1953. While BCG did not offer complete protection against TB infection or progression from initial infection to active disease, it had an important role in the prevention and control of TB, especially the

most severe forms of TB such as TB meningitis in children, when TB was more common. With the decreased incidence of TB in Northern Ireland in recent years, universal BCG for all school children has been discontinued since 2005 but BCG still has an important role in specific high risk groups.[7] The World Health Organisation has identified development of a safe, effective vaccine as a key requirement for global prevention and control of TB.

The incidence of TB in Northern Ireland has fallen in recent decades but it is important to recognise that the disease has not been eradicated. By 1971, the number of TB cases notified in Northern Ireland had fallen to around 250 cases per year and the decrease continued to 1985, after which the rate of decline slowed, with an increasing proportion of cases among people coming to Northern Ireland from countries with a higher incidence of TB (Figure 1).[8] There were 71 cases of TB reported in Northern Ireland during 2017, giving an incidence of rate 3.8 per 100,000 of the population which is lower than England (9.3 per 100,000), Republic of Ireland (6.7 per 100,000), Scotland (5.7 per 100,000), and slightly higher than Wales (3.4 per 100,000). The most recent Global TB Report from the World Health Organisation indicates that TB is the ninth leading cause of death worldwide and the leading cause from a single infectious agent with an estimated 10.4 million people (90% adults; 65% male; 10% people living with HIV) fell ill with TB in 2016 (i.e. were incident cases).[3] Infection with HIV reduces the natural immune defences thereby increasing the risk of developing TB and making treatment more complex and arduous for the patient.

Figure 1: TB in Northern Ireland 2000-17



While the incidence of TB in Northern Ireland is significantly lower than many other parts of the world, it remains an important public health problem in Northern Ireland and early diagnosis is essential to enable effective treatment to achieve a cure. New diagnostic tests enable quicker confirmation of active TB, more accurate typing of specific strains of TB through Whole Genome Sequencing and also allow the identification of Latent TB infection which can be treated prophylactically to reduce the risk of progression to active disease. Detection of Latent TB is particularly important for people who may have been recently in contact with a

case of active Pulmonary TB and people who have come here from countries with a high incidence of TB. It is a legal requirement that all confirmed and suspected cases of active TB should be reported to the Public Health Agency to allow necessary public health action to be taken.

Any of the following symptoms may suggest TB:

- Fever and night sweats
- Persistent cough
- Unexplained weight loss
- Blood in the sputum (phlegm or spit) at any time.

TB has always been closely associated with poverty, disadvantage and social exclusion, and that remains the case today with highest rates of TB found in poorest parts of the world. Locally TB is more common among disadvantaged marginalised groups, including homeless people, prisoners, refugees and asylum seekers and people who have drug or alcohol addiction problems. The most successful interventions against TB will require a “Think Global and Act Local” approach. The challenge for health and social services today is to develop comprehensive approaches to address underlying risk factors, especially social exclusion, as well as ensuring early diagnosis and treatment of people with TB.

References

1. Medical research Council. Streptomycin treatment of pulmonary Tuberculosis. BMJ 1948 (October 30): 769-82.

2. Ulster Year Book, 1950

3. Global Tuberculosis Report 2017. World health Organisation, 2017

4. Tuberculosis. NICE guideline. Published: 13 January 2016. nice.org.uk/guidance/ng33

5. The White Plague in Ulster: A short history of Tuberculosis in Northern Ireland. Calwell HG, Craig DH. Ulster Medical Society.

6. Tuberculosis in Northern Ireland by B.R. Clarke (Director, Northern Ireland Tuberculosis Authority). The Medical Press Dec. 13, 1950.

7. BCG Immunisation Programme. DHSSPS, 2005 (HSS(MD)25/2005)

8. Prevention and Control of Tuberculosis in Northern Ireland. DHSS, 1997 (March).

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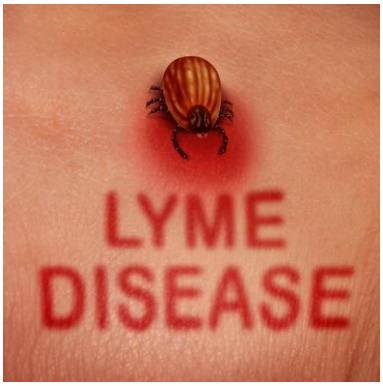
Lyme Disease

Lyme disease is caused by a specific group of *Borrelia burgdorferi* bacteria, which can be transmitted to humans through a bite from an infected tick. This can result in a number of clinical problems ranging from skin rash to serious involvement of organ systems, including arthritis, and neurological problems.

The Lyme disease guideline recently issued by NICE covers the diagnosis and management of Lyme disease. It aims to raise awareness of when Lyme disease should be suspected and ensure that people have prompt and consistent diagnosis and treatment.
https://www.nice.org.uk/guidance/ng95



Key points from the NICE Guideline:

- the bacteria that cause Lyme disease are transmitted by the bite of an infected tick
- ticks are mainly found in grassy and wooded areas, including urban gardens and parks
- tick bites may not always be noticed
- infected ticks are found throughout the UK and Ireland, and although some areas appear to have a higher prevalence of infected ticks, prevalence data are incomplete
- particularly high-risk areas are the South of England and Scottish Highlands but infection can occur in many areas
- Lyme disease may be more prevalent in parts of central, eastern and northern Europe (including Scandinavia) and parts of Asia, the US and Canada
- most tick bites do not transmit Lyme disease and that prompt, correct removal of the tick reduces the risk of transmission.

A summary of the NICE Guideline was published in the BMJ in April 2018 highlighted the following points.[1]

- Lyme disease can occur anywhere in the UK
- Erythema migrans is diagnostic of Lyme disease. Use a combination of clinical presentation and laboratory testing to guide diagnosis and treatment in people without erythema migrans
- Serological testing is a two tier approach: a sensitive initial test is performed first (ELISA), followed by a more specific confirmatory test (immunoblot) in case of a positive or equivocal initial result
- Symptoms of Lyme disease may take months or years to resolve even after treatment for several reasons, including alternative diagnoses, reinfection, treatment failure, immune reaction, and organ damage caused by Lyme disease

- Consider a second course of antibiotics for people with ongoing symptoms as treatment may have failed

There were 1,310 laboratory confirmed cases of Lyme disease (B. burgdorferi) infection in humans in the UK in 2016 (1,136 in England and Wales, 170 in Scotland, and 4 in Northern Ireland).[2] https://www.gov.uk/government/publications/zoonoses-uk-annual-reports

The following guidance can be used to reduce the chance of acquiring a tick bite when enjoying outdoor activities:

- walk on clearly defined paths to avoid brushing against vegetation where ticks may be present
- wear light coloured clothing so that ticks crawling on clothing can be spotted and brushed off
- use an insect repellent that can repel ticks and prevent them from climbing onto clothing or attaching to skin (always follow the manufacturer's guidance)
- wear long trousers and long sleeved tops to reduce the direct exposure of ticks to your skin, making it more difficult for them to find a suitable area to attach.

Locally, clinical / diagnostic advice may be sought from local Trust Microbiologists or the Regional Virology Service (07889086946). While Lyme disease is not a statutorily notifiable disease in Northern Ireland, medical practitioners are requested to continue to report all confirmed or suspected cases of Lyme disease to the PHA Duty Room (Telephone: 03005550119).

References

1. Lyme disease: summary of NICE guidance. Cruickshank M et al. *BMJ* 2018;361:k1261 doi: 10.1136/bmj.k1261 (Published 12 April 2018)

2. Zoonoses Overview Report (UK 2016). Public Health England, 2017

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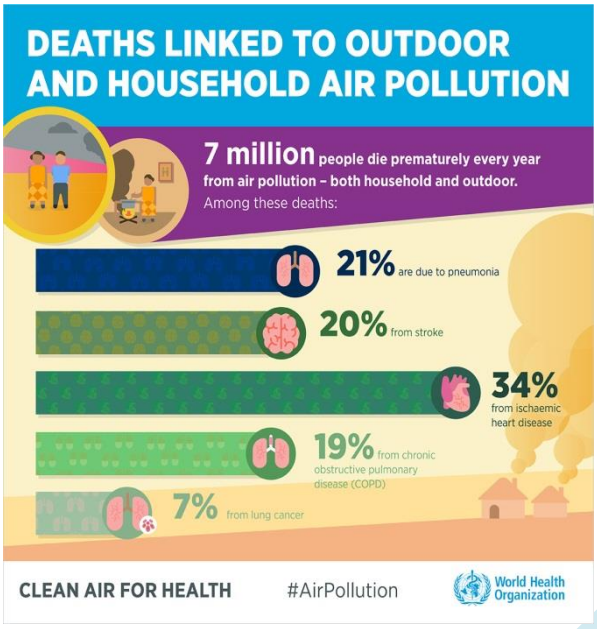
The Impact of Air Pollution on Public Health

Air pollution is the greatest environmental risk to health in the UK, and the fourth greatest risk to public health after cancer, heart disease and obesity. Despite this, the health impact of air pollution is not always well known. A UK-wide survey of 3252 people was conducted in March 2018 which focused on public attitudes to air quality. It found that only 21% of participants felt that they knew a lot about the impact of air quality on health. When compared to other environmental issues only 11% of people named air pollution as their greatest environmental concern.

The five most damaging air pollutants are fine particulate matter, ammonia, nitrogen oxides, sulphur dioxide and non-methane volatile organic compounds. There are many sources of outdoor air pollution including transport, industry, energy supply, dust, agricultural practices, household energy and waste management.

Air pollution has been found to cause or exacerbate long term conditions such as chronic bronchitis, chronic heart disease (CHD), and stroke, which in turn reduces quality of life, life expectancy and increases the financial pressure on an already stretched NHS. Furthermore, air pollution contributes to health inequalities as deprived communities are more likely to be subject to negative health effects from poor air quality because they are more exposed to air pollution, for example, by living close to major roads.

A draft Clean Air Strategy in England has been published this year which aims to improve air quality and reduce public exposure to toxic pollutants. The strategy marks the importance of public information on measures that can be taken to reduce exposure to air pollution, particularly for population groups who are more vulnerable to its effects such as children, the elderly and people with pre-existing cardiovascular or respiratory conditions. This provides a useful source of information that is equally relevant for Northern Ireland residents. Top tips provided by DEFRA for reducing individual exposure to air pollution include:



- not using your car as often for short journeys
- reducing how much you burn in your home and garden
- if you choose to burn, switching to using cleaner fuels like Ready to Burn wood and to more efficient appliances
- opening your windows when you clean, do DIY, smoke or do other activities that release pollutants directly into your home

- staying away from traffic if you're walking or cycling (walking on the side of the pavement furthest from the road, using the quieter roads and keeping back when waiting to cross the road)

- turning off your car engine when you park or are waiting in traffic

Research on the impact of air pollution on public health is currently building. An urban healthy living project supported by Space for Smarter Government and the UK Space Agency will trial using advanced air pollution mapping to predict locations of air pollution hot spots and provide dynamic route planning for people to use when planning their journeys. The demonstration will take place in Belfast in October 2018 and aims through the research findings to provide people with more control over the amount of air pollution they are exposed to when travelling.

References

- Air quality: explaining air pollution – at a glance DEFRA 22 May 2018
- Clean Air Strategy 2018 DEFRA
- http://www.who.int/phe/infographics/air-pollution/en/
- Public Attitudes to Air Quality Report for Defra May2018

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PHA Web Links to Surveillance Data

Surveillance data on the main topics of Public Health interest are available through the following web links:

Notifications of Infectious Diseases:
http://www.publichealth.hscni.net/directorate-public-health/health-protection/notifications-infectious-diseases

Group B Streptococcus:
http://www.publichealth.hscni.net/directorate-public-health/health-protection/group-b-streptococcus

Vaccination coverage:
http://www.publichealthagency.org/directorate-public-health/health-protection/vaccination-coverage

Avian Influenza:
http://www.publichealthagency.org/directorate-public-health/health-protection/avian-influenza

Brucellosis:
http://www.publichealthagency.org/directorate-public-health/health-protection/brucellosis-human

Gastrointestinal infections:
http://www.publichealthagency.org/directorate-public-health/health-protection/gastrointestinal-infections

Hepatitis:
http://www.publichealthagency.org/directorate-public-health/hepatitis

Healthcare Associated Infections:
http://www.publichealthagency.org/directorate-public-health/health-protection/healthcare-associated-infections

Meningococcal disease:
http://www.publichealthagency.org/directorate-public-health/health-protection/meningococcal-disease

Respiratory infections:
http://www.publichealthagency.org/directorate-public-health/health-protection/respiratory-infections

Sexually transmitted infections:
http://www.publichealthagency.org/directorate-public-health/health-protection/sexually-transmitted-infections

Tuberculosis:
http://www.publichealthagency.org/directorate-public-health/health-protection/tuberculosis

Department of Health Web Links

CMO Letters and Urgent Communications relevant to Health Protection, and issued in the three months preceding publication of this edition of Transmit, are accessible through the following web links:

Hepatitis B
Vaccine – 15 March 2018
https://www.health-ni.gov.uk/sites/default/files/publications/health/hss-md-07-2018.pdf

Mass Casualty Framework – 14 March 2018
https://www.health-ni.gov.uk/sites/default/files/publications/health/hss-md-06-2018.pdf

Seasonal Flu
End of Flu Season and Related Issues – 1 June 2018
https://www.health-ni.gov.uk/sites/default/files/publications/health/hss-md-09-2018.pdf

Seasonal Flu Vaccination Programme 2018/19 – 14 June 2018
https://www.health-ni.gov.uk/sites/default/files/publications/health/hss-md-11-2018.pdf

Shingles
Shingles Vaccination Programme – Eligibility Criteria for 2018/19 – 4 June 2018
https://www.health-ni.gov.uk/sites/default/files/publications/health/hss-md-10-2018.pdf

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