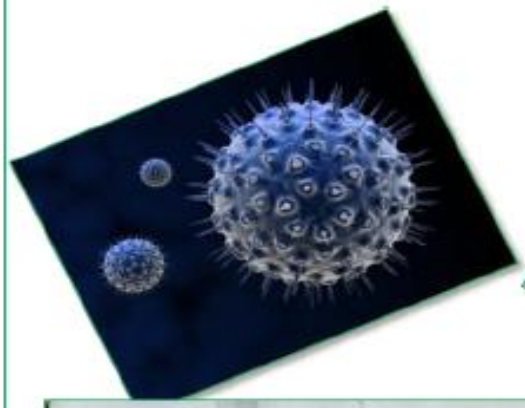
114th ANNUAL
MOH REPORT
Bailiwick of Guernsey

Special themes:

'Infection'

'Liver Disease Prevention'



STATES OF GUERNSEY

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SUMMARY

It is my great privilege to publish the 114th Medical Officer of Health Annual Report for the Bailiwick of Guernsey. The special themes in this report are infection, and liver disease prevention. Also considered are reflections on the 1912 MOH Report, reports on the business of the Directorate, and some health statistics.

Infection

Currently, worldwide, infection causes millions of deaths and diseases every year. In the past, epidemics of transmissible diseases have led to the devastation, and even destruction, of whole civilisations.

In Guernsey and Alderney in the years 2003-2012, infectious diseases were recorded as the underlying cause of death in seventy-three people, 1.3% of all deaths, none of which were in people under forty years old. By contrast, in 1912 there was a "*fortunately small"* number of tuberculosis (TB) deaths (twenty-seven) a third aged 16-25 years old, in 1920 thirty-two measles deaths, in 1938 fourteen diphtheria deaths, and in 1950 twenty TB deaths, many of which were in children.

As well as deaths, infections can be expensive to treat, and cause life-long disability. At the start of the twentieth century, King Edward VII Hospital was built, principally to treat people with infectious diseases, a purpose it served for over half a century. In 1957, Alderney saw an outbreak of acute paralytic poliomyelitis, in addition to regular cases in Guernsey, and this disease left a legacy of long-term problems that some islanders will be suffering from even today. Half a century ago, in 1964/5, during a large measles outbreak in Guernsey, a number of children required hospital treatment from a measles infection. In 2012, by contrast, in only 1% of people admitted to the Princess Elizabeth Hospital was an infection recorded as the primary reason for their admission.

For over a century, there has been a statutory requirement for doctors to notify certain infectious diseases to the Medical Officer of Health, the primary purpose of which is the rapid identification and control of infectious diseases. The years 2012 and 2013 were exceptional, with more scarlet fever notifications than for half a century, more whooping cough notifications than since the 1980's, the first measles notification for over fifteen years, and zero TB notifications. To assist in the control of disease, joint work was carried out with healthcare professionals and the media to advise the public on the prevention, detection and treatment of scarlet fever and associated infections; whooping cough immunisation for pregnant women was introduced in 2013 to provide passive immunity to their infants; and public information campaigns were run to encourage parents to have their children immunised.

Immunisation is one of the most cost-effective healthcare interventions, saving millions of lives worldwide. Bailiwick immunisation programmes have achieved; the eradication of smallpox; the elimination of diphtheria, measles, poliomyelitis, and rubella; and a reduction in meningococcal disease and whooping cough. Population coverage of measles and whooping cough immunisation dipped during past safety scares and a legacy may be the increase of disease currently seen. However, childhood immunisation uptake is currently satisfactory.

Today, *Campylobacter* is the most frequently notified infectious disease. It is a zoonosis (a disease transmitted from animals to man), often spread via food. In 2012, a detailed study of all 143 notified cases showed they were not linked and there was, unfortunately, no specific cause that could be controlled. However, this situation is a reminder of the need for all of us to practise good food hygiene.

Sexually transmitted and blood borne infections are relatively common, but many remain undiagnosed with potentially serious consequences to individuals and their contacts. Prompt diagnosis through testing is very important for people's own health and to prevent spread to others, particularly as a range of effective treatments are available. I note that a *Chlamydia* screening programme, previously recommended as a "spend to save" initiative, is still to be introduced.

The current human immunodeficiency virus (HIV) pandemic, recent fatal outbreaks from newly recognised respiratory infections, and pandemic flu are a reminder that infections do not respect human defined borders and of the need for constant vigilance and disease surveillance. The United Nations tasked the World Health Organisation to set up an international system after the Second World War, and they drew up the International Health Regulations, which have recently been modified. A recent local audit has shown that, that while Guernsey and Alderney meet basic international standards, there are deficiencies that need to be addressed.

Despite our success in controlling the harms from infection, a recent death in London from diphtheria, an outbreak of paralytic poliomyelitis in the Mediterranean, and the regular appearance of newly recognised serious infectious diseases, remind us of the ever present threat of infection. Further emergence of multi-drug resistant bacteria in Guernsey and worldwide mean that it is possible that healthcare interventions we take for granted today, could become too dangerous in the future. We are complacent at our peril, and adequately resourced infectious disease preventative programmes are vital.

Recommendations include: all children should be immunised; pregnant women are immunised against whooping cough to protect their infants; the introduction of additional childhood immunisations such as hepatitis B, flu, and human papilloma virus in boys are considered; monitoring of the immunisation programme is

improved; sexual health strategy is enhanced, including the introduction of a *Chlamydia* screening programme; resources to meet International Health Regulation responsibilities are reviewed; infectious disease notification and control legislation is updated; regulation of infection control in healthcare providers is introduced; investment is made in healthcare facilities to prevent infection; and all residents practise good hygiene to prevent infection.

Liver disease prevention

Liver disease is the underlying cause of death in 1-2% of islanders, but accounts for 7% of the years of life lost under 75 years. Between 2001- 2012, 129 islanders died from liver diseases, around half caused by drinking alcohol, a shocking statistic. Liver disease deaths have been steadily increasing in the British Isles, in contrast to other major organ diseases. Most liver disease is preventable.

The three main underlying causes of liver disease, alcohol, obesity and viral hepatitis, cause liver damage in similar ways; first liver cells are damaged; second the liver becomes inflamed; third there is fibrosis or scarring; and finally there is cirrhosis or advanced irreversible scarring. Disease can lead to liver failure or liver cancer. Unfortunately, people are often unaware they have liver disease until it is advanced. Deaths are, of course, only the tip of the iceberg with many others suffering ill health and disability.

Although alcohol is a carcinogen, the majority of islanders drink it several times a week. A significant minority of children also drink alcohol, with parents or carers their main source. Problem alcohol consumption is the most frequent reason for islanders to seek help from the drug treatment service, and most attendees have started drinking by 15 years old. There is frequently a relaxed attitude to alcohol and children in many parts of our society. At individual level, early detection and brief advice about management of alcohol and liver problems can help reduce risk of death and ill health. The alcohol industry, often led by unaccountable multi-national companies, usually appears to put their profits before public health. It is important Government acts to both set an example and to protect their constituents from the worst excesses of this industry. There is good evidence that consumption is strongly influenced by price and a minimum unit price of alcohol mainly impacts on our heaviest drinkers, who are most at risk of harm. It is estimated that if Guernsey adopted such a policy it would prevent three deaths and fifty illnesses a year, yet have a minimal impact on low risk alcohol drinkers.

Obesity is linked to non-alcoholic fatty liver disease and increases the risk of progression of other liver diseases. Risk increases with the degree of obesity. Adult obesity levels in the Bailiwick have been around 15-20% in adults for a decade, with men and women equally at risk, and those aged 55-64 years having close to twice the risk of younger adults. Children who are obese are at high risk of becoming obese adults. The Guernsey Child Measurement Programme, newly

established in the school year 2012-13, measured 93% of children in years one and five. Of year one children (age 5/6 years), 9% were found to be overweight and 6% obese, Of year five children (age 9/10 years), 14% were found to be overweight and 15% obese. A range of interventions have been implemented under the first phase of the States Obesity Strategy, including the appointment of a school nurse for weight management and a community dietician. With severe constraints on funds it will be important to ensure that not only health focussed interventions, but other interventions such as the encouragement of active transport, help our community address this very serious issue.

Worldwide hundreds of millions of people have chronic viral hepatitis. A secure treatment programme has been established at the Orchard Clinic, and around 120 people with hepatitis C and over 20 with hepatitis B are cared for. Chronic infection can lead to cirrhosis and transmission of the infection. Practising safer sex and avoidance of injecting drugs are very important preventative measures. It is likely that there are some people in the Bailiwick who are unaware they are infected so it is important that people who may be at risk are tested.

Recommendations include; ***Alcoholic liver disease prevention*****:** local sports club members should set an example to young people; the States should not fund alcoholic beverages; local people should avoid high risk drinking; develop work with primary care on early identification and brief interventions for alcohol abuse, and detection of liver disease; explore use of primary care data for population surveillance; introduce a Bailiwick minimum unit price for alcohol; control harmful alcohol advertising and marketing. ***Obesity linked liver disease prevention***; public health to explore work with healthcare providers to monitor adult obesity; States fund the second phase of the Obesity Strategy; a Transport Strategy is adopted which increases active transport for everyday journeys; residents follow guidance on healthy exercise and eating. ***Viral Hepatitis prevention*****:** an action plan is developed to reduce viral hepatitis; practise safe sex; avoid injecting drugs; get tested if you are at risk and treated if appropriate.

Other Highlights in Public Health

The Bailiwick, like all jurisdictions, is having to make very difficult choices of what to fund and what not to fund. From a public health perspective the aim is to obtain the most improvement of length of life, quality of life and personal independence from the resources available, in a fair way. In the 110th MOH report I examined the issues of resources and priority setting, and while significant progress has been made, considerable further work is still required to improve priority setting. I recommend the States further develops its prioritisation processes.

Dr Stephen Bridgman
Medical Officer of Health, Guernsey,
January 2014

INFECTION

An infection can be considered as an event when a bacterium or other micro-organism (pathogen) reproduces in the tissues of the host organism (for example, a human) and harms their health (disease).

A person is said to be colonized by a micro-organism when it reproduces and there is no harm to the host. Although micro-organisms that cause disease often receive the most attention, most micro-organisms do not cause an infection, and indeed some are essential for our health.

We all develop many infections during our lives, but usually we fight them off with the help of our incredible and highly complex natural immune system. However, infection has the potential to kill or cause permanent damage to any person. In the middle ages a third of Europe's people died from one outbreak of a bacterial (*Pasteurella pestis*) infection alone, "the plague". This is now known to have been transmitted to people by bites from fleas living on rats. It has been claimed, that the Black Death pandemic arrived in England in June 1348 having previously struck the Channel Islands (Roberts et al 2003), and it may have been spread by a ship travelling from Guernsey to Weymouth. There were at least five plague outbreak years in the Channel Islands in the sixteenth century (1546/47/63/84/91) and one in the seventeenth (1629) (Darryl Ogier, States Archivist pers. comm.) Good port health practice has controlled plague in Europe. Plague is still endemic in parts of Asia and Africa.

At the end of the nineteenth century a very serious situation arose in Guernsey as regards infectious disease, as illustrated below;

"The sudden increase in deaths from diphtheria, enteric fever, and scarlet fever in the island, particularly since 1895, had prompted the Royal Court to appoint a special committee, charged with the duty of reporting upon the causes of these epidemics, and to recommend measures to reduce, if possible to eradicate these diseases." (White 1969).

One consequence of this committee was the appointment of the Guernsey Medical Officer of Health in 1899.

The continued emergence of newly recognised diseases (for example, since 1980 the discovery of a new disease has been seen nearly every year, Davies 2013), re-emergence of old ones, the development of microbial resistance to anti-microbial drugs and disinfectants, a burgeoning human population and rapid worldwide travel mean premature death and serious illness from infectious disease remain a major threat, worldwide. Unlike other diseases, micro-organisms can rapidly evolve to defeat our preventative and treatment techniques. As medicine advances, it is also

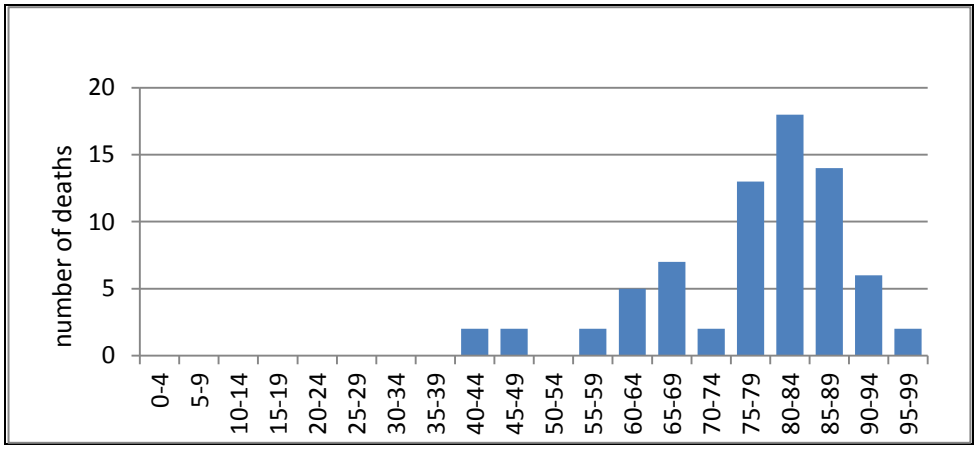
creating new groups, of usually older people, who are at higher risk of infection, for example, people immune-suppressed due to drug treatments for cancer or organ transplant rejection, and those with surgically introduced foreign material such as joint replacements and artificial heart valves. Although battles may be won against infection, infectious organisms evolve, sometimes rapidly, and therefore will always remain a major health threat.

The objective of this section is to examine the public health impact of infections and consider possible policy options and recommendations for improvement.

Deaths

Between 2003 and 2012, seventy-three deaths were registered in Guernsey and Alderney with an underlying cause from infectious and parasitic diseases (A00 to B99), with a mean of seven a year, and a range of four to eleven per year. The mean age at death was 77 years. No deaths were recorded in those under 40 years old (Figure 1). These deaths represented 1.3% of all deaths in this period.

Figure 1 Deaths in Guernsey & Alderney 2003-12 with an underlying cause of infectious or parasitic diseases (A00 to B99), by five year age band.



Three deaths were registered with an underlying cause of TB, two from HIV/AIDS, nineteen from diarrhoeal disease, and forty-nine from other causes. Of those who died from diarrhoeal disease, many had a significant underlying health problem, e.g. dementia, a few had a perforated bowel, and two had pseudomembranous colitis which were likely antibiotic related. Of the forty-nine deaths from other causes, most had septicaemia from a variety of organisms, including one person with a Legionella infection and one with a Pneumococcal infection (which is an immunisation preventable disease). Again, most people who died had a significant underlying health problem.

The rates of death and years of life lost from infectious diseases in Guernsey and Alderney were significantly lower in 2008-10 compared to England and Wales, however, it should be noted that the number of events is small, 2008-10 had the lowest local rates over a five year period, and therefore this might be a chance finding (Tables 1-4).

Table 1 Deaths from Infectious and Parasitic disease (ICD-10 A00-B99), 2006-12 Rates are age-standardised rates (ASR) per 100,000 population standardised to the European Standard Population (ONS 2013), rates for multiple years are three year rolling averages, LCI = lower limit of confidence, UCI = upper limit of confidence.

Guernsey and Alderney	Deaths	ASR	95%LCI	95%UCI
2006-08	25	7.75	4.55	10.95
2007-09	19	5.63	2.97	8.29
2008-10	14	3.59	1.62	5.56
2009-11	17	4.56	2.27	6.86
2010-12	20	5.54	3.00	8.08

Table 2 Deaths from Infectious and Parasitic diseases (ICD-10 A00-B99), Guernsey and Alderney compared to England and Wales, 2008-10. Rates are age-standardised rates (ASR) per 100,000 population standardised to the European Standard Population (ONS 2013), rates for multiple years are three year rolling averages, LCI = lower limit of confidence, UCI=upper limit of confidence. (Source: for England and Wales deaths, https://indicators.ic.nhs.uk/webview/ accessed 29 Aug 13).

	ASR	95%LCI	95%UCI
England and Wales	6.56	6.45	6.66
Guernsey and Alderney	3.59	1.62	5.56

Table 3 Years of Life Lost under 75 from Infectious and Parasitic disease (ICD-10 A00-B99), 2006-12. Rates are age-standardised rates (ASR) per 100,000 population standardised to the European Standard Population (ONS 2013), rates for multiple years are three year rolling averages, LCI = lower limit of confidence, UCI = upper limit of confidence.

Guernsey/Alderney	YLL	ASR	95%LCI	95%UCL
2006-08	97.5	4.89	0	14.06
2007-09	52.5	2.44	0	8.69
2008-10	20.0	0.91	0	4.69
2009-11	30.0	1.36	0	5.96
2010-12	42.5	1.82	0	6.99

Table 4 Years of Life Lost under 75 from Infectious and Parasitic diseases (ICD-10 A00-B99), Guernsey and Alderney compared to England and Wales, 2008-2010. Rates are age-standardised rates (ASR) per 100,000 population standardised to the European Standard Population (ONS 2013), rates for multiple years are three year rolling averages, LCI = lower limit of confidence, UCI – upper limit of confidence. Source: for England and Wales deaths, https://indicators.ic.nhs.uk/webview/ accessed 29 Aug 13.

	ASR	95%LCI	95%UCI
England and Wales	7	6.74	7.26
Guernsey and Alderney	0.91	0	4.69

Hospital Admissions

While infections are a very important health issue they account for only a small minority of hospital admissions. In 2012, in Guernsey an infectious disease was recorded as the primary diagnosis for 144 of the 14,196 coded episodes of care, or 1% of admissions (J Elliott, HSSD, personal communication). Of these, 54 were coded as a form of sepsis, and 25 as a form of gastroenteritis. The clinical coding of sepsis can be defined as the presence of both an infection and a systemic inflammatory response (Roat 2013).

Economic Impact

The economic impact in Guernsey and Alderney of infections is likely to remain high despite the decline in deaths. If Guernsey and Alderney costs were similar pro rata to those in England then they would cost our economy around £3 million a year (Davies 2013). The Social Security Department paid about half a million sick days in 2012, of which around 5% were attributed to an infectious disease.

Island Risk Register: Pandemic Influenza

An outbreak of pandemic flu is the top risk in the Island's Risk Register. Pandemic flu was discussed in a previous report (Bridgman 2010).

In the 1918/9 flu pandemic, 155 deaths from flu were recorded, many of people aged between 25 and 64 years old, compared to 327 members of the Guernsey Light Infantry who died in France during the Great War (Jeffs 1999).

The great pandemic of Asian influenza swept through the world in 1957 and led to 5 deaths in Guernsey. Vaccination was offered to medical, nursing and ambulance staff (Lynch 1958).

A revised local pandemic flu strategic plan is nearing completion which will help improve a local response to the next pandemic. A key message is that responses

will need to be flexible and proportionate to the level of threat, depending on whether it is a mild, moderate or severe pandemic.

HSSD's expert group will continue to monitor the scientific evidence of pandemic strategies and advise any changes in response, as necessary. Some investment will be required, for example, for pandemic vaccines (covered later), if the Bailiwick wishes to be as prepared as neighbouring jurisdictions.

Recommendation 1 :	Financial support will be required if the island wishes to be as well prepared for the next pandemic as neighbouring jurisdictions.

Statutory Notifications of Infectious Diseases to the MOH

The statutory notification of certain infectious diseases reported to the Guernsey MOH facilitates prompt investigation of, and response to, public health risks and enables the monitoring of local trends in infectious disease. Some diseases have been notifiable to the MOH for over a century. The current legislation, the Ordonnance Relative a La Sante Publique 1936 includes a list of notifiable diseases which registered medical practitioners need to notify the MOH. This list has been updated from time to time. The prime purpose of the notification system is speed in detecting possible outbreaks and epidemics to assist in disease control. This function is part of disease surveillance which is the routine ongoing collection, analysis and dissemination of health data (WHO 2003).

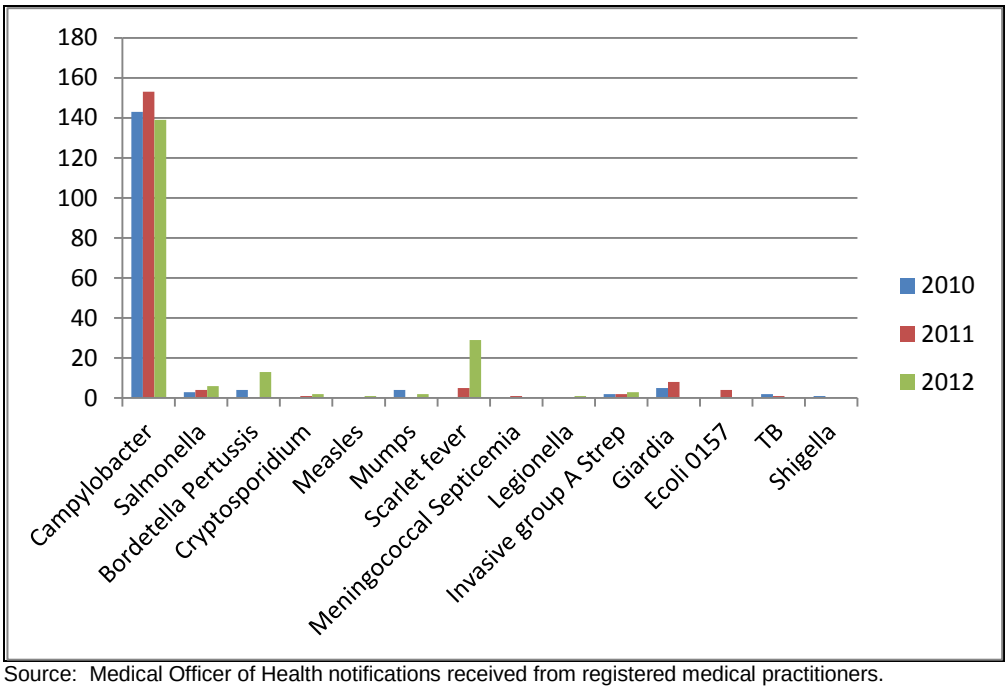
Currently only registered medical practitioners have a statutory duty to notify the MOH of infectious diseases, but public protection would be improved if a duty of notification was extended to include other health professionals. Protection would also be enhanced if other agencies such as laboratories had a statutory duty to notify the MOH of causative agents which are a significant hazard to public health. Similar improvements in notifications have been introduced in some of our neighbouring jurisdictions (HPA 2010). A proposal on this issue will be coming from HSSD in the near future.

Recommendation 2 :	Other health professionals, in addition to doctors, should have a statutory duty to notify certain infectious diseases.

Recommendation 3 :	Agencies such as laboratories should have a statutory duty to notify the MOH of causative agents which are a significant hazard to public health.

The frequency of some diseases notified to the MOH in 2010-12 are shown in Figure 2.

Figure 2 Selected infectious diseases notified to the MOH, 2010-12.



Source: Medical Officer of Health notifications received from registered medical practitioners.

Campylobacter

Campylobacter is currently, by far, the most frequently notified infectious disease in Guernsey (Figure 2). It is considered to be a zoonosis, that is a disease transmitted to humans from animals or animal products.

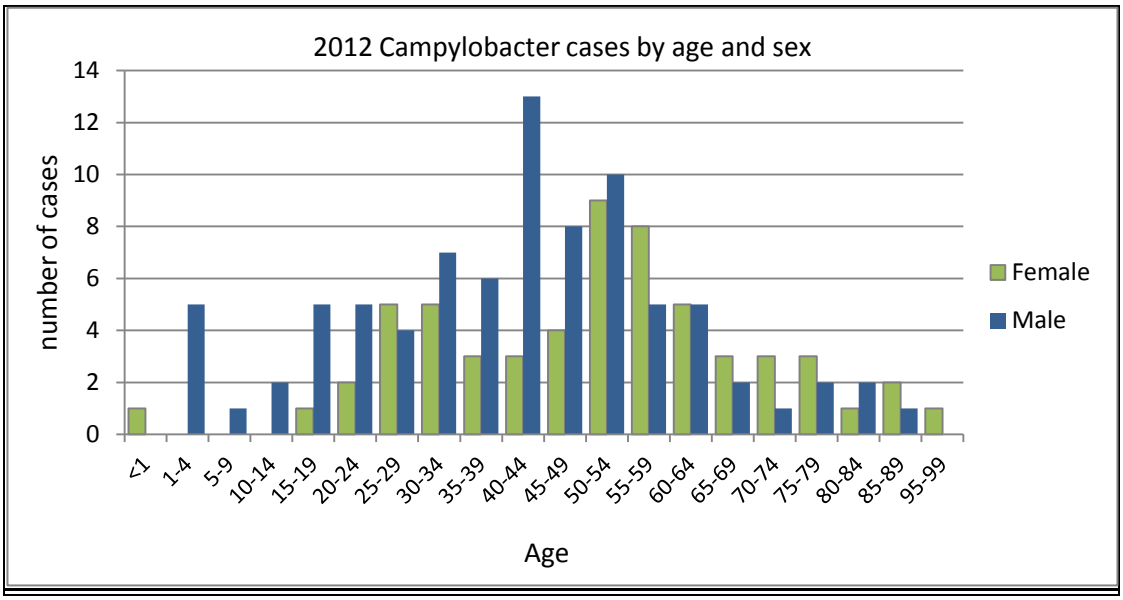
Illness is characterised by severe diarrhoea and abdominal pain. Undercooked meat, especially poultry, is often associated with illness as are unpasteurised milk, unpasteurised dairy products, and untreated water. The majority of infections, however, remain unexplained by recognised risk factors for disease (HPA 2013). Two species account for the majority of infections: *C. jejuni* and *C. coli*.

Between 2000 and 2011 the number of Campylobacter infections notified to the MOH in Guernsey averaged 149 per 100,000, which exceeds the rates for Wales which have varied between 70 and 130 per 100,000 over the last 20 years (PHW 2013). A similarly high rate has been noted in Jersey. The age and sex of the 143 cases recorded in Guernsey in 2012 is shown in Figure 3.

Due to the relatively high infection rates in Guernsey, a year long study has been carried out in collaboration with England and Jersey to try to understand reasons behind these high rates, with the aim of identifying actions that might be taken to

bring down rates in the future (Weerasinghe et al 2013). People with an infection confirmed by the laboratory were asked to complete a questionnaire about their recent illnesses.

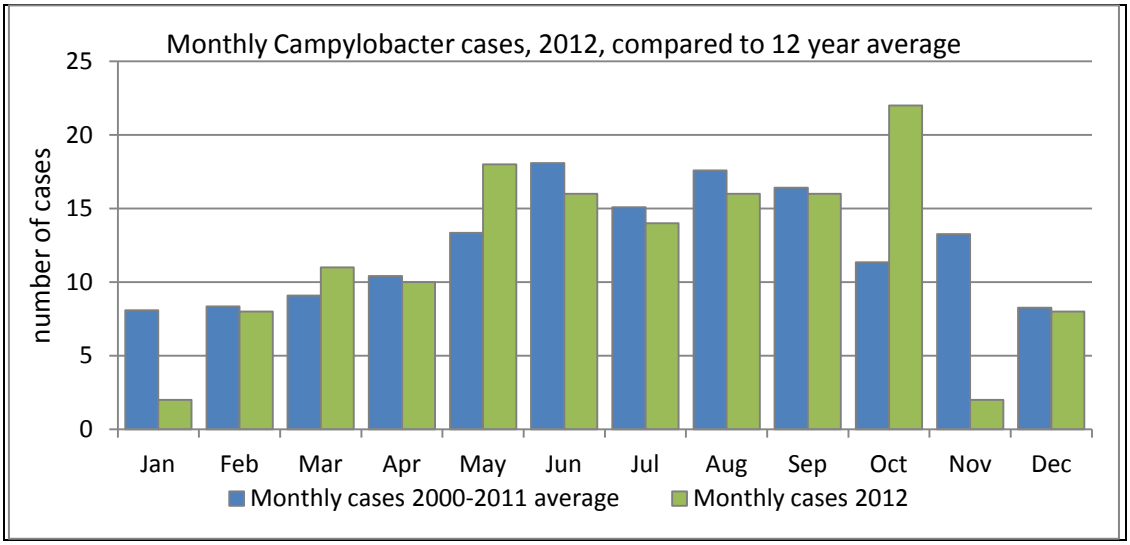
Figure 3 Campylobacter laboratory confirmed cases in 2012 by age and sex.



No cases were seen in St Peters and Herm/Jethou, otherwise all parishes were represented in proportion to their population. Nearly 90% of cases contracted their infection on-island. No single type of job or employment stood out. In the week before illness nearly half the people had handled poultry and nearly half, eggs, and although these are the only findings that stand out, they are not definitive.

Infections occur throughout the year but more usually are observed in the summer. In 2012 an unusually large number of cases occurred in October (Figure 4).

Figure 4 Campylobacter laboratory confirmed cases in 2012 by month, compared to the twelve year average, 2000-2011



A strain, ST-42, associated with cattle was the fifth most frequent among strains from the Channel Islands, but was not within the top nine in strains in other places. Microbiological isolates showed thirty-one different indigenous strains from Guernsey. Both the diversity of individual types in Guernsey and the significant variation from types between the islands and between the islands and England were a surprise. This might be explained by the islands relative isolation.

No unifying feature was identified among the cases originating in Guernsey and Alderney and cases seem to have been independent of one another. There was no obvious outbreak evidence, or linkage by, for example, place of work, occupation or a common eating location. In some locations Campylobacter have been identified in sand from bird excreta. Possible further studies are being considered.

Food may be a source of infection, and the introduction of a Food Hygiene Information Scheme by Environmental Health should help reduce risk (see later food section).

Recommendation 4 :	To reduce the risk of *Campylobacter*; meat, especially poultry should be cooked until piping hot in the middle; raw meat, especially poultry, should be separated from other foods; eggs should be cooked thoroughly; hands should be washed before eating, especially if in contact with farm animals.

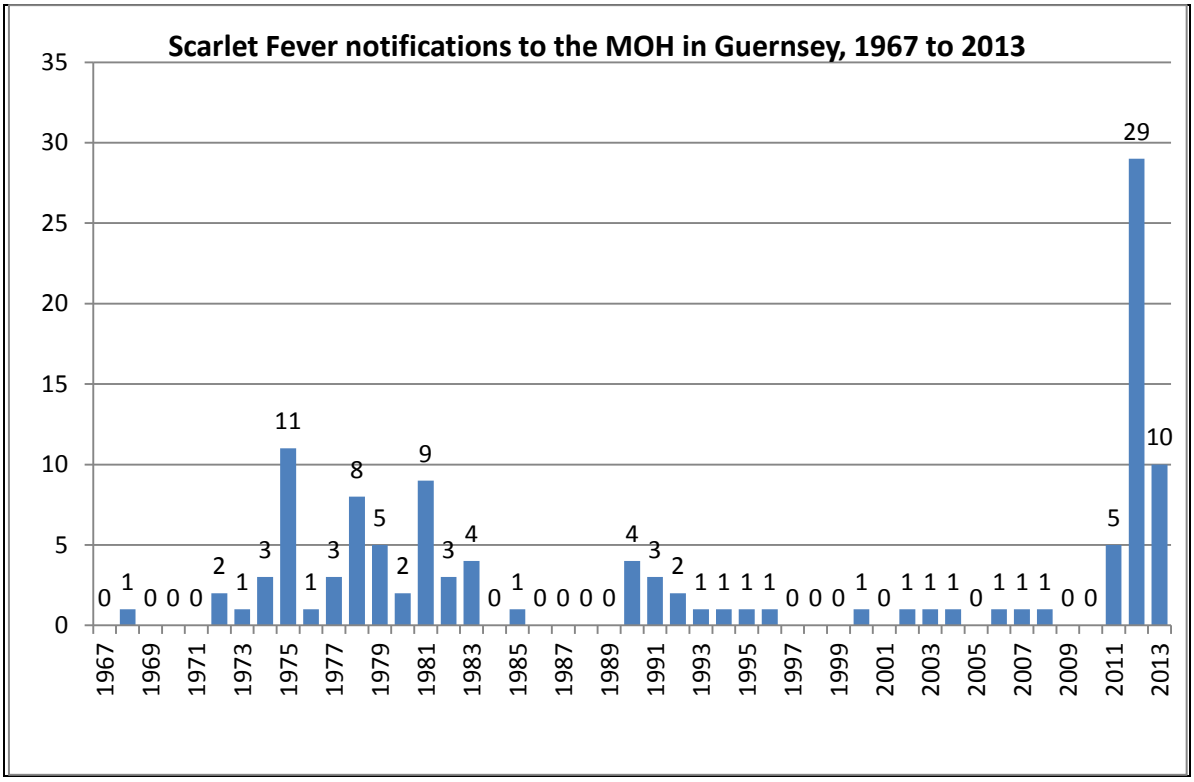
Streptococcal Infections

Scarlet Fever

In 1910, 3 Guernsey children died from scarlet fever (Bishop 1911). In 1950, an exceptional 81 cases were notified to the MOH (Revell 1951), and in 1958, 118 (Lynch 1959). From 1967 until 2011, in only three years, 1975/79/81, with 11, 8, and 9 cases respectively were more than 5 cases notified in a single year (Figure 5).

In 2012 more cases of scarlet fever were notified than for more than half a century (Figure 5), when it was the second most frequent disease to be notified (Figure 2). Of the 29 cases notified, 16 were girls, 13 boys, with 22 aged 5 years or younger. A media release warning the public about scarlet fever and group A Streptococcal infection, and advice on preventative measures was issued on 1st February 2012. The assistance of the local media in publicising this issue was much appreciated.

Figure 5 Scarlet Fever notifications in Guernsey, 1967 to 2013.



Scarlet fever is a highly contagious infection, affecting a small percentage of people who have a throat, or less commonly skin, infection caused by Group A Streptococcus bacteria (also known as *Streptococcus pyogenes*). It is usually

transmitted via the mucus and saliva of infected people through direct contact, sneezing, coughing, breathing out, and sharing of cups, plates or utensils. It takes around 2 to 5 days to develop symptoms after being infected. Protective measures include frequent hand washing, not sharing glasses, utensils, towels etc with an infected person, and hygienic disposal of contaminated handkerchiefs and tissues. It can be infectious for 2 to 3 weeks after the symptoms appear if not treated, but usually only 24 hours after treatment is started (PHE 2013).

Around 80% of cases occur in children under 10 years old with a modal age of 4 years. The first symptoms of scarlet fever often include a sore throat, swollen neck glands, headache, fever often over 38.3^0C, nausea and vomiting. After 12 to 48 hours the characteristic fine red rash develops (if you touch it, it feels like sandpaper). Typically, it first appears on the chest and stomach, rapidly spreading to other parts of the body, followed by peeling skin or the fingertips, toes and groin area as the rash fades. It is sometimes confused with the measles' rash. Bacterial toxins (poisons) cause the rash, a red and swollen tongue and flushed cheeks.

While mild cases of scarlet fever may get better without treatment, treatment speeds recovery, and is necessary to prevent the risk of rare but potentially very serious complications. In most cases, doctors can diagnose scarlet fever from the symptoms alone. Anyone who suspects the illness should seek medical advice. The usual treatment is a 10-day course of antibiotics and hydration with fluids. Children should not return to nursery or school and adults to work until a minimum of 24 hours after starting treatment (PHE 2013)

An effective antibiotic treatment is available, and most cases have no complications. However, in the early stages, there is a small risk of ear infection, throat abscess, pneumonia, inflammation of the sinuses or meningitis (PHE 2013).

Streptococcal Isolates

Group A Streptococcus commonly lives on the skin or in the throat without causing any problems.

Group A Streptococcus causes a minority of sore throats. In 2012 the HSSD Microbiology Department received 687 throat swabs from which they isolated in 14% (97 cases), Group A Streptococcus. However 20% of children can be carriers of Streptococcus A in the winter months (Kaplan 1980), so even from patients with sore throats isolation of Streptococcus A does not necessarily mean it is the cause of the sore throat. A streptococcal sore throat cannot be distinguished from a more common viral infection in the early stages, and local guidelines are that antibiotics are not recommended.

Invasive Group A Streptococcus (iGAS)

IGAS is associated with the isolation of GAS from a sterile body site such as cerebrospinal fluid, joint aspirate, blood, pericardium etc. However severe iGAS infections can be isolated from a non sterile site in combination with severe clinical presentation such as streptococcal toxic shock syndrome or necrotising fasciitis, so called flesh-eating disease. Fifteen to 25% of people with iGAS, unfortunately, die (PHE 2013).

The last three decades have witnessed periodic upsurges in Europe and beyond. The reason for these changes is not understood, but might represent evolutionary shifts in circulating strains, driven by population immunity.

People at higher risk of iGAS include those over 65 years, recent varicella or HIV infection, diabetes, heart disease, cancer, or those on high dose steroids

Acute Rheumatic Fever and Rheumatic Heart Disease

An auto-immune inflammatory condition some weeks following a Streptococcal A infection, acute rheumatic fever (ARF), can occur, which can affect the heart, brain, joints or kidneys. Worldwide, 16 million suffer from rheumatic heart disease, with around 300,000 new cases and 200,000 deaths per year (Carapetis et al 2005, Karthikeyan et al 2009). Primary episodes of acute rheumatic fever occur mainly in children aged 5 to 14 years and are rare in people over 30 years old (BMJ 2013).

Africa and the Asian-Pacific Regions are high disease burden areas, with an incidence of 374 cases per 100,000 children aged 5-15 years per annum (Zuhlke & Steer 2013). Pillars of control of these important diseases have been argued to include primary prevention through treatment of streptococcal sore throats with antibiotics in high incidence areas, in addition to the secondary prevention through penicillin prophylaxis and surveillance recommended by WHO (Mayosi 2010, Karthikeyan & Mayosi 2009).

Acute rheumatic fever and rheumatic heart disease were common in industrialised nations until the first half of the 20th century, when the incidence decreased because of improvements in living conditions and hygiene, which in turn led to decreased transmission of Group A Streptococci (BMJ 2013, Zuhlke & Steer 2013). Strains of Group A Streptococcus associated with ARF in the British Isles are rarely seen (Nye, PHE pers. comm.). A WHO commissioned study found the lowest burden of disease in industrialized countries, with incidence rates of 1 in 10,000 children aged 5-15 years old, (Carapetis 2005, Zuhlke & Steer 2013), which in Guernsey would equate to a case every other year. However other sources suggest the rate might be less than 1 in 100,000 (BMJ 2013). No cases of acute rheumatic fever were admitted to hospital in Guernsey in 2012, and local clinicians said they were not aware of a case in recent years. Fifteen local deaths were

recorded from chronic rheumatic heart disease (ICD 10 codes, I05 to I09) between 2001 and 2012.

Zuhlke & Steer (2013) argue that in order to advocate effectively for patients with rheumatic heart disease, now and into the future, true burden of disease estimates on local, national, and international levels are urgently required. It also noted that the burden of disease from distance sequelae of ARF, congestive cardiac failure, infective endocarditis, atrial fibrillation, and stroke are poorly known (Zuhlke & Steer 2013). In Guernsey the size of the past or current problem of ARF are unknown. Even though the disease in the islands is rare, given that the complications can be life threatening, and that there are uncertainties in our understanding of it, I support the argument that ARF should be notifiable. These additions to notifiable diseases will be considered in an HSSD billet.

Recommendation 5:	Acute Rheumatic Fever and First episode of Rheumatic Heart Disease are made notifiable diseases.

Bordetella Pertussis (Whooping Cough)

Whooping cough (pertussis) is an upper respiratory tract infection caused by the bacterium *Bordetella pertussis*. Transmission is by respiratory droplets. Up to 90% of household contacts will develop the disease. Patients are infectious from about 1 week after exposure to up to 3 weeks after they develop a cough. Pertussis is a cyclical disease with increases occurring every 3-4 years. The third quarter (running from July to September) is usually the period of highest pertussis activity annually (HPA, 2013b).

Before the introduction of the pertussis vaccine, up to 170,000 cases occurred in England and Wales per year, with a peak of more than 2,000 deaths notified in 1941 (HPA 2013d). In Guernsey, 47 deaths occurred from whooping cough in 1901 alone, 33 of which were infants in an outbreak which affected Town, St Sampson's and Vale parishes (Bishop 1902).

Whole cell pertussis vaccine was introduced in the 1950s and by 1972, rates of pertussis in England had fallen to about 2,000 cases per year. (HPA 2013 c&d). Public scares about a link between pertussis immunisation and brain damage led to a drop in immunisation coverage in England from 80% to 30% between 1977 and 1983, resulting in an increase in notifications and deaths. Rates of death and pertussis-related sickness are high compared with other vaccine-preventable diseases (Campbell et al 2012, de Hoek et al 2013).

In Alderney and Guernsey, there was a big increase in notifications between 1977 and 1983 (Figure 6). An outbreak of whooping cough in the spring of 1983 was noted by the MOH (Lawrence 1984). Lower peaks were also seen between 1986

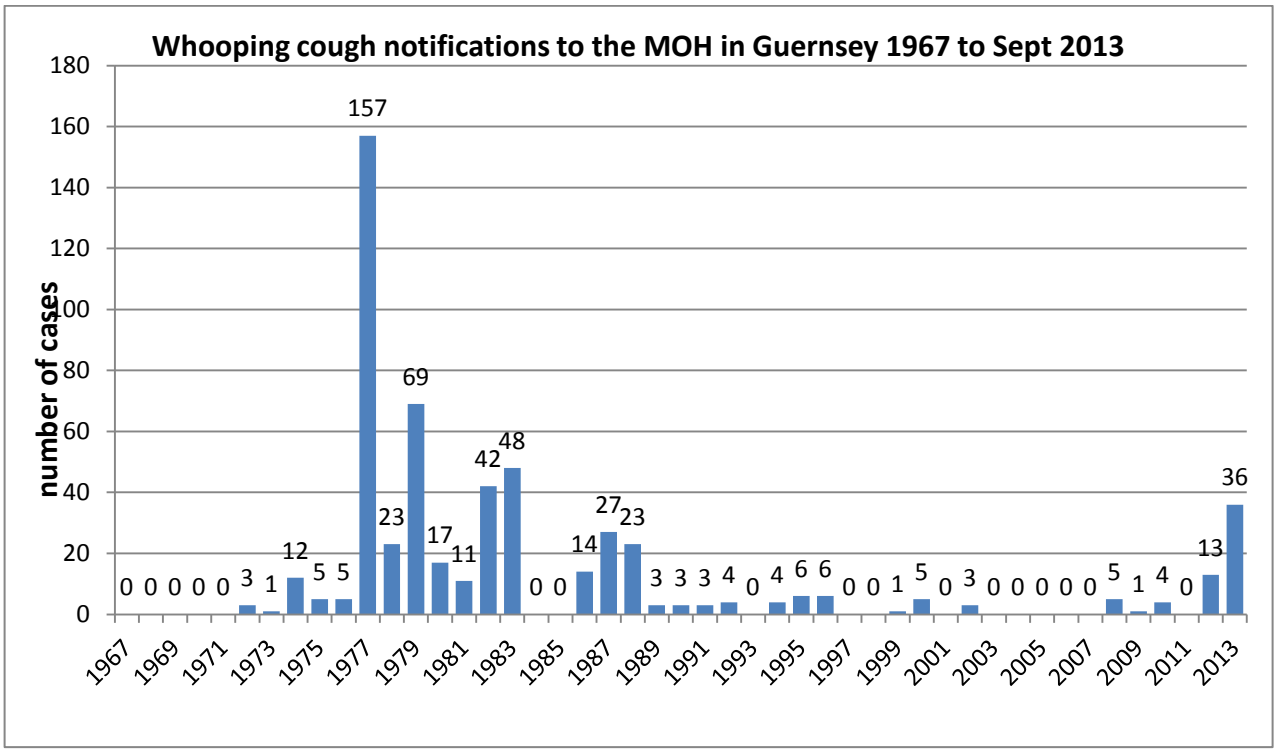
and 1988. In 1980 the whooping cough vaccine rate in infants in Guernsey was 56%, increasing to 70% in 1983, and then to 95% in 1989.

In 1990 an accelerated vaccine schedule with immunisation at 2, 3 and 4 months was introduced (Campbell et al 2012). Household contacts are often the source of pertussis exposure for young infants, although often the source is unknown (Campbell et al 2012). Therefore, a pre-school booster was introduced in 2001, and included an objective of reducing the risk of spreading infection from siblings to infants (Campbell et al 2012). This pre-school booster is in line with recent WHO guidance (WHO 2010).

A number of countries with longstanding immunisation programmes and sustained high coverage have reported a resurgence of pertussis, particularly in older age groups, as vaccine-induced immunity wanes with age. Whether this is a real increase or from increased ascertainment is not absolutely certain (HPA 2013c).

A national outbreak was declared in England in April 2012, and in that year there were more deaths in infants than in any of the previous ten years. In England, 48 infant deaths had been recorded between 2001 and 2011 of which 75% were in the first 2 months of life, although this is likely to be an underestimate (van Hoek et al 2013). In one study, over 70% of infants were infected by their mother or another family member the majority of whom were over 20 years old (Bisgard et al 2004). The increase in whooping cough notifications may also be related to reduced rates of immunisation associated with the vaccine scare.

Figure 6 Whooping Cough (Pertussis) notifications to the MOH 1967 to 2013



As an outbreak control measure, pertussis vaccine was recommended for pregnant women at 28-38 weeks of gestation (van Hoek et al 2013), and introduced in England in September 2012 (DH 2012). As most women will have been vaccinated or exposed to natural whooping cough in childhood, late pregnancy immunisation will temporarily boost the mother's antibody levels, which are then passed to her unborn child, so-called "passive immunity". This provides protection for the first few weeks of life when babies are at greatest risk of catching whooping cough and having severe, potentially life-threatening, complications prior to their first immunisation at 2 months old. In addition, immunisation in pregnancy contributes to a "cocooning" effect by preventing disease in the mother and the risk of an infectious mother passing the disease to her infant (van Hoek et al 2013).

In Guernsey, an increase in Bordetella pertussis (whooping cough) notifications was also identified from the second half of 2012, and has continued into 2013 (Figure 6), mirroring UK trends. The notifications of whooping cough in the islands in 2012 were at the highest level since 1988, and in 2013 even more cases have been reported, with highest number since 1983 (Figure 6). In 2012 the median age of cases was 46 years with a mean of 40, and a range of 10-72 years. In 2013, the

age range was 0-85, with a median of 33 and a mean of 36 years old. In 2013, the first notification of pertussis in an infant in Guernsey for many years was recorded.

To protect infants, an immunisation programme for local women, who were 28-38 weeks or more pregnant, was introduced. In July 2013, 76% (34/45) of women took up the offer, which is higher than the 57% reported in England (PHE 2013). However, this still leaves a quarter of infants at greater risk. The reasons for local mothers not being immunised are due to concerns over vaccine safety despite advice there is no evidence to suggest it is unsafe for mothers or infants, or there was no evidence of the vaccine being offered (6 cases).

Data from Primary Care indicates that 655 of 663 children with a date of birth in 2011 had completed a course of three immunisations by the end of 2012, an uptake rate of about 99%. As well as being personally protected an immunized child is much less likely to catch the disease and pass it onto their siblings.

Recommendation 6:	All pregnant women and infants are immunised against pertussis, midwives and doctors should record the reasons for eligible women and infants not being immunised and report these to the MOH.

Tuberculosis (TB)

Tuberculosis, or TB, is an ancient disease and one of man's oldest foes and for centuries among the most feared (NICE 2011). In 1660, John Bunyan (1628–88), an English Christian writer and preacher, described tuberculosis as "*The Captain among these men of death*" when tuberculosis case rates in London reached a phenomenal 1 in 100 persons per year (Zumla 2011, citing Daniel). During the 19th century, "*the white plague*", as tuberculosis was called in Victorian Britain (due to the loss of skin colour seen in London tuberculosis patients), continued to ravage Britain, and up to 25% of deaths in Europe were caused by this disease (Zumla 2011).

TB is an infection by the bacteria *Mycobacterium tuberculosis*. It most commonly affects the lungs but can affect any organ. It is transmitted through the air from person to person via droplets from the throat and lungs of people with active respiratory disease by coughing, sneezing, spitting, laughing, speaking or singing. Although tuberculosis is contagious, it's not easy to catch. A person is much more likely to get tuberculosis from someone they live with or work with than from a stranger. Most people with active TB who have had appropriate drug treatment for at least two weeks are no longer contagious (Mayo 2013).

The symptoms of active TB of the lung are coughing, sometimes with sputum or blood, chest pains, weakness, weight loss, fever and night sweats. Tuberculosis is

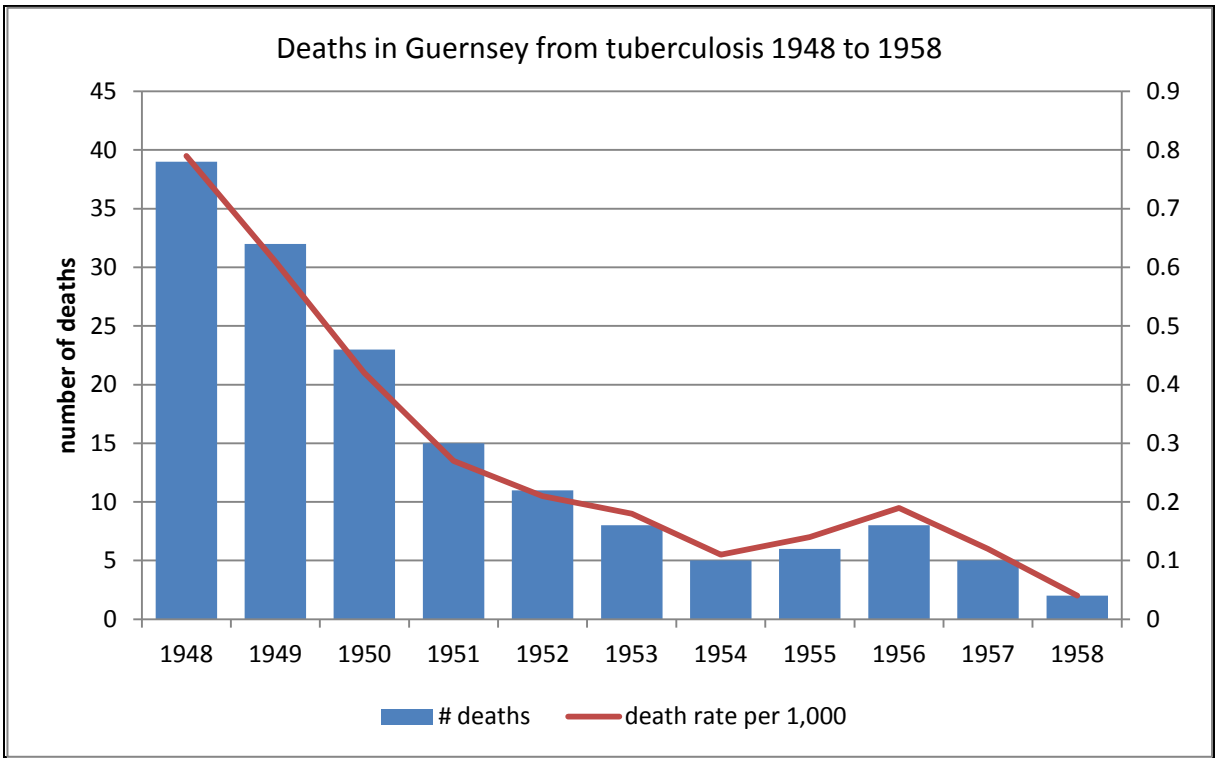
usually treatable with a six-month course of antibiotics, however multi-drug resistant TB is present in nearly all countries (WHO 2013). It can, however, effect many organs and present in a multitude of different ways (NICE 2011).

TB became notifiable in Guernsey around 1911, and in 1913 in the UK (NICE 2012). In 1912, over 28 Guernsey people died from TB. Deaths from TB in Guernsey had dropped dramatically from 39 a year in 1948 to just 2 in 1958 (Lynch 1958) (Figure 7). Five deaths from TB were reported in 1960, and 28 people were admitted to King Edward Sanatorium (Thomas 1961). Three TB deaths were registered locally between 2003 and 2012.

Optimism about TB was shown in the 1958 MOH report, as Lynch (1959) wrote;
"*It may well be that we in our lifetime will see the end of Pulmonary Tuberculosis once known as the "White Plague" and in this connection it is now widely held that BCG vaccination will be responsible for the delivery of the "coup de grace"*.
White (1983) considered two factors that were key to this dramatic change in Guernsey, more efficient medicines and new "*social security*" thinking which the States had approved in 1955.

By 1982 the "*Sanatorium*" had ceased to function as an infectious diseases hospital, and White (1983) in his last MOH report wrote;
"*the single greatest change in the last twenty years has been the reduction in the incidence of tuberculosis. One of my first tasks in 1962 was to accept responsibility for two wards of cases of pulmonary tuberculosis in the King Edward Sanatorium…Between fifteen and twenty cases in each ward, men and women, languished for months rather than weeks while their lungs healed sufficiently so that they were no longer an infectious risk and could circulate in the community once more.."Patients" was the appropriate word for these unfortunate victims of a disease which had got out of control during the last year or two of the German Occupation*."

Figure 7 Deaths in Guernsey from tuberculosis 1948 to 1958.

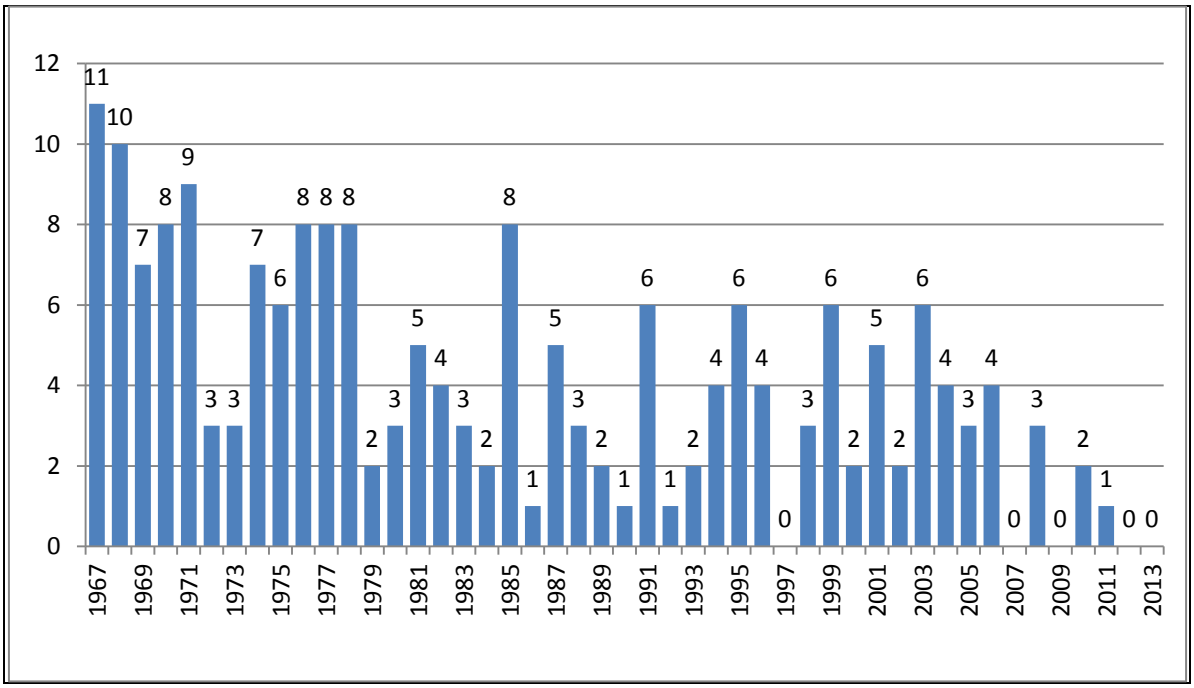


TB clinics were held weekly at Lukis House in the 1950s (Lynch 1960). A TB clinic is currently held monthly, still, at Lukis House. No new cases were seen in 2012, but 27 Mantoux tests were carried out, 23 BCGs immunisations given (19 in children), and there were several follow-ups of immigrants.

There has been a small but regular number of TB notifications from 1967 to date, with a maximum of 11 in any one year (Figure 8). However, in the last six years, only six cases have been notified and, as in 2012 and 2013 in some years none at all (Figure 8).

There is a global epidemic of TB (WHO 2012). In 2011, worldwide, 8.7 million people are estimated to have fallen ill with TB and 1.5 million died, with 60% of cases in Asia (WHO 2012). The number of deaths has declined over 40% since 1990. The vast majority of deaths occur in low and middle income countries where it is 1 of the top 3 causes of death in women aged 15-44. It causes 1 in 4 deaths of those with HIV.

Figure 8 Tuberculosis notifications to the MOH from 1967 to 2013.



In healthy people, Mycobacterium tuberculosis often causes no symptoms, since the person's immune system acts to “wall off” the bacteria. This is called “latent” TB and a third of the world’s population is estimated to be so affected. The lifetime risk of these people falling ill with TB is only about 10%. However, the chances of illness are much higher in the immuno-compromised, for example people who are co-infected with HIV and TB are 20 to 30 times more likely to become ill with TB. TB causes 1 in 4 deaths of those with HIV. Tobacco use greatly increases the risk of TB disease and death, and more than 20% of TB cases worldwide are attributable to smoking (WHO 2012).

Mass-miniature radiography population screening for TB was introduced in the UK in the 1940s but discontinued in 1986 because of falling incidence (Stephens 1992). I have not been able to ascertain from MOH reports when this service was discontinued in Guernsey.

A universal TB programme was introduced in the UK in 1953 with immunisation in school children at age 13. This programme ceased in 2005 because cost-effectiveness had fallen with TB incidence falling to very low levels, such that whereas under a 100 children were immunised to prevent 1 case, this had fallen to more than 1 in 10,000 by the end of the programme. In Guernsey, BCG immunisation is currently offered to at risk infants only.

In the UK, the rate of TB increased from 1990 to 2005, although this has since stabilised (Pedrazzoli 2013). The incidence rate of 14 cases per 100,000 is high compared to most European countries, with non-UK born people at 20 times the risk of UK born. London has the highest rate of TB of any Western European capital, with some Boroughs having rates of more than 40 per 100,000 higher than some high risk areas, such as sub-Saharan Africa (Zenner et al 2013). In the UK the problem appears to be largely reactivation of latent remotely acquired tuberculosis. Consequently consideration is being given to further targeted screening programmes.

In the UK, x-ray screening of immigrants from high risk countries intending to stay in the UK more than 6 months was commenced at Heathrow and Gatwick Airports in 1965. Of 67,000 x-rays taken at Heathrow in 2006/7 only 34 cases of pulmonary TB were identified (Home Office 2012), and even in these cases diagnoses of active TB requires more than x-rays. Further, there are now multiple ports of entry for immigrants where screening does not take place. Therefore, the UK have discontinued TB screening at Gatwick, and is planning to do so in the future at Heathrow (Home Office 2012, Green 2012). Instead, new regulations will require "pre-migration" screening for TB from visa applicants from over 80 countries with a high incidence of TB. This will apply to people requesting to stay in the UK for more than 6 months from high risk countries with a prevalence of TB of 40 or more per 100,000. Migrants will require to have a medical certificate confirming they have undergone screening for active pulmonary tuberculosis and that tuberculosis is not present in the applicant, that is they will need to be treated before migration if necessary (Home Office 2012, Green 2012). This policy is considered likely to reduce the number of imported cases into the UK.

The new UK policy will increase protection for Guernsey too, as Guernsey relies on the UK dealing with this on our behalf through its network of Embassies, Consulates and High Commissions worldwide (Taylor 2013). The Bailiwick is also in the process of amending its Immigration Rules to bring them into line with those currently in force in the UK, although in practice the UK system already operates. For migration to Guernsey, the British Diplomatic Mission will ordinarily refer applications to Guernsey to our Border Agency. There are no screening requirements on those who arrive in the Bailiwick from within the Common Travel Area or other countries within the European Economic Area, or for a person migrating for less than 6 months. British citizens and other EEA nationals do not require immigration permission to enter the Bailiwick (Taylor 2013).

The complex nature of the disease means that TB screening of migrants as part of immigration clearance can only make a limited contribution to TB control (Green 2012). A small minority of the third of the world's population with latent TB will develop the disease in its active form at some point in their lives but it is currently impossible to establish through screening if this is likely to occur in any individual

case. Most foreign-born TB patients only develop the disease in its active form years after arrival in the UK. Guernsey needs, therefore, to explore ways to improve the sharing of information between Guernsey Border Agency and the Directorate of Public Health on people migrating for more than six months from high incidence TB areas.

Recommendation 7 :	Ways of sharing information between the Guernsey Border Agency and the MOH on people migrating from high incidence TB countries are explored.

Anti-tuberculosis (TB) drug resistance is a major public health problem that threatens progress made in TB care and control worldwide. Drug resistance arises due to improper use of antibiotics in chemotherapy of drug-susceptible TB patients. This improper use is a result of a number of actions including, administration of improper treatment regimens and failure to ensure that patients complete the whole course of treatment. Essentially, drug resistance arises in areas with weak TB control programmes. A patient who develops active disease with a drug-resistant TB strain can transmit this form of TB to other individuals. Reports of tuberculosis (TB) patients with severe patterns of drug resistance are increasing and present clinicians with a formidable challenge (WHO 2012). Current definitions define multidrug-resistant (MDR) and extremely drug-resistant (XDR-TB) TB, and consideration has been given to a new definition of totally drug resistance TB as some patients have a disease resistant to all known standard treatments (WHO 2012).

A former Guernsey MOH's optimism that TB would be eliminated in our lifetimes can now be seen to be premature (Lynch 1959), as while TB is now rare in Guernsey, it remains a very significant threat as there are huge reservoirs of TB elsewhere in the world.

Bovine Tuberculosis

There is another rare form of TB, bovine tuberculosis which is usually seen in UK people over 65 years and is thought to be a reactivation of latent infection acquired before routine pasteurisation of milk. Twelve to 38 cases have been reported in the UK each year since 1999 (PHE 2013).

Although many cattle were slaughtered on the island when it was imported from the mainland in 1908 (Bishop 1909), Guernsey has been generally free of bovine TB therefore the risk here is likely to be very low, and I am not aware of any local cases. However, possible TB in imported llamas is responsible for a recent livestock export ban in Alderney (Guernsey Press 2013), demonstrating the continued importance of veterinary preventative measures for the island's public health.

Measles

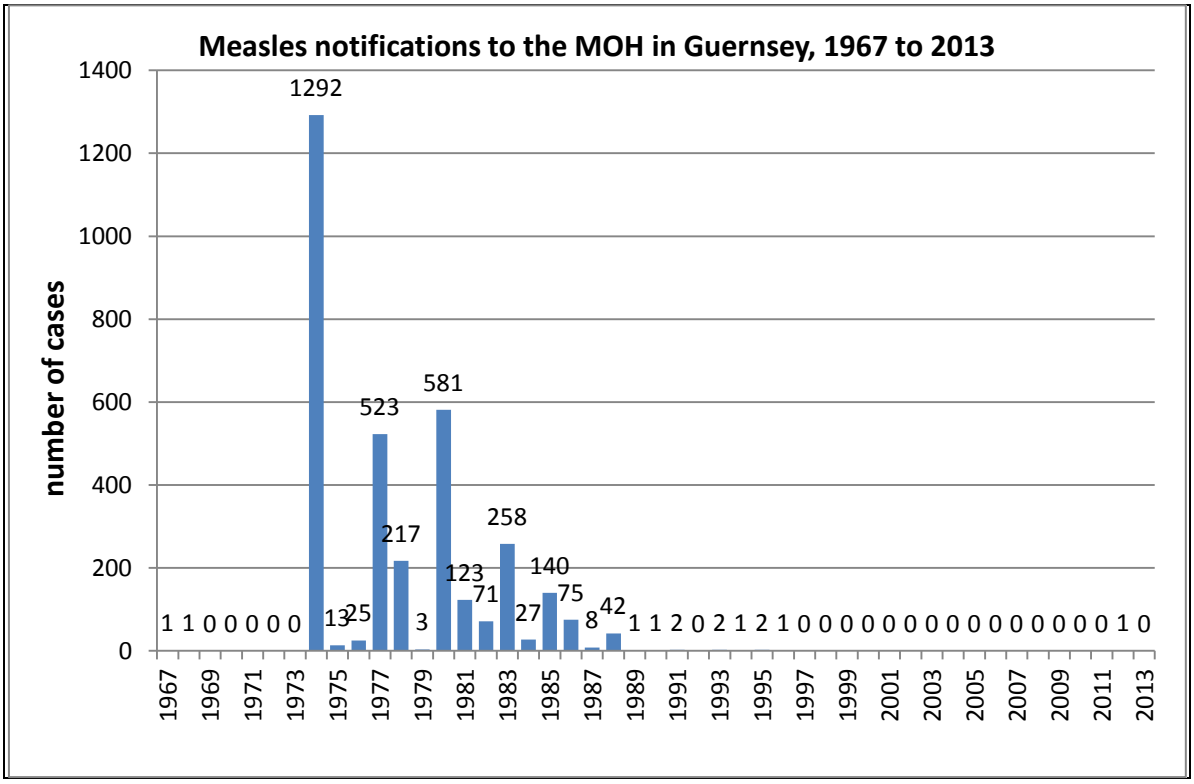
Dr John Brownlee, Guernsey's first MOH wrote in 1900; "*measles…popularly regarded with equanimity, but it is one of the most fatal of infantile diseases*."

In Guernsey, in 1920 there was the first measles epidemic for 8 years. There were 1,000 cases with a "*low*" mortality, only 32 deaths with 18 in the under 5 year olds (Bishop 1921). In 1965, 7 cases of measles were admitted to hospital and 2 had been admitted in the previous year (Thomas 1966). In 1974, an outbreak of measles on the island led to 1,292 notifications, with half in October, and in the week ending 26th October 200 cases were notified. Half the "*victims*" were children aged 3-5 years, and a number required hospital admission "*the condition of some of whom was really quite worrying*", but no death was certified from measles (White 1975). There was a further outbreak of measles in 1980/1 (White 1981/82), and another in 1982 (Lawrence 1984). Measles had been eliminated in Guernsey, but 2012 saw the first case notified to the MOH since 1996 from a local person who caught the disease while in Wales (Figure 9).

Measles is a human disease and is not known to occur in animals. It is one of the most contagious diseases known in man (Ramsey 2013). It is spread by coughing and sneezing, close personal contact or direct contact with infected nasal or throat secretions (WHO 2013). It normally grows in the cells that line the back of the throat and lungs. The most serious complications include blindness, encephalitis (an infection that causes brain swelling), severe diarrhoea and related dehydration, ear infections, or severe respiratory infections such as pneumonia. Complications are more common in children under the age of 5 years, or adults over the age of 20 years. Women infected while pregnant are at risk of severe complications and the pregnancy may end in miscarriage or preterm delivery (WHO 2013). Worldwide measles is still a leading cause of childhood death among young children with more than 150,000 deaths per annum, down from two million before widespread immunisation (WHO 2013). No specific antiviral treatment exists for measles (WHO 2013).

In the pre-immunisation period, Dr Stanley Hoare, Guernsey's second MOH considered outbreaks of measles tend to recur every 3-4 year with "*the fresh appearance of susceptible material*" (Hoare 1901). In England measles notifications peaked at 760,000 in 1955 with a low of 2,000 in 2005 (PHE 2013). There had been on occasions over a thousand deaths a year from measles in England, and as late as 1967 there were 100 deaths. However, from 1992 until 2006 no measles deaths were recorded (PHE 2013). The incidence declined such that apart from occasional outbreaks caused by imported cases, measles had been eliminated. However, in 2008, measles became endemic again in the UK after years of sub-optimal MMR vaccine coverage (HPA 2008), it was also recognized that Europe was facing a measles epidemic (Editorial Team 2008).

Figure 9 Measles notifications to the MOH 1967 to 2013.



Measles immunisation was introduced in the UK in 1968. Initially there was low coverage, and in 1988, 80,000 cases and 16 deaths from measles were recorded. In 1988 MMR was introduced and coverage improved to over 95%. One dose offers 95% protection and two doses more than 99% protection, so a second dose was introduced in 1996 (Ramsey 2013). Measles vaccine is given by injection along with rubella and mumps, within a month of a child's first birthday, followed by a second dose at around 40 months old. Guernsey introduced MMR vaccine in 1988 (Lawrence 1989).

A decrease of immunisation followed news coverage of, subsequently shown to be fraudulent, research describing a link between MMR and autism (Wakefield 1998, Editors of the Lancet, 2010, Godlee et al 2011, Deer 2011). In some areas, particularly low rates of immunisation were linked to sensational press coverage (McCartney 2013). For instance, The South Wales Evening Post ran a campaign "Parents fight for facts", against the MMR vaccine. "*The 2012 Leveson report into the practices and ethics of the press cite witnesses describing reporting on MMR as an example of "false balance", where the scientific view of a very small minority is given prominence which suggest that there is a significant conflict of opinion*

within the scientific community" (McCartney 2013). Perhaps a comment made on the press coverage of a smallpox outbreak in Bradford in the 1960's is pertinent, "*national newspapers made the most of the story and worked hard to ensure that the facts were not allowed to get in the way of sales*" (Williams 2010).

During the scare, immunisation rates dropped to only 80%, so that that the cohort of children born between 1997 and 2003 were under vaccinated. Children born in 2000 were at the highest risk of measles in 2013 (Ramsey 2013).

Myths, following the Wakefield paper, saw many parents opt for single vaccines against measles, mumps and rubella. However, there is no evidence for health benefits from single vaccines in preference to MMR, indeed quite the contrary as single vaccines are likely to leave children vulnerable to infection for longer, children are less likely to complete their course because they have many more injections, and single imported vaccines may not have been independently tested for potency and toxicity.

In a recent UK study, two groups of people who are suspicious about immunisation were categorised as "reformists," who were critical of vaccines but likely to support immunisation in at least some respects, and "radicals," who followed alternative notions of health and questioned all vaccines (McIntyre 2008, Hobson-West 2007).

A consequence of the scare is that measles, which had been eliminated for more than a decade, is now endemic again in the UK (HPA 2008, Editorial 2008, Godlee 2011). There was an outbreak of measles in Wales from November 2012 to July 2013 (PHW 2013), with more than 1,200 notifications of which 108 were admitted to hospital, 15 with very serious complications such as pneumonia and meningitis (PHW, 2013). In England, in the first quarter of 2013 there were 587 cases the highest recorded since 1994, with the highest rates in 10-14 year old children.

To ensure herd immunity and eliminate measles a 95% population coverage level is recommended by the WHO. If the proportion of each cohort of children who remain unvaccinated remains greater than 5% then there is a risk of an outbreak (Choi et al 2008). The goal of 95% immunisation coverage is a constant challenge and the occurrence of disease outbreaks when coverage wanes is a salient reminder of the need for vigilance (McIntyre 2008).

In the 2010 birth cohort, returns from the three primary care practices in Guernsey showed 95.1% MMR coverage (605 of 636 children), up from 93.3% in the 2009 birth cohort. Data was not available from Alderney primary care practices.

Given the measles outbreak in the UK and our first notification of measles for over a decade, and the likelihood that our population also had a dip in immunisation rates during the UK vaccine scare, it was considered there was a risk of an

outbreak locally. Therefore, a media supported campaign was implemented to encourage catch-up immunisations in those who had missed them. Unfortunately it was not practically possible to identify from the new Electronic Child Health Record information system, unimmunised individual children. Consequently targeted reminders to parents of unprotected children could not be sent or historical rates of population coverage calculated. Work is in progress to improve systems. However, primary care provide data that indicate that population coverage rates for childhood immunisations in recent years have been consistently greater than 90% but generally under 95%, so it is likely there is a risk of a measles outbreak locally.

Recommendation 8 :	Child Health information systems to be improved so that population immunisation statistics can be compared with other jurisdictions, and unimmunised individual children can be identified to enable targeted interventions if there is an outbreak or a serious risk of an outbreak.

At the population level, initiatives such as linking parental financial incentives or entry to school or childcare facilities to completion of immunisation have improved overall immunisation coverage. They require legislative action and societal support (McIntyre 2008, Salmon et al 2006).

Recommendation 9 :	Parents ensure their children receive timely immunisation against measles, but even if their children have missed routine immunisations they should be encouraged to have them vaccinated.

Recommendation 10 :	Single agent vaccines for measles are not recommended and should be discouraged by health professionals.

Diphtheria

In 1894, there had been 14 deaths from diphtheria in St Martin's connected with just one school. In 1895-99, there were 52 further deaths (Brownlee 1900). Notifications of diphtheria began in Guernsey in 1895, prior to that only death information is available (White 1974). The arrival of Guernsey's first MOH and the subsequent formation of the Board of Health in 1899, is associated with this diphtheria outbreak (Jeffs 1999). Disinfection of dwellings and isolation of cases brought the outbreak under control.

In 1937, there were 62 notified cases of diphtheria (Revell 1938), in 1938, 489 cases and 14 deaths (Revell 1939), and in 1939, 200 notified cases and 4 deaths (Revell 1940). The States introduced compulsory immunisation against diphtheria

in response. The last case of diphtheria that appears to have been notified was in 1952 (Revell 1953).

Diphtheria is a bacterial infection caused by *Corynebacterium diphtheria*, transmitted from person to person through close physical and respiratory contact. This bacterium produces a toxin that can harm or destroy human body tissues and organs. It can cause infection of the nasopharynx, which may lead to breathing difficulties and death (WHO 2013). Between 4,000 and 5,000 cases were reported worldwide in 2012 (WHO 2013).

In England in 1942, there were 60,000 cases and 4,000 deaths per year (HPA 2008). Following immunisation that year diphtheria became rare. However, an unvaccinated child died in London in 2008 (HPA 2008). While there are still some residents who will have experienced the epidemic in the 1930's, the great majority of our population will have no experience of this potentially lethal disease. The London death is a reminder that diptheria immunisation is essential for children.

Poliomyelitis

Six cases of poliomyelitis with paralysis were seen in autumn 1955 (Revell 1956), two cases of poliomyelitis were recorded in Guernsey in 1957, both of whom were admitted to King Edward Sanatorium and survived (Lynch 1958). Alderney experienced its first cases of acute poliomyelitis on record which was introduced by a visitor who developed paralytic poliomyelitis immediately on his return to the mainland (Lynch 1958). Vaccine was made available by the States Board of Health for children aged between two and nine, in 1957 (Lynch 1958). Thomas (1961) reported no cases of polio in 1960 two years after immunisation, and no further cases appear to have been notified since.

The last case of domestically acquired acute poliomyelitis in the UK was in 1982 (PHE). Currently, there are an estimated 120,000 people previously affected by polio living in the UK. If the UK figures are applicable to Guernsey, this would equate to 120 people in Guernsey. Up to 80% of these may develop post-polio syndrome (PPS) a neurological condition which can severely limit normal activities of daily living after a long period of stability (PHE 2013).

Polio is a highly infectious disease caused by a virus. The virus enters the body through the mouth and multiplies in the intestine. Initial symptoms are fever, fatigue, headache, vomiting, stiffness in the neck and pain in the limbs. It invades the nervous system, and can cause total paralysis in a matter of hours. One in 200 infections leads to irreversible paralysis (usually in the legs). Among those paralysed, 5% to 10% die when their breathing muscles become immobilized (WHO 2013).

Worldwide polio cases have decreased by over 99% since 1988, from an estimated 350,000 cases then, to 223 reported cases in 2012. The reduction is the result of the global effort to eradicate the disease, and it was reported to be endemic in only three countries, Afghanistan, Nigeria and Pakistan (WHO 2013). As long as a single child remains infected, however, children in all countries are at risk of contracting polio. The WHO (2013) advise that failure to eradicate polio from these last remaining strongholds could result in as many as 200,000 new cases every year, within 10 years, all over the world. Of great concern is that wild polio has very recently been detected in Israel and the Horn of Africa, and there has been an outbreak in the Mediterranean Region in Syria, a country currently ravaged by civil war.

Although natural polio infection has been eliminated from Guernsey for many years, there is still the potential for acute cases to present in Guernsey that have been acquired in endemic areas, so it is very important that all our children are immunized against polio.

Tetanus

In Guernsey the last cases reported to the MOH were single cases in 1979 and 1981 (Parkin 1991). Prior to these, occasional cases were recorded.

Since 2000, the number of tetanus cases in England has varied from 2 to 22.

Tetanus is acquired through exposure to the spores of the bacterium *Clostridium teta*ni which are universally present in the soil. The disease is caused by the action of a potent neurotoxin produced during the growth of the bacteria in dead tissues, for example, in dirty wounds or in the umbilicus following non-sterile delivery. Tetanus is not transmitted from person to person, and a person usually becomes infected with tetanus when dirt enters a wound or cut. Tetanus is a risk for all residents, therefore childhood immunisation against tetanus is recommended as, is immunisation following certain injuries (PHE 2011, WHO 2013).

Haemophilus influenza type b (Hib)

Haemophilus influenza type b (Hib) is a bacterium responsible for severe pneumonia, meningitis and other invasive diseases almost exclusively in children aged less than 5 years. It is transmitted through the respiratory tract from infected to susceptible individuals. In 2000, Hib was estimated worldwide to have caused two to three million cases of serious disease, notably pneumonia and meningitis, and 386,000 deaths in young children (WHO 2009). Immunisation was introduced in Guernsey in October 1992 (Harker 1993). The number of cases in the UK has fallen from nearly a thousand cases a year to the low tens (HPA 2011). I have found no local data on the local numbers of cases prior to immunisation in Guernsey, but I have no record of any recent cases.

Meningococcal Disease

Meningococcal disease, is a contagious disease caused by the meningococcus bacterium (*Neisseria meningitidis*). It is spread by person-to-person contact through respiratory droplets of infected people. There are three main clinical forms of the disease: the meningeal syndrome, the septic form and pneumonia. The onset of symptoms is sudden and death can follow within hours. In as many as 10-15% of survivors, there are persistent neurological defects, including hearing loss, speech disorders, mental retardation, paralysis, and there may be loss of limbs (HPA 2011, WHO 2013).

Approximately 10% of the population will carry *Neisseria meningitidis*, with the highest carriage (around 25%) in 15-19 year olds. It inhabits the mucosal membrane of the nose and throat, where it usually causes no harm. The bacteria are not easily spread and prolonged close contact is usually required. Most cases are acquired through exposure to asymptomatic carriers (HPA 2011, WHO 2013).

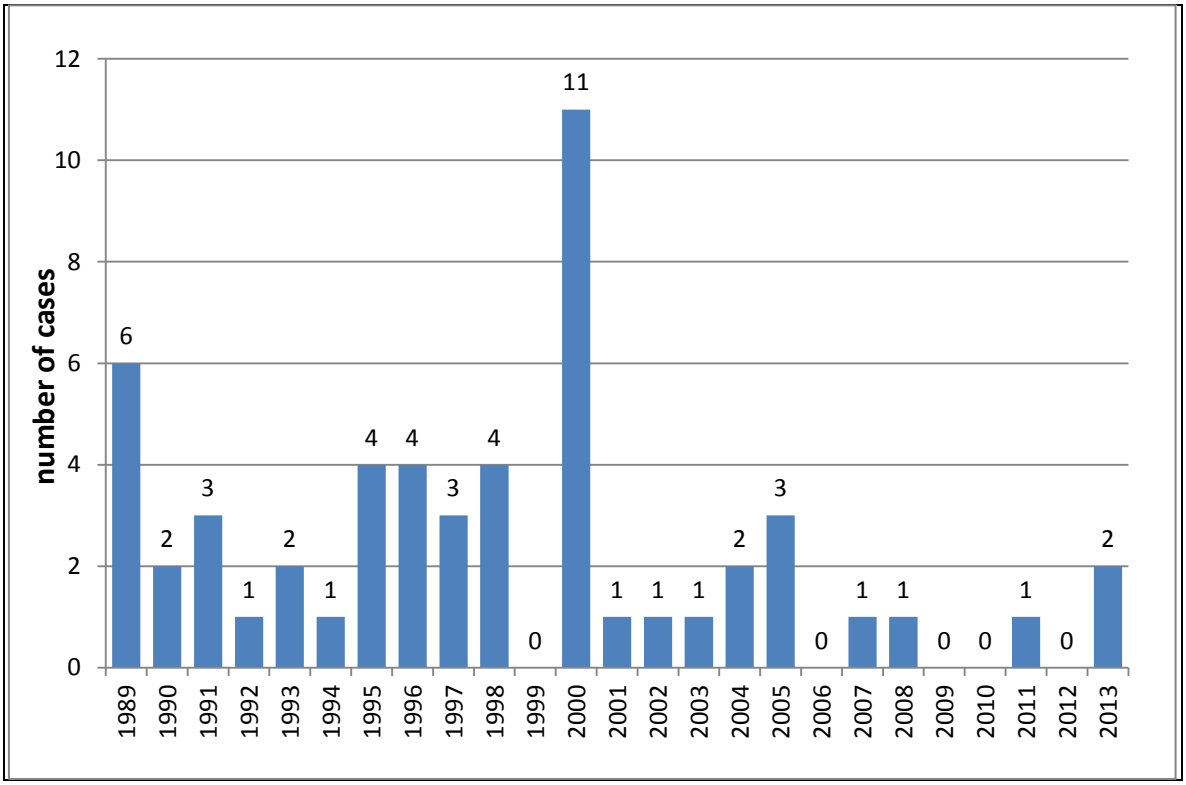
The great majority of cases occur sporadically and are not linked to other cases. The incidence of meningococcal disease is highest in infants under one year of age, followed by children aged one to five years. The next highest incidence is seen in young people aged 15 to 19 years (HPA 2011, WHO 2013).

The year 2000 started tragically in Guernsey with an outbreak of meningococcal C disease when there were 9 cases, and 2 deaths (Parkin 2001). For a 15 month period from the year 2000, nearly 30,000 doses of vaccine were given by primary care and school nurses (Parkin 2001).

Meningococcal C vaccine was introduced in 1999/2000. From the 2013-14 school year, it is recommended at 3 and 12-13 months, with a booster around 14 years old. In England and Wales, the number of cases seen every year has dropped by over 95%, from nearly a thousand, to under 30. Serogroup C is the group commonly responsible for outbreaks of meningitis in schools and universities. The “teenage” booster at age 14, will reduce risk of transmission in tertiary education settings such as university halls. Although the numbers of events are small, since the introduction of the vaccine there has been less meningococcal cases notified per year (Figure 10).

A small number of cases of the other major type of meningitis, meningitis B, occur on Guernsey in most years. International work is ongoing on the development of a cost-effective vaccine for this strain too.

Figure 10. Meningococcal notifications to the MOH 1989 to 2013.



Pneumococcal Disease

This is caused by the bacteria *Streptococcus pneumoniae*. Transmission is by aerosol, droplets or direct contact with respiratory secretions of someone carrying the organism. Transmission usually requires either frequent or prolonged close contact. There is a seasonal variation in pneumococcal disease, with peak levels in the winter months (PHE 2013). It can cause invasive infections such as pneumonia, meningitis, septicemia, and infections of the bones and joints that can be life threatening. The very young, very old and those with a weakened immune system are most at risk. There are about 90 strains.

Only pneumococcal meningitis is notifiable to the MOH, and no cases were notified between 2010-12. One case of pneumococcal disease was admitted to hospital in Guernsey in 2012.

Pneumococcal conjugate vaccine (PCV) is offered at 2, 4 and 12-13 months as part of the childhood immunisation programme. It protects against 13 strains of the bacteria.

Pneumococcal polysaccharide vaccine (PPS) is offered to those over 65 or who are at higher risk because of long term health conditions. It protects against 23 strains, over 95% of the types that cause serious disease in the UK (PHE, 2013, Green Book). It is more effective than the PCV vaccine, but cannot be used in those under two. The pneumococcus is also the commonest cause of community-acquired pneumonia.

Rotavirus

Rotaviruses are the most common cause of severe diarrhoeal disease in young children throughout the world, and about half a million children a year die (WHO 2013). Most symptomatic episodes occur in young children between the ages of 3 months and 2 years (WHO 2013). WHO recommends routine immunisation as part of all childhood immunisation programmes.

Rotavirus disease is highly contagious. The virus is present in the stool of an infected person and can remain viable for a long time on contaminated surfaces, including people's hands. Children catch it by touching something that's contaminated and then putting their hands in their mouth. The spread of rotavirus infection is a particular problem in hospitals and in day care settings, where it can be easily spread from child to child. It's also easily spread by healthcare workers, with poor hand hygiene compliance. Symptoms of rotavirus infection, which may last up to eight days, include fever, nausea, abdominal cramps, and frequent, watery diarrhea. If it is severe enough, the diarrhea can cause dehydration, and it's the dehydration that's responsible for hospital admissions (WebMD 2013).

Rotavirus infections are seasonal, usually occurring ifrom January to March (Russell 2013). In England, rotavirus GP consultations and hospital admissions have been estimated (Russell 2013), and if these estimates are applicable to Guernsey then there would be at least 130 local GP consultations and 13 hospital admissions each year from rotavirus. However, these are likely to be an underestimate as most cases of gastroenteritis presenting to the health service do not undergo laboratory testing for the causative organism. It is estimated there are 3-4 deaths from rotavirus in England and Wales each year (Russell 2013), so a death is very unlikely to be seen in Guernsey.

Rotavirus vaccine has been shown to be 85% effective at protecting against severe rotavirus infection in the first two years of life with a 97% reduction in rotavirus gastroenteritis hospital admissions in Finland (Russell 2013). Rotavirus immunisation was introduced in Guernsey in July 2013, at the same time as in England. The rationale was that it was likely to greatly reduce the incidence of infective gastroenteritis in young children, reduce hospital admissions to Frossard Ward, reduce disease in nurseries, reduce time off work taken by parents, and by timing its introduction with England, Guernsey could take advantage of English health promotion materials.

Guernsey should consider surveillance of rotavirus vaccine coverage, and infections to help assess the impact of the programme.

Recommendation 11 :	A local rotavirus surveillance scheme to monitor immunisation coverage and rotavirus infections should be considered.

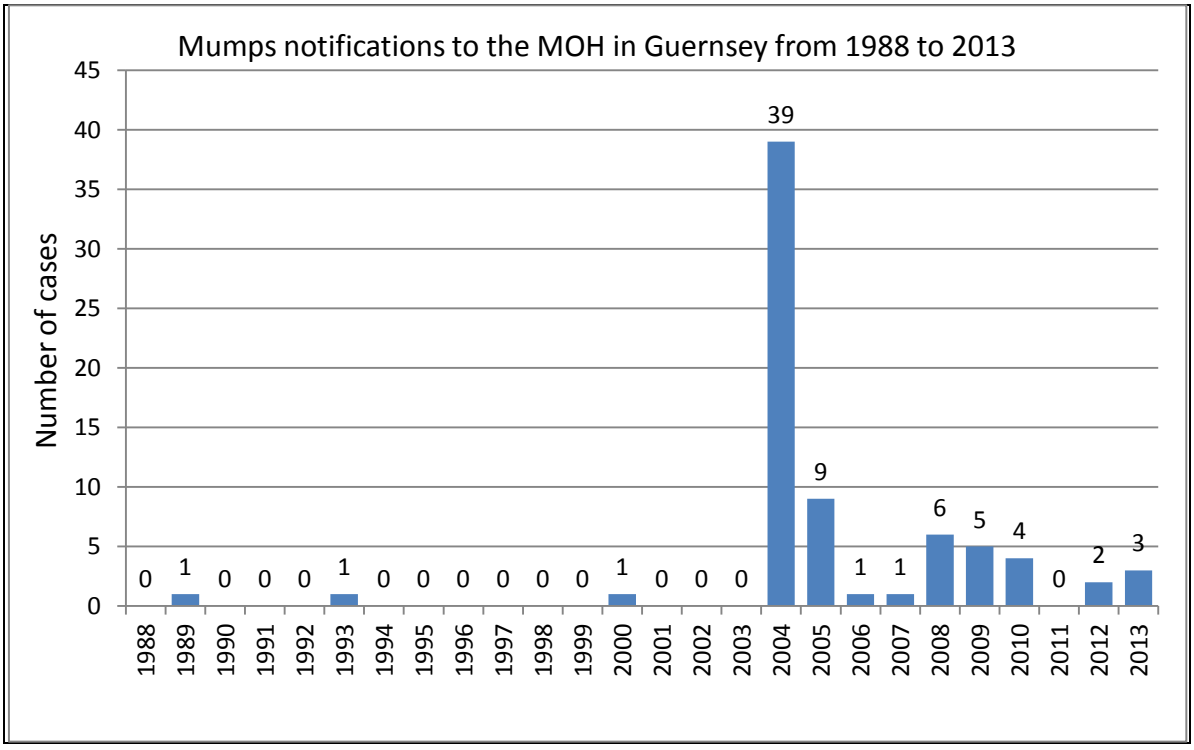
Mumps

Mumps has been notifiable in Guernsey since 1988 (Jeffs 1999).

Mumps is an acute viral illness spread by airborne or droplet transmission and with an incubation period of 2-4 weeks. While some infected people have no symptoms, it can cause a wide range of symptoms and complications such as meningitis, encephalitis, deafness, pancreatitis and inflammation of the ovaries and testes (PHE 2013).

Before the introduction of mumps vaccine as part of MMR in 1988, mumps was common in school children and the cause of over a 1,000 hospital admissions a year in England and Wales and was the commonest cause of viral meningitis. In some countries with high immunisation coverage, mumps has been eliminated. Mumps immunisation has greatly reduced transmission in the UK.

Figure 11 Mumps notifications to the MOH in Guernsey 1988 to 2013.



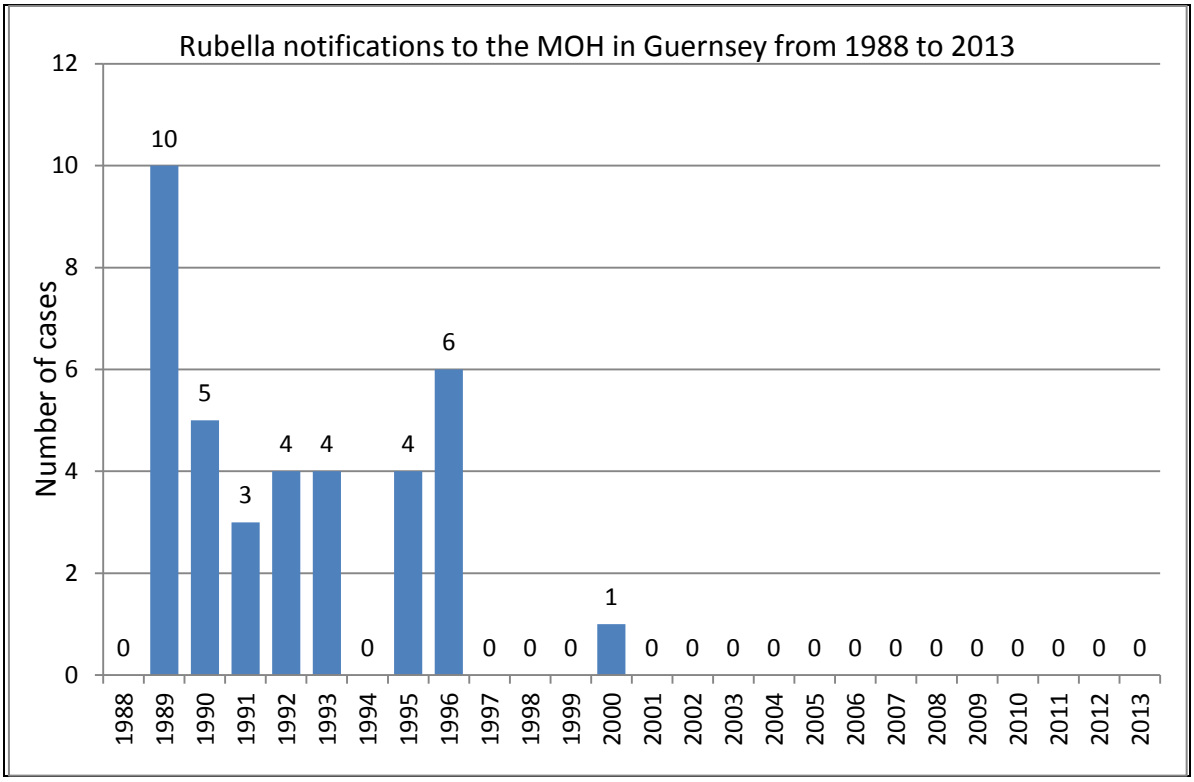
There was an outbreak of mumps in local adolescents and young adults reported at the end of 2004 (Jeffs 2005), and a few cases are currently notified to the MOH most years (Figure 11).

Rubella

Rubella is a viral disease transmitted by droplet transmission of respiratory secretions, and has an incubation period of 2-3 weeks. While usually causing low grade mild respiratory symptoms, rarely it can have severe side-effects such as encephalitis and clotting problems.

Infection during pregnancy may lead to an abortion or Congenital Rubella Syndrome (CRS). In CRS the infant may be born with a wide range of serious health problems, such as cataract, deafness, impaired brain development, and heart problems. Infection between 8-10 weeks of pregnancy has a 90% risk of some defects in the baby. Infection after 16 weeks rarely causes problems.

Figure 12 Rubella notifications to the MOH in Guernsey 1988 to 2013.



Immunisation in pre-pubertal girls was introduced in 1970 with the aim of protecting young women, but not interrupting the circulation of wild virus. While the number of

cases of CRS and terminations reduced, there remained a problem, therefore in 1988 universal immunisation of children was introduced with the aim of interrupting the circulation of virus among children, thereby protecting susceptible adult women from exposure. Following this there has been a reduction in CRS births to a very small number every year in England (PHE 2013). In Finland, indigenous rubella has been eliminated through high immunisation rates.

In Guernsey, in 1972 the Board of Health decided to provide free immunisation (White 1973), "*the tragedies of malformations following the occurrence of German measles in the early months of pregnancy are well enough known*", and 300 girls were immunised early. There have been no rubella notifications since 2000 (Figure 12).

Smallpox

Smallpox, also known as the "*red plague*", or "*Angel of Death*" (Williams 2010) was a viral illness unique to man. It had two forms, variola minor with a death rate of 1% and variola major with a death rate of around 30%, but around 80% in children. In the early nineteenth century, most people developed smallpox in their lifetime. It is estimated that 250 to 500 million people died from smallpox worldwide in the twentieth century and 2 millon a year as recently as the 1960's.

Smallpox has been rarely mentioned in MOH reports as it had been eliminated from Guernsey by 1900. In 1901 it was noted that no smallpox cases were notified despite an outbreak in London (Bishop 1902). One case of smallpox was notified in 1902 but in the end this was judged to have been a severe attack of chickenpox in a 10 month old child (Bishop 1903). That no cases of smallpox were notified was noted in 1922 (Bishop 1923).

Smallpox vaccination was introduced in Guernsey in 1808 and became compulsory in 1856. Routine smallpox vaccination was withdrawn in 1971 when the risks were thought to outweigh the benefits (Salmon et al 2006). In 1973, however, over a thousand islanders were vaccinated for smallpox after London became an infected area. Two secondary cases died in this outbreak (White 1974).

The last natural cases of smallpox was in 1977, although there was one case in England in 1978 from a laboratory accident in Birmingham in which one person died and there was a small outbreak (WHO 2013).

Smallpox was declared eradicated worldwide in 1979 (HPE 1979), and is the only human infectious disease that has been eradicated so far (Andre et al 2008).

Smallpox has been used as a weapon for centuries, and weaponised smallpox was developed by the former Soviet Union into a biological weapon in recent times. There is still a risk of a release from one of the two laboratories worldwide who still

hold the virus, or from bioterrorism. Contingency plans are in place should this occur.

Hepatitis

WHO recommend all countries to have universal childhood hepatitis B immunisation programmes (WHO 2009), and over 80% of countries have implemented this (Pollard 2007). The majority of European Countries, Canada, Australia and New Zealand have this as part of their infant immunisation programme (Namygal 2002).

In Guernsey, there is a very low prevalence of hepatitis B so, as in the UK where there are about 8,000 new cases of hepatitis B a year mainly in immigrants, current local policy is to only offer immunisation to high risk children. However, as high risk individuals are hard to identify and protection could be added to the childhood immunisation programme without any extra healthcare visits or injections (Pollard 2013), there is an argument to offer hepatitis B vaccination to all our children.

Recommendation 12 :	The introduction of universal childhood hepatitis B immunisation, as advised by the WHO, is considered.

Given that the majority of cases of hepatitis B in the UK derive from immigration from high prevalence countries, (where more than 8% of the population are infected), there have been calls internationally for better surveillance and control, including pre-immigration screening as for tuberculosis (Willams & Holt 2013).

Viral hepatitis is discussed further in the liver section of this report.

Sexually Transmitted Infections (STIs)

In 1942, venereal diseases were notifiable, and treatment was compulsory (Revell 1945). Sexually transmitted infections remain a significant issue for Guernsey, but they are not currently notifiable to the MOH.

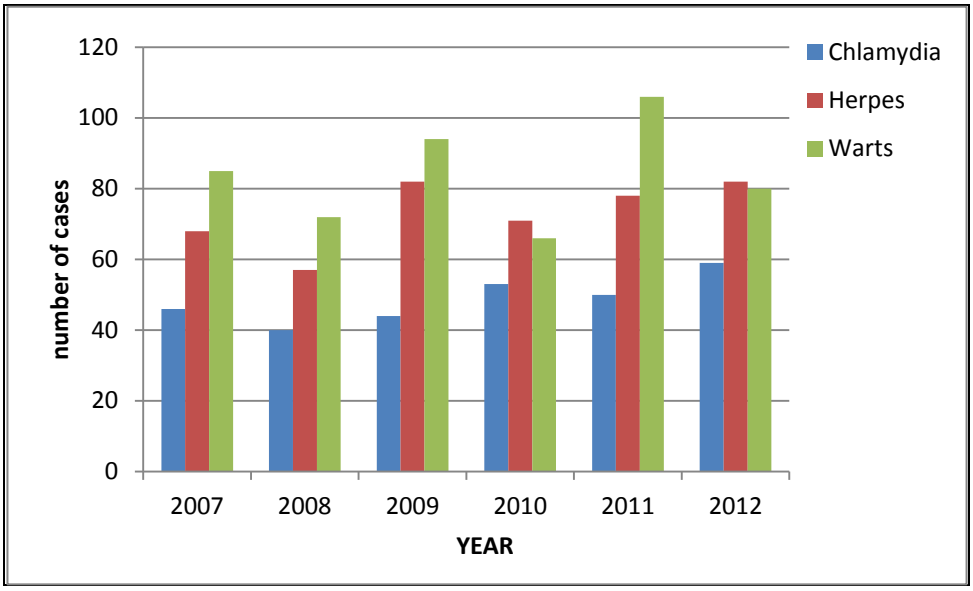
One key service providing help for people with STIs, among other services, is the Orchard Clinic. This is a directly managed service within the Public Health Directorate. Statistics from the unit have previously been highlighted in MOH reports.

Chlamydia, genital herpes and human papilloma virus infections (HPV) also known as warts, are the most common infections diagnosed at the Orchard Clinic (Figure 13). Statistics from the Orchard Clinic do not give a true island wide picture as they do not include diagnoses in general practice or at the Guernsey Contraceptive Service.

Chlamydia

People with Chlamydia infections often have no initial symptoms, however, the infection can later lead to a wide range of serious complications such as pelvic inflammatory disease (PID), ectopic pregnancy and infertility in women and epididymitis in men. Infection in pregnancy may lead to premature rupture of membranes, neonatal ophthalmic infection and neonatal pneumonia. Chlamydia is easily treated with antibiotics.

Figure 13 Chlamydia, Warts and Genital Herpes cases diagnosed at the Orchard Clinic, 2007 to 2012.



Rates of Chlamydia diagnoses in the Bailiwick averaged 246 per 100,000 between 2008-12 (Table 5), lower than the 356 per 100,000 reported in England and Wales, during the same period. However, local rates are 20% higher than the England and Wales pre-screening rates of 193 infections per 100,000, which is of concern.

Table 5 Chlamydia diagnoses numbers and rates per 100,000, with 95% confidence intervals (CI), 2008 – 2012.

Year	Chlamydia +ve (N)	Population (all ages)	crude rate Chl +ve per 100,000	95% LCI	95% UCI
2008	168	63,996	262.5	224.3	305.4
2009	156	64,500	241.9	205.4	282.9
2010	156	64,625	241.4	205.0	282.4
2011	153	65,026	235.3	199.5	275.7
2012	162	65,175	248.6	211.8	289.9
ALL	**795**	**323,322**	**245.9**	**229.1**	**263.6**

The importance of high volume high quality Chlamydia screening has also been highlighted by the Department of Health in England (DH 2013). England has set a target of greater than 2,400 diagnoses per 100,000 15-24 year olds (NCSP) and the Guernsey rates are much lower at 1,400 per 100,000 15-24 year olds (Table 6). These targets are likely to represent a small minority of prevalent infections.

Table 6 Chlamydia Diagnoses rates per 100,000 under 25 year old, 2008 – 2012. (It is assumed all under 25s are age 15 and above).

YEAR	Chlam'+ve (under 25y) (N)	Population (15-24y)	Crude rate Chlam' +ve per 100,000	95% CI Lower	95% CI Upper
2008	123	8,121	1514.6	1258.8	1807.1
2009	109	8,289	1315.0	1079.7	1586.3
2010	108	8,112	1331.4	1092.1	1607.4
2011	110	8,129	1353.2	1112.1	1630.9
2012	116	8,024	1445.7	1194.6	1733.9
ALL	**566**	**40,675**	**1391.5**	**1279.2**	**1511.0**

In Guernsey and Alderney 72% of diagnoses are in those aged 16-25 years. In England it has been estimated that between 5 and 10% of sexually active people in this age group are infected with Chlamydia. If Guernsey has as similar rate of infection as in England, which is considered quite likely, then diagnoses rate of 1.4% suggests that 75-90% of infections go undetected. This will be associated with a burden of preventable, distressing and expensive to treat health problems in later life.

Screening has been shown to decrease ectopic pregnancy rates and also rates of pelvic inflammatory disease by 35 to 50% (NCSP 2013), both distressing and

costly to treat complications of Chlamydia. The introduction of a Guernsey Chlamydia Screening Programme (GCSP) would be one important intervention in the prevention of future health complications. In the 112th MOH report Chlamydia screening was recommended as a spend to save initiative (Bridgman 2011), but this important policy option with both a significant health and economic yield has yet to be agreed.

Recommendation 13 :	A Chlamydia screening programme is introduced to improve health and save public money.

Human Immunodeficiency Virus (HIV)

HIV was an infection that became well known in the 1980s. Its history was traced back to the 1950s, and infection may have been a zoonosis that arose from human contact with great apes in the Congo. Human to human transmission has led to a global epidemic with an estimated 35 million people living with HIV in 2012, 2.3 million new infections, and 1.6 million deaths (UN 2013). The trend currently is for a reduction in new infections and deaths (UN 2013). Late stage disease is called AIDS (Acquired Immunodeficiency Syndrome). The majority of cases of HIV are in sub-Saharan Africa. HIV does, however, occur in Guernsey.

The first notification of HIV in Guernsey was in 1987, although there were already 3 known carriers in 1986 when the MOH, Lawrence (1988), wrote;
"*if any individual on the island does not know what HIV stands for, and what the infection means, they are in grave danger of jeopardising their health*".

In Guernsey, 24 people were newly diagnosed with HIV at the Orchard Clinic between 2007 and July 2012, of which 7 had late stage infection, AIDS, on diagnosis. People who are diagnosed early in Guernsey can expect a near-normal life expectancy, while those diagnosed late have a tenfold increased risk of death within one year of diagnosis. In the UK, of the 100,000 people estimated to have an HIV infection, around 25% are estimated to be undiagnosed. In addition each case is estimated to have a life-time treatment cost of £300,000. Use of UK cost estimates suggest that the prevention of all cases of HIV infection diagnosed in Guernsey between 2007 and 2012 would have prevented current and future States expenditure on these patients of between £5-10 million in lifetime treatment costs.

Late diagnosis also means that a person has remained unaware of their HIV status for many years, increasing the risk of onward transmission. People whose infection is well controlled by anti-HIV virus therapy pose negligible transmission risk to others. Prompt HIV diagnosis, therefore, helps to prevent others contracting HIV. At a population level, therefore, a key target is the reduction of patients presenting with late stage disease.

It is also in all our interests that we remove the stigma associated with an HIV infection so that people can be encouraged to be tested knowing they will be supported by the whole community, as routine testing of HIV in those with clinical indicator diseases or sexually transmitted infections, will detect undiagnosed cases.

Sexual health is a very personal and sensitive subject, but very important for the health and well-being of our community. A sexual health needs assessment has been carried out. It is recommended that sexual health strategy is enhanced.

Recommendation 14 :	Sexual health strategy is enhanced.

Human Papilloma Virus (HPV), prevention of cervical cancer and warts

Human papilloma virus (HPV) is a double stranded DNA virus that infects squamous epithelia including the skin and mucosae of the upper respiratory and anogenital tracts. There are approximately 100 types of HPV, of which about 40 infect the genital tract. Although most infections are asymptomatic and self-limiting, genital infection by HPV is associated with genital warts and anogenital cancers in both men and women. HPV viruses are classified as either 'high-risk' or 'low-risk' types depending on their association with the development of cancer. Genital HPVs are transmitted by sexual contact with an infected individual, primarily through sexual intercourse. The risk, therefore, is related to the number of sexual partners, the introduction of a new sexual partner, and the sexual history of any partner. Studies of incident HPV infections, based on HPV DNA detection, demonstrate that acquisition of at least one type of HPV infection often occurs soon after sexual debut (PHE 2013).

Low-risk HPV types are responsible for genital warts, which are the most commonly diagnosed viral sexually transmitted infection in the UK. HPV types 6 and 11 cause the majority of all genital warts. Genital warts appear from three weeks to eight months after primary infection (most commonly two to three months) (PHE 2013). Genital warts are not usually life threatening, but they can cause significant morbidity.

Immunisation is over 99% effective at preventing pre-cancerous lesions and genital warts associated with types 16 and 18, 6 and 11.

Many infections produce no symptoms. Most infections clear within 2 years, and protection is maintained for at least 7 years. However, persistent infection by high-risk HPV types is detectable in more than 99% of cervical cancers. Of these high-risk types, HPV16 is responsible for almost 60% and HPV18 for more than 15%, of all cervical cancers in Europe. In addition to cervical cancer, HPV is causally associated with other less common cancers, including cancer of the vulva, vagina,

penis and anus, and some cancers of the head and neck. Infection with multiple types of HPV is common (PHE 2013).

Immunisation against HPV serotypes 16 and 18 was introduced in 2008 and is offered to girls aged 12-13 years old. A reduction in precancerous lesions has been demonstrated following immunisation (Harper et al 2006), and a future reduction of the incidence of cervical cancer and cancer deaths is predicted in the cohort of Bailiwick children who have been immunised. More recently a different vaccine, providing additional protection against HPV serotypes 6 and 11, has replaced the original programme vaccine.

In Australia, which introduced a quadrivalent vaccine for all women aged 12-26 years between 2007-2009, a reduction in the incidence of high grade cervical abnormalities (precursors of cancer) of about 40% has been reported just 3 years after immunisation (Brotherton et al 2012).

HPV vaccine has been shown to reduce the incidence of certain wart strains by more than 50% in a multi-national study (Giuliano et al 2011). Australia has recently started a national programme to vaccinate boys age 12-13 years (Australian Government 2013) as it is considered likely that immunisation of boys will protect them from penile, anal and throat cancers and warts. It is also considered likely that it will indirectly protect women from cervical cancer.

Recommendation 15 :	Consideration should be given to the introduction of HPV vaccination for boys as well as girls.

The reduction in diseases from immunisation is likely to have an economic yield in terms of diseases prevented, and in future it is possible that the current cervical screening programme at a population level will no longer be cost-effective.

Gonorrhea

Gonorrhea is a sexually transmitted infection that can lead to complications such as pelvic inflammatory disease or epididymitis. Thirteen people in Guernsey had this infection identified by the microbiology laboratory in 2013.

Syphilis

This sexually transmitted disease is uncommonly detected in Guernsey. Currently, it can be cured with antibiotics. However, it remains a potentially fatal disease untreated, so vigilance and appropriate testing and treatment remain essential.

Other Infections

Influenza

Influenza is an acute viral infection of the respiratory tract spread by respiratory secretions. The disease is characterised by the sudden onset of fever, chills, headache, myalgia, and extreme fatigue. Other common symptoms include a dry cough, sore throat and stuffy nose. For otherwise healthy individuals, influenza is an unpleasant but usually self-limiting disease with recovery usually within two to seven days. Complications can include bacterial pneumonia, meningitis and encephalitis, and rarely influenza pneumonia in which a high proportion of people die. The risk of serious illness is higher in children under 6 months old, pregnant women, older people, and those with an underlying health problem. Some people may be infected and have no symptoms (PHE 2013).

Most cases in Guernsey tend to occur during an eight to ten week period during the winter. The timing, extent and severity of this 'seasonal' influenza can all vary.

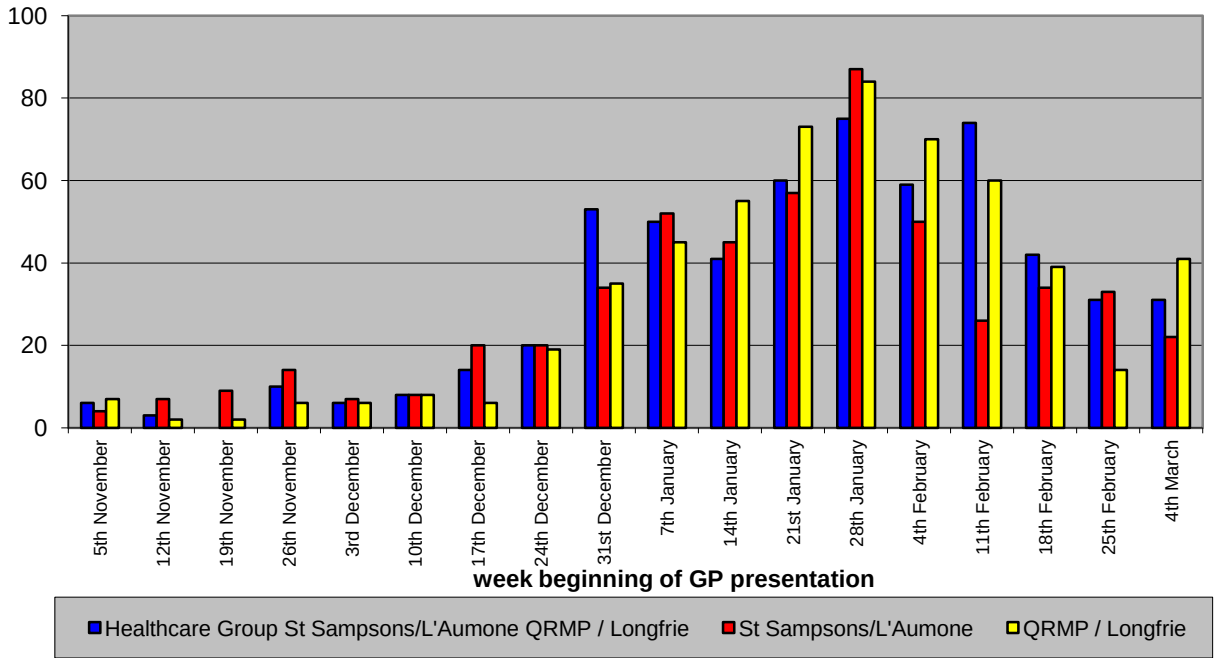
Influenza immunisation has been recommended since the late 1960s, with the aim of directly protecting those in clinical risk groups who are at a higher risk of influenza associated morbidity and mortality. In the year 2000, the policy was extended to include all people aged 65 years or over. In 2010, pregnancy was added as a clinical risk category for routine influenza immunisation.

In children a flu vaccine is administered via a nasal spray so does not involve injections, and requires less expertise. Consideration is being given to introduction in Guernsey, particularly. England began to immunize two to three year old children in 2013.

Flu vaccine is offered to frontline healthcare workers by HSSD, is offered by some employers, and individuals can access it via primary care or pharmacies.

Flu vaccine has also been found to have unexpected protective effects against other diseases (Andre et al 2005). Elderly individuals given influenza vaccine in the USA had approximately 20% less chance of suffering cardiovascular and cerebrovascular disease and 50% lower risk of mortality from all causes compared to their unvaccinated counterparts (Nichol et al 2003). In Sweden, administration of polysaccharide pneumococcal vaccine and inactivated influenza vaccine significantly reduced the risk of in-hospital mortality for pneumonia and cardiac failure among elderly persons, with an additive effect when both vaccines had been administered (Christenson et al 2004).

Figure 14 Patients presenting at GPs practices *with flu like illness*, November 2012 to March 2013.



GPs in Guernsey are crucial in flu surveillance by advising of cases of flu-like illness in the seasonal flu season (Figure 14). There is also an immunisation lead for each practice. This arrangement is very valuable in monitoring disease in the flu season and assisting in any measures required to manage seasonal flu in both the community and hospital setting. Currently, Alderney practices do not submit data.

Recommendation 16 :	Alderney practices consider participation in flu-like illness surveillance.

Changes in the surface proteins of influenza A may lead to the development of new subtypes of virus to which the population may have little or no immunity, and this may therefore lead to widespread epidemics or even pandemics (PHE 2013). Despite the 2009-10 influenza pandemic caused by the A(H1N1)v strain (Bridgman 2010), conditions still exist for the emergence of other influenza strains with potential to lead to another pandemic. All human infections with non-seasonal influenza viruses are reportable to WHO under the International Health Regulations

(WHO 2013). Due to the constantly-evolving nature of influenza viruses, WHO continues to stress the importance of global monitoring of influenza viruses in animals and people and recommends that all Member States strengthen routine influenza surveillance. Currently a range of avian influenzas have infected man in various countries and are a potential pandemic threat. The issue of pandemic flu and the fact it is the top risk on the island risk register currently, is briefly considered earlier in this report.

Outbreaks of influenza in animals are also under surveillance (WHO 2013), as it is likely to be the mixing of genes between animal and human flu viruses that leads to the creation of a new pandemic strain of flu virus to which there is no human immunity.

Recommendation 17:	HSSD review the adequacy of its response to WHOs recommendation on strengthening infectious disease surveillance.

Puerperal Sepsis

Puerperal sepsis is any infection of the genital tract which occurs after the birth of the baby. There are half a million deaths of mothers worldwide (WHO 2008), and it used to be a major problem in the British Isles. Problems in Guernsey are rare. A local death was recorded in 1935 (Revell 1936).

Chickenpox (Varicella-zoster)

Varicella-zoster virus, is a member of the herpes virus family. The disease only occurs in humans. After primary infection as varicella (chickenpox), the virus remains dormant in the sensory-nerve ganglia and can reactivate at a later time, causing herpes zoster (shingles) (CDC 2013). The disease is transmitted from person to person by direct contact, inhalation of aerosols from vesicular fluid of skin lesions of varicella or herpes zoster, or from infected respiratory tract secretions that might also be aerosolized. The virus enters the host through the upper respiratory tract or the conjunctiva.

Varicella is often a mild disease in children, and most people recover without serious complications, but rarely there are serious complications that can include death in 1 in 40,000 (CDC 2013). In healthy children, serious complications are not common, but in rare cases it can lead to septic shock as a result of the blisters becoming infected, as well as pneumonia and encephalitis.

People who are infected should stay at home until they are no longer infectious, which is until the last blister has burst and crusted over. This usually takes five or six days after the rash begins. They also should avoid contact with:

pregnant women; newborn babies; anyone who has a weak immune system, such as people who are having chemotherapy (a treatment for cancer) or taking steroid tablets (CDC 2013).

In the UK, chickenpox is most common in children under 10, and is so common in childhood that 90% of adults are immune to the condition because they have been infected.

Varicella vaccine contains live, attenuated varicella-zoster virus. Varicella vaccine is routinely used to vaccinate healthy children in only some countries, such as Australia, Canada, Germany, Switzerland, and USA. It is up to 90% effective for preventing varicella and 100% effective in preventing severe or moderate disease (NNii, 2009). The vaccine can lead to "Modified varicella", also known as breakthrough, which is infective.

In the UK the vaccine is not currently routinely used, and there is some concern about future risk of shingles if adults are not exposed to the virus. The vaccine is used, however, to protect people who are most at risk of a serious chickenpox infection or of passing the infection on to someone who is at high risk of complications, for example, the siblings of a child with leukaemia or a frontline healthcare worker who is not immunised.

Chickenpox is a preventable, unpleasant disease with, on occasions, severe complications, especially for children who are already ill. In addition, it stops children going to school and means parents have to take time off work. Disease surveillance and universal vaccination against chickenpox in Guernsey should be considered.

Recommendation 18 :	Disease surveillance and universal vaccination against chickenpox should be considered.

Coronavirus

Coronaviruses are a wide range of viruses that can cause colds in humans and more severe illnesses.

A coronavirus was the cause of the highly virulent disease SARS (severe acute respiratory syndrome), which led to the death of the doctor who first diagnosed a case (Medline Plus 2013). The 2003 outbreak had an estimated 8,000 cases and 750 deaths, and has changed the way that the world responds to infectious diseases during a time of widespread international travel. It is thought SARS may have originated in bats in Asia and possibly been transmitted to humans via civets (BMJ 2013, WHO 2003 & 2012, Hawkes 2013).

Another novel severe coronavirus infection was identified in London in 2012, and has been associated with over 60 cases worldwide, half of whom have died. It is considered it may have been transmitted to people by bats via camels, and is now termed Middle East respiratory syndrome Corona virus (MERS-CoV) (PHE 2013).
It is planned to make these diseases notifiable to the MOH at the next revision of the Guernsey notifiable diseases list.

Helicobacter Pylori

This organism is now known to cause chronic gastritis, most peptic ulcers, and gastric adenocarcinoma and lymphoma (Crowe 2013, Gatta et al 2013). A high proportion of the world's population is infected. It is thought to be spread by the faecal oral route. While a common cause of disease, it is not notifiable. Antibiotic treatment can eradicate it.

Immunisation

The aim of immunisation is disease prevention. Vaccines have antigens which induce our bodies to produce antibodies which are proteins that neutralise or destroy disease-carrying organisms and toxins.

Immunisation is the second most important measure to control infectious diseases, after clean water (Andre et al 2008), and the most important intervention offered by health services (Davies 2013). Childhood immunisation continues to be one of the most cost-effective health policy interventions (OECD 2011). Immunisation has a long history in the UK dating back to before Edward Jenner at the end of the eighteenth century (Hobson-West 2007, Williams 2010, PHE 2013 - Vaccine Update), but is said to have been practiced in Asia a thousand years ago. Although vaccines are considered safer than therapeutic medicines, there has been an anti-vaccine lobby for many years (Andre et al 2008, Hobson-West 2007).

As well as protecting individuals, at a population level immunisation has the objective of creating so many people in the population who are immune that the microbe cannot find enough non-immune victims to propagate itself so its dies out, so called "herd immunity". Therefore immunisation is not only important for the protection of the individual, but also the protection of the community. If a significant proportion of the population is not vaccinated then there is a risk of outbreaks with serious consequences.

Immunisation programmes require funding for infrastructure (for example, cold-chain maintenance), purchase of vaccines and adequate staffing (Andre et al 2006). However, the mortality and morbidity prevented translates into long-term cost savings and potential economic growth, which have been estimated at tens of billions of dollars globally (Ehreth 2003) and are usually underestimated (Wagstaff 2002).

States Childhood Immunisation Programme

The Bailiwick universal childhood immunisation programme offers protection to our children against 11 potentially dangerous infectious agents: diphtheria; tetanus; pertussis (whooping cough); polio; haemophilus influenza type B; pneumococcal disease; rotavirus; meningococcal group C disease; measles; mumps; and rubella (Table 7). In this programme 37 antigens are administered. Immunisation is routinely offered at 6 different ages to all islands children; 2 months; 3 months; 4 months; between 12 and 13 months; 3 years 4 months (40months); and around 14 years old. Many of the vaccines protect against multiple infections, and in all, 13 immunisation injections and 2 oral immunisations are offered. Rotavirus immunisation only commenced in July 2013.

In June 2013, the schedule of the meningitis C programme changed. Children now are offered a dose of meningitis C immunisation as a booster in secondary schools, to protect against the second peak of incidence in 15-19 year olds, instead of one of the early childhood immunisations.

Protection is also offered to girls against human papilloma virus (HPV) (types 6 and 11 causing genital warts, and types 16 and 18 causing cervical and other cancers). Most HPV immunisations are administered by school nurses, with a few by GPs. Uptake increased from 88% to 95% between 2010 and 2012, related to the improved vaccine available from 2012.

In 2012-13, the pre-school booster uptake improved to 98% from 95% the year before.

For at risk children, hepatitis B immunisation is offered at birth, 1 month, 2 months, and 12 months old, and tuberculosis at birth.

Table 7 Childhood Immunisation Schedule for Alderney and Guernsey

Age	*Vaccine given*	*How it is given*
2 months old	Diphtheria, tetanus, pertussis (whooping cough), polio and Hib (DTaP/IPV/Hib). Pneumococcal (PCV). Rotavirus.	Injection Injection Oral
3 months old	Diphtheria, tetanus, pertussis (whooping cough), polio and Hib (DTaP/IPV/Hib). Meningococcal C (MenC). Rotavirus.	Injection Injection Oral
4 months old	Diphtheria, tetanus, pertussis (whooping cough), polio and Hib (DTaP/IPV/Hib). Pneumococcal (PCV). Rotavirus.	Injection Injection Oral
Between 12 and 13 months of age (i.e. within a month of the first birthday)	Hib/MenC. PCV. Measles, mumps and rubella (MMR).	Injection Injection Injection
3 years 4 months to 5 years old	Diphtheria, tetanus, pertussis and polio (DTaP/IPV or dTaP/IPV). Measles, mumps and rubella (MMR).	Injection Injection
Girls aged 12 to 13 years old	Human papilloma virus (HPV)	Three injections
13-18 years old	Men C. Tetanus, diphtheria and polio (Td/IPV).	Injection Injection

Consideration is currently being given to a possible childhood influenza immunisation programme.

Recommendation 19 :	A child flu influenza immunisation programme should be considered.

Immunisation is free at the point of access, and is currently funded through taxation via HSSD. HSSD commissions primary care to administer to pre-school children, and the school nurse service to school age children. Funding is currently an issue with financial pressures on the States, and any new programme will need to compete against other priorities.

WHO targets are that 95% of the child population should be vaccinated against each antigen, called coverage (HPA, Cover 2013). Coverage may be measured differently in different countries, with some surveying the population, and others using actual encounters with the health service. Guernsey uses encounters.

In 2012, very good uptake rates were reported by the three Guernsey primary care practices, with 98.8% receiving the first dose and 97.5% the second dose of DTP, 98.6% the first dose of Men C, 98.5% the first dose of pneumococcal vaccine, and 95.1% the first dose of MMR. As noted above under measles, there have been issues with Guernsey's new Child Health Information System such that it is not possible yet to obtain valid immunisation coverage statistics, but efforts continue to try to solve this problem.

States Adult Immunisation Programme

At risk adults are offered seasonal flu and pneumococcal immunisation as part of the States programme. Adult vaccines are procured through HSSD and funded by the Social Security Department as a pharmaceutical benefit.

Influenza immunisation is advised annually as there may be changes to the circulating strains from one season to the next, and protection decreases with time. The uptake rate in Guernsey of flu immunisation in 2011/12 for the over 65s was 58% which was lower than the 71-75% seen in England in the last decade (PHE 2013), and below recommended levels.

The Social Security Department in the second half of 2013 agreed to fund the prescription of shingles immunisation initially for people who are 70 years. Shingles results from the reactivation of latent chickenpox or varicella virus from the nervous system, sometimes in people who have problems with their immune system. The lifetime risk of varicella infections in the absence of a primary immunisation programme is about 95%. Shingles affects around 1 in 120 people per year in the age group 70-79 years, with an estimated lifetime risk of about 1 in 4. Shingles is often followed by pain, post-herpetic neuralgia, which can last for months. The vaccine can reduce the risk of shingles by about 50% (PHE 2013).

There is currently no requirement for practitioners to report immunisations to the MOH so therefore monitoring population coverage of immunisation is a problem.

Recommendation 20 :	Immunisations should be reported to the MOH to enable monitoring of population coverage.

Pandemic Flu Immunisation

If a new influenza A subtype were to emerge with epidemic or pandemic potential (as occurred in 2009 with influenza A(H1N1)v), it is unlikely that the influenza vaccine will be well matched to the emerging strain. In these circumstances, as was achieved during the 2009 pandemic, a monovalent vaccine against the new strain would be developed (PHE 2013). In the event of such a strain emerging

there will be, initially, a shortage of vaccine. The island will need to consider whether or not it wishes to invest in the contingency of securing early stocks of a vaccine in the event of a pandemic, as Jersey has done.

Recommendation 21 :	The States of Guernsey consider a pre-pandemic vaccine agreement.

Travel Immunisations

Residents who travel abroad may be at risk from a range of vaccine preventable illnesses such as cholera, hepatitis A, Japanese encephalitis, rabies, typhoid, tick-borne encephalitis and yellow fever. Travellers are encouraged to consult a Travel Clinic or Primary Care well in advance of travel to ensure recommended vaccines are available before they travel.

Occupational Immunisation

Any vaccine-preventable disease that is transmissible from person to person poses a risk to both healthcare professionals and their patients. Healthcare workers have a duty of care towards their patients which includes taking reasonable precautions to protect them from communicable diseases. Immunisation of healthcare and laboratory workers may therefore protect the individual and their family from an occupationally-acquired infection; protect patients and service users; protect other healthcare and laboratory staff; and allow for the efficient running of services without disruption (PHE 2013). Occupational health departments have a very important role in health services, and it is important that every healthcare provider has access to a competent service.

One policy issue for HSSD has been, as in other jurisdictions in the British Isles, the relatively low uptake of flu immunisation in healthcare staff, which was 43% in 2012-3. HSSD's target in 2013-4 is 50%.

Protection of the unimmunised population: Herd or indirect protection

Immunisation programmes can protect the unvaccinated population through indirect or herd protection. The coverage rate (proportion of vaccinated population) necessary to stop transmission depends on the basic reproduction number (R0), defined as the average number of transmissions expected from a single primary case introduced into a totally susceptible population. Diseases with a high R0 (for example, measles) require higher coverage to attain herd protection than a disease with a lower R0 (e.g. rubella, polio and Hib). For measles, 95% coverage is required for herd immunity, while for polio and Hib 70% may suffice (Andre et al 2008).

Mandatory Immunisation as a Policy

The Royal Court introduced licensing for vaccination against smallpox in 1808, and brought in regulations in 1825. In 1856, The Parish Constables of St Peter Port were allowed by Ordinance to compel children to be vaccinated. The first full law

was the Loi relative à la vaccinations des enfants, 1896, which was repealed in 1935.

The first jurisdictions to introduce compulsory vaccination were in Napoleonic territories in 1806 (Salmon 2006). In England compulsory vaccination laws from 1853 led to an anti-vaccine lobby that led to a riot, and some politicians stood on the mandate (Salmon 2006). This then led to the introduction of a "conscientious exemption" for those opposed that was later the basis of the same in the First World War.

Compulsory immunisation for diphtheria for children aged 2 to 10 was introduced to control an outbreak in Guernsey in 1938 (Jeffs 1999). Dr Revell, MOH, wrote in 1939, "*When diphtheria is not prevalent, it is very difficult to persuade parents to have their children inoculated, but to prevent future epidemics of this disease it is essential to maintain a high percentage of inoculated children, and in my opinion can only be effected by some form of compulsion*".

Following progress in the global eradication of smallpox, in 1972 the Board of Health laid aside a power, held for many years, for compulsory smallpox vaccination (White 1973). At the same time, the Board relinquished its power for compulsory diphtheria immunisation, as they did not wish to extend the compulsion to other immunisation procedures and the cost of single agent vaccines were not acceptable (White 1973).

Mandatory vaccination has been used successfully in parts of the USA and Australia (Salmon et al 2006). State nursery places and/or school places have been made available only if children have been immunised. Given the relatively high coverage rates in Guernsey currently I would not recommend it for the childhood immunisation programme given the controversy it would be likely to cause.

The low rate of staff flu immunisation in HSSD, in line with other British jurisdictions, is disappointing. This puts patients at risk. Mandatory flu immunisation has been used as a condition of employment at a large US healthcare provider, which led to a very successful outcome of 98% of 26,000 employees being vaccinated (Babcock 2013). One strapline used to promote such as a policy is, "*No vaccine, no job*" (Finnegan 2012). Every member of staff has a professional responsibility to protect patients, but each is also a person with their own autonomy. Arguments for and against a policy of compulsory immunisation of healthcare staff have been well rehearsed but remain controversial (Behrman and Offley 2013). HSSD's Immunisation Committee have seriously discussed the possibility of compulsory immunisation, but have so far decided not to recommend it.

Future Programmes

Guernsey's Immunisation Advisory Committee consists of Health and Social Services Department and Social Security Department staff, Primary Care and the Medical Specialist Group staff. It carefully considers the policy recommendations of the English Joint Committee on Vaccination, as well as those of the WHO. Immunisation plans in other countries are also considered, and it has been noted that there is variation based on the different risks of disease and different judgements as to what is beneficial, acceptable and affordable. Advice is then given based on a judgement of what would be appropriate and acceptable for Guernsey. For instance areas currently under consideration are childhood influenza vaccination, and meningococcal B vaccine.

Areas that should be considered in future are further extension of the flu immunisation programme, which is a universal programme in the USA, and hepatitis B and chickenpox vaccination which are part of some countries routine childhood immunisation schedules.

One issue in getting best value at a population level out of the immunisation programme has been that there are currently two different States departments with separate budgets, powers and processes to determine independently the childhood and adult immunisation programmes.

Immunisation Research

Immunisation is one of the most cost-effective health interventions.

While local immunisation uptake rates in children are good currently, a small minority of children are not protected. It would be useful if we knew why parents do not have their children immunised, and if there is anything further we can do to help them make their choices. Similarly, it would also be useful to know why so many health service staff decline flu immunisation.

Microbiology

The identification of the nature of an infection may be made from chemical, microscopic, microbiological, immunological, or pathological study of secretions, discharges, blood, or tissue sections. Diagnostic tests are essential in the control and treatment of every infection and every outbreak of infection. A medical microbiology laboratory in Guernsey was first fitted out in April 1899, at a cost of £100 with a microscope being the most expensive piece of equipment, (Brownlee 1900).

Today, Guernsey has a directly managed medical microbiology laboratory within its Pathology Department at the Princess Elizabeth Hospital. The Microbiology section is broadly divided into bacterial, viral and fungal identification.

Guernsey also commissions consultant microbiologist services from the Public Health England laboratory in Birmingham (PHELB), and in partnership with PHELB the local department provides a comprehensive routine microbiological service which supports all clinicians. After identification of an infection, the service identifies appropriate treatment options and gives guidance to the clinician. It also works closely with the MOH to help limit and control disease outbreaks on the Island.

Despite a wide-range of tests being available locally, some specialized tests require samples to be sent to Birmingham for analysis and on occasions to other specialist laboratories in England such as the Centre for Disease Control at Colindale. Joint working with PHELB means Guernsey has access to some of the most advanced technologies in the world, technologies that Guernsey alone would not have the patient throughput to warrant.

A good example is the sequencing of a bacterial genome. This was first achieved worldwide in 1995 at great cost, but less than 20 years later, bacterial genomes are routinely sequenced relatively cheaply. In 2012, PHELB carried out sequencing on isolates from Guernsey patients to identify the original source of the first cross-infection of *Clostridium difficile* seen for many years in the PEH.

Another technology is MALDITOF (Matrix-assisted laser desorption ionization time-of-flight), a form of mass spectrometry available currently in Birmingham but not Guernsey. These sophisticated tests are faster, more accurate and cheaper than traditional immunological or biochemical tests, and may become standard over the next few years. Quicker diagnoses are of great benefit in managing both individual cases and controlling outbreaks of infection (WHO 2013). The experience gained by the PHELB team will be invaluable as and when the technology becomes affordable in Guernsey.

Advances in genetic testing for bacteria such as nucleic acid amplification tests (NAATs) for Chlamydia are already available in Guernsey and playing an important role in the monitoring and improvement of sexual health in the Island. Local men and women can have tests carried out on their urine to diagnose infection, rather than undergo an unpleasant intimate examination. It is hoped in future to extend these tests to other bacterial infections. NAAT testing has potential as a point of care testing technology, also known as bedside or near patient testing (Walker 2013). The range, performance and ease of use of microbiological point of care tests, which can produce results in minutes and hours compared to days by traditional culture methods, are likely to increase in future for the benefit of users.

The Guernsey's microbiology laboratories database is linked to the PHE database for disease surveillance. On a non-statutory basis all notifiable organisms are

reported to the South East Regional Epidemiology Unit via “CoServ” databases, in the same way as English laboratories. This information is part of a continuous monitoring process allowing all contributors to have the earliest possible warning of dangerous outbreak causing organisms, including bioterrorism threats.

Travel

With global air travel rising, there is both an increased risk of exposure to infectious diseases abroad and a risk of travelers bringing disease to Alderney and Guernsey. SARS is a dramatic example of how quickly world travel can spread a disease (Medline Plus 2013). During pandemic flu in Guernsey there was experience of people flying from the Americas to Guernsey and then onto Asia, possibly transmitting the disease en route. Therefore, although some diseases may no longer be common or endemic here, it is very important that people receive available immunisations from diseases which might be transmitted here by travelers from abroad.

The most common vaccine-preventable diseases among travelers are influenza and hepatitis A. Other vaccine-preventable health risks for local residents to consider include rabies, hepatitis B, typhoid, cholera, yellow fever, and Japanese encephalitis (Andre et al 2005). In addition there are risks from a wide range of other diseases such as HIV and malaria. It is important that travelers seek advice on health risks of places they travel to.

Food

Food Safety

Food can become contaminated by micro-organisms at any stage during production, processing, transport or cooking. Illness usually occurs 1-3 days after exposure. While most people get better, people with an underlying illness may suffer severe complications or even death.

In the Bailiwick, the Office of Environmental Health and Pollution Regulation (OEPHR) regulates the approximately 700 retail and wholesale food outlets which include restaurants. They undertake risk based assessments and visit premises every 6-24 months, and more frequently if required. It has been noted that in the last year or so there has been a concerning increase in premises requiring improvement notices, perhaps an indication of financial pressures leading to less cleaning and pest control (V Cameron, pers. Comm.). A Hygiene Award Scheme was introduced in 1998 (Cook 2004). A local Food Hygiene Information Scheme based on UK practice, called “Scores on the Doors”, will be introduced by OEHPR in 2014, which will allow businesses to inform consumers how they were rated in their last food hygiene inspection, and should raise standards and reduce risks (V Cameron pers comm, Scores on the Doors, 2013).

Food can also become contaminated in the home, so it also important that all islanders hygienically manage the food they eat in homes. One factor increasing the risk, which is outside our direct control, is the globalisation of our food supply whereby we have to rely on regulation in other jurisdictions to protect the food chain. Over 90% of the food consumed in Guernsey is imported from the UK and EU.

Several milk-borne diseases, such as typhoid fever, diptheria, scarlet fever, tuberculosis (TB), anthrax and foot and mouth disease, had been recognised before 1900, and milk was reported to be responsible for a quarter of disease associated with water, milk or food in the USA (Holsinger et al 1997). Mycobacteria in the milk of cows sub clinically infected with TB was once a major public health issue in the UK, but, thankfully the island has remained free of bovine tuberculosis in cattle, at least within living memory. Currently, all cows on the island are tested to ensure they remain free of TB and some other transmissible disease that are known to cause human infection. Raw milk can also be a source of Campylobacter (Holsinger 1997). Today, by law all milk must be heat treated (pasteurised) before sale to the public (Milk Control, Guernsey, Law 1955 and Milk Control, Guernsey, Ordinance 1958, as amended).

The MOH in 1950 noted that when all milk supplies are pasteurised, a large measure of safety against epidemics will have been procured (Revell 1951). This was achieved in 1951 (Revell 1952). Technical failures can, of course, still occur and a Salmonella outbreak, likely associated with failure of pasteurisation at the States Dairy, was reported in 1985 (Lawrence 1986). Therefore work to monitor the microbiological quality of milk remains essential, and this is carried out locally by Guernsey Dairy with the process regulated by OEHPR. It is also appropriate to remember that all milk can carry disease, so the public should ensure that goats milk is pasteurised before purchase and consumption, and that unpasteurised milk should be avoided when abroad.

One disease that can be food borne, Campylobacter is discussed earlier, and some other food safety issues are discussed below under zoonoses. In Guernsey *Salmonella enteridis* Phage type 4, known only from poultry and eggs had been the most common organism identified to cause food poisoning (Jeffs 1994). Investigation in 2008 showed there was strong circumstantial evidence of a single point source from a local egg producer. The local producer ceased production and the incidence of infections rapidly dropped (Bridgman 2009). Major preventative measures were put in place before the farm reopened under new management and the farm is still regularly inspected by Environmental Health Officers. There had previously been a Salmonella outbreak on the island in 1986 when 123 people were infected from confectionery filling (Lawrence 1987).

Food Security and Plant Infections

Human health can be damaged from plant diseases or the eating of mouldy food from mycotoxins. Mycotoxins have led to outbreaks of disease, including many deaths, in some countries, and can cause chronic diseases and cancers at low exposure levels (Pitt 1989).

Households are considered food-secure when its occupants do not live in hunger or fear of starvation. Food security involves the availability of food through domestic production or importation, sufficient resources to access the food, adequate use of food, clean water, and stability of access to food over time. Micro-organisms that infect plants may be transported far and wide as a result of global trading systems, and they may also find more favorable conditions for reproduction and transmission because of global warming (Wilkinson et al 2011). Plant infections can lead to failure of food production and are a major risk for food security.

MacKenzie (2007) reports on the dangers of a fungal infection of wheat to our food security and therefore health;

"This infection isn't going to give you flu, or TB. In fact, it isn't interested in you at all. It is after the wheat plants that feed more people than any other single food source on the planet. And because of cutbacks in international research, we aren't prepared. The famines that were banished by the advent of disease-resistant crops in the Green Revolution of the 1960s could return" (MacKenzie, 2007).

As a net importer of food, Guernsey would be particularly affected by a world food shortage. Given the uncertainties in the world, the protection of the Bailiwick's domestic food production from infection is very important to protect public health.

Food Safety Legislation in Guernsey has been reviewed recently and in 2011 the States approved the drafting of new food safety legislation to protect the food chain.

Water and Sanitation

Very many infectious diseases are either waterborne or water-related. Disease can arise from both drinking and bathing waters. Water of poor quality can cause disease outbreaks and can contribute to background rates of disease. The provision of clean water through disinfection, filtration etc, has been said to be the most important development to control infectious disease (Andre et al 2008). Water and sanitation are also human rights issues.

Drinking Water

Worldwide, the lack of clean drinking water is an issue for billions of people (WHO 2013). Despite our sophistication, even in developed countries, such as Guernsey, clean water should not be taken for granted. In my own experience, I have investigated and reported an outbreak of cryptosporidiosis, an emerging infection, caused by contamination of the public water supply by cow faeces (Bridgman et al 1995). An outbreak of a similar waterborne parasite affected an estimated 400,000 people in North America in 1993 (MacKenzie et al 1994).

WHO guidelines on water quality are followed in Guernsey and Alderney (WHO 2011). Extensive microbiological surveillance is carried out on drinking water to ensure safety. Given much of the islands are a water catchment area, protection of the catchment is of great importance to protect public health.

Guernsey Water is currently responsible for the provision of the public drinking water supply, and for protection of the water catchment in Guernsey. The States of Alderney Engineer has a similar responsibility in Alderney.

The OEHPR is the shadow water regulator in Guernsey, and will in the near future have responsibilities similar to the Environment Agency and Drinking Water Inspectorate in England. New legislation is being developed that will specify environmental standards for ground water contributing to the drinking water supply and the protection of the marine environment.

In addition, however, private consumers and commercial enterprises have very important roles in looking after the distribution system for water. For instance deadlegs in plumbing systems can lead to the multiplication of organisms such as *Legionella* (see below), stagnation and contamination from metallic pipes.

The Estates & Services Committee is the responsible body for the safety of public drinking water in Alderney. All households are on mains water, with no borehole water used for drinking. Alderney follows Guernsey practice to protect drinking water and is regularly tested by the States Analyst laboratory. Alderney has a variety of laws to protect water from pollution, and on sewerage (see http://www.guernseylegalresources .gg/article/91436/Environment-and-Public-Places).

Legionellosis

The risk of *Legionella* infections from local water supplies has become a higher priority within the last year or two with contamination discovered in the PEH water system, although no disease attributable to this contamination are known to have occurred.

The *Legionella* bacteria are found naturally in the environment, and grow best in water temperatures between 20 and 45 deg C. They are present in many water systems, living in the thin film of microbes which grows on the inside of water

pipes. They only become a risk to health when conditions allow them to grow to large numbers and when fine aerosol sprays are created which can be breathed in by vulnerable people. The key methods of *Legionella* control are keeping the water temperature below 20 deg C or above 50 deg C and by keeping the water moving so that bacteria are not allowed to build up in areas of stagnant water. Poor plumbing system design and maintenance compound the problem and in large premises additional chemical dosing of the water system may be required to control bacterial growth. People are at risk if they breathe in contaminated mist or small droplets. Poorly maintained shower-heads are an obvious risk in the home. Most people exposed to the bacteria do not become ill. People may develop "flu-like" symptoms 2 to 14 days after exposure (CDC 2013), but the most dangerous form of the disease is a severe pneumonia. The bacteria are not spread from one person to another person. Older people with underlying health problems, the immuno-compromised and smokers are at particular risk.

In 2012 there were two admissions to hospital in Guernsey with this disease, the causes of which were unknown. In England and Wales around 250 cases have been reported on average a year of which about 5% may have been hospital related. A significant minority of cases are associated with travel (PHE 2013). For instance, in one case in Guernsey the source may have been the mist from a fountain in Italy.

An outbreak is when two or more people become ill in the same place at the same time. Outbreaks have been linked to hospitals, cruise ships, hotels, and leisure centres. People who have become ill in the past have included workers (offices, factories, shops, hospitals), visitors (for example, delivery drivers), and members of the public (hospital in-patients, guests or passers-by).

Prevention of the disease is through good design and maintenance of water systems as above, but if *Legionella* are found in a system, chemical treatment and a thorough engineering review are required. Other potential sources such as spa pools, fountains etc may need to be taken out of use.

The Guernsey Health and Safety Executive introduced an Approved Code of Practice in 2013 entitled:- *''The control of Legionella in water systems in Guernsey"*. Approved codes of practice have a unique status in Guernsey law in as much as they are a standard and can be followed, whereby a duty holder can discharge the duty applied by the Health and Safety at Work (General) Guernsey (Ordinance) 1987. A significant risk may exist when water is at a temperature that suits bacterial reproduction, a fine mist is formed and people may be exposed to the mist. The Ordinance requires that employers and those in control of premises manage that risk and reduce it so far as is reasonably practicable. The Approved Code of Practice gives practical guidance as to how this can be achieved and should become a tool in preventing exposure.

A regime of managing water systems which will include regular sampling is just part of successful risk reduction. Accredited testing for *Legionella* is available on-island from the States Analyst's Laboratory.

With their extensive water supply systems, hospitals are known to be one area of significant risk, and indeed HSSD have found significant contamination in its facilities. A huge amount of work has been carried out to control the risk at the PEH, including; temperature control; chlorine dioxide level monitoring; daily/weekly flushing records; shower head decontamination; training on *Legionella* control; general maintenance and removal of deadlegs; frequent water sampling as per Health and Safety Executive Guidance.

Cases or an outbreak associated with a hotel or other public facility would constitute a significant public health problem, and would be a major issue for the local tourist industry. As this remains a risk in any property with a poor temperature control, throughput or deadlegs (which owners are likely to be unaware of), it is important that businesses follow Guernsey HSE's guidance.

Recommendation 22:	Businesses should follow the Guernsey HSE Approved Code of Practice and guidance to reduce *Legionella* risk, and householders should also be aware of risk and how to reduce it.

Sanitation

In 2012, Guernsey Water took over from the Public Services Department Central Services, the responsibility to remove wastewater from all properties on the Island and treat it appropriately for return into the natural environment. Historically, wastewater has been discharged to the Little Russel through the Belle Greve long sea outfall (Saunders 2011).

Although European standards suggest a minimum of primary treatment for wastewater discharges for a population the size of Guernsey, because of Guernsey's unique tidal flow and lack of heavy industry it was concluded that bathing waters and shellfish beds would be unlikely to be significantly affected by the Belle Greve outfall (Saunders 2011). Ultra-Violet (UV) rays of the sun, natural wave action, together with massive dilution provide the current bacteriological breakdown, so that effects were concluded to be virtually eliminated more than 20 to 30 metres from the outfall (Saunders 2011, Guernsey Water 2013). Therefore, while having a biological and disinfection treatment plant would be the lowest risk situation, it was considered that a primary treatment works which would cost £100 million over 25 years would provide no significant benefit (Saunders 2011, BBC 2013). A recent improvement has been the introduction of mechanical screens at Belle Greve Wastewater Treatment Centre, opened in August 2013, which remove

the non-biodegradable material larger than 6mm in diameter from wastewater (BBC 2013). A new stormwater storage tank has also reduced the incidence of stormwater overflow of the short sea outfall.

Licensing of the Guernsey sewage outfall will be the responsibility of the independent Office of Environmental Health and Pollution Regulation (OEHPR) when a new water pollution ordinance is introduced.

Guernsey Water also has major projects to repair leaks in sewers and plan, when resources allow, to increase from 75%, the proportion of the public who have access to the mains sewerage system (Guernsey Water 2013). Until then, about 5,000 properties which have cesspits will require emptying of their sewerage by truck.

The Estates & Services Committee, through the States Engineer, is responsible for sanitation in Alderney. Of 970 domestic households reported in the 2013 Alderney census, 140 are not connected to mains drainage. Around half of properties not connected to mains drainage are served by a tanker at frequencies ranging from once a week to once a year (J Turner per. comm.). There are two main drainage systems.

Most properties are connected to an outfall in which untreated sewage is discharged into the sea beyond Fort Doyle. Fort Doyle is adjacent to Platte Saline beach which is steep and gravelly and has a fast current and so is unsuitable for bathing. All tankered waste is discharged to the Doyle outfall.

The second sewage outfall in Alderney is at Longis which is a sandy bathing beach. About 90 properties use this outfall. The effluent flows into a septic tank which separates the solids out, the liquid effluent is then discharged onto a mineral media trickling filter, following which it is discharged into a stream on the beach at the high tide mark. Although this is a popular tourist beach, no water quality checks are currently carried out on the bathing water. Alderney is working on further treatment to the effluent at Longis, using ultra-violet light on the discharged effluent.

There are no shellfish beds on Alderney that might be contaminated.

Recreational or Bathing Water

Infections can occur from faecal pollution or free living micro-organisms (WHO 2003). Faecal pollution can occur from sewage outfalls, contamination of recreational water from bathers, discharges from boats, and dogs.

The most frequent adverse health outcome associated with exposure to faecally contaminated recreational water is enteric illness (WHO 2013). Faecal pollution

can also cause acute febrile respiratory illness (AFRI). Microbial standards of bathing water are monitored at several sites in Guernsey by the OEHPR who work closely with the Environment Department, States Analyst and Guernsey Water to maintain good bathing water quality.

Alderney does not take part in a scheme for bathing water quality.

Recommendation 23:	Alderney should consider participation in a scheme to check bathing water quality.

International Health Regulations (IHR)

In 1946, the World Health Organisation (WHO) Constitution established responsibilities for WHO in combating infectious diseases. In 1951, the International Health Regulations (IHR) were adopted to provide an international legal framework to prevent and control the cross-border spread of communicable diseases.

Modernised International Health Regulations (IHR 2005) were introduced in 2007. IHR 2005 establishes a legal framework for the control and spread of disease by controls over passengers, conveyances and commodities. Port health officers employed at sea and air ports have powers to control the imports of food, especially of animal origin. Working with port medical officers, port health officers are the first line of defence for our islands against infection. Currently the Environmental Health Officers in the OEHPR fulfill these roles with the MOH, but resources are stretched and so only reactive action is taken. There are no resources for proactive surveillance, which means our islands could be at risk. For example, food entering Guernsey is not currently inspected on arrival and relies on the controls in the country of origin therefore any failures in transit go undetected. Vessels arriving in Guernsey's waters are not currently inspected unless the Master requests a Ship Sanitation Control Certificate, which is an international statutory requirement. This is a missed opportunity as this work would be charged for.

The International Health Regulations (IHR 2005) also require that States Parties report to the WHO within 24 hours of any incident that could be of international concern as a public health emergency using the fastest available means of communication via national IHR Focal Points, and subsequently provide further detailed information as quickly as possible. The WHO is obliged to send all necessary information, confidentially and as quickly as possible, to the States Parties. The National Focal Point for the UK, Crown Dependencies and British Overseas Territories is Public Health England. Information flows between

Guernsey and the WHO via the UK Focal Point. The responsibility for local action, however, rests with the Bailiwick authorities not the UK.

The Global Outbreak Alert and Response Network (GOARN) is a technical collaboration of existing institutions and networks who pool human and technical resources for the rapid identification, confirmation and response to outbreaks of international importance. The Network provides an operational framework to link this expertise and skill to keep the international community constantly alert to the threat of outbreaks and ready to respond (WHO 2013). The MOH receives updates from this network via the UK National Focal Point, and passes relevant information onto local health professionals.

The IHR 2005 establishes "core capabilities" that need to be deployed to protect our borders against international infection and contamination effects. This includes facilities for surveillance activities and sufficient competent staff to undertake specific port health duties. As previously mentioned these duties are not currently happening. Earlier this year Guernsey was asked by the UK National Focal Point, in response to a WHO request, to undertake a self-audit on its compliance with the International Health Regulations. While Guernsey complies with all basic standards, there are a number of deficiencies which need to be addressed.

The MOH has a responsibility for the surveillance of infections and island infection control measures. It has been observed that where public health systems breakdown and become ineffective then dormant diseases, the control of which may have been taken for granted, can re-emerge (WHO 1998). The current reduction in costs has led to only a fraction of the analytical resource that was available several years ago, with associated infection control risks.

Recommendation 24 :	The States should ensure that there are sufficient resources in Disease Surveillance and Port Health to meet its International Health Regulation responsibilities.

Healthcare-Associated Infections (HCAI)

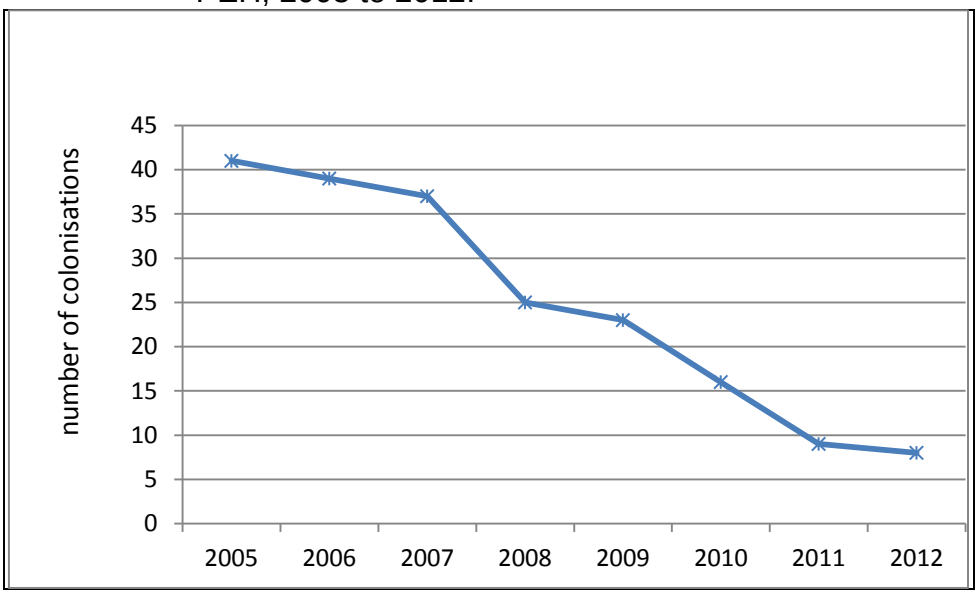
A healthcare-associated (HCAI) infection is an infection occurring in a patient receiving care in a hospital or other healthcare facility (or apparent after discharge). It is a major public health issue worldwide. HCAI represents the most frequent adverse event during care delivery, affecting hundreds of millions of patients around the world and affects all institutions (WHO 2011). HCAI can result in prolonged hospital stay, long-term disability, increased resistance of microorganisms to antimicrobial agents, and excess deaths. The HCAI burden is

much more severe in high-risk populations, such as the very young, the over 65s, those who are immuno-compromised or have underlying health problems, and those in intensive care.

HCAI is not only a health issue, but it is also an economic issue, as managing HCAI infections can be very expensive for the health service, an individual and their families, and wider society. One particular issue for Guernsey has been the system whereby the NHS in England is expected to pick up serious complications of private healthcare, and HSSD has been expected to do the same.

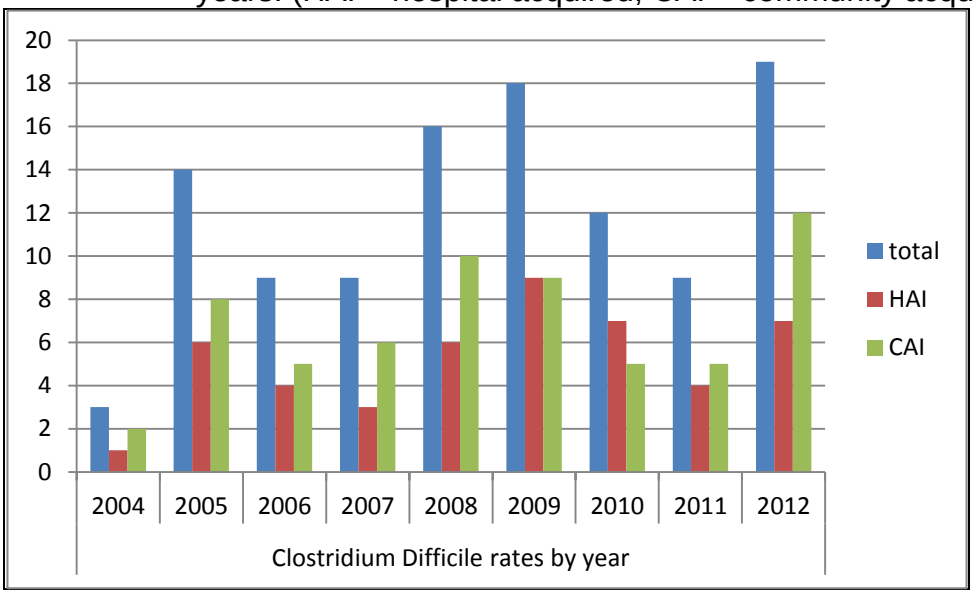
Locally, HSSD has a very capable infection prevention and control team (IPACT), supported by a local microbiological laboratory and consultant microbiologists from Heartlands Hospital Birmingham. There is an extensive programme of training and audit for HSSD staff and on HSSD sites, with a mandatory training programme. There is also a system of surveillance for HCAI. Any HCAI is subject to a root cause analysis by IPACT to look for remediable factors that can prevent future infections. In addition, post-operative surgical site surveillance has been implemented for Caesarean Sections and hip and knee surgery. The PEH continues to have low rates of hospital acquired infection, but strives year on year to reduce HAI as everyone is deemed preventable and unacceptable.

Figure 15 Meticillin resistant *Staphylococcus aureus* (MRSA) colonisations at PEH, 2005 to 2012.



Meticillin resistant *Staphylococcus aureus* (MRSA) is a type of bacteria that is resistant to a number of widely used antibiotics. This means it can be more difficult to treat than other bacterial infections. In 2012, for the fourth year in a row there were no cases of MRSA bacteraemia. Hospital acquired colonisations have progressively reduced year on year from 41 in 2005 to 8 in 2012 (Figure 15).

Figure 16 Number of cases of Clostridium difficile recorded in Guernsey by years. (HAI = hospital acquired, CAI = community acquired)



A *Clostridium difficile* infection (CDI) is a type of bacterial infection that can affect the digestive system. When this happens, the bacteria can multiply and produce toxins which cause symptoms such as diarrhea. The disease is easily spread by highly resistant spores, usually on the hands of healthcare personnel (CDC 2013). CDI can also cause life threatening complications such as severe swelling of the bowel known as toxic megacolon. CDI increased to 21 in 2012, with 13 community acquired and 7 hospital acquired infections (Figure 16). At the end of 2012 the PEH had its first CDI cross-infection for many years. This was associated with the ward closures at the end of 2012.

Just one outbreak occurred in 2012 in acute inpatient settings which was associated with Norovirus. Norovirus is the most common viral cause of infectious gastroenteritis in England (Davies 2013).

While there are internal audits of infection control, apart from nursing and residential homes, which are audited every two years as part of a regulatory system, other island healthcare establishments are unregulated as regards infection control. There is an argument that regulation should be introduced to further protect the public.

Recommendation 25 :	Regulation of infection control is extended to all healthcare facilities.

Buildings and Facilities

The States voted £6,500 on 20th March 1901 for a new facility to act as an isolation hospital for the island. King Edward VII Sanatorium was opened for patients on 1st January 1903 when six patients were transferred from the Town Isolation Hospital (Bishop 1902) (see front cover photograph). At the time it was an up to date modern facility, but today it is very near the end of its useful working life.

It is very important that infection prevention is considered in the design of any new building or the refurbishment of existing buildings (DH 2013). The guidance is complex and evolves with the development of evidence and building technology. To protect public health it is important that buildings are of a good standard, but the downside is that standards progressively improve so that regular investment is required. Of course, that investment may not be available. However an infection that could have been prevented may cost hundreds of thousands of pounds to remediate, as well as misery and care issues for the affected person and their family, so keeping buildings up to date is an important public health measure.

There is strong evidence that single en suite hospital rooms reduce the spread of infection and increase the use of standard precautions (Doughty and Lister 2011). The Princess Elizabeth Hospital has dedicated single rooms with en suite facilities which enable the safe isolation of patients with many different types of infectious diseases such as diarrhoea and vomiting to MRSA and many more. The PEH is fortunate to have six negative pressure rooms where staff can safely nurse patients with highly infectious respiratory spread infections, and a range of other facilities such as clean air operating theatres to filter air to reduce the risk of infection.

Photo 1 Dedicated single room with en suite facilities at the Princess Elizabeth Hospital (photo E Burgess), used for isolation of infectious patients.

Zoonoses

A zoonoses is an infection that is naturally transmissible from vertebrate animals to humans. Zoonoses have been recognized for many centuries, and over 200 have been described (WHO 2013). Pathogens circulating in animal populations can threaten both animal and human health, and thus both the animal and human health sectors have a stake in, and responsibility for, their control.

Every year worldwide, millions become ill from foodborne zoonoses, which include the most common notified infection in Guernsey, *Campylobacter*. They also include *Salmonella*, bovine TB, parasitic worms, viruses such as avian influenza, and the prion that caused new variant Creutzfeldt–Jakob disease (vCJD) (WHO 2013).

Most of the emerging infections in humans are acquired from animals, for example, SARS and MERS discussed above.

One recent zoonosis, bovine spongiform encephalopathy (BSE), commonly known as mad cow disease, is a fatal disease of the brain with an incubation period, in cattle, of about two to eight years. It is estimated, approaching half a million infected animals entered the human food chain before controls were put in place in 1989 (Valleron et al 2001). The cause is a transmissible, protein, or prion, found mainly in the brain and lymphatic systems of affected animals. The disease led to a similar fatal disease in humans called new variant Creutzfeldt-Jakob disease (vCJD), with an estimated incubation period of about sixteen years (Valleron et al 2001). Prion diseases are progressive, currently untreatable and ultimately fatal (NCJDRSU, 2013). While 176 people contracted and died from vCJD by 2011, in 2012 and 2013 no new cases have been identified (NCJDRSU). There is, as yet, no blood test for vCJD, but a recent study of tissue from 32,000 appendix resections between 2000 and 2012 found sixteen had antibodies against the prion, a point prevalence estimate of subclinical infection of 1 in 2000 people (Gill et al 2013). This disease had a major economic impact in Guernsey as regards export of beef, and also led to significant extra measures in the local slaughterhouse. The methods of protein replication in this disease have been observed in others, such as Alzheimer's Disease, and questions are being asked whether other animal prion diseases might also be zoonotic (Salmon 2013).

While the integration of control systems across animal, food and human sectors has been attempted in some countries and regions, most country control systems are generally non-integrated with limited collaborative work (FAO 2010). The Food and Agricultural Organisation (FAO), the World Organisation for Animal Health (OIE) and the World Health Organisation (WHO) recognise the need to collaborate. In Guernsey, the States Veterinary Officer, Director of Environmental Health and Pollution Regulation and MOH liaise on interface issues.

In comparison with human and livestock diseases, none of the international health agencies are mandated to coordinate surveillance of diseases in companion animals, and in addition, surveillance systems exist for only a few of the small animal zoonoses (e.g. rabies and leishmaniasis) (Day et al 2012). Day argues that the public health role of many zoonotic agents of small companion animals is under recognized or poorly understood by medical and veterinary health care providers and pet owners, and small companion animals might play a major role in potential zoonoses of the future, either by acting as a reservoir or as an intermediate host.

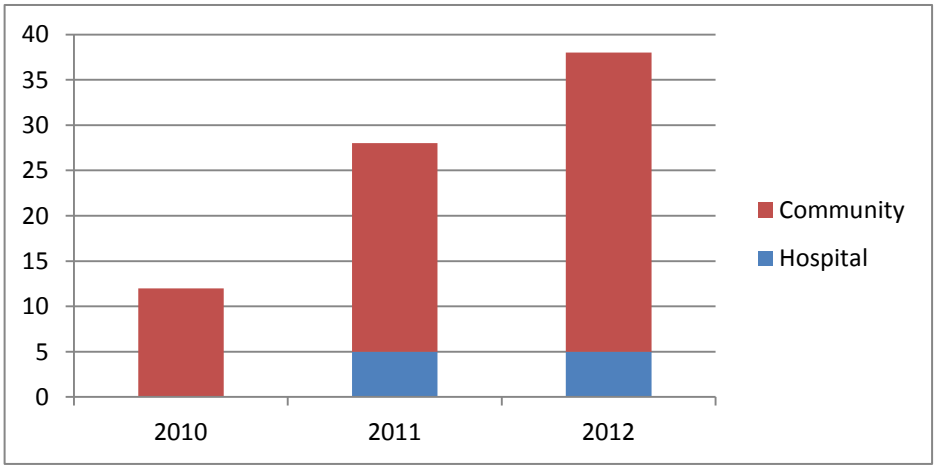
What is clear is that zoonoses are a significant risk and people need to be careful and sensible about hygiene in the presence of both domestic and farm animals.

Antibiotic Resistance

Antibiotics are substances that can kill or inhibit the growth of micro-organisms, and are a cornerstone of modern health care. They are used to treat and prevent infections with bacteria, fungi, parasites and viruses. They have revolutionised clinical care, for instance they have made major surgery, such as joint replacements or bowel surgery, much safer.

Unfortunately, our attempts to control infections in humans are continuously under threat by the emergence, through natural selection, of micro-organisms resistant to antibiotics. Each year in the European Union alone, over 25,000 people die from infections caused by antibiotic-resistant bacteria (WHO 2011). In Guernsey there has been a rapid increase between 2010 and 2012 in Multi Drug Resistance Organisms (MDRO) (Figure 17), despite great care being taken to reduce the risk of cross-infection. Antibiotic resistance is considered one of the greatest threats to the public's health (Davies 2013, Godlee 2013). The economic costs are also estimated to be very large (Smith & Coast 2013) and it threatens our way of life.

Figure 17 Number of Guernsey Multi-Drug Resistant Isolates by Setting and Year.



The causes of resistance are; the lack of new drugs; massive overuse of existing antibiotics; the natural selection of resistant strains through new genetic mutations; and/or the transfer of resistant genes to pathogenic organisms (Davies 2013). It is argued that the development of resistance may lead to many existing antibiotics becoming ineffective, with reduced length and quality of life for many. For instance the numbers of joint replacements would be expected to fall, given the likely much greater risks without effective antibiotics. In Guernsey there are antibiotic guidelines and compliance is audited quarterly within HSSD.

Arguably the use and overuse of antibiotics in the rearing of livestock and poultry (Wallinga & Burch 2013, WHO 2011) is a more important cause than their overuse in human medicine. However, this idea is controversial (DEFRA 2009) and one recent study in the global epidemic of *Salmonella* suggested that human to human transmission of resistance genes in this infection was more important than animal to human transmission (Mather 2013). Most antimicrobials routinely fed to animals are medically important (Wallinga & Burch 2013). Anti-microbials added to animal feed or drinking water comprise 72% of all US sales of antimicrobials (Wallinga & Burch 2013). These are not single injections for sick animals, but additives in feed given routinely, without a prescription, at lower than therapeutic concentrations for purposes such as growth promotion and controlling disease in otherwise healthy animals being raised in crowded and often unhygienic conditions that can promote disease. Commonly used human antibiotics are also used in industries such as shrimp-farming (Bermudez-Almara 2012).

The issue of antibiotic resistance is a global problem and requires; the appropriate use of antibiotics in animals as well as humans; that antibiotic use in all animals is carried out under the supervision of a qualified vet; the cessation of the use of antibiotics for growth promotion, feed efficiency and routine disease prevention purposes in food animals; supporting companies and institutions research new antibiotics.

Recommendation 26 :	Audit of compliance of antibiotic prescribing against standards is considered in primary care.

In Guernsey, local meat producers do not use antibiotics for growth promotion (D Chamberlain pers.comm.), and there will be the opportunity to modernise Veterinary Laws to support better use of antibiotics.

Recommendation 27 :	Antibiotic use in rearing livestock for growth promotion and routine disease prevention in food animals should end worldwide, requiring all antibiotics in food animals to be given under veterinary supervision.

Education Department

In 1920, the Education Department did not accept the MOH advice re closing schools and there was a major epidemic of measles with 34 deaths (Bishop 1921). In 2009 the MOH worked very closely and successfully with the Education Department in controlling pandemic flu in schools.

Rainwater harvesting systems gather water from roofs of premises and as such, the water is likely to be contaminated by the faeces of birds and other wildlife and this carries a significant risk that the water may contain pathogenic organisms (DWI 2010a/b). In 2010, the Education Department decided on such a system for a new school building, in this case contrary to the advice of both the MOH and DEHPR, as they felt there were appropriate controls in place. This is an example of a lower level risk where consideration of infection risk is important.

The Education Department, in collaboration with local schools have a vital role in helping ensure all pupils have the knowledge and skills in personal hygiene to protect themselves and others. A jointly funded post between the Education and Health and Social Services Department is a key role in helping ensure best practice in this field as well as others. Given a high level of hygiene knowledge and practice is vital for maximum health protection, it would also be useful to more formally assess the knowledge and skills of children in infection control.

In the proposed new education legislation there remains the need for the MOH to have a statutory role in providing public health advice to the Education Department. Further, it is recognised that adult education of health professionals, food industry professionals and others is also crucial to maintain public health.

Recommendation 28 :	The MOH should continue to have a statutory role in providing public health advice to the Education Department.

Contributions of Wider Society to Infection Prevention

We all have a role as citizens in obtaining the knowledge to protect ourselves and others from infection, and by practicing good hygiene in our personal lives, be it respiratory, food and drink, toilet or in our intimate relationships.

Many professions and businesses are vital in the fight against infectious diseases, from housekeepers and cleaners whose quality of work is so important in keeping the environment clean and tidy in hospital or food outlets, farmers, vets and retailers in keeping food safe, engineers in providing safe water and sewage

disposal, scientists inventing new antibiotics, funders financing appropriate facilities architects and builders in designing and building new hospitals (Department of Health, 2013), doctors and nurses in diagnosing and managing infections, to regulators helping us all comply with standards. The continued efforts of many people will be required if in the future we are to continue in Guernsey to benefit from the current protection from infectious diseases.

Overall, the Bailiwick can be very proud of its success in reducing the burden of infectious disease in the last century. However the next century will provide many challenges to not only improve on the current situation, but to maintain the advances achieved against the ever evolving threat of infection, and so we cannot afford to take future success for granted

Recommendation 29 :	Residents know and practice good hygiene to prevent infections through respiratory, gastrointestinal and sexual routes, in particular.

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LIVER DISEASE PREVENTION

"*The liver sits on the right hand side of the body, resting underneath the rib cage. The heaviest organ in the body, the liver performs over 500 vital functions, and is the body's natural processor. It plays a major role in metabolism and has a number of functions including detoxification. It produces bile, an alkaline compound which aids in digestion. Other functions include processing food from the intestine, controlling fat levels, breaking down food and turning it into usable energy, expelling toxins, manufacturing and regulating hormones, storing iron and other chemicals, cleaning the blood and controlling the level of fats and glucose in the blood.*" CNN (2007).

There are many types of liver disease,, but the 3 principal areas reflect the 3 main causes, alcohol, viral hepatitis and obesity (NHS 2011);

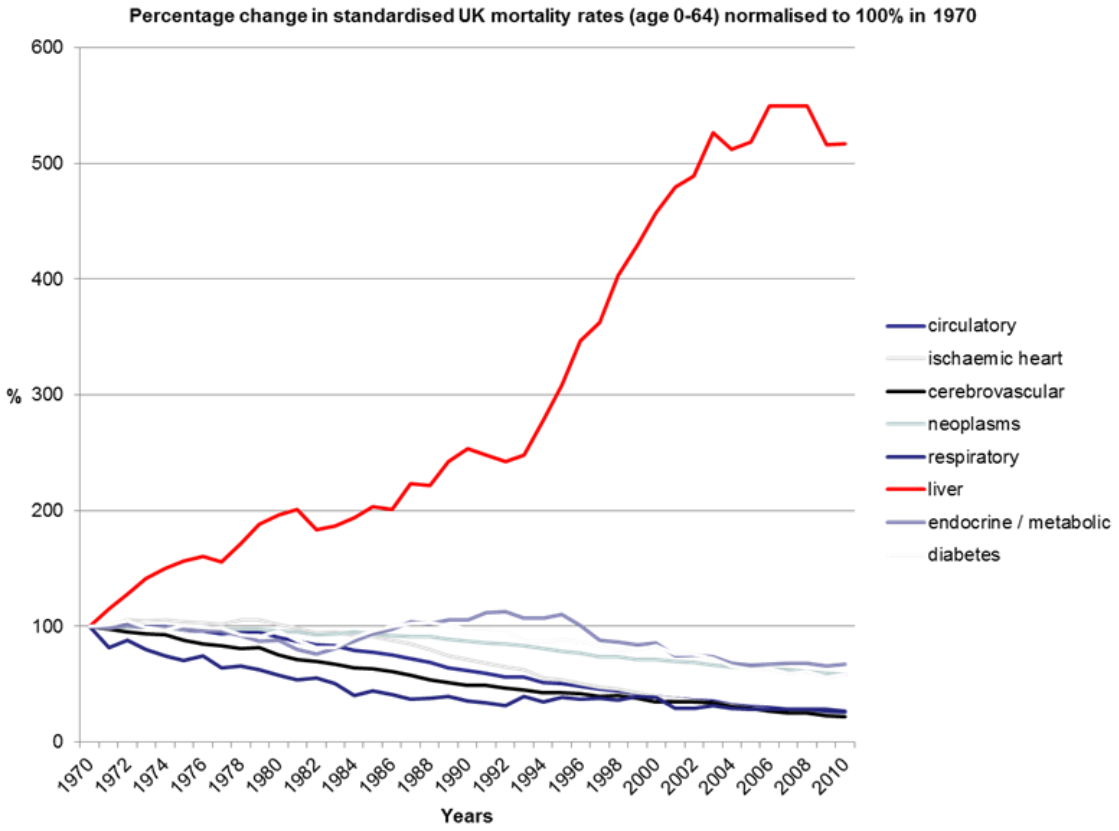
- **Alcoholic liver disease**, where the liver is damaged after years of alcohol misuse, which can lead to cirrhosis (permanent scarring of the liver with nodules),
- **Non-alcohol related fatty liver disease**, which is a build-up of fat within liver cells, usually seen in people who are obese,
- **Viral hepatitis**, which is inflammation (swelling) of the liver caused by a viral infection or exposure to harmful substances such as alcohol.

Liver disease develops silently, often with only vague symptoms, and is sometimes referred to as the 'silent killer' as there are often no symptoms until liver damage is quite severe (Sheron 2013). Many people have no idea they have liver failure until it is too late. The majority of treatable liver disease therefore remains undiagnosed and untreated (Sheron 2013).

While organ death rates for people under 65 years old have been decreasing in the UK, death rates from liver disease have increased several-fold (Figure 18), such that it has been considered a crisis (Williams and Horton 2013). Death rates from cirrhosis among men in the UK are now higher than in France and Italy where rates have been falling (Sheron et al 2012). In the UK, 90% of people who die from liver disease are under 70 years old (NHS 2012).

Guernsey liver disease death rates are equivalent to the high rates in the UK as will be seen later and therefore liver disease is of great concern here too.

Figure 18 UK change in standardised mortality rates for under 65 year olds from various chronic diseases (copyright N Sheron, Southampton).



Liver disease deaths

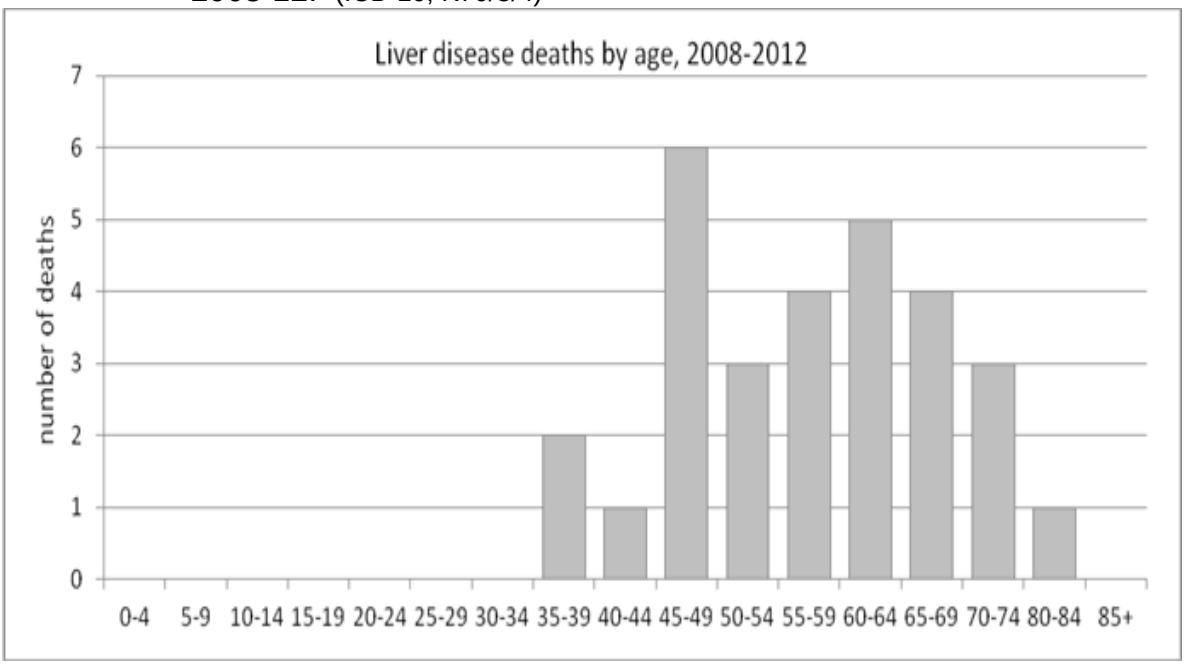
One to two percent of deaths registered in the Bailiwick have been from liver disease (Table 8).

Table 8 Liver disease deaths as a proportion of all deaths in Alderney and Guernsey, 2008-12, by gender. (ICD 10, K70/3/4, ONS 2006, ONS 2013).

YEAR	Males	Females	Persons
2008	1.28%	1.49%	1.39%
2009	2.26%	1.37%	1.80%
2010	1.19%	0.00%	0.58%
2011	1.03%	0.35%	0.70%
2012	1.07%	0.60%	0.81%
TOTAL	**1.36%**	**0.76%**	**1.05%**

Figure 19 Liver disease deaths in Alderney and Guernsey by sex 2008-12 (ICD 10, K70/3/4)

Figure 20 Liver disease deaths in Alderney and Guernsey by age (years), 2008-12. (ICD 10, K70/3/4)



Over the last five years, there have been three to ten registered deaths a year in the Bailiwick from liver disease coded as K70/3/4 (ICD 10 codes, K70-Alcoholic Liver Disease, K73-Chronic hepatitis or K74-Fibrosis and Cirrhosis of the Liver,

WHO 2013). Although the numbers are relatively small, a consistent gender difference is seen with an average of four deaths a year in men and two in women (Figure 19). The age of liver disease deaths is shown in Figure 20.

Although the number of deaths from liver disease in Guernsey and Alderney is smaller than those due to cancer, vascular or respiratory disease, those who are dying of liver disease tend to die at a much younger age than those from other causes. *Years of Life Lost* (YLL) is a measure of premature mortality which is used to compare mortality in different populations for particular causes of death. It is the number of years *not* lived by individuals who die under the age of 75 years; 75 is given as an age that everyone would expect to reach. When measured as 'years of life lost', the impact of liver disease in Guernsey and Alderney becomes much more apparent (Cataroche & Bridgman 2012). Liver disease accounted for 7% of the Years of Life Lost in the Bailiwick, compared with respiratory disease which accounted for 8% (Table 9). Therefore although liver disease only accounts for 1-2% of deaths in the Bailiwick it is responsible for **7% of '*years of life lost*'**.

Table 9 Years of Life Lost (<75y) in Guernsey and Alderney for main causes of death, sum of the three years 2006–08. (ICD K70/3/4).

Disease	*ICD-10 codes*	*Male*	*Female*	*Persons*	*Pers' %total*
All Causes	A00-Y99	3555	2260	5815	100%
All Cancers	C00-C99	1193	973	2165	37%
Cardiovascular	100-I99	763	148	910	16%
Accidents	V01-X59	428	90	518	9%
Respiratory	J00-J99	233	210	443	8%
Chronic Liver	**K70/3/4**	263	128	390	**7%**
Suicide/ Undetermined Injury	X60-84,Y10-33 excl Y33.9	278	75	353	6%

Source: 2008 Health Profile for Guernsey and Alderney (Cataroche & Bridgman)

The rates of liver disease deaths in the Bailiwick are comparable to those in England and the South-West of England, common comparators for Guernsey (Tables 10/11). The number of deaths in England of people with liver disease as an underlying cause rose from 9,231 in 2001 to 11,575 in 2009 (NHS 2012). This 25% increase contrasts to a drop in deaths of 20% in the EU (NHS 2012, PHE 2013). The UK is one of a few developed nations with an upward trend in mortality from liver disease. The median age of death from liver disease in the UK is 59 years, compared to 82-84 years for heart and lung disease or stroke. There has been a 5-fold increase in the development of cirrhosis in 35-55 year olds over the last 10 years (Moriarty 2010).

Most liver deaths in England were in people under 70, while 1 in 10 deaths of all people in their 40's were from liver conditions. Men are disproportionately affected,

especially when deaths from liver disease are related to alcohol consumption, and this contributes to the increasing inequalities gap in liver disease in the British Isles (NHS 2012).

Table 10 Chronic liver disease death rates compared to England and the South-West *(European age-standardised rates, EASR). (ICD 10, K70/3/4)*

Location	Years	PERSONS		95% confidence	
		N	EASR	LL	UL
Guernsey and Alderney	2006-08	24	10.5	6.2	14.8
Guernsey and Alderney	2007-09	29	12.7	8.0	17.4
Guernsey and Alderney	2008-10	20	8.8	4.9	12.6
England	*2008-10*	*17608*	*10.3*	*10.1*	*10.4*
South West	*2008-10*	*1658*	*8.7*	*8.3*	*9.2*
Guernsey and Alderney	2009-11	17	7.4	3.9	11.0

Source for England and South West comparison data: https://indicators.ic.nhs.uk/webview/
"Mortality from chronic liver disease including cirrhosis (ICD10 K70, K73-K74), 2008-10"

Table 11 Chronic liver disease death rates in Guernsey and Alderney (Guer and Ald) compared to England and the South-West, by gender.
(European age-standardised rates, ICD 10K70/3/4)

		MALES		95% confidence		FEMALES		95% confidence	
Location	Years	*N*	EASR	LL	UL	*N*	EASR	LL	UL
Guer and Ald	2006-08	17	15.2	7.9	22.4	7	6.6	1.7	11.5
Guer and Ald	2007-09	18	16.5	8.8	24.2	11	9.2	3.7	14.8
Guer and Ald	2008-10	12	11.1	4.8	17.4	8	6.3	1.8	10.8
England	*2008-10*	*11267*	*13.7*	*13.5*	*14.0*	*6341*	*7.0*	*6.8*	*7.2*
South West	*2008-10*	*1064*	*11.8*	*11.1*	*12.5*	*594*	*5.9*	*5.4*	*6.4*
Guer and Ald	2009-11	12	11.1	4.8	17.4	5	3.7	0.3	7.1

Source for England and South West comparison data: https://indicators.ic.nhs.uk/webview/
"Mortality from chronic liver disease including cirrhosis (ICD10 K70, K73-K74), 2008-10"

In addition to the standard method of looking at liver disease, a modified and more complex analysis has been developed in England that picks up more liver deaths than the usual analysis above. For instance this method also considers deaths from liver cancer, many of which will follow other diseases such as cirrhosis or hepatitis. Using this methodology there has been on average over ten liver disease deaths a year in Guernsey this century (Table 12).

Table 12 Underlying cause of death from liver disease in Guernsey and Alderney residents 2001 to 2012, alternative death code methodology developed by NHS English End of Care Life Network (NHS 2012).

Disease category	*Deaths 2001-2012*
Alcoholic liver disease (K70)	48
Other chronic liver disease (B581, D868, I820, J632, K770, O226, O904, Q446, T391, T864, Z944, Y830, I81, K71/ and certain 4 digit codes in K72/3/4/5/6 I85)	30
Liver cancer (C22)	24
Hepatocellular cancer (C22.0)	15
Cholangioma (C22.1)	9
Fatty liver disease (K76.0)	2
Hepato-pancreatic biliary disease (K85, K830/1/8/9, K86)	1
Viral hepatitis (B008, B251, B15-19)	0
TOTAL	129

Liver disease is increasing in the British Isles, and has been identified as a major preventable disease. Given Guernsey rates are comparable to those in the UK, liver disease is of significant public health concern in Guernsey too. The main drivers of this increase are alcohol, obesity, and viral hepatitis infection which all are preventable (Davies 2011), and each of these will be considered in turn.

Alcohol and Liver Disease

Alcohol misuse accounts for over a third (37%) of all liver disease deaths in Guernsey and the UK (Table 12, NHS 2012-ELCN). Alcohol is '*no ordinary commodity*' and most developed countries have implemented policies to regulate its harmful effects (WHO 2011).

Globally around 2 billion people use alcohol, it is responsible for 3% of worldwide deaths, and it is responsible for 4% of the loss of disability adjusted life years globally but 7% in developed countries ((WHO 2009, WHO 2013).

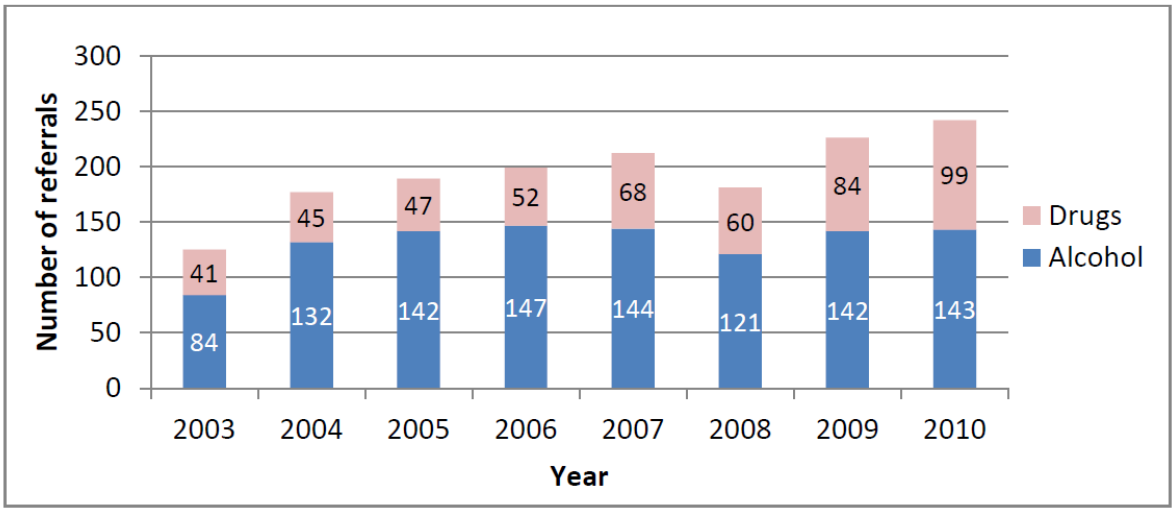
The impact of alcohol misuse is widespread outside of health issues; there are significant social impacts including domestic abuse and crime, teenage pregnancy, and homelessness (NICE 2011). The effects of alcohol misuse on alcohol related illness and injuries have been shown to be significant and widespread. Given that much alcohol-related harm is the accumulated result of years of harmful individual drinking behaviours, the full effect of changes in consumption may not be immediately apparent in harm data (Holmes 2012).

At meetings with health professionals considering a future drug and alcohol strategy, opinion was expressed among island health-care professionals that

alcohol is the most prevalent dependency problem for islanders. Alcohol dependence is characterised by craving, tolerance, a preoccupation with alcohol and continued drinking in spite of harmful consequences (for example, liver disease or depression caused by drinking). Alcohol dependence is also associated with increased criminal activity and domestic violence, and an increased rate of significant mental and physical disorders (NICE 2011b).

Professionals were also concerned with the hidden harm that alcohol dependency causes families, and intergenerational alcohol misuse. The majority of referrals to the Community Drug and Alcohol Treatment Service (CDAT) are for alcohol problems (Figure 21).

Figure 21 Referrals to Community Drug and Alcohol Treatment Service (CDAT) for drug and alcohol problems, 2003-10, by year.



Alcohol is a legal substance, and has always played a significant role in Bailiwick culture. Many social events take place in licensed premises, or provide a temporary bar. Much entertainment provided for young people takes place in or near licensed premises, although there is a policy of identity-checking for age. A particular issue about the perception of alcohol is the drinking culture in local sport, use of alcohol for celebrations, and acceptance of drinking in front of young people.

Civic receptions such as the Vin D'Honneur (Culture and Leisure 2013), as the name implies, generally have alcohol, although credit to the Culture and Leisure Department for running some alcohol free events and starting to reduce the civic focus on alcohol. Similarly the whole of the States have a really important leadership role in sending a message to our communities. There is a perception that, as long as consumption is not excessive to the point of drunkenness, no harm is done. This is not the case, as alcohol represents a danger to health, liver health and safety even at levels that may be perceived to be relatively low.

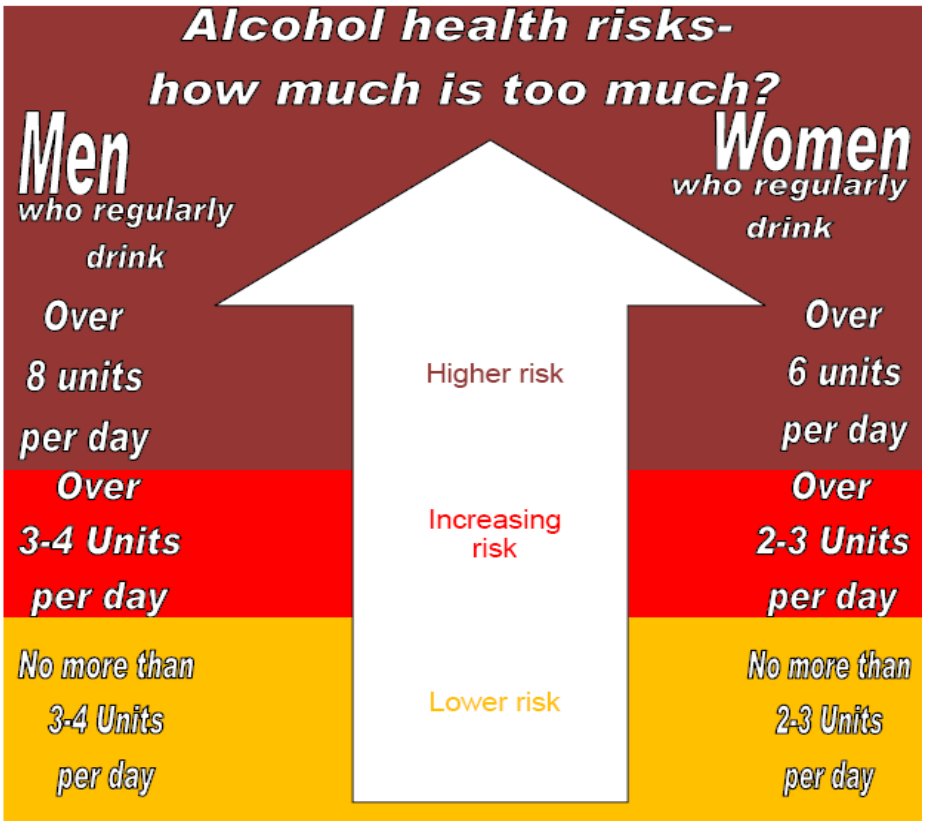
Recommendation 30 :	Event organisers, including sports clubs, consider running more alcohol free events, especially if children are involved.

Recommendation 31 :	The States of Guernsey and Alderney set an example by introducing a policy to not publicly fund any alcoholic beverages.

Alcohol risk levels

There is no such thing as a 'safe' level of alcohol consumption, and any consumption carries a level of risk (RCP 2011). Given the fact that alcohol consumption is widespread and practised by many, there is a judgement about what an acceptable level of risk is (RCP 2011). Our liver processes alcohol, but it can only cope with so much at a time. Drinking more alcohol than the liver can cope with can damage liver cells and produce toxic by-product chemicals. It is considered that increases in UK liver deaths are the result of daily or near-daily heavy drinking, not episodic or binge drinking, and that this regular drinking pattern is often evident at an early age. Alcohol health risk categories are shown in Figure 22.

Figure 22 Alcohol health risk categories (from 110th MOH report).
(One unit of alcohol = 10ml or 8 grams or pure alcohol).



- **Lower risk drinkers** are men who don't regularly drink more than 3 to 4 units of alcohol a day (equivalent to a pint and a half of 4% beer) and women who do not regularly drink above 2 to 3 units a day (equivalent to a 175 ml glass of wine).
- **Increasing risk drinkers** are men who regularly drink 3/4 to 8 units of alcohol a day and women who regularly drink 2/3 to 6 units a day.
- **Higher risk drinkers** are men who regularly drink more than 8 units a day or 50 units a week and women who regularly drink more than 6 units a day or 35 units a week. (http://www.nhs.uk/Livewell/alcohol/Pages/Effectsofalcohol.aspx

However, some countries think these levels are too high and have significantly lower guidelines than the UK and Guernsey (RCP 2011, HCSTC 2012).

Drinking regularly means every day or most days of the week. In addition to the amount someone drinks, frequency is also an important risk factor. It has been

recommended that people should abstain from alcohol for 2-3 days a week (RCP 2011).

Recommendation 32:	People who decide to drink alcohol should follow lower risk guidelines, and should have at least 2 to 3 alcohol free days a week.

'Increasing risk' or 'higher risk' drinkers may also be moderately or severely dependent drinkers (Beynon et al 2011). Depending on their level of dependence, a person can experience withdrawal symptoms if they suddenly stop drinking alcohol. Withdrawal symptoms can be both physical and psychological.

Anyone who drinks at higher risk levels is estimated to be 13 times more likely to develop liver disease. They will also suffer significantly increased risk of hypertension, stroke, coronary heart disease and pancreatitis (Anderson 1993).

Alcohol-related deaths in Guernsey and Alderney

In line with the Office for National Statistics methodology, deaths with any of the underlying cause codes noted in Table 13 below are said to be 'alcohol-related' (ONS 2012, WHO 2013). The causes of death included are only those regarded as being most directly due to alcohol consumption. Diseases where alcohol has been shown to have some causal relationship, such as cancers of the mouth, oesophagus and liver, are not included, so these figures are likely to underestimate deaths from alcohol. The definition includes all deaths from chronic liver disease and cirrhosis (excluding biliary cirrhosis) even when alcohol is not specifically mentioned on the death certificate (ONS 2012).

During the eleven year period 2001–2011 there were a total of 84 alcohol-related deaths recorded in Guernsey and Alderney, varying between 1 and 15 per year (Table 13). Sixty-one deaths were among males and 23 among females, that is men experienced over 2½ times the alcohol-related mortality of women (Figure 23). Fifty-one percent of all alcohol-related deaths during the period concerned were from alcoholic liver disease, 20% were from fibrosis or cirrhosis of the liver and 19% were from accidental poisoning with alcohol (Table 13).

Deaths by year are shown in Figure 23. While a bell shaped distribution for males with a peak in deaths around 2007 and then a subsequent decline may be suggested, and for females a gradual increase with a peak in 2008/9, the numbers of events are small and any differences or apparent trends could be due to chance (Figure 23).

Figure 23 Alcohol-related deaths in Guernsey and Alderney 2001-2011 by year and gender. (ICD 10 codes are shown in Table 13)

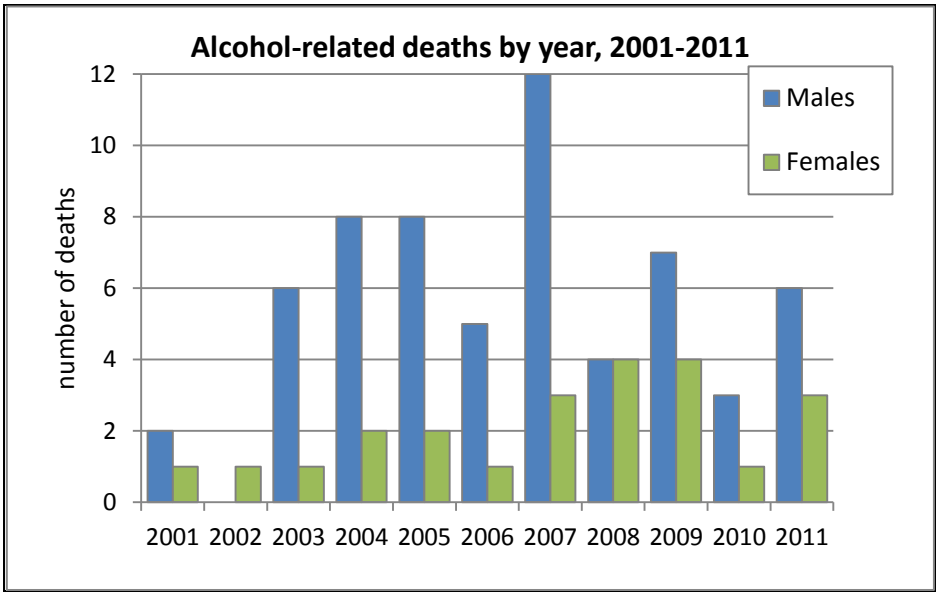


Figure 24 Alcohol-related deaths in Guernsey and Alderney 2001-2011 by age. (see Table 13 for method)

Deaths by age are shown in Figure 24. The majority of alcohol-related deaths are under the age of 75 and therefore classified as premature (Figure 24).

Table 13 Alcohol-related deaths in Guernsey and Alderney by cause code group in the years 2001-11. (Based on ONS 2013, methodology, codes are ICD 10).

Code	*Disease*	*N*	*%*
F10	Mental and behavioural disorders due to use of alcohol	3	4%
G31.2	Degeneration of nervous system due to alcohol	1	1%
G62.1	Alcoholic polyneuropathy	0	0%
I42.6	Alcoholic cardiomyopathy	1	1%
K29.2	Alcoholic gastritis	0	0%
K70	Alcoholic liver disease	45	54%
K73	Chronic hepatitis, not elsewhere classified	1	1%
K74	Fibrosis and cirrhosis of liver (excluding K74.3–K74.5 biliary cirrhosis)	17	20%
K86.0	Alcohol induced chronic pancreatitis	0	0%
X45	Accidental poisoning by and exposure to alcohol	16	19%
X65	Intentional self-poisoning by and exposure to alcohol	0	0%
Y15	Poisoning by and exposure to alcohol, undetermined intent	0	0%
Total		**84**	100%

Estimates of population alcohol use from self-reported data

While a 2013 Guernsey Lifestyle Survey is currently being undertaken, the last completed survey was in 2008 (Jenkins & Bridgman 2010). The survey provides comparison with previous Lifestyle Surveys and gives detail about drinking patterns by age and gender. It asked if respondents wanted to reduce their drinking and explored ways in which they thought they might be helped to do so, as well as asking questions as to how often people had drunk more than they intended or if their drinking had been a problem.

The following tables give indications of frequency of drinking and amounts consumed by week. It should be noted that weekly consumption is no longer the preferred measure of alcohol consumption, because it does not reflect the harm done by binge drinking on a few days per week, with reduced intake on other days.

The survey found that it was more usual for people aged over 45 to drink daily, and the younger age groups drank alcohol less often, for example on 2 or 3 days a week. Eight percent said they abstained from alcohol (Table 14), and this varied from 14% of 65-74 year olds, down to 3% of people age 25-34 years.

Table 14 Drinking habit of Guernsey Lifestyle Survey 2008 respondents by sex (Source: Jenkins and Bridgman 2010)

How often do you drink alcohol?	Male		Female		Total	
	n	%	n	%	n	%
Almost every day	74	26%	71	17%	**145**	**20%**
On two or three days a week	119	42%	136	32%	**255**	**36%**
Once or twice a month	39	14%	79	18%	**118**	**17%**
Once every couple of months	7	2%	10	2%	**17**	**2%**
Only very occasionally	29	10%	99	21%	**117**	**17%**
I totally abstain from alcohol	16	6%	41	10%	**57**	**8%**
Total	**284**	**100%**	**425**	**100%**	**709**	**100%**

The proportion of respondents drinking daily decreased between the 2003 and 2008 surveys, for men from 31% to 26%, and for women from 22% to 17%, and this was mainly due to fewer people under 35 drinking daily.

It is not possible from the data available to estimate the proportion of lower risk, increasing risk, higher risk or dependent drinkers in Guernsey, therefore these cannot be compared to the UK. However, there is a measure of abstention of 8% in Guernsey to which a comparison can be made with synthetic estimates for England, the South West Region of England, and English localities (Beynon et al 2011). Guernsey rates of abstention can be seen to be relatively low, but equivalent to some parts of Hampshire and the South of England (Table 15).

Table 15 Abstention rates in Guernsey compared to England, South West England and selected English localities (source Jenkins 2008, and Benyon et al 2011).

Location	Alcohol Abstention (%)
Isles of Scilly	6%
New Forest	6%
Guernsey and Alderney	8%
Isle of Wight	10%
Southampton	11%
South West England	12%
England	15%

Estimates of alcohol misuse in Guernsey Youth

A review of the evidence about harms from alcohol consumption in young people concluded that an alcohol free childhood is the best option to avoid damage to the developing brain (Donaldson 2009). If this cannot be achieved, onset of drinking should be delayed for as long as possible (at least until 15 years old). Furthermore, if 15-17 year olds do drink, they should do so only under a parent or carer's supervision, should not drink more than weekly, and should not exceed the maximum daily units for adults (females: 2-3 units; males: 3-4 units).

The School Health Education Unit (SHEU 2013), recently surveyed Year 8 and 10 children attending secondary school in Guernsey, with the exception of Blanchelande and St Anne's. Questionnaires were self-completed. Valid responses were received from 980 children, of which 283 were boys in year 8 (age 12-13y), 240 girls in year 8, 245 boys in year 10 (14-15y), and 212 girls in year 10. Eleven questions were asked about drinking alcohol, and approximately 93% of responses to these questions were counted.

In the SHEU survey, it can be seen that 10-28% of children said they had drunk alcohol within the previous seven days, of which 3-11% had been drunk (Table 16). Of children who were drunk, the great majority said this was at the weekends. The majority of children who said they drank alcohol did so at home, a large minority at a friend's or relations home, and a small minority in other places such as a party, disco or in the street. Of children who drank, a third of parents or carers had supplied them with alcohol and a third, friends had. Between 5-8% of children said they had bought alcohol in a supermarket, shop, pub or club. About 90% of children stated that their drinking had not caused a problem for others.

Table 16 Percentage of young people who responded that they had an alcoholic drink in the seven days before the survey (who drank on more than one day) (*who got drunk on at least one day).*

	Year 8 (12-13y)	Year 10 (14-15y)
Boys	16% (3%) *(5%)*	28% (6%) *(8%)*
Girls	10% (3%) *(3%)*	19% (6%) *(11%)*

Source: Schools Health Education Unit 2013 Guernsey Survey

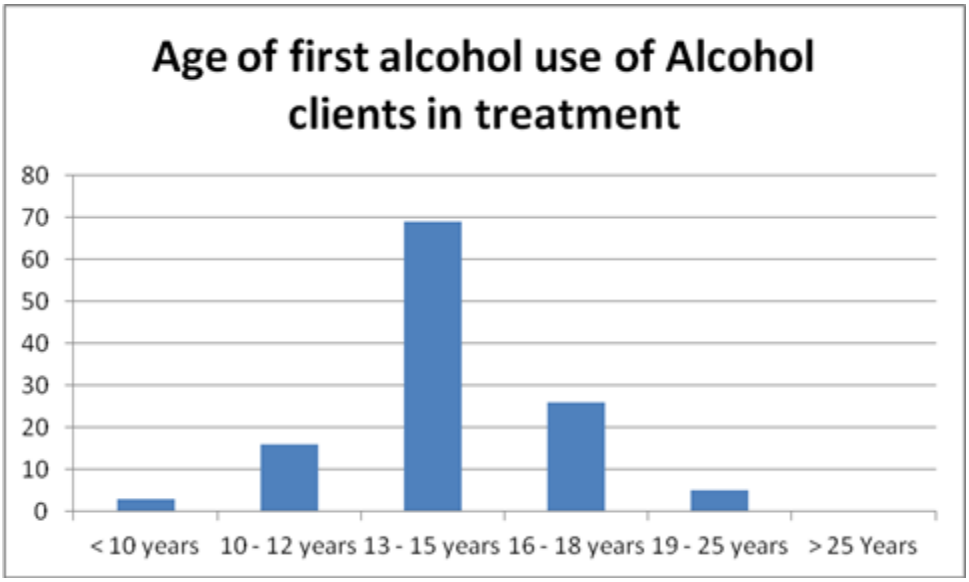
Data from the Young Person's Substance Misuse Treatment services shows that alcohol is the substance most often misused by Child and Adolescent Mental Health Service clients.

Despite advice that children should not drink below the age of 15, many do, and children reported that supply of alcohol from a parent or carer was the most frequent source. Unfortunately, therefore, it appears there is a lack of understanding in some with parental responsibility, and more widely in society, of

the damage that alcohol can do to the development of the adolescent brain (Donaldson 2009). There is an acceptance that young people will drink to 'pre-load' before entering dry premises, or premises where they know they will not be served alcohol. This is compounded by the ready availability of off-sales at low prices and a culture of proxy sales. Accident and Emergency staff also report a relaxed attitude of parents to the behaviour of young people who have consumed so much alcohol that they were brought to the Accident and Emergency Department for medical care.

Clients of the Drug and Alcohol Treatment Service seek help because they have become dependent on drugs or alcohol. They are asked the age of their first alcohol use as part of a standard assessment (Figure 25). Nearly everyone in touch with services started drinking alcohol as a child, and most had started drinking before they were 16 years old. A significant number of clients first drank alcohol between the ages of 10 to 12 years.

Figure 25 Clients of Drug and Alcohol Treatment services (2011) – age at first alcohol use.



Recommendation 33 : Children under 15 years should not drink alcohol.

Raising awareness in the general population of alcohol risk

The HSSD Health Promotion Unit works closely with the Bailiwick Drug and Alcohol Strategy Group to raise awareness in the general population of the negative effects of problematic alcohol use on individuals and on society, in

campaigns such as those to warn of the dangers of drink-driving. Population-wide campaigns have also raised awareness of the levels of alcohol consumption that keep people within lower risk limits (Figure 22).

Two Youth Alcohol Workers (1 primary and 1 secondary), are funded by the Drug and Alcohol Strategy and offer education from Year 5 upwards, including the Colleges and Colleges of Further Education. Lessons recommend an alcohol free childhood is the safest and healthiest option, the older someone starts drinking the lower the risk, and children should not drink alcohol when under 15 years. These lessons complement the programme of Personal, Social and Health Education that is undertaken across all schools.

STAART (Start Thinking About Alcohol Today) is a new health promotion programme aimed at preventing misuse in 11-15 year olds and delaying the start of drinking alcohol. It is funded by the Co-operative Society and delivered by Health Promotion and Education.

Seeing patients on an individual basis, clinicians in both primary and secondary care are ideally placed to check patient levels of alcohol risk. Identification and Brief Advice (IBA) is an effective evidence-based method to raise awareness of risk and will reduce alcohol use to lower risk levels in about 1 in 8 increasing risk or higher risk drinkers (Kaner 2007, Wise 2010). In addition, dependent higher risk drinkers will be identified and can be referred into services to help them to address their problem drinking. Opportunistic use of IBA is justifiable when a high proportion of the population is drinking in excess of lower risk levels. These drinkers are likely to benefit from brief advice given by generic workers in almost any setting, including general practice (Wise 2010). One study estimated the cost-effectiveness of opportunistic screening in primary care as highly cost-effective (Purshouse et al 2012).

Training in the Alcohol Use Disorders IBA tool has been provided for a wide range of practitioners and GPs, but data collection systems are not in place to measure how many interventions have been delivered, and to use results to establish a more accurate measure of prevalence of increasing and higher risk drinking in Guernsey.

Whereas about 1 in 8 people need to receive advice in primary care to significantly reduce drinking, in specialist liver clinics it is as high as 1 in 2 (Sheron 2013). The object of secondary care has two aspects, to keep people alive until they stop drinking and to ensure as high a proportion of people stop drinking as possible (Sheron 2013). If drinking behaviour could be changed in primary care, then secondary care would become unnecessary (Sheron 2013), and would save resources.

One study showed that less than a third of cases admitted to hospital with alcoholic liver disease had had their alcohol use discussed with them by their GP (Sheron 2013). Unfortunately a third of people admitted with alcoholic liver disease die within a year because of liver failure or bleeding (Sheron 2013). People are developing disease but it is not being recognised until it is at a late stage, often too late to save a life.

Liver diseases damage the liver by scarring or fibrosis. An innovative 'Traffic Light' risk predictor, developed in Southampton, is based on two serum markers of fibrosis, collagen p3 n peptide (P3NP) and hyaluronic acid (HA), together with platelet count. Risk is calculated by entering the blood test results on to a web based calculator: (www.livertrafficlight.info). The level of scarring is predicted as follows: Green – no evidence of severe fibrosis but early damage cannot be excluded; Amber – liver fibrosis likely but not certain, patients are encouraged to avoid alcohol misuse - Red – fibrosis almost certain, possible severe fibrosis or cirrhosis, patients are referred to hospital. With liver problems due to alcohol or obesity the main treatment is to stop drinking and to lose weight respectively. Sheron et al found that in alcohol related liver disease feeding back an Amber or Red Traffic Light result, doubles the number of patients who are drinking safely a year later (Sheron et al 2013 Southampton Univ 2013). The test can help GPs to assess the potential severity of liver fibrosis among heavy drinkers, the obese, and patients with Type 2 diabetes (PHE 2013, Southampton Univ 2013). While promising, the population impact of the new test has yet to be defined.

Recommendation 34:	Develop brief alcohol interventions.

Recommendation 35:	Explore use of routine primary care data for population measures of liver disease.

Recommendation 36:	Explore use of a traffic light system to detect chronic liver disease in primary care.

Pricing Policy to prevent harm from alcohol

In some countries it is illegal to sell alcohol.

In jurisdictions like Guernsey, where alcohol is legal, there is extensive and consistent evidence that raising the price of alcohol reduces alcohol-related harm, as drinkers respond to increases in prices by drinking less (WHO 2013). While the reduction in drinking varies, systematic reviews of the international evidence indicate, on average, a 10% increase in price leads to an approximately 5% decrease in alcohol consumption (WHO 2013).

Policies that increase alcohol prices have also been found to delay the time when young people start to drink, slow their progression towards drinking larger

amounts, and reduce their heavy drinking and the volume of alcohol drunk on each occasion. Crucially, evidence suggests price increases reduce the harm caused by alcohol at a population level, which is an indicator that heavier drinking has been reduced (WHO 2009).

Natural experiments in Europe have shown that as alcohol taxes and prices have been lowered, so sales and alcohol consumption have usually increased (WHO 2009). In Finland, Herttua et al (2008) studied the effect of alcohol price cuts on mortality and found that these had most effect on heavy drinkers and the less affluent.

An effective pricing strategy should aim to lower the overall level of consumption across a population, as this has been consistently shown to be an effective approach to reduce alcohol-related harm. Further, by linking price to alcohol strength, policy can discourage the consumption of higher strength alcoholic products (BMA 2012). There are two main policy levers to achieve these aims:

1. controlling the level of excise duty paid on alcoholic products
2. setting minimum price levels for the sale of alcoholic products.

The commonest policy adopted by jurisdictions on pricing is increased taxation. From a health perspective, it is important in Guernsey that alcohol taxes at least keep pace with inflation. Duty free sales are also an issue.

A complementary policy is minimum price levels, which is a targeted way of making sure alcohol is sold at a sensible price by setting a floor level below which a unit of alcohol cannot be sold (Scottish Government 2013). Minimum pricing is not a tax. Influencing the prices of the cheapest drinks on the market by raising floor prices has a larger impact on total consumption than does increasing the prices of more expensive drinks (WHO 2013). The BMA (2012) also concluded that the evidence shows that a minimum price per unit is the most effective of all available price-related policy options for reducing-alcohol related harm, and will prevent deep discounting of alcohol, lead to major reductions in alcohol consumption and related harms. The policy also reduces health-related costs (Purshouse 2010).

Work in both Scotland and England has concluded that a minimum alcohol pricing policy would have substantial societal benefits (Meng et al 2012, 2013). The English study concluded that such a policy would be effective in reducing alcohol consumption, alcohol-related harms (including alcohol-attributable deaths, hospital admissions, crimes and workplace absences) and the costs associated with those harms.

In Canada it was found that a minimum unit price for alcohol significantly reduces alcohol-related illness and deaths, with little impact on the lower risk drinking population (Stockswell et al 2012/3). Scotland, Ireland, Northern Ireland and

Switzerland are planning to adopt similar policies (Sheron, personal communication).

As evidenced in Canada (Stockwell et al 2012/13, Zhao et al 2013) and previously in the Soviet Union (Nemtsov 2002), effective alcohol control policies translate into lives saved within a one or two year time frame, because although alcohol related liver disease may take 10-20 years to develop, deaths are related to recent alcohol intake.

A practical example of the effect of minimum pricing would be that if alcohol was a minimum of 50p per unit, then a 75cl bottle of 10% alcohol by volume (abv) wine would have a minimum price of £3.75, whereas a 15% (abv) bottle would be £5.63. In 2012 Scotland decided to set a minimum price of 50p a unit (Scottish Government 2013). If international research is generalisable to the Bailiwick then the introduction of a 50p minimum price per unit of alcohol here would prevent about 3 deaths a year, 50 cases of illness a year, save healthcare resources, and would target the very heavy drinker while having marginal effects on the lower risk drinker or those on low incomes (Williams and Horton 2013). The costs of different drinks with a minimum unit price of 50p are shown for illustration (Table 17).

Table 17 Cost of different alcoholic drinks by unit (dose of pure alcohol).
(1 unit = 10ml or 8grams of pure alcohol, ABV = alcohol by volume (%))

Drink	*Volume*	*(ABV)*	*Units*	*Cost@50p per unit*
Small shot of spirits (gin/vodka/whisky)	25ml	40%	1	50p
Large shot of spirits	35ml	40%	1.4	70p
Small glass of wine	125ml	12%	1.5	75p
Standard glass of wine	175ml	12%	2.1	£1.10p
Large glass of wine	250ml	12%	3	£1.50p
Alcopops	275ml	5.5%	1.5	75p
High strength beer/lager	1 pint	5.2%	3	£1.50p
Bottle of beer/lager/cider	330ml	5%	1.7	85p
Can of lager/beer/cider	440ml	4.5%	2	£1.00p
Lower strength lager/cider	1 pint	3.6%	2	£1.00p

Pub prices are considerably higher than 'take away' sales, and as a result minimum unit pricing reduces the price differential between pub and supermarket prices and is favoured by the pub trade. For instance CAMRA (2012) argued "*This move to end irresponsible alcohol loss leaders by the large supermarkets will encourage a cultural shift towards drinking beer sociably and responsibly in well-run community pubs."*

Recommendation 37 :	Ensure alcohol excise duty at least keeps pace with inflation.

Recommendation 38 :	The Bailiwick introduces a minimum unit price for alcohol.

In conclusion, taking the consistent international research findings, it is likely in Guernsey too that a policy of a minimum price of a unit of pure alcohol (dose) is likely to be effective in reducing harms, costs, and targeting impacts upon those consumers at highest risk while having much smaller impacts on moderate drinkers.

Alcohol beverage advertising and marketing

Alcohol beverage advertising and promotion increases the likelihood that adolescents will start to use alcohol, and to drink more if they are already using alcohol (Smith & Foxcroft 2009, WHO 2009). The findings of the impact of advertising are similar to those for tobacco and children's food preferences. One study found that total bans of supermarket and off-licence discounting are effective but banning only large discounts has little effect (Purshouse 2010).

Currently the control of advertising of alcohol in Europe is totally inadequate, and in particular the protection of children from persuasive advertising. There is no reason to believe that the industry will participate for selfless reasons just to improve public health. The evidence is that television and films are particularly important influencers. In Guernsey it will be important to consider controls of advertising locally in the new drug and alcohol strategy.

Recommendation 39 :	Improve the protection of our children from the harmful effects of alcohol advertising and marketing, working with UK jurisdictions.

Obesity and Liver Disease

It has been increasingly recognised, that many people who are obese also have non-alcoholic fatty liver disease (NAFLD) (Argo et al 2009). If left unchecked, NAFLD may progress from fatty liver (the most common condition) to liver inflammation, to liver fibrosis (scarring), and eventually to cirrhosis (advanced, irreversible scarring from chronic inflammation). Obesity is an additional risk factor in the progression of alcohol-related liver disease and viral hepatitis (Williams & Horton 2013). The greater the level of obesity, the greater the risk of liver disease (NHSb 2012) as well as of heart disease, stroke, diabetes and some cancers. The impact of obesity may be under recorded locally (Table 12).

The first key approach to tackling NAFLD is prevention, the mainstay of which is obesity prevention. The second is treatment for those who have progressed to more severe forms, (NASH or non-alcoholic steatohepatitis), the mainstay of which is specialist hepatology services supported by general primary care and general medicine.

Addressing the obesity epidemic is a public health priority and urgent, sustained action is required to minimise the social, economic, and health impact on each of individuals, communities and healthcare systems (WHO 2000).

Overweight and obesity in adults

Body mass index (BMI) is a simple index of weight adjusted for the person's height that is used to classify overweight and obesity in adults (WHO 2013). It is calculated by taking weight (Kg) and dividing it by height (metres) squared. Although individual level differences in body composition mean that BMI only provides a rough guide to fatness in individuals, these differences balance out across large numbers of people so it provides a useful measure across populations.

Further, a perennial problem in clinical diagnosis is where to draw the line in a continuous distribution, and clearly there will be some people just above or just below the cut-off or threshold. WHO (2013) definitions of adult overweight and obesity are shown below (Table 18). It should be noted that different cut-offs were used to define normal or abnormal weight in Guernsey Lifestyle Surveys prior to 2008 (Table 19). In the first Guernsey Lifestyle Survey in 1988 Deeks & Campbell (1988) state their definitions of overweight and obesity are based on "The Royal College of Physicians Report", (assumed to be, RCP 1983). The 1998 survey states the cut-offs are very similar to those in Garrow, 1988 (Goddard et al 1999, p58). However, Garrow (1988) had three working definitions of obesity based on BMI, grade 0 (20-24.9), grade 1 (25-25.9), grade 2 (30-40), and grade 3 (>40).

Table 18 Current WHO (2013) Body Mass Index (BMI) definitions for adult underweight, average, overweight and obesity, used in the 2008 Guernsey Lifestyle Survey (definitions used in the 1988-2003 Surveys)

BMI (kg/m^2)	*Category*
<18.5	Underweight (1988-2003,<20)
18.5-24.99	Average (1988-2003, 20-23.8 in women)
25-29.99	Overweight (or pre-obese) (1988-2003, 23.8-28.6 in women)
30-34.99	Obesity Class I (1988 to 2003, >28.6 in women)
35-39.99	Obesity Class II
>40	Obesity Class III (severely or morbidly obese)

Where the cut-offs are, is to some extent, arbitrary, but based on evidence of risk (WHO 2013). The changes in cut-offs in men made no difference to the proportion

of men considered overweight or obese, but in the case of women the new cut-offs led to 4% less women being rated obese, and 8% less rated as overweight in 2008 than had the old cut-offs been used (Table 19).

Table 19 Comparison of the percentage of women considered overweight or obese in the 2008 Guernsey Lifestyle Survey using old cut-offs used in 1988-2003 lifestyle surveys, compared to the WHO cut-offs (WHO 2013), used in the 2008 survey.

	Underweight	Normal	Overweight	Obese
Old cut-offs	6.0%	33.2%	39.5%	21.3%
WHO cut-offs	1.6%	50.4%	31.1%	16.9%

To provide a comparison over time, the old cut-offs have been used which indicate that adult obesity levels locally rose between 1988 and 1998 but stabilised thereafter at a relatively high level (Figure 26). Unfortunately the raw data from the 1988 to 2003 surveys are not available, so it is not possible to recalculate local overweight and obesity population prevalence's using the current WHO cut-offs.

The proportion of people overweight or obese is similar between genders (Figure 27). The proportion of the sample who were overweight and obese increased with age in all Guernsey Lifestyle surveys (Figure 28).

Figure 26 Percentage of samples overweight and obese by survey year (using old cut-offs. These over-estimate the proportion of people with overweight and obesity compared to current WHO cut-offs, (source Guernsey Lifestyle Surveys 1988 to 2008).

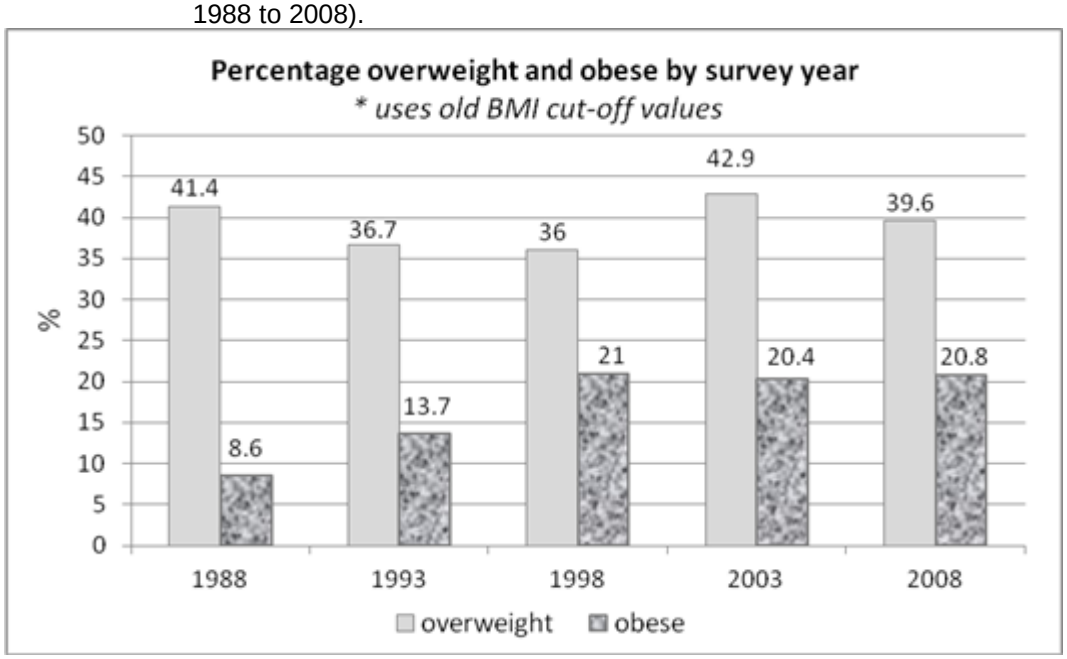


Figure 27 Obesity and overweight by persons and gender between 1988 and 2008 using old BMI cut-offs. (sources are Guernsey Lifestyle Surveys, 1988 to 2008, using old cut-offs which over-estimates proportion of people with overweight and obesity)

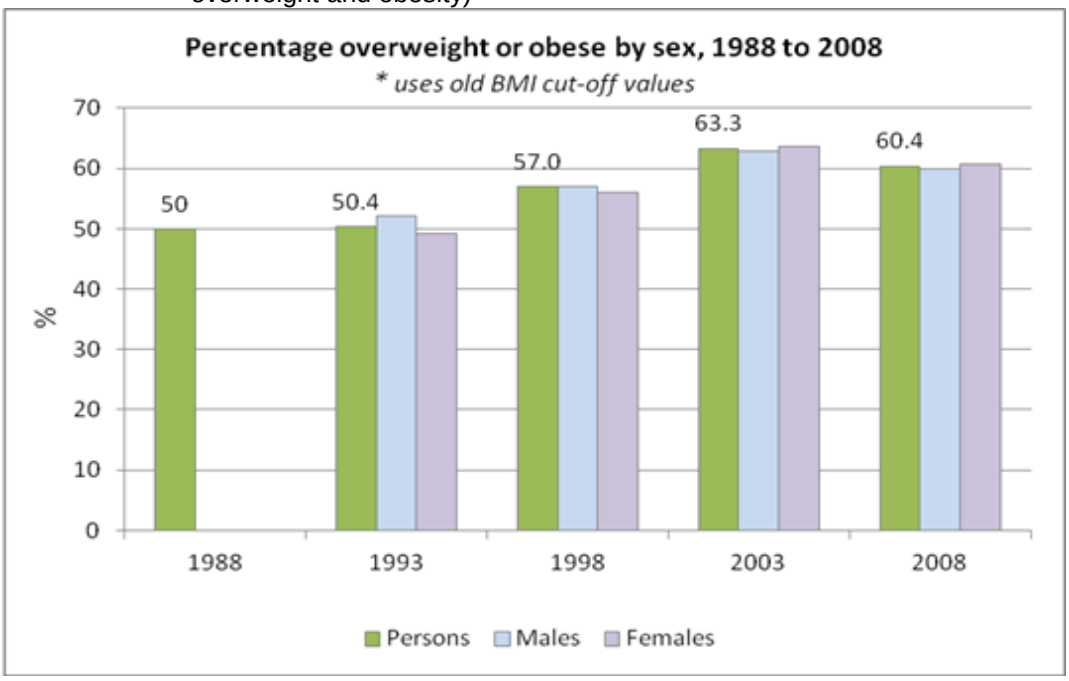
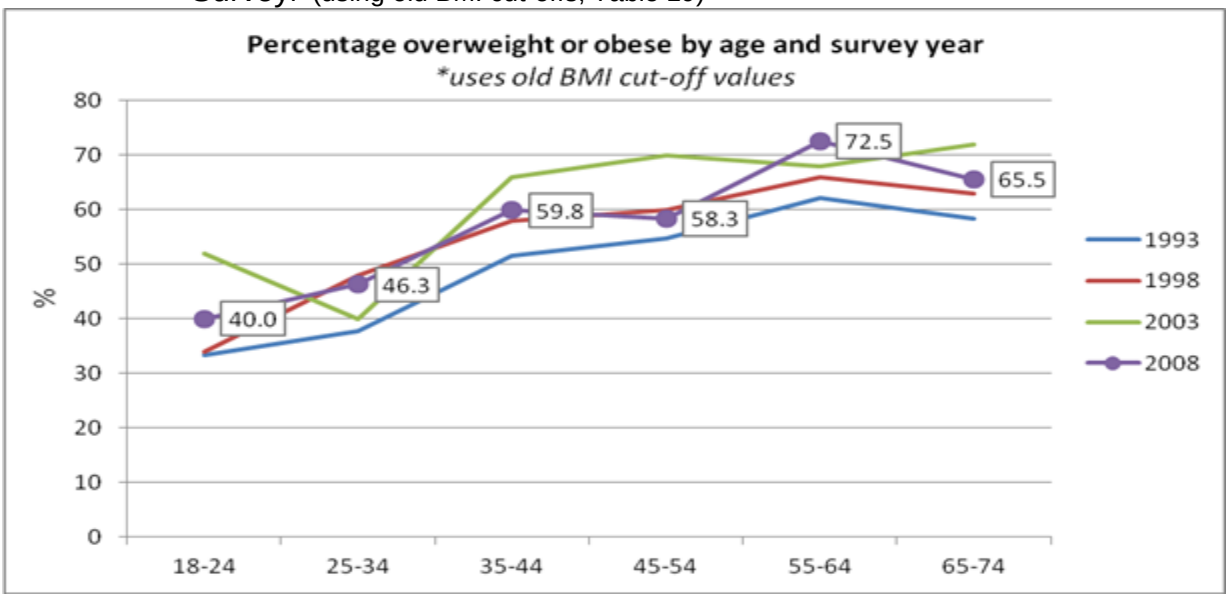


Figure 28 Obesity and Overweight by Age (persons), 2008 Guernsey Lifestyle Survey. (using old BMI cut-offs, Table 19)



It is not currently possible in Guernsey to establish whether a significant social gradient exists, but this is to be expected if the research in the UK Foresight report which indicated the less well-off have greater levels of obesity (Foresight Programme 2008) proves to be applicable in Guernsey.

Another window on the local situation is from work carried out jointly between the Public Health Directorate and Chest and Heart Unit (Figures 29 and 30). The Chest and Heart Unit provide a unique cohort of clients, although they are self-selected and might possibly represent a healthier than average sub-population of Guernsey people.

Figure 29 Obesity among first time visitors to the Chest and Heart Unit, 1975-2009, by sex. (using WHO (2013), cut-offs, Table 19).

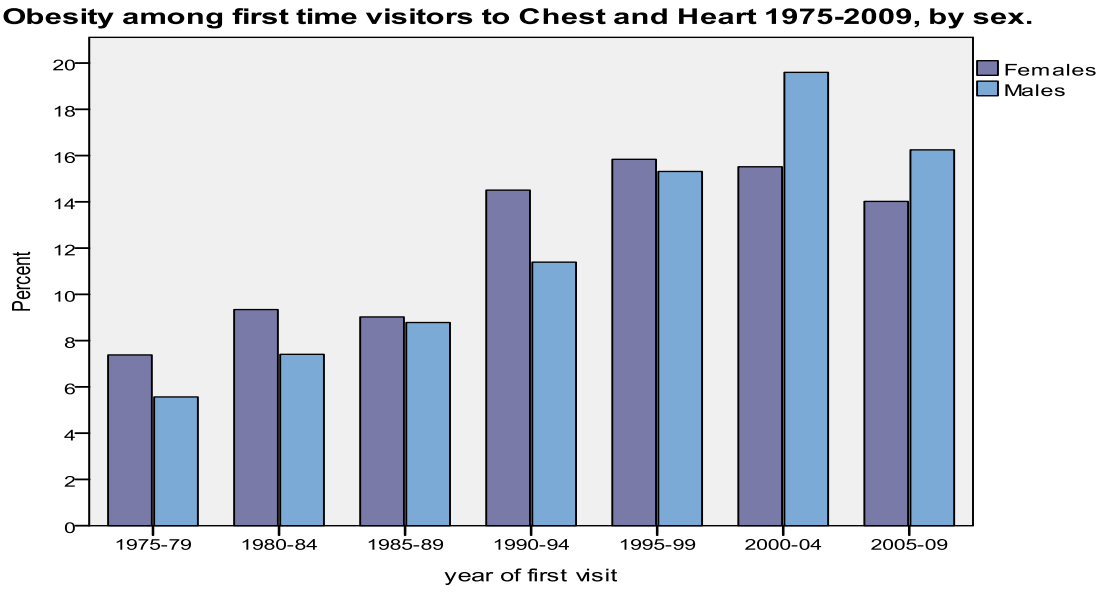
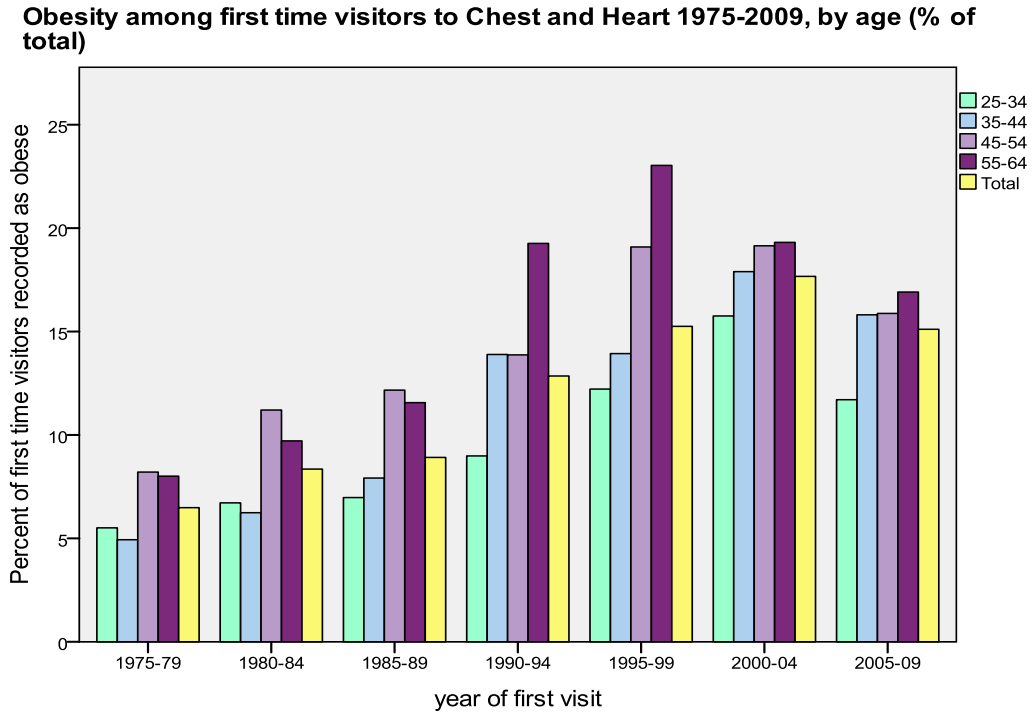


Figure 30 Obesity among first time visitors to the Chest and Heart Unit, 1975-2009 (using WHO 2013 cut-offs, Table 19)



There are identifiable life stages where overweight and obesity bring particular risk. Obese pregnant women are at an increased risk of almost every serious obstetric complication, and maternal obesity has become one of the commonest risk factors in obstetric practice (Bridgman 2010). Between 1st November 2009 and 30th April 2010 (six months) anonymous data was extracted for women mostly at or before 12 weeks of pregnancy to assess prevalence of overweight and obesity. Of the 360 women booked, 40% were recorded as overweight or obese and 13% as obese. Babies of obese mothers have a higher risk of perinatal and neonatal death and long term health problems. Foetal growth is affected by overweight and obesity in mothers, and babies have a significantly increased risk of obesity at 12 months. Obesity in pregnancy is already taken very seriously by local health professionals, and women with a BMI greater than 30kg/m^2, who are classified as obese (Table 18), are referred to the Community Dietician for support with healthy eating and weight management during pregnancy, although only 25% of women referred took up the service offer in 2012.

Using the WHO (2013) definitions, in the 2008 Guernsey Lifestyle Survey, an estimated 60% of men and 48% of women were overweight or obese: 20% of men and 17% of women were obese and 7% of women had a BMI score of 35 or more. This already presents the Bailiwick with a costly and challenging situation that signals a significant current and future preventable burden of ill health and health

expenditure due to the cost of treating obesity and obesity related disease. The current lifestyles surveys, while are of great value in monitoring population health are infrequently performed. It would be of great value to provide other measures of obesity and overweight across the entire population, in addition to the very valuable collaborative work carried out with the Chest and Heart Unit.

Recommendation 40 :	Public health to explore how to work more closely with healthcare providers to seek additional ways to work with primary and secondary care to monitor obesity and overweight in our community.

Childhood overweight and obesity

Childhood obesity is one of the most serious public health challenges of the 21st century (WHO 2013). Overweight and obese children are likely to stay obese into adulthood and more likely to develop non-communicable diseases like diabetes and cardiovascular diseases at a younger age (Serdula et al 1993). Overweight and obesity, as well as their related diseases, are potentially preventable. Prevention of childhood obesity therefore needs a high priority (WHO 2013).

The fundamental causes behind the rising levels of childhood obesity are a shift in diet towards increased intake of energy-dense foods that are high in fat and sugars but low in vitamins, minerals and other healthy micronutrients, and a trend towards decreased levels of physical activity (WHO 2013).

While there is currently no single, universally agreed, definition of either childhood obesity or childhood overweight, following a review it was concluded that BMI offers the greatest number of benefits at a population level, whilst minimising both the resource requirement and potential harm (McHardy 2012). However, a common view is that BMI should not be used in isolation to provide a definitive clinical diagnosis of overweight or obesity in either children or adults and that individual level interpretation is vital (McHardy 2012).

Assessing the BMI of children is more complicated than for adults as it needs to take into account changes in body composition as a child grows, with different patterns of growth between boys and girls. Therefore, to work out whether a child's BMI is too high or too low, both the age and sex of the child need to be taken into account. As a child's BMI changes considerably between birth and adulthood, fixed thresholds such as those used for adults are not applied to children as they would be misleading (NOO 2011).

Population monitoring in the UK is performed by using relative thresholds defined on the UK 1990 growth reference curve charts (Cole et al 1995/8, NOO 2011). Individual children can be compared to a child growth reference population, and the degree of variation from the expected value can be calculated (Table 20).

Table 20 Weight status categories of children for population monitoring (Cole et al 1995 and 1998), NOO (2011).

BMI centile	Category
BMI centile less than or equal to 2	Underweight
BMI centile greater than or equal to 85 but less than 95	Overweight
BMI centile greater than or equal to 95	Obese

Population monitoring is important to measure progress in tackling childhood obesity.

A longitudinal programme of measurement of children's heights and weights, the Guernsey Child Measurement Programme (GCMP), was introduced from the school year 2012-2013. GCMP is a joint project between schools, HSSD, and the Education Department. In England, Reception and Year 6 children are measured. However, in Guernsey, on the basis of an extensive literature review and pilot (McHardy 2012), Year 1 (ages 5/6 years) and Year 5 (ages 9/10 years) were measured because of their predictive value for later weight status, likelihood of best participation, and appropriateness for the local school events calendar (including avoidance of the 11 plus exam year).

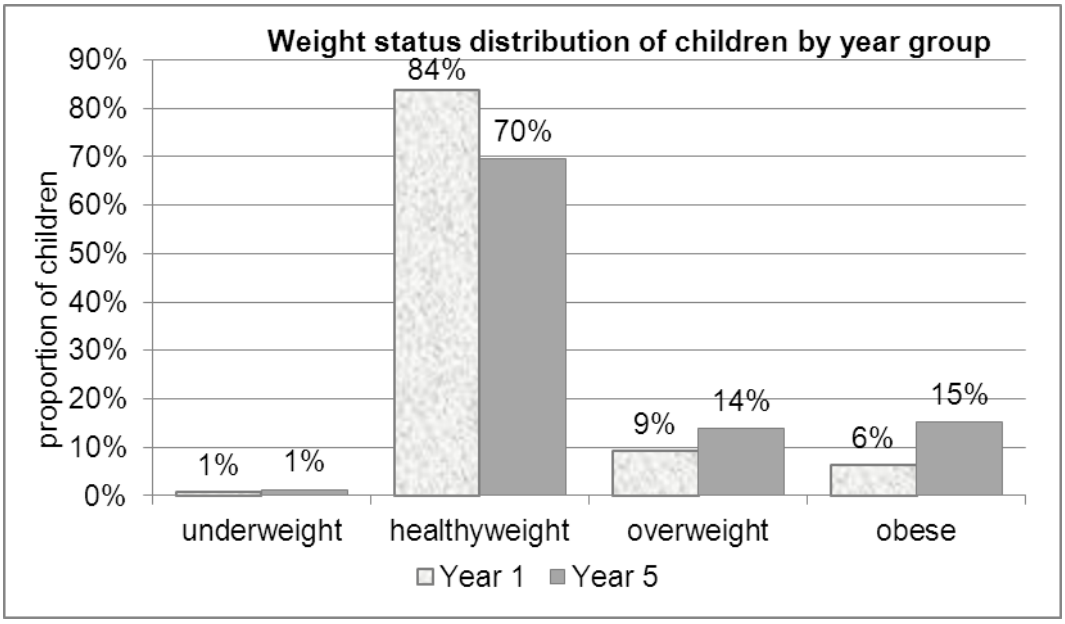
In 2012/2013, 93% of children participated, while 7% were not measured either because of absence from school or the child having been opted out of the programme.
Of measured Year 1 children, 9.2% were observed to be overweight, and 6.3% obese, and of measured Year 5 children 13.8% were observed to be overweight and 15.3% obese (Table 21). Only around 1% of children were underweight.

Table 21 Weight status of children in years 1 and 5 in 2012-2013, population cut-offs or thresholds for overweight and obesity, NOO (2011), (Table20)

	Year 1		Year 5	
	N	%	N	%
underweight	4	0.7%	7	1.3%
healthy weight	493	83.8%	383	69.6%
overweight	54	9.2%	76	13.8%
obese	37	6.3%	84	15.3%
Total	**588**	**100.0%**	**550**	**100.0%**
non-healthy weight	95	16.2%	167	30.4%
of which overweight/obese	91	15.5%	160	29.1%

Source: HSSD, Public Health Directorate

Figure 31 Weight status of children in Years 1 and 5, school year 2012-2013 (using population cut-offs or thresholds, NOO (2011)



It was observed that the percentage of the population of school Year 1 children who were overweight and obese was 15.5%, compared to 29.1% of school Year 5 children (Figure 31). By the age of 5 or 6 years, some children are already on a path that could lead to increased overweight by age 9 or 10 years, and potentially, a lifetime of increased health risk. In both school years, boys were more often overweight or obese compared to girls, and this difference was more pronounced in school Year 5 than in school Year 1.

In view of the high prevalence of overweight and obesity, the role of Health Visitors in supporting all families with children under five to encourage healthy eating and exercise is pivotal. The levels of obesity also demonstrate the need for more robust promotion of breastfeeding, which is a strong protective factor against obesity (Bridgman 2012).

Schools also play an important role in educating young people on the benefits of healthy eating and instilling healthy eating habits. The Education Department under the auspices of the obesity strategy have undertaken a range of actions for instance; promotion of the National Healthy Schools Programme (three schools have achieved the standard and six are working towards it; development and implementation of healthy food guidelines for all food served in State schools; encouragement of young people to take part in physical activity in and out of schools.

In addition to those children in school Years 1 and 5, there will be more children in other school years who were not measured who will also have weight management problems. In addition to whole school and community approaches, children and families who are struggling to manage their weight should be able to access help and should be encouraged to do so in a non-judgemental, non-stigmatising way supported by our wider society.

Services for children and young people

Following the recommendations of the Obesity Strategy, and the States funding of Phase 1 of the Obesity Strategy, a Specialist School Nurse for Weight Management was appointed and there are now on average, approximately 40 children and young people being monitored and supported at any one time. The Weight Management Nurse sees students on a one to one basis, in school, at home or in clinic. Parents/carer support is essential for a student to achieve and maintain realistic life style changes and permission to involve family members is always sought. Individual referrals into the service come from health professionals, teachers, parents and students, using a newly developed pathway established with support from the School Nurses, Paediatric Consultants, Dietetic Service, Child and Adolescent Mental Health Service and the Guernsey Sports Commission. Clients who are not yet ready to engage with the service are assessed on a regular basis, and an intervention introduced when they are ready. For those willing to accept help, contact is graduated with frequent support initially, moving to less regular input as clients initiate behaviour changes.

The *Spring* programme for overweight/obese Primary School children, run by the Specialist School Nurse for Weight Management, was introduced in 2012. Parents and Carers are expected to attend with their child/children to ensure the healthy lifestyle messages can reach home. *Spring* worked with 12 families in 2012 and 8 families completed the course of 12 weeks. The 2 hour sessions included hands-on cooking, sports skills, nutritional advice and psychological input. Those children who attended *Spring* initially benefited from improvement in self-esteem, an increase in physical activities and an understanding of food labels; their progress will continue to be monitored.

Services for adults

Tier One and Tier Two services are provided in the community by the Community Dietician. The Tier One service for patients with a BMI of over 35, receive referrals from both hospital and primary care. The programme has consisted of 4 one-hour talks over 4 consecutive weeks, followed by ongoing drop-in support. This service received 30 referrals in 2012, with an uptake rate of 47% (14 patients); 64% of whom were female. Four programmes were held, with an attendance rate of 69%.

The Community (Tier 2) Dietetic Service for the Guernsey Obesity Strategy received 140 referrals in 2012, of which 51% had a BMI greater than 40; and 15% had a BMI greater than 50. Of referrals, 77% (108) attended, of which 64% were women, and 94% had at least one co-morbidity (other health problem), many of which were preventable and will improve significantly if weight is reduced (Table 22).

Table 22 Co-morbidities of patients attending the Community Dietetic Service.

Co morbidities	Number	% of total
Musculoskeletal	41	38
Type 2 Diabetes Mellitus/IGT	36	33
Hypertension (High blood pressure)	35	32
Mental illness (inc. Learning Difficulties)	31	29
CVD	28	26
Respiratory disease	22	20
Dyslipidaemia	21	19
Endocrine	16	15
Gastro-intestinal	15	14

Of the 108 patients seen in clinic in 2012, 81% (n=87) attended at least one follow up appointment. Forty-nine patients had reached 3 months in treatment 84% of whom had begun to lose weight, 25 patients had reached 6 months treatment period 80% of whom had begun to lose weight. Four weight management group talks were offered to patients in addition to one-to-one treatment, and 14 patients attended these talks, with a 68% attendance rate.

Both Tier One and Tier Two services are being constantly evaluated and reviewed to improve the learning experience for service users.

Obesity Strategy

In 2011 the States funded the first phase of the States Approved Obesity Strategy (Billet D'Etat XXX1 2009 vol 2). One aspect of this strategy was the implementation of the Guernsey Child Measurement Programme (GCMP) which has demonstrated the scale of the problem of obesity in children. The Treatment services for children and adults, which have been carefully researched for maximum local effect, have been implemented with success, but are currently reaching a very small percentage of the people (both children and adults) who need help. Pathways into free of charge treatment only begin when adults have reached a BMI of 35, and children, in excess of the 91st centile.

The causes of the rising rates of obesity in the UK were modelled by the Foresight Programme (2008) and a complex, multifaceted system was identified which locks individuals and societies into an unequal balance between energy intake of food and energy expenditure through exercise. The four key determinants of obesity were identified as physiological factors, eating habits, activity levels and psychosocial influences, with additional attitudinal drivers including ambivalence and lack of personal identification with the agenda. It appears likely that the same influences are affecting the population of Guernsey and Alderney.

The contribution of obesity to liver disease is considerable. There is much to do to persuade Guernsey men and women to make a priority of maintaining a healthy weight, and help and encourage their children to do the same, in the face of a society that is recognised as obesogenic (this term draws together 'the sum of influences that the surroundings, opportunities, or conditions of life have on promoting obesity in individuals or populations', (Foresight Programme 2008). In order to develop effective environmental interventions in relation to obesity, we need to understand how individuals and different groups of individuals, interact with their environment in terms of physical activity and food intake.

The Guernsey Obesity Strategy (2009) is comprehensive, but has not yet been fully implemented. The second phase of investment in the Strategy has yet to be agreed. NICE guidelines for treatment of severe obesity remain unmet; there is a lack of Tier 3 (specialist multi-disciplinary team) and Tier 4 services (for example, obesity surgery). In view of financial constraints and States resolutions restricting service development, there is value in reviewing the specific solutions proposed in the recommendations of the Strategy. This should be done against the four key determinants of obesity and additional attitudinal drivers, exploring additional, more recent research and guidance, the local experience, and alternative opportunities for delivery and measurement of the desired outcomes. In addition, given the constraints on finances the action and strategies led by other departments, for example, the Environment Department who are leading the Transport Strategy are going to be vital to help Guernsey tackle the health and economic consequences of obesity.

Recommendation 41:	The second phase of the Obesity Strategy is funded.

Recommendation 42:	The existing obesity strategy is updated in the light of recent evidence.

Recommendation 43:	A transport strategy is adopted which helps people choose active transport for everyday activities like transport to work and school.

Viral Hepatitis

Viral hepatitis infections are the third main preventable cause of liver disease. They are on the increase. They can cause cirrhosis, liver failure and liver cancer.

Hepatitis C infection (HCV)

The WHO estimates that about 170 million people, 3% of the world's population, are infected with HCV and are at risk of developing liver cirrhosis and/or liver cancer. The prevalence of HCV infection in some countries in Africa, the Eastern Mediterranean, South-East Asia and the Western Pacific (when prevalence data are available) is high compared to some countries in North America and Europe. Most European countries have a prevalence of between 0.5 to 2%. Some infections were iatrogenic from use of re-usable glass syringes and blood transfusion before donor screening was available (WHO 2013).

In Scotland the prevalence is 0.7%, while England have a lower estimated prevalence of about 0.4% chronically infected (Harris 2013). A quarter to a half of people who inject drugs are infected, and among those who continue to inject drugs, sharing of injecting equipment and associated paraphernalia is the main route of transmission of infection (Harris 2013). Many people have no symptoms when first infected. Key elements of strategy to reduce harm from hepatitis C are; prevention of new infections; increasing awareness of infection; increasing testing and diagnosis (NICE 2013) and; getting diagnosed individuals into treatment and care as treatments exist that can clear the virus in the majority of cases. Prevention will also decrease downstream costs that might include liver transplants and cancer surgery.

Surveillance studies in the UK suggest that almost 90% of individuals with hepatitis C in the UK have genotype 1 or 3 infections, with genotype 3a being the most common genotype. Patients can be infected with more than one genotype.

There are currently 120 HCV infected patients registered at the Guernsey Hepatitis Service, located at the Orchard Clinic. At present there is no Island wide

prevalence data, but the number suggests we have a similar prevalence to the UK. Knowledge of local epidemiology is important in setting local priorities and planning treatment programmes. An audit of Hepatitis C infected patients attending the Guernsey Sexual Health Unit in 2010 showed that the overwhelming majority of service users (84%) acquired their infection through injecting drug use.

This overall distribution of Hepatitis C genotypes in Guernsey and Alderney is comparable to those found in the UK Denominator Study, (Health Protection Agency 2006). However, when the subset of "Guernsey only" injectors are examined, the majority (in excess of 90%) are found to be infected with genotype 3a, providing strong supportive evidence of on-island transmission of hepatitis C. Hepatitis C is treatable with anti-viral drugs, and knowledge of the infecting genotype is important in treatment as those people infected with HCV genotype 1 and 3 require different drugs.

The successful establishment of secure treatment programmes in Guernsey and Alderney has been an essential first step to mitigate against the burden of liver disease in Guernsey and Alderney in the future. However, the on-going on-Island transmission of Hepatitis C virus amongst injecting drug users remains an issue of concern with new infections being diagnosed monthly. It is for this reason that reduction of transmission events needs to be a key priority on a blood borne virus action plan for Guernsey and Alderney.

Hepatitis B infection

Worldwide about 240 million people have a chronic infection with Hepatitis B and over half a million die annually (WHO 2013). Many new infections with Hepatitis B are sub-clinical or may have a flu-like illness. Acute infection may occasionally lead to fulminant hepatic necrosis, which is often fatal.

The virus is transmitted by parenteral exposure to infected blood or body fluids. Transmission mostly occurs through vaginal or anal intercourse, as a result of blood-to-blood contact (e.g. sharing of needles and other equipment by injecting drug users (IDUs), 'needlestick' injuries) or through perinatal transmission from mother to child. The incubation period averages 2-3 months (PHE 2013b).

Chronic infection puts people at high risk of death from cirrhosis and liver cancer. In Europe, there are estimated to be one million people infected every year. In the UK, about 0.3% of adults are estimated to be chronically infected with hepatitis B. Most new cases in the UK are in immigrants (PHE 2013).

We have no Island-wide figures on the prevalence of Hepatitis B infections in Guernsey and Alderney. However, there are now 22 Hepatitis B infected patients being cared for in the Orchard Clinic with further cases being referred to the clinic on a regular basis. However, none of these are newly acquired infections but were

either newly diagnosed or existing chronic infections referred to the Orchard Clinic for further management.

Given the prevalence of hepatitis B has doubled in the UK in the last decade, mostly from immigration, it has been argued that a pre-immigration screening programme should be introduced for hepatitis B, in a similar manner to that for TB (Williams 2013).

Both hepatitis B and C are infectious conditions that can be caught through having unprotected sex or by sharing needles to inject drugs. Using a condom during sex and not injecting drugs will reduce risk of developing hepatitis B and C. There is a vaccine to protect against hepatitis B but not hepatitis C.

Recommendation 44:	An action plan is developed to reduce the health impact of viral hepatitis in the islands as a spend to save initiative.

Top Tips for Liver Disease Prevention

Looking after your liver doesn't have to be difficult. Top tips for a healthy liver are:

- Enjoy more fruit and vegetables and avoid sugary drinks.
- Exercise regularly to burn the fat in your liver and other organs.
- Abstain from alcohol but if you do drink take 2-3 consecutive days off alcohol a week, to let your liver cells recover and repair themselves, and don't exceed lower risk levels of drinking.
- Practise safer sex
- Avoid injection of drugs.

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REFLECTIONS ON THE 14th MOH REPORT (1912)

The 14th Medical Officer of Health (MOH) report was attached as an Appendix to a letter in the Billet d'Etat from the President of the Board of Health, John N Brouard. The Bailiff and President of the States of Guernsey at this time was William Carey.

Dr H Y Draper Bishop MD (DB), the MOH, estimated a population of 41,854 in Guernsey, the same as in 1911, although he noted the 1911 census figures were yet to be published for the "*Islands of the British Seas*". He regretted he was unable to obtain emigration figures from "*various shipping companies*". He noted that there was little unemployment and inferred the place of émigrés were filled "*by an influx of aliens*".

DB wrote there were 983 births in 1912 with 45 stillborn children. The number of deaths was 552. There were 101 infants deaths, with a death rate of 103 per 1,000 registered births. The rate was half that of the 208 per 1,000 in 1911, and less than the average of the preceding 10 years of 143 per 1,000. England and Wales by comparison had a rate of 95 per 1,000 in 1912. St Sampson's Parish had a death rate of 300 per registered births in 1911 and 75 in 1912. Dr Bishop wrote "*In St Sampson's Parish it is to be hoped that the more abundant supply of water, the extension of the main drainage, and the collection of household refuse will in the future enable me to record figures as satisfactory as those for 1912*."

DB considered "*insanitary conditions*", "*maternal ignorance*", and "*the decline of breast feeding*" as factors linked to high infantile mortality rates. "*If the mother has to go out to work she cannot nurse her baby, and the care of it often devolves upon quite young children….*" *"The breast-fed child enjoys a comparative immunity for the intestinal disorders and convulsions of infancy which are so fatal."* "*Unfortunately the expense of sufficient cows' milk in these cases is often prohibitive: as a result the baby gets but little of it and plenty of baked flour and boiled bread*."

DB wrote "*The year 1912 was one in which the conditions in every way favoured a low rate of infantile mortality*." He noted no infant deaths from "*Epidemic Enteritis*" in 1912 compared to 60 in 1911. He noted only 2 deaths from measles and none from whooping cough in infants compared to 18 and 11 in 1911.

Categories of death included epidemic, infective and septic. Of 31 "*Epidemic*" deaths there were 21 deaths from diphtheria, 4 from influenza, 4 from measles, 1 from scarlet fever, and 1 from cerebrospinal meningitis. Of the diphtheria deaths, 7 were in those aged 1 to 5 and 12 in those aged 6 to 15. There were 6 deaths from

Septicaemia. Twenty-one infants died from bronchitis or pneumonia. Four deaths were from meningitis, and 1 death from Tabes dorsalis, a complication of syphilis. Of 28 "*Infective*" deaths 27 were from tuberculosis (TB) and 1 from tetanus, with 9 TB deaths in those aged 16-25 years, and 14 in those aged 26-65 years. Dr Bishop considered this was "*fortunately a small number*". The death rate was 0.6 per 1,000, less than half the 1.4 per 1,000 seen in England and Wales, and around a third of the 2.2 per 1,000 rate of France where TB caused nearly half the deaths in those aged 20-39 years.

There were 163 cases of diphtheria notified, with epidemics chiefly confined to the Town, Vale and St Sampson's, with Vauvert and Amherst, two of the schools, affected. The MOH noted the impact of public beliefs. "*In the town I do not think that the belief in witchcraft or "overlooking" had much to do with the spread of the disease, but in the country it certainly had, and in the last months of the year the opening up of the Cromlech at L'Ilset was considered in the north end of the island to be answerable to the prevalence of Diptheria. When such views are held it is not surprising to find but little importance is attached to medical treatment and isolation*."

One hundred and one cases of scarlet fever were notified and was considered a mild type. Cases were noted at Capelles and Melrose schools.

Of the 270 cases of notifiable infectious diseases reported in 1912, 235 were admitted to King Edward Sanatorium, and a daily average of 22 patients were noted, with 14.3 staff. Interestingly, the decision as to whether a case was to be removed to a Sanatorium rests "*with the Constables of the parish*" and the MOH was not happy with this situation.

Dr Bishop considered "*After the past heavy years we are justified in now expecting a period of comparative freedom from infectious diseases, and we should make ready for the time when the cycle will again change and busy years results. We know by long experience that this will happen, and the day when a permanent diminution in the number of cases will take place in Guernsey is not yet*." (page 19)

DB recommended the adoption of measures from the UK Shop Hours Act of 1892 restricting under 18s to no more than 74 hours a week. He observed the unhygienic way in which landed meat was dumped on hurdles and "*exposed to the unwelcome attentions of dogs*", and argued for a small van for the transfer of meat such as that used in Jersey, (page 27). He wrote "*During dry weather the dust nuisance is much in evidence*", and recommended tarring the roads rather than exporting Guernsey derived tar to England. He also noted that the Sanitary Inspector and Staff disinfected over 10,000 objects, including 4,000 items of clothing, (page 25).

He noted 22 deaths of persons aged 90 and over, and 68 of persons aged 80 and over, 4% and 12% of the deaths respectively, and wrote "*It is evident therefore that our old people must be tough and live long*" (page 8).

Finally he wrote "*It is my duty to the community, and an unpleasant one it is, to point out the deficiencies of our sanitary organisation: but it is with pleasure I can call attention to some great advantages which residents and visitors to Guernsey enjoy. The natural beauties of the Island are such that no one can fail to appreciate them, the abundant sunshine (and in the year 1912 we hold the record for the British Isles), the milk at once so rich in fat and free from tuberculosis, are points much in favour of Guernsey that it is difficult to over-estimate their value*." (page 28).

OTHER PUBLIC HEALTH HIGHLIGHTS 2012

A very wide range of services and activities influence the health of the public in Alderney and Guernsey. The Directorate aims to support and influence the health of the whole of the island population and influence actions across the breadth of the public, private and voluntary sectors.

A small range of public health services are either directly managed or commissioned through the Public Health Directorate. Some brief highlights of these units' achievements and future plans and challenges are included below.

Clinical Coding Unit

The Unit operates a system of coding of clinical information from hospital admissions. This enables later analysis. The entire exercise is very important for health needs assessment and in helping clinicians and managers maintain and improve the quality of their services. A re-organisation during 2012 led to the unit being subsumed into the Medical Records Unit of HSSD within the Finance Directorate. I put on record my thanks for the work of this small and dedicated team for their important work.

Epidemiology/Public Health Intelligence

Epidemiology and public health statistical analysis is the cornerstone of public health research. This is a key service to help maintain health, control diseases and as a foundation for health needs assessment.

Achievements:

1. Initiation of planning and preparation for the Guernsey and Alderney Health and Lifestyle Survey, the sixth survey of its kind, which was carried out in Autumn 2013.
2. Work also commenced on an updated Health Profile for Guernsey and Alderney, in collaboration with Jersey. Health profiles contain statistical data on many different health indicators covering a wide range of topics, from population size and birth rate to causes of death and smoking prevalence. The Health Profile builds on the success of an earlier profile produced by Guernsey's Public Health Directorate. It is a piece of collaborative work between Guernsey and Jersey and is expected to be published in 2014.
3. Statistical data about tobacco use and smoking-related ill health were provided to the Director of Public Health for use in the revision of the Guernsey and Alderney Tobacco Control Strategy.
4. Planning and preparation was undertaken for the inaugural year of the Guernsey Child Measurement Initiative.
5. A year-long study of campylobacteriosis (a type of gastro-intestinal infection) among Guernsey and Alderney residents was undertaken in 2012. This was a cross-departmental and inter-agency project, which drew on the expertise of

colleagues working both locally and nationally. The aim of the study was to better understand the relatively high rates of this type of infection that are seen in the islands.

Future Developments-Challenges:

1. Complete reporting of abortion statistics remains an issue.
2. Joint work with Education Department on Young People's Survey.

Infection Prevention and Control Unit

Achievements:

1. HSSD inpatient areas had a very low incidence of MRSA infections with none recorded in 2012.
2. Only 8 healthcare acquired MRSA colonisations in 2012 compared to 41 in 2005. Colonisation can be defined as the presence of bacteria on a body surface, for example the skin, mouth, intestines or airway, without causing disease in the person, however those patients colonised with MRSA have the potential to transmit MRSA to other vulnerable patients and become infected with MRSA.
3. Caesarean Section surgical site surveillance study in which women were telephoned 30 days post Section and asked questions based on the Health Protection Agency definitions of surgical site infections. An infection rate of 9% was identified (15 out of 165), with most infections being detected after discharge from hospital. This will provide baseline data for monitoring future improvement.
4. Introduction of post-operative surveillance for orthopaedic hip and knee patients.
5. Over 1,000 staff were trained in infection control.
6. Major initiative to reduce risk of healthcare acquired *Legionella* infection.
7. Support for management of 13 community infectious disease outbreaks.

Future Developments/Challenges

1. Increases of multi-drug resistant organisms
2. Increase of *Clostridium difficile* infections in the community
3. Improving compliance of HSSD staff with handwashing standards, for example, wearing of wrist-watches, stoned rings, nail polish and staff not being bear below the elbow when washing hands.
4. Introduction of PLACE (Patient Led Assessment of the Care Environment) with a focus on cleanliness, buildings, food, privacy and dignity.

Sexual Health Unit (Orchard Clinic)

This small unit provides a range of diagnostic, treatment and preventative services for sexually transmitted infections, HIV and hepatitis.

Achievements:

1. In 2012 an increase in the number of cases of infections with *Neisseria Gonorrhoeae* was noted. An audit was therefore conducted to evaluate the management of Gonorrhoea within the Bailiwick, together with the analysis of local patterns of infection. Information on local trends and antibiotic resistance patterns are essential to inform local policies. This audit demonstrated that most infections with *Neisseria Gonorrhoeae* are imported into the Bailiwick and therefore highlighted the importance of monitoring local antibiotic susceptibility trends. At the time of this audit local care was compliant with 80% of the auditable standards published by the British Association of Sexual Health and HIV.
2. The hepatitis B and C treatment programmes are now well established and the goal is to continue treating patients in accordance with UK National Guidelines and in collaboration with a UK National Centre of Excellence. This ensures a comprehensive and cost-effective service that has been welcomed by our local population.
3. Development of a sexual health needs assessment for a future strategy.
4. Meeting a range of national and local standards for HIV and other services.
5. Active involvement in local educational activities, which have included a local Hepatitis Study day attended by more than 70 local health care professionals, presentations at local clinical meetings, teaching on courses run by the Institute of Health and Social Care and involvement with training and education for community organisations and schools.

Future Developments/challenges:

1. It is estimated that 5-10% of sexually active women and men between 20 and 24 may be infected with *Chlamydia* on the island, and in many cases there are no symptoms. Complications in women include pelvic inflammatory disease which can lead to miscarriage, ectopic pregnancy and infertility, and in men inflammation of the testes. A screening programme is required to improve health and save money.
2. There remains a challenge in preventing on-Island transmission of hepatitis C.
3. Development and implementation of a sexual health strategy.
4. Development of further local quality indicators for sexual health services.
5. Early diagnosis of HIV is associated with a much greater chance of a good outcome. It is important to reduce the proportion of late attenders. To do so it is important to continue to reduce stigma associated with HIV, and to encourage testing when appropriate.
6. Meeting the increasing needs of Guernsey residents in a climate of ongoing financial constraints.

Clinical Governance and Service Quality

During a 2012 re-organisation the clinical governance team joined the Health and Safety Team to form a Governance and Assurance Team.

Achievements:

1. HSSD Board approved a governance strategic framework, with governance considered under clinical, financial, information, and staff governance.
2. A clinical governance strategy was agreed.
3. New service governance groups are being set up.
4. Island's dentists develop a governance framework.

Future developments and challenges:

1. Clinical audit is time-consuming, and with resource reductions and clinical priorities, many clinicians struggle to find time to allocate to data collection and entry.
2. The clinical audit strategy mandates that where possible Guernsey participates in the National Clinical Audit and Patient Outcomes Programme in the UK, to enable us to have comparative data. In the future it is likely that subscriptions will be required to cover the cost of participation.
3. A challenge for HSSD is to undertake valid baseline assessments about compliance and non-compliance with local guidelines.
4. Statistical information for clinicians to underpin governance remains a challenge

Health Improvement and Health Promotion

Achievements:

1. The Quitline Coordinator and Health Promotion Officer for Smoking worked with staff at Guernsey Prison to support their plans to instigate a smoke free site in January 2013. This included training for staff and helping those prisoners and staff who wanted to stop smoking.
2. A new cohort of Health Trainers completed their qualifications through the College of Further Education. They began working with clients in the autumn and cover areas such as weight management, stress, healthy eating and physical activity.
3. The Health Promotion Officer for cancer worked with the newly trained HOPE tutors to set up and run three courses for recovering cancer patients. The courses looked at all aspects of healthy lifestyles, goal setting and mental health promotion and were deemed invaluable by their participants.

Future Developments and Challenges

1. Implementation of the smoke free site policy for all HSSD staff and patients at the Princess Elizabeth Hospital.
2. Support development of the revised Smoking Strategy from 2014 onwards.

3. Drug and Alcohol Needs Assessment as a foundation for new proposals and plans from 2015 onwards.
4. Review of the Units weight management programme and care pathway linking with other services.
5. Organisation and implementation of the sixth Guernsey Health and Lifestyle Survey.

States Analyst

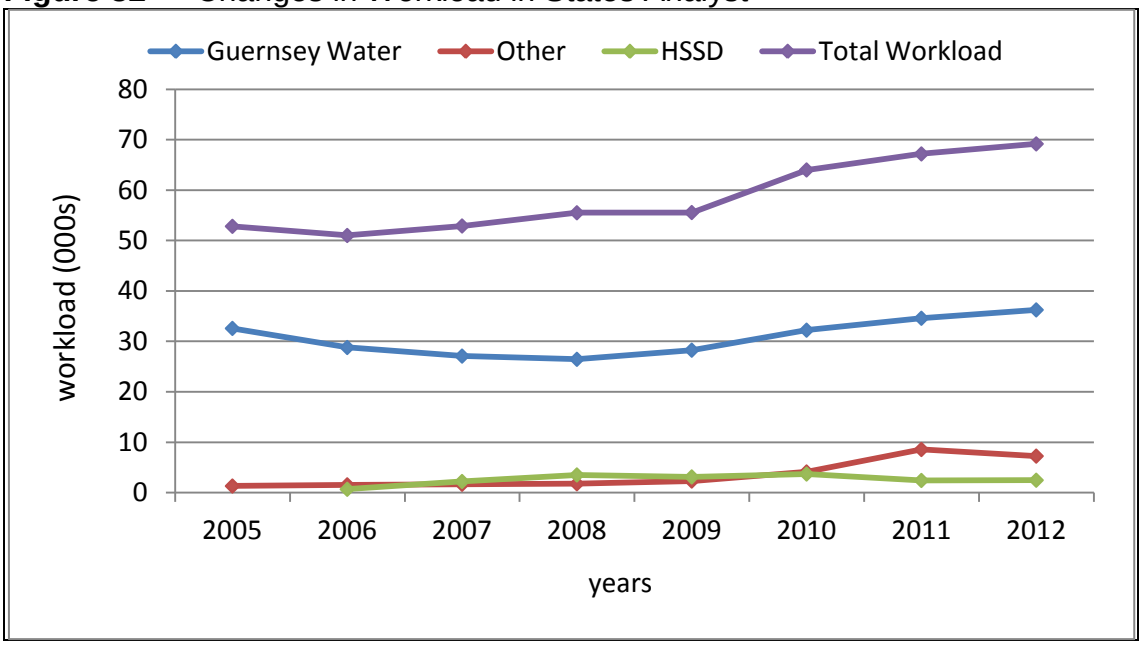
Achievements:

1. In May, 2012, the Laboratory's quality assurance systems were audited by the United Kingdom Accreditation Service (UKAS) audited, and re-accredited. UKAS described the laboratories systems, developed and maintained by Laurence Knight, as "*exemplary*".
2. The Laboratories new Gas Chromatograph and Mass Spectrometer, introduced in the second half of 2011, proved a powerful tool to help Guernsey agencies protect local public health from emerging drugs of concern. For instance, of the 73 new psychoactive substances (NPS) reported to the European Monitoring Centre for Drugs and Drug Addiction (EMCDDA)* in 2012, three of these were first identified in Guernsey and a fourth was identified in collaboration with Guernsey, an astonishing achievement for the island and a tribute to the knowledge and skills of local laboratory and enforcement staff. *http://www.emcdda.europa.eu/publications/implementation-reports/2012
3. *Legionella pneumophila* is a very small bacterium than can cause devastating outbreaks of pneumonia that can be fatal. There was an increase in the amount of *Legionella* testing in 2012, including a significant amount of work to support testing in HSSD premises, including the Princess Elizabeth Hospital. This work would have been sent off island if the laboratory was not accredited for this test, and has provided additional income for the States.
4. Overall an increase in workload was observed, 69,000 work units completed in 2012 up from 67,000 in 2011, and 53,000 in 2005.

Future Developments

1. Continued surveillance for Emerging Drugs of Concern (EDOC's).
2. To increase private water *Legionella* testing to provide greater public protection.

Figure 32 Changes in Workload in States Analyst



Environmental Health

The Office of Environmental Health and Pollution Regulation delivers Environmental Health services for the Health and Social Services Department (HSSD) so is directly aligned to HSSD and environmental health is part of the public health discipline. It is one of the few services that is entirely based in statute and dates back to the nineteenth century when the then 'Inspector of Nuisances' was appointed to work with the Medical Officer of Health in controlling disease and poverty in the community.

Over the last century the service has evolved to provide a modern environmental health and pollution regulation service, ensuring that impacts on the health of the public, eco systems and the environment are measured, monitored and when necessary mitigated to protect, maintain and improve public health. In this context, the environment includes food, water, air, land and the built environment including houses, facilities used for leisure and work and the infrastructure.

Achievements and Successes

1. The service was delivered within budget.
2. Two Graduate Trainee EHOs were recruited to assist with succession planning.
3. The Deputy Chief EHO, Tony Rowe, retired after 34 years of service with HSSD, a major achievement. Tobin Cook was promoted and took over as Deputy Chief EHO in May 2012.
4. The team interviewed all of the Campylobacter patients as part of the inter-agency study on this debilitating food-borne illness.

Table 23 Environmental Health Statistics (from OEHPR)

Topic	*Number*
Total complaints, enquiries and routine inspections.	1866
Seawater sampling undertaken at 32 coastal sites and submitted for analysis.	606
Taken on behalf of Environment Department under contract for bathing beach survey.	
• Guide pass	556
• Mandatory pass	25
• Fail	25
Shellfish samples were taken for the classification of harvesting areas.	51
Leachate samples.	87
Pest Control visits.	
• Rat infestations	272
• Mice, Ants, Bedbugs, Cockroaches, Fleas, Weavels, Wasps etc	22
Domestic water samples.	
• Mains water	1
• Boreholes and wells	22
Complaints requiring interventions.	
• Commercial bonfires	45
• Domestic bonfires	58
• Air Quality	10
• Dust, Effluvia etc	24
• Drainage and Sanitation	23
• Light Nuisance	3
• Accumulations	23
• Other Nuisances	57
• Housing Conditions	47
• Commercial Noise	122
• Domestic Noise	58
• Smell Nuisance	23
Communicable diseases requiring intervention.	
• Campylobacter	142
• Cryptosporidium	1
• E coli 0157	0
• Giardia	0
• Salmonella	6
• Staphylococcus aureus	0
• Shigella	0
Food Premises Inspections.	
• Premises inspections	434
• New registrations	117
Food complaints.	
• Food Unfit/Labelling etc	45
• Premises Complaints	16
Consultations – planning/building control – delayed responses.	104
Consultations – licensing – detailed responses.	26
Air Quality monitoring.	
• 4 real-time analysis sites, NO_2, SO_2, CO, O_3, PM_{10}	
• Monthly changeover of NO_2 diffusion tubes at 9 sites	

Healthcare Public Health

Every public health care system in the world has to make difficult choices of what it can provide and what it cannot provide, irrespective of how much resource it has. The scope and quality of publicly provided healthcare requires difficult choices to be made regarding what services can be afforded and what cannot. Finance of the system is a major issue, and currently there is a Financial Transformation Programme to help reduce public expenditure. Public health services can support the islands in working towards health improvement of the population from the funding available, in a fair and ethical way.

In the 110th MOH report, the health and social care system was examined and consideration given to, for example, the resources available; the reasons for pressures on expenditure; priority-setting and need for health and social care. Recommendations to improve our systems were made including; that investment decisions should not be made on a singular basis, i.e. all competing priorities should be considered when a decision is made, a framework for setting priorities is developed, and better professional and public engagement was needed.

Some good progress has been made. For instance the HSSD Board have adopted an ethical framework for making decisions. A Professional Guidance Committee involving local professional organisations has been formed with a role to advise the Board on clinical priorities, and a priority setting tool to help rank healthcare priorities has been developed. Finally, an Individual Funding Request Panel has been established which ensures requests for care, which are not normally funded, are ethically considered and a range of policies have been developed to guide decision making. HSSD is also making progress on making more explicit statements on what will and will not be funded.

Further development of this key aspect of HSSD's function is required. Some continued investment in developing the States systems will be essential if the objectives of best health and well-being are to be realised from the available finances.

Achievements:

1. Development of the HSSD priority setting processes - so that they are more robust and transparent.
2. Development of a set of health care policies which have provided greater clarity and openness about what the HSSD will and will not fund.
3. Strengthened public health input to the healthcare commissioning process.
4. Review of the renal dialysis service.

Challenges:

1. Further developing healthcare and social care priority setting across departments.
2. Engaging with the public on priority setting and developing the capacity of the public to engage in priority setting processes (this is a long term process).
3. Designing services across the patient pathway.
4. Developing more local access to sub-specialisms within tertiary services.
5. Further development of joint commissioning work with Jersey.
6. A coherent process to prioritise investments in health and social care services across departments.

Recommendation 45:	Priority setting systems in health and social care are further developed

Guernsey and Alderney deaths 2012, by Gender and Cause.[1]

	Number of deaths			
CAUSE OF DEATH (ICD-10 codes)	Male	Female	Total	% of all deaths
Cancer (C00-C97 or D00 to D48)	94	96	190	31%
Cardiovascular disease (I00-I52 or I60-I69)	83	102	185	30%
Respiratory disease (J00-J99)	25	31	56	9%
Other (any other code not included above)	78	105	183	30%
Total	**280**	**334**	**614**	**100%**

CANCER TYPE	Male	Female	Total	% of all deaths
Oesophagus (C15)	2	4	6	1%
Colon (C18)	6	6	12	2%
Pancreas (C25)	4	7	11	2%
Bronchus & lung (C34)	22	22	44	7%
Breast (C50)	0	10	10	2%
Prostate (C61)	18	0	18	3%
Other cancers	42	47	89	14%
Total	**94**	**96**	**190**	**31%**

CARDIOVASCULAR DISEASE TYPE	Male	Female	Total	% of all deaths
Acute myocardial infarction (I21)	18	19	37	6%
Chronic Ischaemic heart disease (I25)	22	19	41	7%
Cerebrovascular diseases (I60-I69)	26	32	58	9%
Other cardiovascular diseases	17	32	49	8%
Total	**83**	**102**	**185**	**30%**

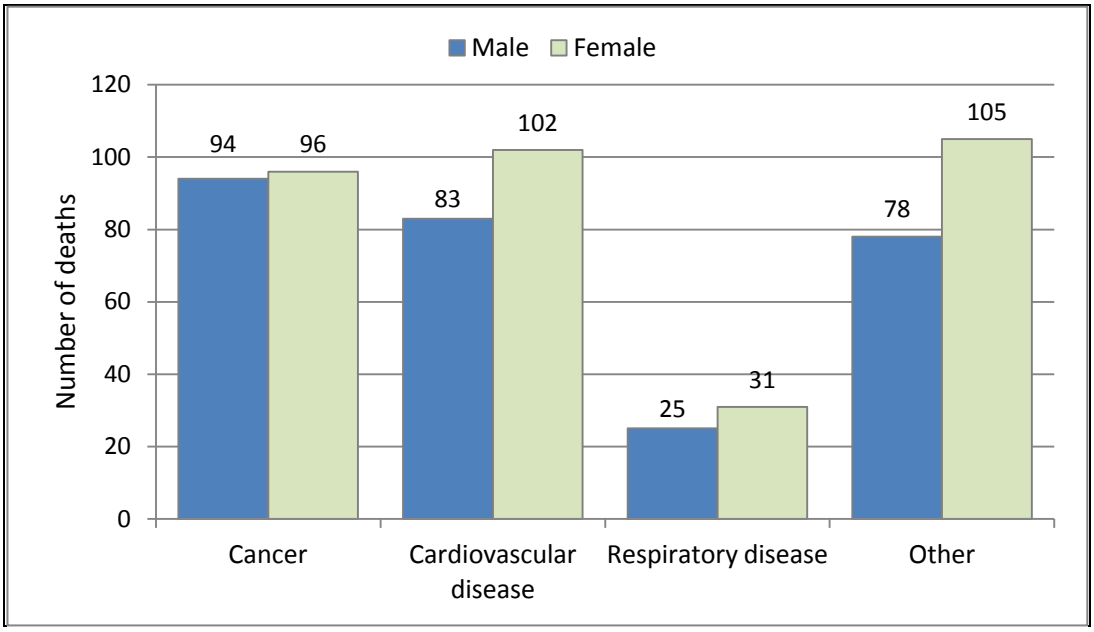
[1] Includes stillbirths.

* Provisional (includes one outstanding inquest death where an accident death cause code is expected).

RESPIRATORY DISEASE TYPE	Male	Female	Total	% of all deaths
Pneumonia (J18)	3	8	11	2%
Emphysema (J43)	2	1	3	0%
Chronic obstructive pulmonary disease (J44)	11	10	21	3%
Other respiratory diseases	9	12	21	3%
Total	**25**	**31**	**56**	**9%**

OTHER CAUSES	Male	Female	Total	% of all deaths
Unspecified dementia (F03)	10	32	42	7%
Senility ('old age') (R54)	2	8	10	2%
Chronic renal failure (N18)	2	0	2	0%
Deaths where an inquest verdict of suicide was returned (In 2011 X70 and X78)	3	0	3	0%
Accident deaths (V01-X59)	7	6*	13	2%
Other 'other causes'	54	59	113	18%
Total	**78**	**105**	**183**	**30%**

Deaths by Major Cause Group



2012 vital statistics by Island

Guernsey

	M	F	Total
Estimated mid-year population	31147	31938	63085
Live births registered	343	328	671
Stillbirths	0	2	2
Deaths (all ages)	270	315	585
Deaths under age 1	1	0	1

Alderney

	M	F	Total
Estimated mid-year population	1022	1068	2090
Births in Guernsey	3	7	10
Births in Alderney	0	2	2
Total births	3	9	12
Deaths (all ages)	10	17	27
Deaths under 1 year	0	0	0

Sark

	M	F	Total
Estimated mid-year population	not known	not known	not known
Births in Guernsey	3	5	8
Births in Sark	0	0	0
Total births	3	5	8
Deaths (all ages)	2	3	5

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- The front cover photograph of King Edward V11 Hospital shortly after its opening was copied by Sue Laker, Deputy Chief Librarian at the Priaulx Library, from a book by Nick Mahon (NM), "*Guernsey as it was*", published in 1985 with the source photograph from the Guernsey Press archive, with NM advising it is no longer in copyright.

The health of the public is everyone's business. I also thank all those who have contributed to public health initiatives, however broadly defined, over the past year.

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Deputy Chief Environmental Health Officer
Mr Tobin Cook MSc CMCIEH (from May 2012), formerly an EHO
Mr Tony Rowe (retired May 2012)
Environmental Health Officers
Charlotte Jones CMCIEH (from May 2012)
Catherine Rirsch MSc MCIEH (from Dec 2012)
Mr Stuart Wiltshire (retired June 2012)
Mr Philip Goodchild (left April 2013)
Graduate Trainee EHOs
Ruth Briggs BSc(Hons) (from Apr 2012)
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Pest Control Officers
Mr Paul Tostevin
Mr Michael Brache
Secretary
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Mr Andrew Harrington (April to Oct 2012)
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Acting Clinical Audit and Quality Manager
Mr Brian O'Connell

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Clinical Coder
Mrs Sue Sheppard

HSSD Board

From January to April 2012
Deputy Hunter Adam (Minister)
Deputy Peter Gillson (Deputy Minister)
Deputy Mary Lowe
Deputy Mike Hadley
Deputy Shane Langlois

From May to December 2012
Deputy Hunter Adam (Minister)
Deputy Barry Brehaut (Deputy Minister)
Deputy Elis Bebb
Deputy David Inglis
Deputy Arrun Wilkie

From December 2012
Deputy Mark Dorey (Minister)
Deputy Martin Storey (Deputy Minister)
Deputy Barry Brehaut
Deputy Elis Bebb
Deputy Sandra James

HSSD Corporate Management Team (2012)

Mr Mark Cooke, Chief Officer
Mr Richard Evans, Director of Corporate Services and Deputy Chief Officer
Dr Stephen Bridgman, Director of Public Health
Ms Jacqui Gallienne, Director of Health and Social Care
Mr Tom Niedrum, Director of Finance and Performance

Chief Executive, States of Guernsey

Mr Mike Brown

Previous Medical Officers of Health

Dr John Brownlee	1899-1900
Dr E Stanley Hoare	1900-1901
Dr Henry Draper Bishop	1901-1935
Dr Rowan Revell	1935-1956
Dr FRN Lynch	1956-1961
Dr ATG Thomas	1961-1969
Dr CG White	1969-1982
Dr EP Lawrence	1983-1990
Dr B Parkin (Acting MOH)	1991
Dr Peter Harker (Acting MOH)	1992-1993
Dr David Jeffs	1993-2008

GLOSSARY

Infection	“A human with an infection has another organism inside them which gets its sustenance from that person, it colonizes that person and reproduces inside them. The human with that organism (germ) inside is called the host, while the germ or pathogen is referred to as a parasitic organism. Another name for an organism that causes infection is an infectious agent. It is only an infection if the colonization harms the host. It uses the host to feed on and multiply at the expense of the host to such an extent that his/her health is affected. The normal growth of the bacterial flora in the intestine is not an infection, because the bacteria are not harming the host. An organism which colonizes and harms a host's health is often called a pathogen. Examples include, prions, viruses, bacteria, fungi, worms.” Nordqvist (2013).
Colonisation	Colonisation means the presence of microorganisms on skin, on mucous membranes, in open wounds, or in excretions or secretions but are not causing adverse clinical signs or symptoms (CDC 2013).
Contagious Disease	A disease spread from one person or organism to another.
Contagious Person	Having a disease that can be transmitted by contact with other people.
Health gain	An increase in the measured health of an individual or population, including length and quality of life (WHO 1999).
Health potential	The fullest degree of health that an individual can achieve. Health potential is determined by caring for oneself and others, by being able to make decisions and take control over one’s life, and by ensuring that the society in which one lives creates conditions that allow the attainment of health by all its members (WHO 1999).
Zoonosis	A disease transmitted from animals, not humans.

ABBREVIATIONS

AIDS	Acquired Immunodeficiency Syndrome
HIV	Human Immunodeficiency Virus
HPV	Human Papilloma Virus
HSSD	Health and Social Services Department
MOH	Medical Officer of Health
OEPHR	Office of Environmental Health and Pollution Regulation
PEH	Princess Elizabeth Hospital, Guernsey
HCAI	Healthcare-associated infection

FIGURES, TABLES AND PHOTOGRAPHS

FIGURES

TABLES

PHOTOGRAPHS

RECOMMENDATIONS SUMMARY

Recommendation 1 : **Page 9**	Financial support will be required if the island wishes to be as well prepared for the next pandemic as neighbouring jurisdictions.
Recommendation 2 : **Page 9**	Other health professionals, in addition to doctors, should have a statutory duty to notify certain infectious diseases.
Recommendation 3 : **Page 9**	Agencies such as laboratories should have a statutory duty to notify the MOH of causative agents which are a significant hazard to public health.
Recommendation 4 : **Page 12**	To reduce the risk of *Campylobacter*; meat, especially poultry should be cooked until piping hot in the middle; raw meat, especially poultry, should be separated from other foods; eggs should be cooked thoroughly; hands should be washed before eating, especially if in contact with farm animals.
Recommendation 5: **Page 16**	Acute Rheumatic Fever and First episode of Rheumatic Heart Disease are made notifiable diseases.
Recommendation 6: **Page 19**	All pregnant women and infants are immunised against pertussis, midwives and doctors should record the reasons for eligible women and infants not being immunised and report these to the MOH.
Recommendation 7 : **Page 24**	Ways of sharing information between the Guernsey Border Agency and the MOH on people migrating from high incidence TB countries are explored.
Recommendation 8 : **Page 28**	Child Health information systems to be improved so that population immunisation statistics can be compared with other jurisdictions, and unimmunised individual children can be identified to enable targeted interventions if there is an outbreak or a serious risk of an outbreak.
Recommendation 9 :	Parents ensure their children receive timely immunisation against measles, but even if their

Page 28	children have missed routine immunisations they should be encouraged to have them vaccinated.

Recommendation 10 : **Page 28**	Single agent vaccines for measles are not recommended and should be discouraged by health professionals.

Recommendation 11 : **Page 34**	A local rotavirus surveillance scheme to monitor immunisation coverage and rotavirus infections should be considered.

Recommendation 12 : **Page 37**	The introduction of universal childhood hepatitis B immunisation, as advised by the WHO, is considered.

Recommendation 13 : **Page 40**	A Chlamydia screening programme is introduced to improve health and save public money.

Recommendation 14 : **Page 41**	Sexual health strategy is enhanced.

Recommendation 15 : **Page 42**	Consideration should be given to the introduction of HPV vaccination for boys as well as girls.

Recommendation 16 : **Page 44**	Alderney practices consider participation in flu-like illness surveillance.

Recommendation 17: **Page 45**	HSSD review the adequacy of its systems as a response to WHOs recommendation on strengthening surveillance.

Recommendation 18 : **Page 46**	Disease surveillance and universal vaccination against chickenpox should be considered.

Recommendation 19 : **Page 49**	A child flu influenza immunisation programme should be considered.

Recommendation 20 :	Immunisations should be reported to the MOH to

Page 50	enable monitoring of population coverage.
Recommendation 21 : **Page 51**	The States of Guernsey consider a pre-pandemic vaccine agreement.
Recommendation 22: **Page 60**	Businesses should follow the Guernsey HSE Approved Code of Practice and guidance to reduce *Legionella* risk, and householders should also be aware of risk and how to reduce it.
Recommendation 23: **Page 62**	Alderney should consider participation in a scheme to check bathing water quality.
Recommendation 24 : **Page 63**	The States should ensure that there are sufficient resources in Disease Surveillance and Port Health to meet its International Health Regulation responsibilities
Recommendation 25 : **Page 65**	Regulation of infection control is extended to all healthcare facilities.
Recommendation 26 : **Page 69**	Audit of compliance of antibiotic prescribing against standards is considered in primary care.
Recommendation 27 : **Page 69**	Antibiotic use in rearing livestock for growth promotion and routine disease prevention in food animals should end worldwide, requiring all antibiotics in food animals to be given under veterinary supervision.
Recommendation 28 : **Page 70**	The MOH should continue to have a statutory role in providing public health advice to the Education Department.
Recommendation 29 : **Page 71**	Residents know and practice good hygiene to prevent infections through respiratory, gastrointestinal and sexual routes, in particular.
Recommendation 30 :	Event organisers, including sports clubs, consider

Page 84	running more alcohol free events, especially if children are involved.

Recommendation 31 : **Page 84**	The States of Guernsey and Alderney set an example by introducing a policy to not publicly fund any alcoholic beverages.

Recommendation 32: **Page 86**	People who decide to drink alcohol should follow lower risk guidelines, and should have at least 2 to 3 alcohol free days a week.

Recommendation 33: **Page 91**	Children under 15 years should not drink alcohol.

Recommendation 34: **Page 93**	Develop brief alcohol interventions.

Recommendation 35: **Page 93**	Explore use of routine primary care data for population measures of liver disease.

Recommendation 36: **Page 93**	Explore use of a traffic light system to detect chronic liver disease in primary care.

Recommendation 37 : **Page 96**	Ensure alcohol excise duty at least keeps pace with inflation.

Recommendation 38 : **Page 96**	The Bailiwick introduces a policy for a minimum unit price for alcohol.

Recommendation 39 : **Page 96**	Improve the protection of our children from the harmful effects of alcohol advertising and marketing, working with UK jurisdictions.

Recommendation 40 : **Page 102**	Public health to explore how to work more closely with healthcare providers to seek additional ways to work with primary and secondary care to monitor obesity and overweight in our community.

Recommendation 41 : **Page 108**	The second phase of the Obesity Strategy is funded.

Recommendation 42: **Page 108**	The existing obesity strategy is updated in the light of recent evidence.

Recommendation 43: **Page 108**	A transport strategy is adopted which helps people choose active transport for everyday activities like transport to work and school.

Recommendation 44: **Page 110**	An action plan is developed to reduce the health impact of viral hepatitis in the islands as a spend to save initiative.

Recommendation 45: **Page 127**	Priority setting systems in health and social care are further developed.

114th ANNUAL MOH/DPH/CMO REPORT Bailiwick of Guernsey

HEALTH AND SOCIAL SERVICES
A STATES OF GUERNSEY GOVERNMENT DEPARTMENT