



Communicable Disease Surveillance Centre
(Northern Ireland)



Review of
..... Communicable
Diseases 1999

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This is the first annual report from the Communicable Disease Surveillance Centre for Northern Ireland (CDSC (NI)). It describes how surveillance of communicable disease is undertaken in Northern Ireland and some of the major trends in communicable disease in recent years. This report does not attempt to describe in detail the wide range of organisms or infectious diseases which were reported during 1999, instead the emphasis is on highlighting significant changes in the pattern of certain infections, particularly where Northern Ireland is at variance with other parts of the UK.

Surveillance is about providing information for action. This report will illustrate how surveillance information can and is being used for public health action. In some instances the reasons behind a significant change in the pattern of infection or why the incidence in Northern Ireland differs from elsewhere in Great Britain remains unclear. This will be the focus of further investigation.

The control of communicable disease involves not just doctors and nurses but individuals from a wide variety of background e.g. farmers, vets, water engineers, environmental health officers and those working in the food industry. It is hoped that this report, while primarily aimed at a professional audience, would be of interest to consumer groups and members of the public.

This report is primarily based on information received from clinicians, hospital laboratories, consultants in communicable disease control and environmental health officers. Northern Ireland is fortunate to have a tradition of voluntary central reporting of laboratory confirmed infections and CDSC (NI) acknowledges the contribution of laboratories and other organisations to regional surveillance of communicable disease.

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Regional Epidemiologist



Communicable Disease Surveillance Centre (Northern Ireland)

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In 1998 the Chief Medical Officer reported on a major review of communicable disease control in the Province. Included among the review's recommendations was that the Department of Health, Social Services and Public Safety (DHSS&PS) should establish a Regional Communicable Disease Epidemiology Unit, independent of but reporting to the DHSS&PS, to assist it in fulfilling its role in the control of communicable diseases. The Unit was to be established in 12-18 months.

The DHSS&PS subsequently entered into an agreement with the Public Health Laboratory Service-Communicable Disease Surveillance Centre (PHLS-CDSC) to provide this regional service. CDSC provides a similar regional service throughout England and Wales.

CDSC (NI) is based at the Belfast City Hospital, on the same site as the Northern Ireland Public Health Laboratory. Staff were appointed during the second quarter of 1999 and the Unit became fully operational in its new accommodation in August.

The key elements of the service to be provided by CDSC (NI) include:

1 Surveillance of Communicable Disease

This includes monitoring changes in the incidence, prevalence and patterns of communicable disease in the Province and ensuring that relevant information is communicated in a timely manner to consultants in communicable disease control (CsCDC), microbiologists and others involved in the prevention, investigation and control of communicable disease. Surveillance information is published in a monthly report, which is widely disseminated throughout the Province, to other national centres in Great Britain and Ireland and to the World Health Organisation (WHO) in Geneva.

The surveillance function transferred during 1999 from DHSS&PS to CDSC (NI) and will be enhanced through developments in information technology. The PHLS strategy is for an integrated system for national, regional and local surveillance, through the implementation of CoSurv. This is a laboratory based computer software system which will facilitate the electronic transmission of data from microbiology laboratories to the local CCDC as well as to the Regional Epidemiology Unit for onward transmission to the national centre at Colindale in north London. This avoids the need for multiple entry of the same data. The initial step was the installation of the regional module or database of CoSurv during June/July 1999 in CDSC (NI) onto which the current paper based laboratory reports are then entered. A pilot study is currently underway installing CoSurv in two laboratories and in two of the Health and Social Services Boards. The results of this pilot will inform the rollout of CoSurv to all laboratories and Boards over the next twelve months.

With CDSC (NI) being part of the PHLS it is now much easier for Northern Ireland to participate in a range of national surveillance programmes. Northern Ireland is now

participating, with other regions in England and Wales, in enhanced national surveillance programmes for meningococcal infection and tuberculosis. This facilitates the collection of epidemiological and microbiological data in a common format permitting comparisons to be made between the various regions of the UK. These enhanced surveillance programmes are described in greater detail later in this report.

2 Advice and support to DHSS&PS, Health and Social Services Boards and Trusts

This will be on a range of communicable disease issues and will include:

- Contributing to policy development and guidance. Surveillance information, both local and national, should inform communicable disease policy and guidance.
- Assisting in the assessment of local arrangements.

The Unit is represented on the newly established Regional Advisory Committee on Communicable Disease Control and many of its sub-committees. The remit of the Regional Committee is to advise the Department, through the Chief Medical Officer, on matters relating to communicable disease control. The Committee, which is multi-disciplinary and inter-agency, has an independent advisory, consultative and monitoring role.

3 Advice and support to professionals

This includes twenty-four hour advice and support to the Chief Medical Officer and Directors of Public Health (DsPH). The DPH of each Health and Social Services Board has the statutory responsibility for the control of communicable disease in his/her area and this is normally delegated to the CCDC.

CDSC (NI), working closely with PHLS colleagues nationally, provides practical support in the management of incidents/outbreaks and, in particular, contributes to the co-ordination of incidents that straddle area, regional or national boundaries. During 1999 CDSC (NI) participated in several Outbreak Control Teams.

4 Training and the promotion of professional standards

Control of communicable disease involves staff from a wide range of backgrounds e.g. laboratory, environmental health, general practice, nursing and animal health. Thus training programmes should reflect this multi-professional and inter-agency input.

CDSC (NI) will be exploring with local universities and other training bodies how it can contribute to undergraduate and postgraduate training. It already contributes to medical undergraduate and postgraduate teaching and to infection control training programmes in specific Trusts.

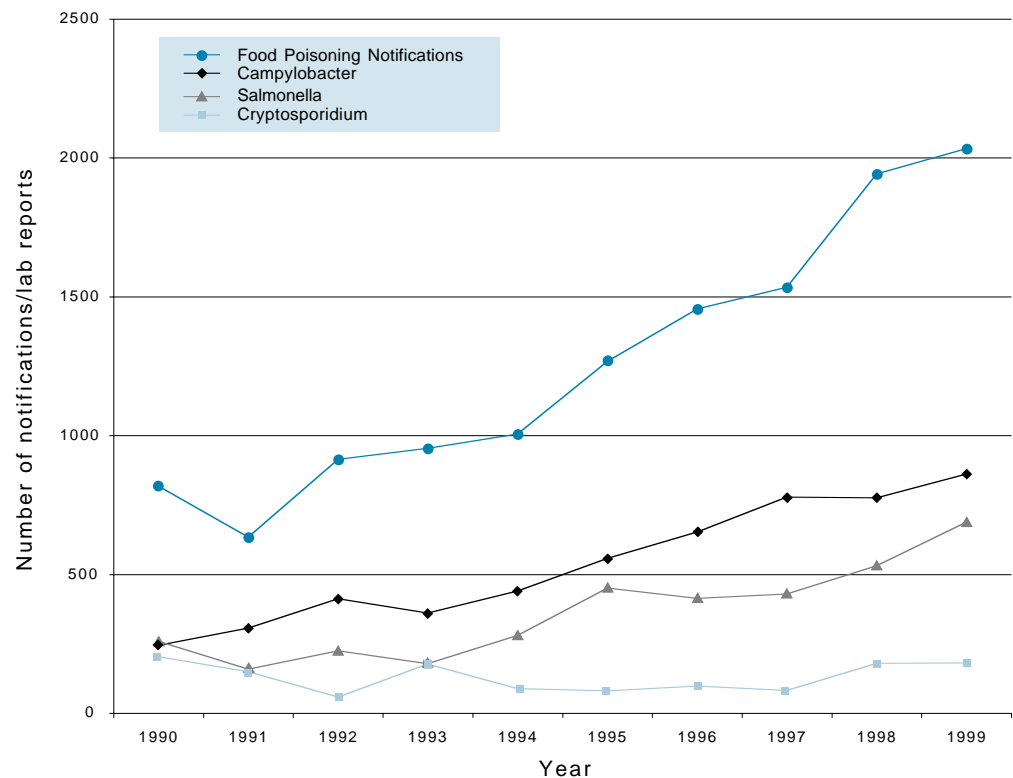
5 Research

The Unit will facilitate and undertake research to support effective control of communicable disease. This could include future short-term attachments/secondments to CDSC (NI) for work on specified projects as well as actively seeking research funds. The Unit is establishing links with the Medical School and earlier this year a medical student was attached to the Unit and undertook a Special Study Module on the local epidemiology of *E. coli* O157 infection.

Food borne and gastrointestinal infections

Food poisoning notifications in Northern Ireland have risen each year from 1992 -1999. In 1999 there were 2,033 such notifications – almost 2.5 times more than the number notified in 1990. Whilst an increased awareness among doctors of their statutory duty to notify such cases to their local Director of Public Health may be a contributory factor, laboratory reports of campylobacter and salmonella have also increased over this period, implying an underlying real increase in the number of food poisoning cases. One of the highest increments was between 1997 and 1998 (27% increase), when there were a number of large outbreaks of food poisoning; however the increment from 1998 to 1999 is the second lowest of the decade (5% increase). In 1999 the incidence of food poisoning in Northern Ireland was lower than in England and Wales and Scotland – approximately 120 notifications per 100,000 population compared to 165 and 168 respectively (provisional figures for England and Wales and Scotland).

Figure 3.1:
Food Poisoning: Notifications and laboratory reports, 1990-1999, Northern Ireland



Source: DHSS&PS, CDSC (NI)

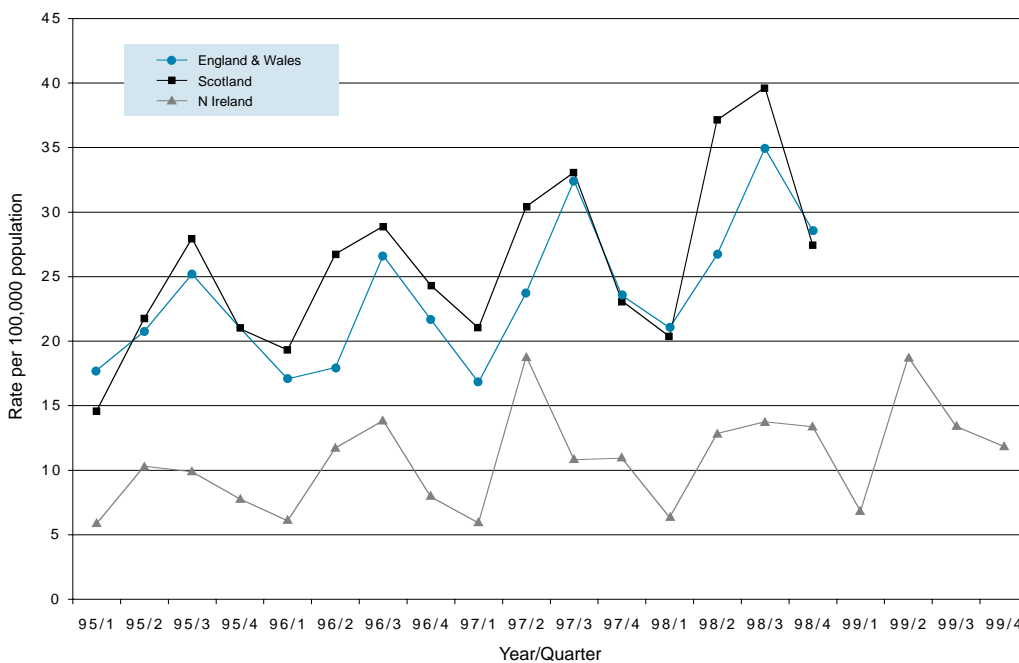
Campylobacter

Campylobacteriosis is an acute enteric bacterial infection characterised by diarrhoea, abdominal pain, malaise, fever, nausea and vomiting. The illness usually lasts no more than ten days and is frequently over within two to five days.

Animals, most frequently cattle and poultry, are carriers of the organism and transmission to man is mainly foodborne. This includes unpasteurised milk and water, or from direct contact with infected animals. Cross-contamination of foods can occur when uncooked poultry are handled with cooked food on common cutting boards or when shared utensils are used in food preparation. However, in most cases a definite source is not identified.

Reports of campylobacter infection first exceeded reports of salmonella infection in Northern Ireland in 1991, and campylobacter remains the single most common form of bacterial food poisoning with 861 reports in 1999 compared to 688 reports of salmonella infection. Reports increased steadily from 1993 to 1997 with an average annual increment of 21%. There was a very small decrease in numbers between 1997 and 1998, but reports increased by 11% in 1999. Reports of campylobacter infection peak in the early summer.

Figure 3.2:
Campylobacter: Quarterly rate of faecal isolates, 1995-1999, England & Wales, Scotland & Northern Ireland



Source: CDSC (Colindale), SCIEH, CDSC (NI)

1999 data for England & Wales, and Scotland are not available at time of going to press.

The incidence of campylobacter infection in Northern Ireland is lower than in England and Wales, and Scotland, but the reasons for this have never been fully explained.

Salmonella

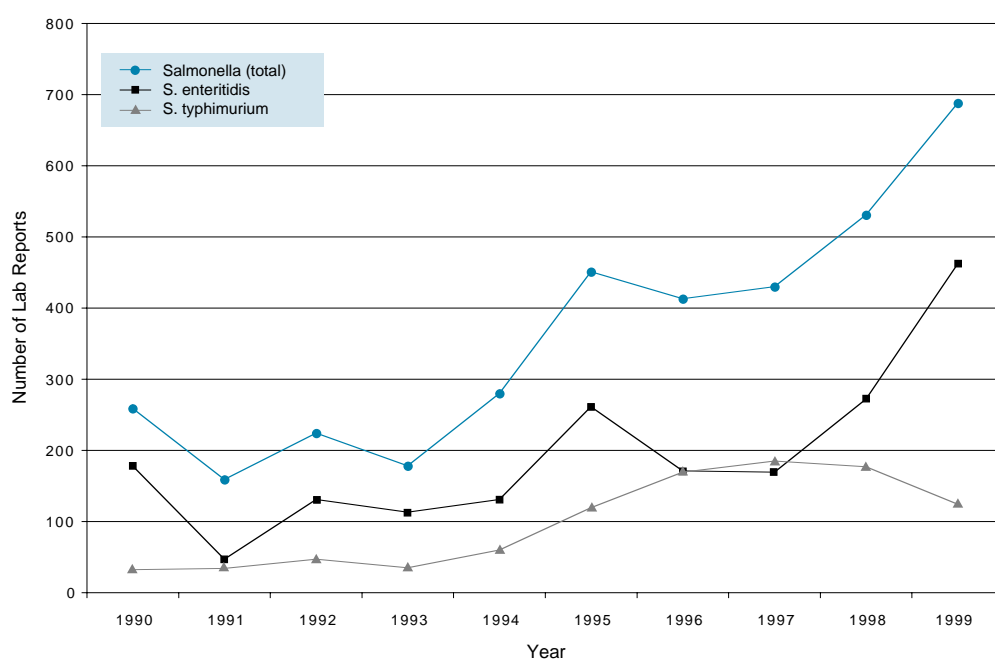
Salmonellosis is a bacterial disease commonly manifested by an acute enterocolitis, with sudden onset of headache, abdominal pain, diarrhoea, nausea and sometimes vomiting; fever is almost always present. Dehydration, especially among young infants, may be severe as diarrhoea often persists for several days. Infection may begin in the gastro-intestinal tract and develop into septicaemia or focal infection. Severity of the disease depends on the

serotype. Whilst it is not often fatal, except in the very young, the very old and the debilitated, the morbidity and associated costs of salmonellosis may be high.

The predominant mode of transmission is consumption of contaminated food. These include raw and undercooked eggs and egg products, unpasteurised milk and raw milk products, meat and meat products, poultry and poultry products. It can also be passed from person to person by faecal-oral spread, especially when diarrhoea is present and from exotic reptiles kept as pets.

Information on 688 human isolates was collected during 1999. *Salmonella enteritidis* and *S. typhimurium* serotypes were responsible for approximately 85% of all isolates in 1999. Together they have consistently accounted for at least 80% of all salmonella isolates in Northern Ireland from 1995. Reports of *Salmonella typhimurium* exceeded reports of *Salmonella enteritidis* only once during the past decade, in 1997, and then began to decline.

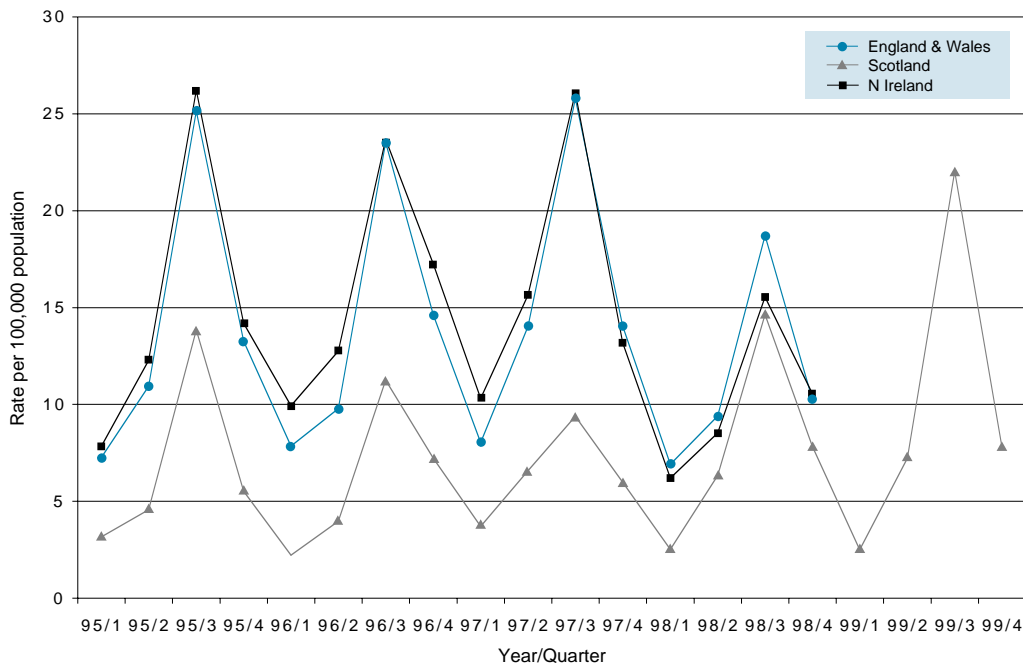
Figure 3.3:
Laboratory reports of Salmonella, 1990-1999, Northern Ireland



Source: CDSC (NI)

There has been a marked increase in salmonellosis with 688 reports in 1999 compared to 531 in 1998 (an increase of 30%). The increase has been largely due to an increase in *Salmonella enteritidis* phage type 4. Reports of this phage type have increased by 92% between 1998 and 1999. Laboratory reports of salmonella and *Salmonella enteritidis* phage type 4 are the highest on record. In 1999 *Salmonella enteritidis* phage type 4 accounted for 58% of all reported salmonella infection in Northern Ireland compared to 39% the previous year. Reports of salmonella peak in the summer quarter.

Figure 3.4:
Salmonella: Quarterly rate of faecal isolates, 1995-1999, England & Wales, Scotland & Northern Ireland

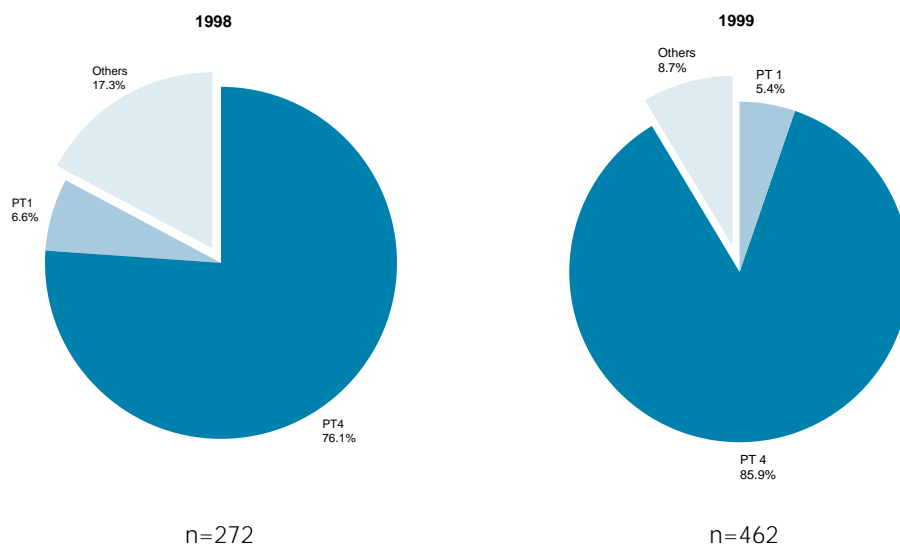


Source: CDSC (Colindale), SCIEH, CDSC (NI)

1999 data for England & Wales, and Scotland are not available at time of going to press.

The most frequently isolated phage type of *Salmonella enteritidis* is phage type (PT) 4. In 1999 it accounted for 86% of *S. enteritidis* isolations and 58% of all reported salmonella infections in Northern Ireland.

Figure 3.5:
Salmonella enteritidis phage types reported, 1998 & 1999, Northern Ireland

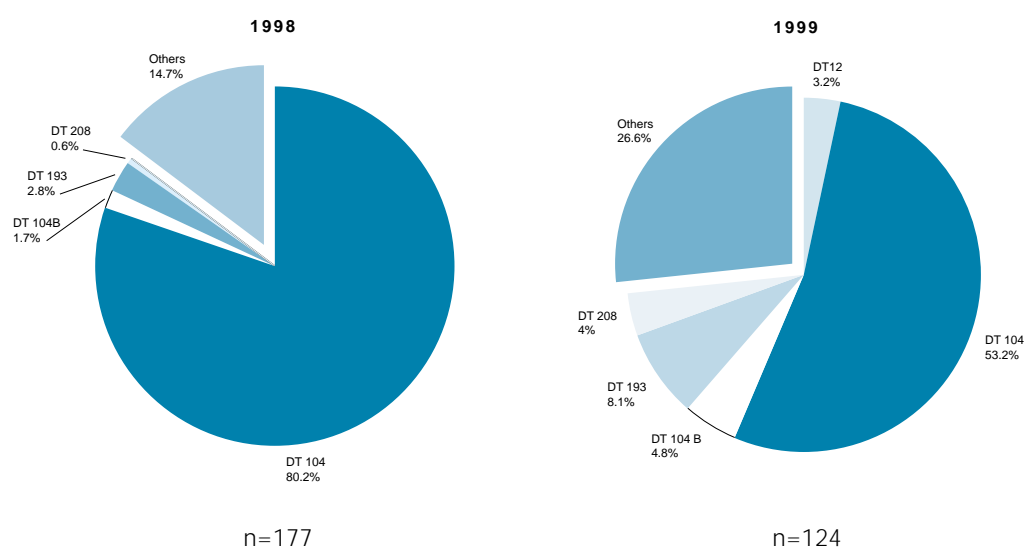


Source: CDSC (NI)

During 1999 there were six outbreaks of *Salmonella enteritidis* PT4 infection involving 54 confirmed cases (Table 3.2). These represented 14% of all cases of *Salmonella enteritidis* PT4 infection that year.

The most frequently isolated phage type of *Salmonella typhimurium* is definitive type (DT) 104, which has accounted for between 49-80% of all *S. typhimurium* isolates each year since 1995. Laboratory reports of *Salmonella typhimurium* fell from 177 in 1998 to 124 in 1999 (30% decrease). Reports of *Salmonella typhimurium* DT 104 fell by 54% from 142 to 66 between 1998 and 1999.

Figure 3.6:
Salmonella typhimurium phage types reported, 1998 & 1999, Northern Ireland



Source: CDSC (NI)

Table 3.1 lists serotypes for which more than one report was received from 1995 to 1999. *Salmonella enteritidis* and *Salmonella typhimurium* are consistently the top two serotypes with *Salmonella bredeney* being amongst the top five each year. *Salmonella virchow*, *agona* and *hadar* each make regular appearances in the five most frequently reported serotypes. A full list of all salmonella serotypes reported from 1992 to 1999 is contained in Appendix IV.

Table 3.1:

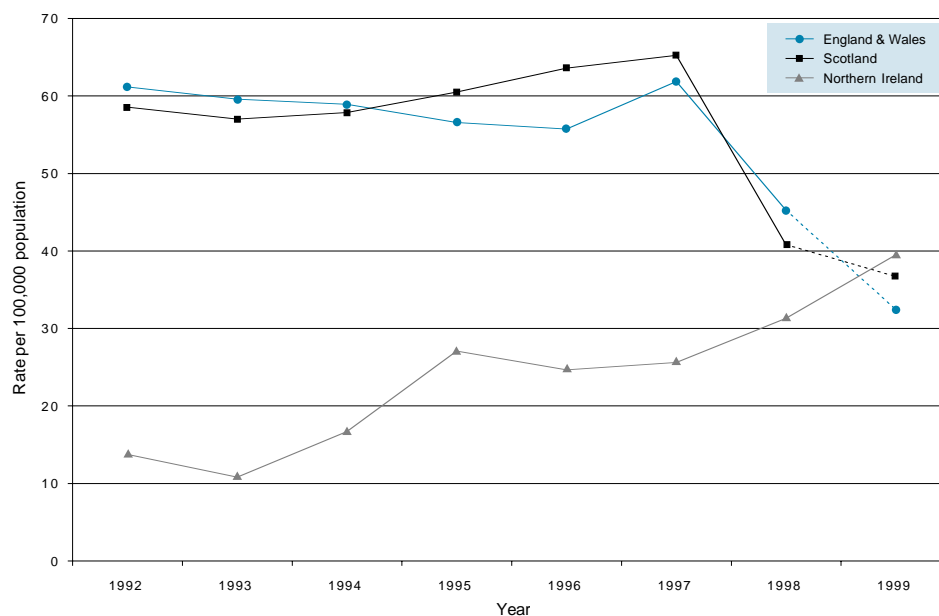
Top salmonella serotypes, 1995 – 1999, Northern Ireland

1995 Total Salmonella	451	1996 Total Salmonella	413	1997 Total Salmonella	430	1998 Total Salmonella	531	1999 Total Salmonella	688
enteritidis	261	enteritidis	171	typhimurium	185	enteritidis	272	enteritidis	462
typhimurium	119	typhimurium	169	enteritidis	169	typhimurium	177	typhimurium	124
agona	11	virchow	13	bredeney	20	virchow	15	virchow	12
bredeney	9	bredeney	10	hadar	7	hadar	7	bredeney	10
virchow	8	agona	7	agona	5	bredeney	4	hadar	6
heidelberg	5	hadar	5	bareilly	4	corvallis	3	braenderup	5
kentucky	4	dublin	3	heidelberg	4	dublin	3	agona	4
infantis	3	newport	3	virchow	4	oranienburg	3	heidelberg	4
saint-paul	3	bovis-morbificans	2	kentucky	3	aberdeen	2	java	4
braenderup	3	heidelberg	2	newport	3	agona	2	stanley	4
dublin	2	kottbus	2	panama	2	heidelberg	2	thompson	4
schwarzengrund	2	schwarzengrund	2	remo	2	infantis	2	anatum	2
		stanley	2	stanley	2	muenchen	2	hidalgo	2
				thompson	2	newport	2	infantis	2
						saint-paul	2	mbandaka	2
						schwarzengrund	2		
						stanley	2		
						weltevreden	2		

Source: CDSC (NI)

Not all salmonella isolates in Northern Ireland were recovered from faeces; systemic infection was reported in eighteen cases in 1999. Fifteen isolates of salmonella were cultured from blood, three from blood and faeces, and three from other sites. Of the eighteen cases of salmonella bacteraemia, thirteen were caused by *Salmonella enteritidis* PT 4, whilst the remaining five were caused by *Salmonella bredeney*, *Salmonella enteritidis* PT 1, *Salmonella enteritidis* PT 6a, *Salmonella typhimurium* DT 104 and an unnamed serotype. The reported cases of salmonella bacteraemia demonstrate the severity of illness which can be associated with salmonella.

Figure 3.7
Salmonellosis – Faecal isolations, excluding *S. typhi* and *S. paratyphi*, 1992 – 1999,
England & Wales, Scotland and Northern Ireland



Source: CDSC (Colindale), SCIEH, CDSC (NI)

1999 data is provisional for England & Wales and Scotland

From 1992 until 1996 the incidence of salmonellosis declined in England and Wales, peaked in 1997 and exhibited a marked decrease in 1998. Similar trends were noted in Scotland. Provisional data for these countries suggest a further decrease in the incidence of salmonellosis in 1999. In England and Wales just over 17,000 salmonella infections were reported in 1999, 27% less than in 1998, and the lowest level recorded since 1986. The reasons for this decrease may include improvements in food hygiene and vaccination of poultry flocks. This is currently being investigated.

The situation in Northern Ireland is quite different. The incidence of salmonella infection has increased each year since 1996. There were 40 cases reported per 100,000 population in 1999 – almost three times the rate recorded in 1992. Whilst this is some way off the pre-1998 rates for England & Wales and Scotland, the overall incidence of salmonellosis in Northern Ireland exceeded the rest of the UK for the first time in 1999.

Some of the sporadic cases of *Salmonella enteritidis* PT4 infection and three of the six food poisoning outbreaks associated with this phage type were linked to the consumption of raw or lightly cooked eggs/egg dishes. The Chief Medical Officer has advised the public in recent years of the risks of eating raw eggs:

"everyone should avoid eating raw eggs and home-made uncooked egg dishes such as mayonnaise or mousses. In addition, for those people who are sick, elderly, pregnant or prepare food for toddlers and babies, any eggs should be thoroughly cooked until the white and yolk are solid. For recipes which require eggs to be only partially cooked or not cooked at all, pasteurised egg products should be used."

A survey undertaken in 1996/97 by the Northern Ireland Public Health Laboratory and local environmental health departments¹ examined the shells and contents of approximately 2,000 packs of six raw eggs from shops in Northern Ireland for the presence of salmonella. Nine isolates were detected from separate packs of eggs (0.4%). Three of these isolates were of *Salmonella enteritidis* of which two were *Salmonella enteritidis* PT 4. Extrapolating results from the survey the authors concluded that over 10,000 boxes containing one or more contaminated eggs may be sold in Northern Ireland each year. In view of the marked rise in *Salmonella enteritidis* over the past two years it would be desirable to repeat the survey, using a similar methodology, to determine any change in the prevalence of salmonella in raw shell eggs.

Cryptosporidiosis

Cryptosporidiosis is a parasitic infection which causes profuse watery diarrhoea, abdominal pain and fever. In those with an intact immune system cryptosporidiosis is a self-limiting illness lasting 2-3 weeks, but in those with an impaired immune system the clinical course is prolonged and fulminant and can be fatal. As yet there is no specific treatment. It also causes watery diarrhoea in animals.

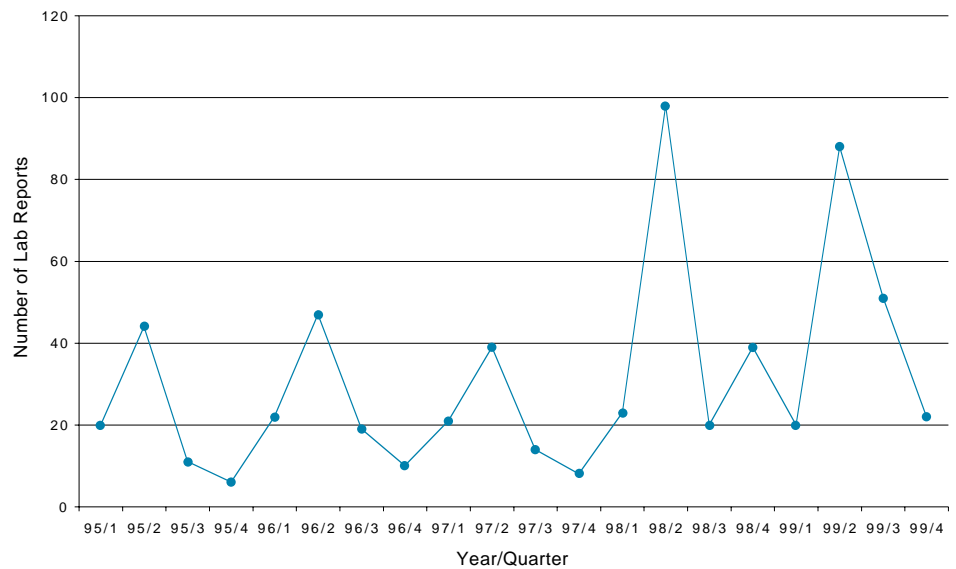
Human infection can be passed from person to person and also from animals to man. Waterborne transmission is increasingly recognised as a major source of infection. In the period 1988-1998 there have been twenty five reported outbreaks of cryptosporidiosis in the UK that have been associated with the consumption of public drinking water supplies.²

There have been seven reported outbreaks of cryptosporidiosis associated with swimming pools in England and Wales between July and December 1999.³ This is a much higher rate than in previous years. There have been no reports of similar outbreaks in Northern Ireland.

Laboratories in Northern Ireland began to routinely test for cryptosporidiosis in 1990; 204 reports were received in that year, but have not reached that level subsequently. Numbers of reports fluctuated between 1990 and 1993, but remained constant thereafter until 1997, with an average annual total of 88. In 1998 reports increased by 120% to 180 with a similar number of reports in 1999.

Reports of cryptosporidium peak in the spring, prior to the increase in campylobacter and salmonella reports.

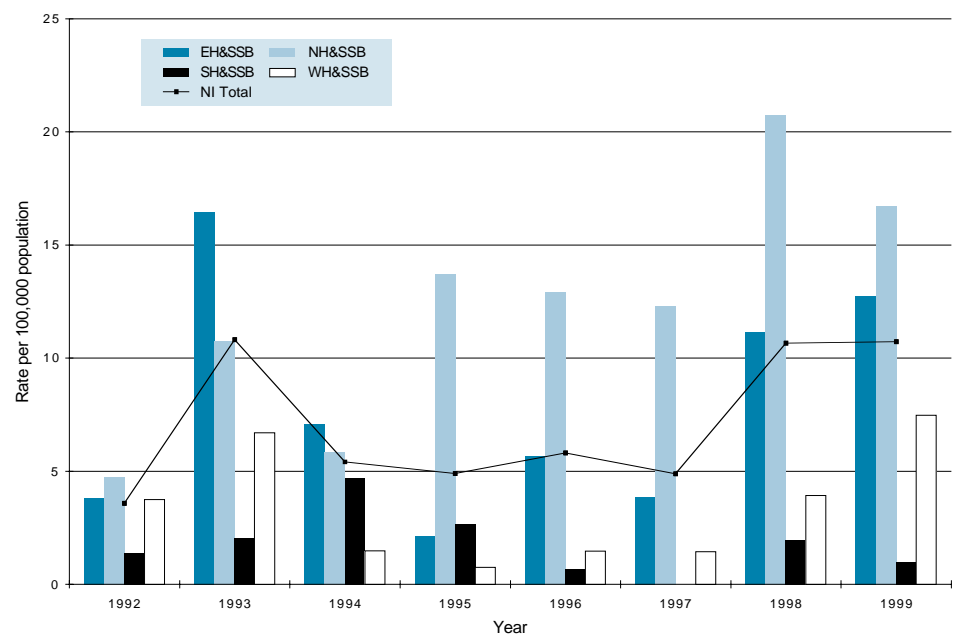
Figure 3.8:
Laboratory reports of cryptosporidium by quarter, 1995-1999, Northern Ireland



Source: CDSC (NI)

Analysis of cryptosporidium laboratory reports by the patient's Board of residence reveals markedly different rates of infection. In recent years the Northern Board has had a much higher rate of infection compared to the other Boards. There is considerable variation among laboratories as to how they examine specimens for the presence of the parasite. Some laboratories will screen all faecal specimens, others screen faecal specimens from children and others only on specific request. Thus great care is needed when interpreting these rates. It is unlikely that the rate of cryptosporidiosis in one rural area is 3-4 times higher than in another rural area. It is considered that much of the inter-Board variation is due to different laboratory practices. There is a need for all clinical laboratories to adopt a similar methodology when examining faecal specimens for cryptosporidium.

Figure 3.9:
Rate of laboratory reports of cryptosporidium by Health and Social Services Board of residence, 1992-1999, Northern Ireland



Source: CDSC (NI)

Escherichia coli O 157

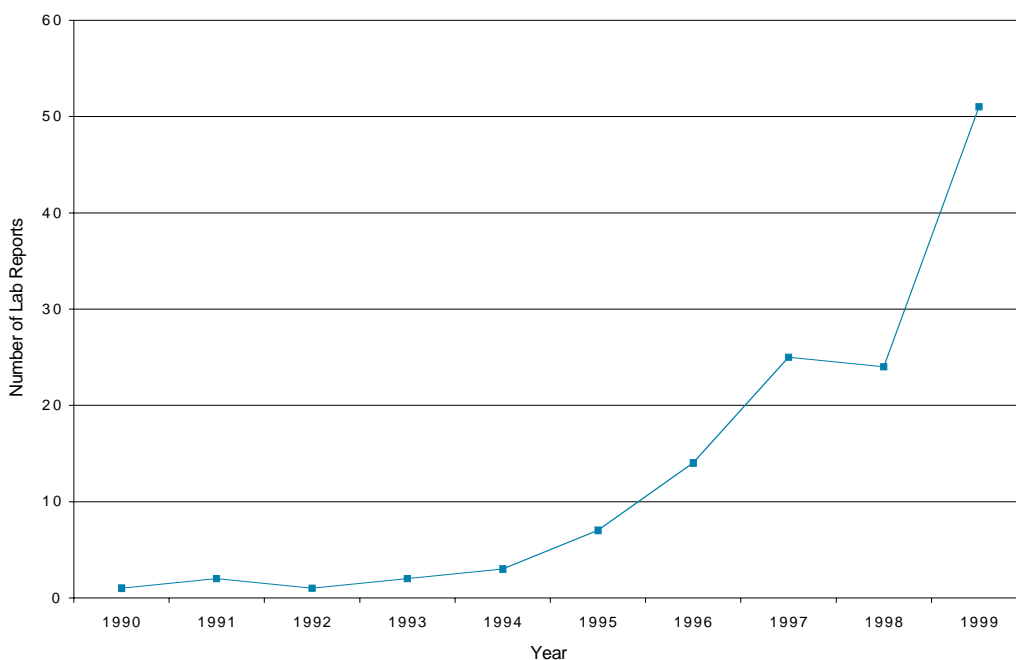
Escherichia coli is a bacterium, many types of which live harmlessly in the gastro-intestinal tracts of humans and animals. However certain strains are pathogenic and can cause gastro-intestinal disease and other complications. *E. coli* O 157:H7 was first identified as a cause of human illness in 1982 in patients affected in two outbreaks of bloody diarrhoea in the USA, both associated with eating undercooked hamburgers. There have since been numerous and increasing reports worldwide associated with the organism.

E. coli O 157:H7 is often toxin producing and is highly virulent. Relatively few organisms are required to cause illness in man and is potentially a more serious form of foodborne infection than salmonella or campylobacter.

Transmission occurs by means of contaminated food, most frequently poorly cooked beef and raw milk. Outbreaks in the UK have been associated with minced beef, milk, yoghurt and water. It can also be spread from person to person, probably by the faecal-oral route, and this has been responsible for outbreaks of infection among high risk settings such as hospitals, child care centres and nursing homes.

Laboratory reports of *E.coli* O 157 in Northern Ireland have increased from 24 reports in 1998 to 51 in 1999 (113% increase). There were no reported *E. coli* O 157 clusters or outbreaks reported during 1999.

Figure 3.10:
Laboratory reports of *Escherichia coli* O 157, 1990-1999, Northern Ireland



Source: CDSC(NI)

Since 1998 a descriptive study of *E. coli* O 157 in Northern Ireland is being undertaken in conjunction with the CsCDC. This study will combine demographic data, symptoms, dietary history, environmental factors and microbiological data. An interim report of cases reported in 1998-99 will be available later this year and will provide a more complete picture of *E. coli* O 157 infection in Northern Ireland.

Foodborne and other Gastrointestinal Outbreaks 1999

Table 3.2 describes outbreaks reported by CsCDC to CDSC (NI) in 1999.

There were nine foodborne outbreaks: three viral and six due to *Salmonella enteritidis* PT 4. One hundred and sixteen individuals were known to be affected in these incidents with the causative organism being detected in sixty five people. The suspect food vehicle in all the food borne outbreaks was derived from descriptive studies. The causative organism was not detected in samples of the suspect food.

An egg producer supplied eggs to two restaurants, both of which were associated with an outbreak of *Salmonella enteritidis* PT 4. Samples taken from the producer's premises were positive for salmonella.

In two outbreaks associated with small round structured viruses (SRSV), foodhandlers were considered to be the source of infection. SRSV was detected in three catering staff who had a recent history of gastrointestinal illness.

SRSV is a common cause of gastro-enteritis in hospitals and other institutions. At least one hundred and seventy patients and staff were associated with five reported SRSV outbreaks. In these outbreaks the main route of transmission was considered to be person to person spread.

Table 3.2:
Food borne and other Gastrointestinal Outbreaks 1999, Northern Ireland

Food borne Outbreaks

HSSB	Organism	Place of Outbreak	Month	No. ill	+ve Cases	Suspect Vehicle	Evidence
EHSSB	SRSV	Hotel	Jan	23	3	Infected Food Handler	D
EHSSB	SRSV	Restaurant	Mar	7	7	Infected Food Handler	D
EHSSB	<i>S. enteritidis</i> PT 4	Sandwich Bar	April	13	14	Chicken	D
WHSSB	<i>S. enteritidis</i> PT 4	Bakery	July	26	20	Cream the only common food	D
EHSSB	<i>S. enteritidis</i> PT 4	Chinese Restaurant	Aug	10	7	Egg fried rice	D
SHSSB	<i>S. enteritidis</i> PT 4	Chinese Restaurant	Aug	n/a	5	Egg fried rice/chicken curry	D
SHSSB	<i>S. enteritidis</i> PT 4	Restaurant	Aug	n/a	3	Battered chicken with egg	D
NHSSB	<i>S. enteritidis</i> PT 4	Chinese Restaurant	Oct	7	5	No common food/raw eggs used	D
EHSSB & WHSSB	Small round virus	2 Restaurants	Dec	30	1	Oysters	D

Other Gastrointestinal Outbreaks

HSSB	Organism	Place of Outbreak	Month	No. ill	+ve Cases
EHSSB	SRSV	Hospital	Mar	59	7
EHSSB	SRSV	Hospital	Mar/Apr	70	14
SHSSB	SRSV	Hospital	Apr	20	6
SHSSB	SRSV	Nursing Home	Apr	16	2
NHSSB	SRSV/C difficile	Hospital	Apr	70	5 SRSV, 30 C difficile
NHSSB	C difficile	Hospital	Aug	27	6

Source: CDSC (NI)

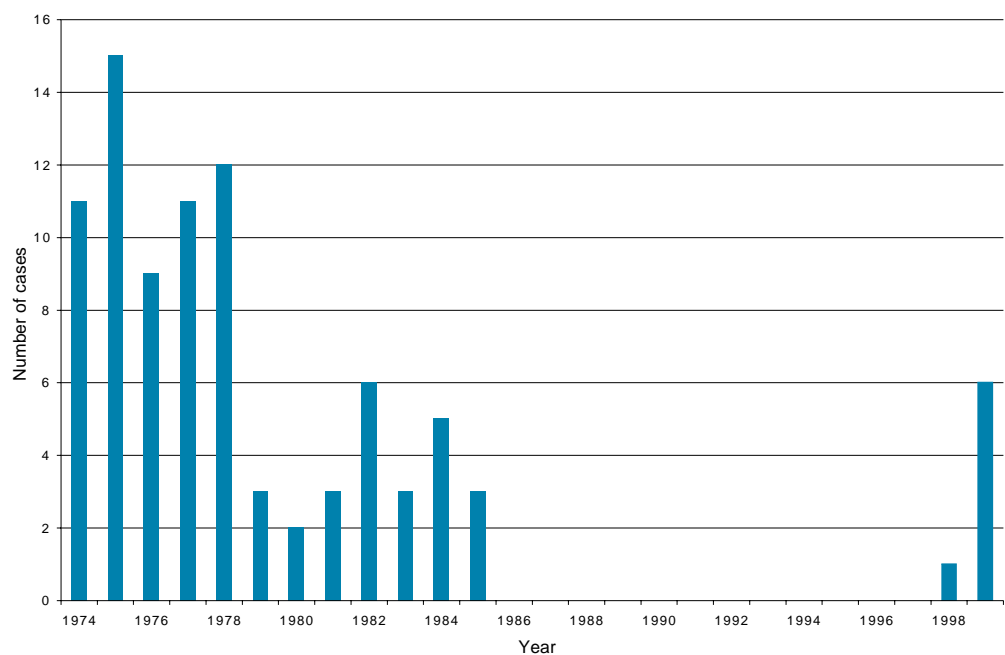
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2. Cryptosporidium in Water Supplies
Third Report of the Group of Experts to: Department of the Environment, Transport
and the Regions and Department of Health 1998
3. Communicable Disease Report Vol 10 No.7 18 Feb 2000

Northern Ireland is mainly a rural area with a large animal population. Many live and work on farms while others work in the food processing industry. It is not surprising therefore, for our health to be closely linked to that in animals. Infections in animals can often be transmitted to man. Changes to the pattern of infection in animals can sometimes be followed by similar changes in man and this has been reflected in the recent rise of brucellosis.

Brucellosis is an infection which, until recently, had declined in incidence in both animal and man. In 1998 there were seven recorded cases in Great Britain. Since January 1998 there have been seven reported cases of human brucella infection in Northern Ireland of whom six have occurred since June 1999. These figures contrast with an absence of cases since 1985. Most of these recent infections were considered to have been occupationally acquired and probably reflect the re-emergence of brucellosis in the cattle population.

Figure 4.1
Human brucellosis, 1974-1999, Northern Ireland



Source: CDSC (NI)

Brucellosis has an acute or insidious onset, characterised by continued, intermittent or irregular fever of variable duration, headache, weakness, profuse sweating, chills, painful joints, depression, weight loss and generalised aching. Subclinical and unrecognised infections may also occur. The disease may last for several days, months, or occasionally for a year or more. Recovery is usual but disability can be pronounced. Laboratory diagnosis



is made serologically or by isolating the organism from cultures of blood, bone marrow or other tissues.

Those working with infected animals or their tissues are at risk of contracting brucellosis. Occupations at risk include farm workers, veterinarians, abattoir and laboratory workers. The infection is usually acquired following contact with tissues, aborted foetuses, placentas and body fluids from infected animals.

It can also be acquired following the ingestion of raw milk or dairy products such as cheese made from the infected milk of such animals. This is prevented by pasteurisation. Spread from an infected person to other people does not occur.

The principal method of control is eradication of the infection from the cattle population. Cattle are normally tested serologically every two years. If positive cases are detected in a herd, the herd is then slaughtered in a designated abattoir. Good animal husbandry, personal hygiene and the use of personal protective clothing are important measures to control exposure.

Surveillance is about providing information for action. The rise in brucellosis has led to a co-ordinated programme to heighten diagnostic awareness of this infection among doctors and vets and the need for vets, farmers and those working in meat plants to wear appropriate protective clothing and practice good personal hygiene. Reference was made in the Chief Medical Officer's regular bulletin that doctors, particularly in rural areas, should be alert to the possibility of occupational acquisition of this infection in at risk workers. The Health and Safety Executive for Northern Ireland produced an advice card on brucellosis for those at risk in meat plants. This card explains what precautions are required in the workplace, the relevant symptoms and recommends that should such symptoms occur staff should alert their general practitioner that their symptoms could be work related. Brucella awareness would also be included among the items covered during farm visits by Health and Safety Inspectors.

In Northern Ireland, meningococcal disease affected 183 people in 1999 and was the cause of 12% of deaths in children aged 1 to 4 years the previous year¹. It is an important cause of morbidity and mortality, particularly among young children. Early signs and symptoms can be non-specific posing diagnostic difficulties for general practitioners and staff in Accident and Emergency Departments.

The pattern of the disease has changed in recent years with an increase of serogroup C infection. These changes led to the introduction of meningococcal C conjugate vaccines into the national vaccination programme in the UK during 1999. Surveillance has been strengthened to closely monitor the changing pattern of the disease and to assess the impact of the new vaccine.

Enhanced surveillance of meningococcal disease began in 1998 in England and was extended to Wales and Northern Ireland in 1999. Locally, it involves CsCDC reporting all the confirmed and probable cases of meningococcal disease to CDSC (NI). The information is then forwarded to CDSC in London for national collection.

This report describes the outcome of the first year of the enhanced surveillance system in Northern Ireland.

Enhanced meningococcal surveillance in Northern Ireland

A confirmed case was defined as someone with the following criteria:

- final clinical diagnosis of meningitis, septicaemia or other invasive disease
- laboratory identification of *Neisseria meningitidis* (from culture, serology or by PCR)
- onset of the disease in 1999
- normally resident in Northern Ireland at the time of onset of illness

A probable case was defined as one in which meningococcal infection was considered to be the most likely diagnosis by the CCDC in consultation with the physician managing the case in the absence of laboratory confirmation.

The information was regularly matched and augmented with laboratory reports from Northern Ireland and the Meningococcal Reference Laboratory in Manchester. By the end of the year, CsCDC were sent a list of cases for verification and asked to add any missing records.

The enhanced surveillance figures for 1999 were compared with notification data for bacterial meningitis and meningococcal septicaemia for 1997-1999 and with laboratory reports of meningococcal infection during the same period.



Results

In 1999, a total of 183 cases of meningococcal infection were identified through the enhanced surveillance system in Northern Ireland. The incidence rate for 1999 was 10.8 cases per 100,000 population. This is similar to the rate reported in England and Wales² of 9.0 per 100,000 population.

The Western Board had the highest incidence rate. This was due to a large number of probable cases with the rate of probable cases (9.6) being over twice that experienced by Eastern Board (3.4). There was less variation in the rate of confirmed cases between Boards.

Table 5.1:
Enhanced meningococcal surveillance: cases and rate per 100,000 inhabitants and per Board, 1999, Northern Ireland

Board	*Population	Confirmed Cases	Confirmed cases per 100,000	Total Cases	Total Cases per 100,000
EHSSB	675,000	33	4.9	56	8.3
NHSSB	425,400	34	8.0	48	11.3
SHSSB	307,800	18	5.8	33	10.7
WHSSB	280,500	20	7.1	47	16.8
Total	1,688,600	105	6.2	183	10.8

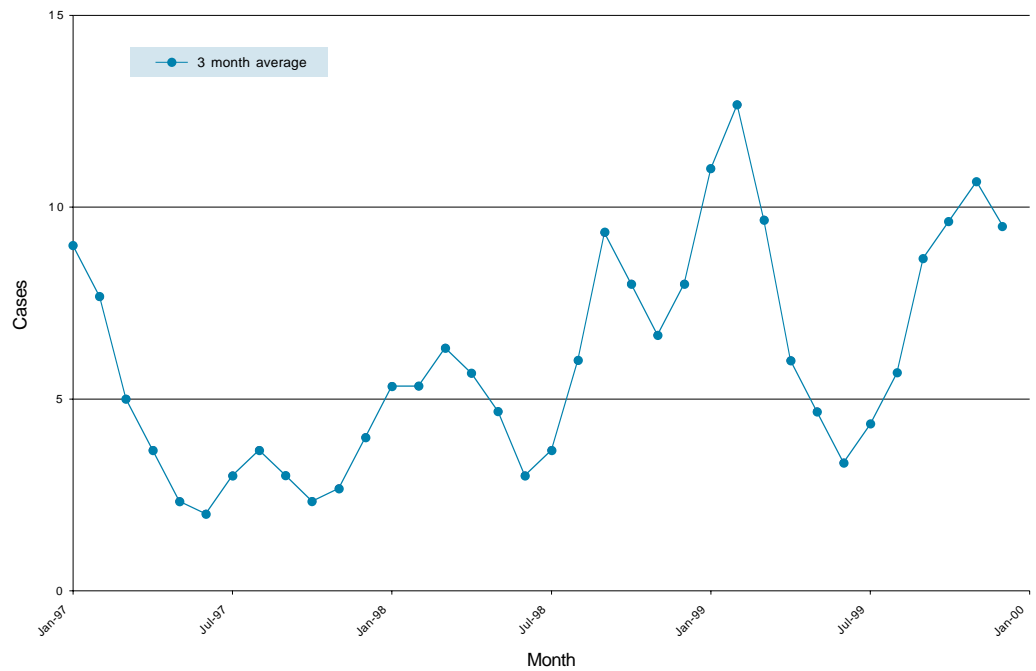
**Mid-year population estimates: Northern Ireland Statistics and Research Agency*

There were 105 (57%) confirmed cases. Almost half of the confirmed cases were serogroup B and 39% were serogroup C (Table 5.2).

The serogroup distribution was similar in England and Wales but the proportion of confirmed cases was lower (49%).

Allowing for the marked seasonal variation with the usual peak around January and much lower levels during the summer months, the overall trend over the last 3 years shows an increase in laboratory confirmed cases (Figure 5.1).

Figure 5.1:
Confirmed cases of meningococcal disease per month, Jan 1997 to Dec 1999,
Northern Ireland



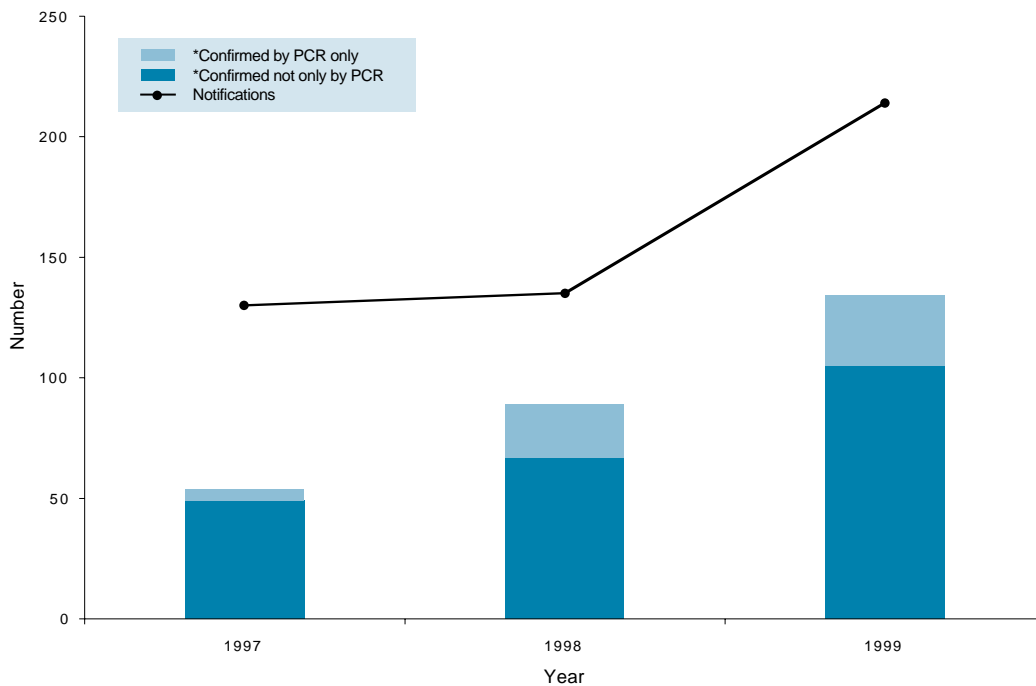
Source: CDSC (NI)

Over the same period clinical notifications of bacterial meningitis and meningococcal septicaemia in Northern Ireland have increased by 65% (Figure 5.2).

In 1999, 105/214 (50%) of the total cases notified were laboratory confirmed. This proportion was 49/130 (38%) in 1997 and 67/135 (50%) in 1998. The proportion of cases confirmed only by new molecular methods (PCR) has steadily increased from 5/49 (10%) in 1997 to 29/105 (28%) in 1999. In other words, had PCR testing not been available in 1999 there would have been 29 fewer confirmed cases. However PCR testing does not completely explain the increase in cases, which probably reflects a real increase in the incidence of meningococcal disease.

Figure 5.2:

Bacterial meningitis and meningococcal septicaemia notifications and meningococcal laboratory confirmed cases, 1997-1999, Northern Ireland



Source: CDSC (NI)

* The first group refers to cases only confirmed by PCR and the second group to cases confirmed by other methods which may include PCR.

In 1999, group B remained the most frequent type of meningococcus isolated from confirmed cases but the proportion due to this serogroup has decreased over the past 3 years. In contrast, the proportion of group C has increased from 27% in 1997 to 39% in 1999.

Table 5.2:

Confirmed cases of meningococcal disease and distribution of serogroups by year, 1997-1999, Northern Ireland

	B	C	Other	Total
1997	27	13	9	49
1998	41	16	10	67
1999	48	41	16	105
Total	116	70	35	221

In 1999, the age of meningococcal cases ranged from 1 month to 72 years with a median of 2.4 years. The sex ratio M/F was 1.2:1. The highest age-specific rate was in children aged less than one year. Among the under 1 and those aged over 24 years, serogroup B was predominant. Serogroup C was more common in the other age groups.

Table 5.3:
Enhanced meningococcal surveillance and age group distribution, 1999, Northern Ireland

Age group (year)	Population	Confirmed	Probable	Total	Age specific rate per 100,000 pop
< 1	23,687	36	27	63	266.0
1 - 4	123,913	32	26	58	46.8
5 - 14	203,020	21	16	37	18.2
15 - 24	213,950	9	6	15	7.0
> 24	1,124,090	7	2	9	0.8
Unknown			1	1	
Total	1,688,600	105	78	183	10.8

Among the 183 cases, 112 (61%) presented with septicaemia, 57 (31%) with meningitis and 3 (2%) with both. These proportions were similar for confirmed and probable cases.

Information regarding pre-admission penicillin was available for 136 cases but this was only administered in 30 (22%). It is disappointing that this proportion is so low despite initiatives to increase professional awareness of the importance of administering pre-admission penicillin to suspected cases. However, this percentage must be interpreted cautiously as some children will be admitted directly to hospital without having seen a general practitioner.

Table 5.4:
Enhanced meningococcal surveillance – Confirmed cases and pre-admission antibiotics, 1999, Northern Ireland

	Pre-admission antibiotics			Total
	Yes	No	Unknown	
Confirmed	16	61	28	105
Probable	14	45	19	78
Total	30	106	47	183

There was little difference in the proportion of confirmed and probable cases that received pre-admission antibiotics.

In contrast, pre-admission penicillin was given to 30% (15/50) of patients admitted to intensive care (ICU) and to 15% (15/99) of those who were not transferred to ICU.

Four children died from meningococcal septicaemia: 2 males and 2 females, aged from 8 to 13 months. Two deaths were associated with group B infection and one was secondary to group C disease. The case fatality rate for 1999 was 2.2% compared to 4.6% in England and Wales.²

In 1999, there were 3 clusters of meningococcal infection reported in Northern Ireland. Two were family clusters and one was in a school. The latter involved two children with group C infection and this led to 298 children and adults at the school receiving antibiotics and meningococcal vaccine in line with national guidelines.



The winter increase of meningococcal infection started soon after the commencement of the vaccination programme. None of the patients who developed meningococcal infection in November and December 1999 had received the new meningococcus group C conjugate vaccine. During this period the proportion of group C cases was higher than before but the study period was too short and numbers too small to draw any conclusions on the initial impact of the vaccination programme (Table 5.5). However, if the implementation programme proceeds as planned there should be a marked reduction in group C infection over the next 12 months.

Table 5.5:
Meningococcal disease and group C distribution, 1997-1999, Northern Ireland

	Group C	Total confirmed cases	Proportion of group C
Jan 97 to Oct 99	55	198	28%
Nov 98 to Dec 98	3	7	43%
Nov 99 to Dec 99	13	19	68%

References

1. Registrar General, Northern Ireland. Annual report 1998.
2. Feedback on results of the enhanced surveillance system of invasive meningococcal disease in all English regions, Wales and Northern Ireland. Katy Davison, CDSC Colindale, personal communication.

There have been important changes in the epidemiology of tuberculosis (TB) in recent years in the UK. The marked decline in tuberculosis notifications after the Second World War ceased in the mid-1980's and since then, small year on year increases have occurred. The incidence varies widely within the UK and is higher in inner city areas and in groups originating from high risk areas (e.g. Africa). Tuberculosis in HIV patients is increasing as is resistance to some drugs used to treat TB.

Enhanced tuberculosis surveillance

Surveillance of TB in Northern Ireland was enhanced in 1992 with specially designed forms to collect clinical, demographic and microbiological information at the time of notification. In addition, clinicians are contacted nine months later to provide details on confirmation of diagnosis, method and duration of treatment. Due to the time period between the two forms, complete information regarding 1998 notifications only became available at the end of 1999.

For the purposes of enhanced surveillance, a confirmed case was defined as one in which infection due to *Mycobacterium tuberculosis*, *M. bovis* or *M. africanum* was confirmed by culture. A non-confirmed case was defined as one, in the absence of confirmation by culture, in which there were signs and symptoms compatible with tuberculosis and the clinician's decision to treat the patient with a full course of anti-tuberculous drugs.

Pulmonary TB was defined as disease involving the lung parenchyma and/or bronchial tree; it includes all diseases diagnosed by examination of sputum, broncho-alveolar lavage, bronchial washings, gastric washings, lung biopsy, etc. It excludes pleural and intra-thoracic lymph node disease unless the lung parenchyma and/or bronchial tree are also involved.

Laboratory reports and notifications of TB by clinicians were the two main sources of information. Notifications later not considered as mycobacterium tuberculosis as defined above were excluded from the analysis.

1998 data

A total of 61 cases of pulmonary and non-pulmonary tuberculosis were reported in 1998. The annual notification rate of tuberculosis for Northern Ireland was estimated at 3.6 cases per 100,000 population. The incidence rate is the lowest in Northern Ireland since 1994. It is significantly less than the incidence rate of 10.9 per 100,000 reported from England and Wales¹ in 1998. If the London data is excluded the rate in England and Wales falls to 7.7 per 100,000 population.

Table 6.1:

Enhanced TB surveillance: cases and incidence rate, 1992-1998, Northern Ireland

Year	Population	Cases	Incidence rate per 100,000 population
1992	1,618,400	71	4.4
1993	1,631,800	77	4.7
1994	1,641,700	87	5.3
1995	1,649,000	84	5.1
1996	1,663,300	78	4.7
1997	1,675,000	65	3.9
1998	1,688,600	61	3.6

The Eastern Board had the highest annual notification rate for tuberculosis in 1998 with 4.7 cases per 100,000 population (Table 6.2).

In most patients (74%) the clinical diagnosis was confirmed by culture. This proportion did not differ from previous years and is higher than the proportion of confirmed cases (54%) in England and Wales in 1998.

All confirmed cases in Northern Ireland were due to *M. tuberculosis*.

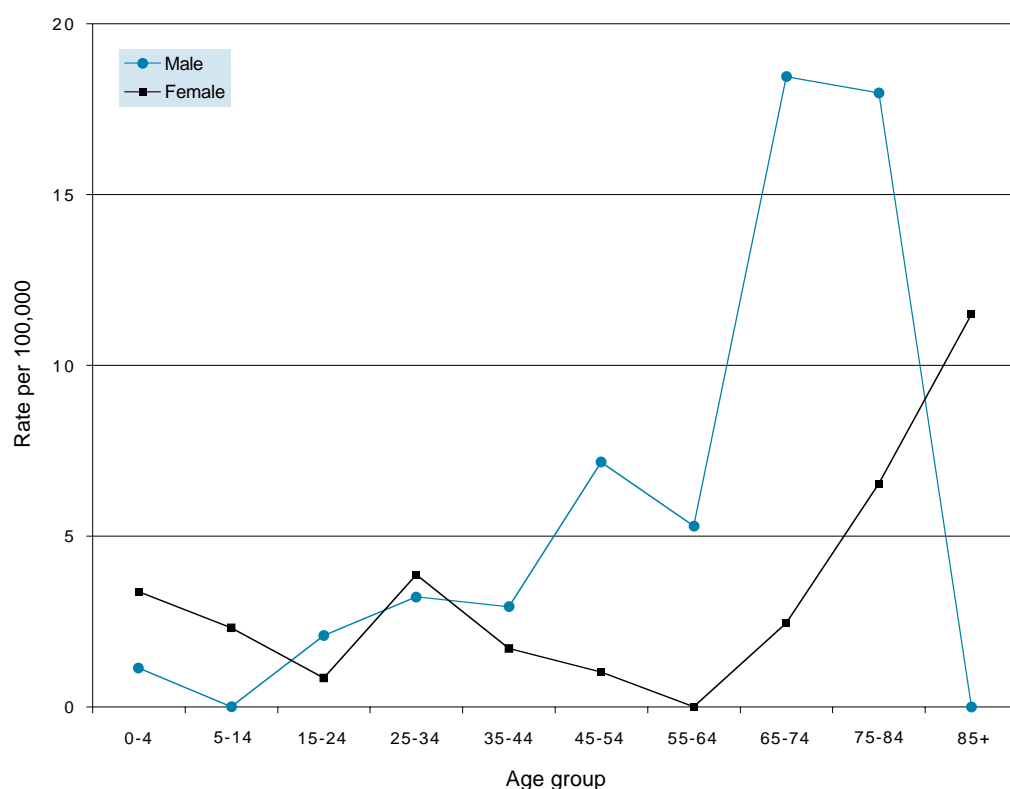
Table 6.2:

Enhanced TB surveillance: cases and rate by Board, 1998, Northern Ireland

Boards	Confirmed	Number of cases		Total	Rate per 100,000 population
		Confirmed	Not confirmed		
EHSSB	26	6		32	4.7
NHSSB	6	4		10	2.4
SHSSB	7	4		11	3.6
WHSSB	5	2		7	2.5
Unknown	1			1	
Total	45	16		61	3.6

Of the 61 tuberculosis cases, 40 were male and 21 female, giving a sex ratio M/F of 1.9:1. The ages ranged from 3 to 93 years (median 53 and mean 51 years). The highest age-specific rate occurred in the oldest age group (65 years and over).

Figure 6.1:
Enhanced TB surveillance: age sex specific rate, 1998, Northern Ireland



The age and sex distribution is very similar to that observed since 1992.

The country of birth was recorded for 58 people. Fifty (86%) were born in the British Isles, two (3%) in other parts of Europe and six (10%) in Asia. From 1992-1998 the proportion of TB cases associated with being born outside the British Isles was always less than 20%. In contrast, in England and Wales, more than half the cases in 1998 were born outside the UK.

Table 6.3:
Enhanced TB surveillance: country of birth, 1992-1998, Northern Ireland

YEAR	UK and Ireland	Other	% born in British Isles
1992	68	3	96%
1993	75	0	100%
1994	65	13	83%
1995	60	10	86%
1996	60	4	94%
1997	63	2	97%
1998	50	8	86%

Of the 57 cases from whom information was available, 54 were new cases and 3 were reported to have received previous treatment for tuberculosis. The latter were considered to be reactivation of earlier infections. There were 42 cases of pulmonary tuberculosis of which 21 were smear positive. Contact tracing associated with the smear positive pulmonary cases



led to the identification of three further cases. Two of them had been exposed to the same index case.

Among the 45 reporting information concerning BCG vaccination, 8 had been previously vaccinated, 18 had not and 19 did not know. The presence of a scar was not recorded in the questionnaire.

Forty-two (69%) of the 61 tuberculosis cases had pulmonary disease of whom one patient also had non-pulmonary involvement and 18 (30%) had non-pulmonary infection. One case could not be classified.

Table 6.4:
Enhanced TB surveillance per case definition, 1998, Northern Ireland

	Confirmed	Not confirmed	Total
Pulmonary	30	12	42
Non-pulmonary	14	4	18
Unknown	1		1
Total	45	16	61

The sites of disease in the 18 non-pulmonary cases are as follows:

lymph nodes	7
pleura	5
genitourinary	1
joint	3
skin	1
abdomen	1

Details of initial treatment were recorded for 50/61 cases, of whom 31 received a combination of rifampicin, isoniazid and pyrazinamide. Information on continuation therapy was stated for 46 cases of whom 37 received a combination of rifampicin and isoniazid.

There were five deaths reported among the tuberculosis cases in 1998 but tuberculosis was not stated to be the cause of death in any of these patients.

Altogether, 49 isolates of *M. tuberculosis* had antibiotic sensitivity performed in 1998 and none showed any resistance to first line antituberculous drugs. This differed with the 6.1% isoniazid resistance and 1.3% multidrug resistance reported in 1998 in England and Wales¹.

Future surveillance

England and Wales commenced enhanced surveillance of tuberculosis in January 1999. As noted earlier enhanced surveillance of tuberculosis in Northern Ireland has been in place since 1992. However by participating in the enhanced surveillance programme now operational in England & Wales and using a standard questionnaire it will be possible to more readily compare and contrast the relevant epidemiological features between regions.

This commenced in Northern Ireland on 1 January 2000 though it should be noted that much of the additional information being sought in England and Wales has already been available for the past seven years in Northern Ireland.

The Mycobacterial Reference Laboratory, based at the Northern Ireland Public Health Laboratory, at Belfast City Hospital, also participates in a national scheme for the surveillance of resistant strains of mycobacteria (the UK Mycobacterial Resistance Network or MYCOBNET).

In conclusion, Northern Ireland has a low incidence of tuberculosis. Nevertheless, it remains important to have an effective surveillance programme to detect any increased incidence of infection whether in the general population or in specific high risk groups. Multi-drug resistance poses difficult treatment and control problems in other countries but at present is relatively rare in the UK. The enhanced surveillance programme including information from MYCOBNET will enable drug resistance to be continuously monitored and assist in assessing the impact of measures to control the spread of drug resistance.

Reference

1. Tuberculosis: incidence rising, resistance stable, surveillance enhanced and communication improving. *CDR weekly*, 1999, **(9)**, 51: 453-6



Influenza was rarely out of the local and national headlines over the Christmas and New Year period. During this time there was widespread community morbidity and both the primary and secondary health care sectors were very busy. Many people were asking if all the respiratory illnesses were due to 'flu and how the 1999/2000 winter compared to other winters as regards 'flu-like illness.

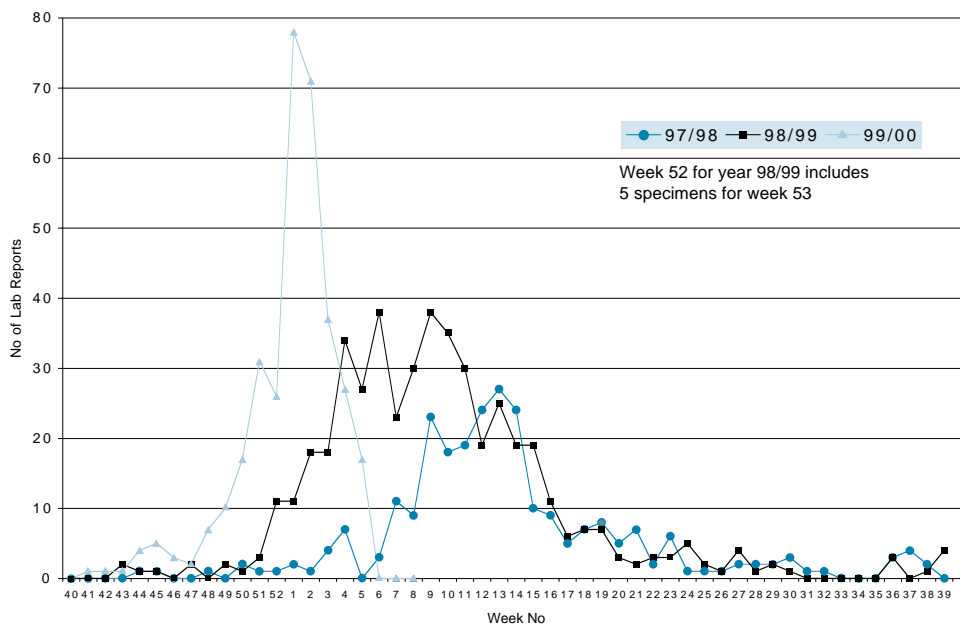
Influenza is an acute viral disease of the respiratory tract characterised by fever, headache, myalgia, coryza, sore throat and cough. While the cough can be severe and prolonged, recovery is usual in 2 - 7 days. Influenza derives its importance from the rapidity with which epidemics evolve, the widespread morbidity, and the seriousness of complications, especially viral and bacterial pneumonias. During major outbreaks or epidemics, severe disease and deaths occur mainly among the elderly and those debilitated by chronic cardiac, respiratory, renal or metabolic disease, anaemia or immunosuppression.

Three types of influenza virus are recognised: A, B and C. Type A viruses cause most epidemics and can cause worldwide epidemics (pandemics). The main pandemics this century were in 1918, 1957 and 1968. The largest in 1918, caused approximately 20 million deaths worldwide and it is estimated that 23% of the United Kingdom population developed influenza that year. In the United Kingdom, influenza A activity increases, although not necessarily to epidemic levels, most winters. Type B can also cause outbreaks, usually between outbreaks of influenza A; however they tend to be less extensive and are usually associated with less severe illness. Type C is linked with sporadic cases and minor localised outbreaks and is of relatively little importance. Clinical attack rates during epidemics range from 10%-30% in the general community to greater than 50% in institutions. Influenza is spread by the airborne route particularly among crowded populations in enclosed spaces.

Winter 1999/2000

The first influenza isolates for the 1999/2000 winter in Northern Ireland occurred towards the end of November. Over the next four weeks there was a marked rise in laboratory reports of influenza with a peak in the first week of January. Numbers of reports then fell rapidly during the rest of January. It is interesting to note that the rise in influenza reports occurred approximately four weeks earlier than in the 1998/99 winter, which itself was approximately four weeks before the 'flu season in 1997/98. The peak this winter was twice as high as the peak noted in the 1998/99 winter. However this does not necessarily imply that influenza was twice as severe or twice the number of individuals were affected with influenza compared with previous winters for reasons outlined underneath.

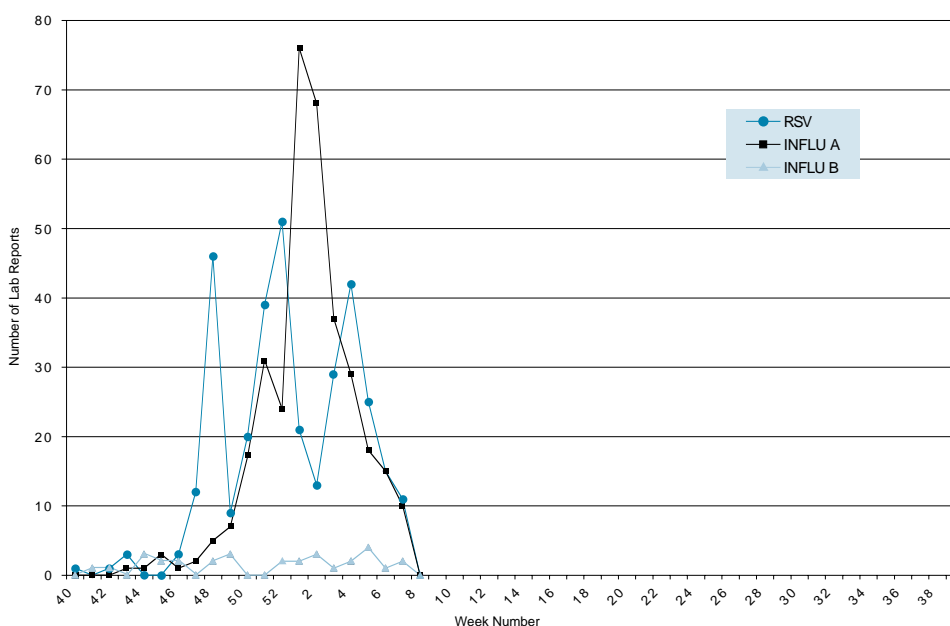
Figure 7.1:
Laboratory reports of influenza A and B by date of specimen, 1997-2000, Northern Ireland



Source: CDSC (NI)

However not only did the 'flu season start earlier last winter, it also co-incided with the seasonal increase in respiratory syncytial virus (RSV). As the name suggests this is another respiratory virus which causes an acute feverish respiratory illness. It particularly affects young children causing bronchiolitis, pneumonia, croup, bronchitis and otitis media. In most recent winters there was a three-four week interval between outbreaks of influenza and RSV but last winter their increase coincided at the end of November. This contributed to the sudden increase in community morbidity.

Figure 7.2:
Laboratory reports of Influenza and RSV by date of specimen, 1999/2000, Northern Ireland



Source: CDSC (NI)

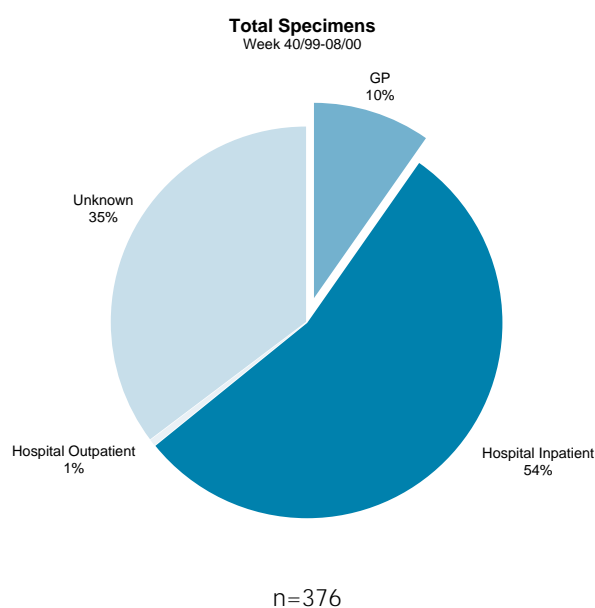
Influenza surveillance

Many of those with influenza will self medicate and not require medical attention. Last winter the public were actively discouraged from visiting their general practitioner with 'flu-like symptoms unless their symptoms were particularly severe or prolonged and were encouraged to treat themselves with standard preparations from their local pharmacy. Thus those with prolonged or severe symptoms, particularly those in the high-risk group for complications (as described earlier) were more likely to consult their general practitioner. Influenza is primarily a clinical diagnosis and it would be unusual for a general practitioner to obtain clinical samples for viral analysis. Such samples are more likely to be obtained from hospitalised patients.

Nationally influenza surveillance usually commences in week 40 each year and continues to week 20 or longer in the incoming year, depending on the extent of influenza activity. Currently influenza surveillance in Northern Ireland is based on laboratory reports from the Regional Virus Laboratory at the Royal Victoria Hospital received by CDSC (NI). Recent analysis of influenza reports showed they tended to originate from hospitalised patients with 37% of total reports arising from patients aged 65 years or more.

Figure 7.3:

Source of influenza reports from week 40/99 to week 08/00, Northern Ireland.



Source: CDSC (NI)

There were 376 laboratory reports of influenza A and B between week 40 in 1999 and week 8 in 2000. Thus laboratory information on influenza considerably under-estimates the extent of influenza related morbidity in the community. In addition by the time patients are admitted to hospital with influenza related complications, the appropriate clinical samples obtained and analysed, the virus will have been circulating in the community for possibly several weeks. Experience from other parts of the United Kingdom suggests that laboratory reports lag behind data from GP spotter practices by 3-4 weeks. Thus current regional surveillance is incomplete and based on the later consequences of influenza infection.

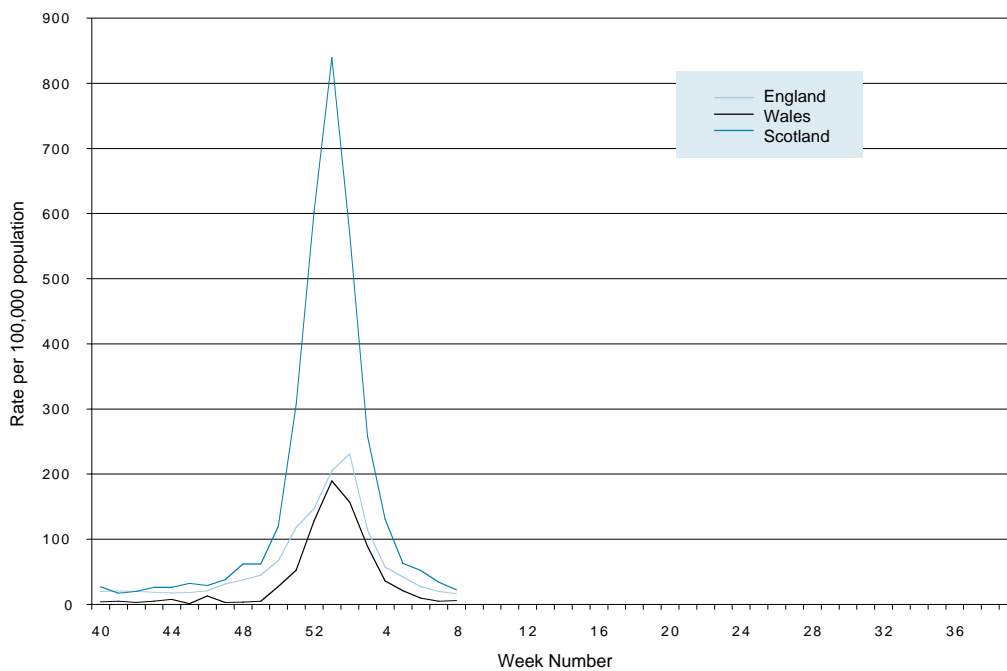
If laboratory reports on influenza could be supplemented with information from primary care, this would provide more timely and complete surveillance. It would also be able to detect the

start of the winter influenza season. While influenza usually increases each winter it is not possible to predict in mid autumn when influenza activity will peak later in the winter. However aggregated spotter practice information could provide early warning to primary care, Trusts and Boards of an imminent increase in demand for services and provide an opportunity to make appropriate advance arrangements to accommodate this expected increase in workload.

Influenza surveillance in England, Wales and Scotland includes information from laboratory reports and general practice. These surveillance arrangements have been in place for a number of years and are co-ordinated through the regional communicable disease epidemiology units and the Royal College of General Practitioners' research unit. Selected practices forward details each week of patients presenting clinically with influenza-like illness. By linking this with population data from the practice it is possible to calculate the rate of 'flu-like illness in a given population. The regional or national centre collates the practice information, produces the various consultation rates, compares them with previous years and, at weekly intervals, disseminates this information e.g. to health authorities, Trusts etc. The advantage of having historical data means that threshold values can be set against which the rates can be measured.

In Scotland 'baseline activity' is defined as less than 50 cases per 100,000 population; 'normal' 'flu season activity' at between 50-600 cases; 'higher than expected' at between 600-1,000 cases and 'epidemic level' at over 1,000 cases. In England and Wales the same principles apply although the threshold values differ as cases are recorded in a different manner.

Figure 7.4:
GP consultation rates for influenza and influenza like illness, 1999-2000, England, Wales and Scotland



Source: CDSC (Colindale)

In some parts of England and Wales general practitioners submit throat and nasal swabs for laboratory analysis from a small proportion of patients presenting at the surgery with 'flu-like' illness. This then complements laboratory information derived from hospitalised patients and provides a more complete picture of which viruses are circulating in the community.

In recent years general practitioners in Northern Ireland have formed out of hours 'co-operatives' to provide an on-call service for those requiring GP services. These co-operatives operate from designated centres and cover the majority of the Northern Ireland population. A log is kept of all phone calls. The increase in influenza morbidity during December was reflected with a sharp upsurge in calls to the co-operatives. The peak period for calls in December differed between co-operatives as influenza spread across the Province. As the co-operatives provide an after hours service they can provide information during extended holiday periods e.g. Christmas and New Year.

Last winter the Northern and Eastern Boards established an Emergency Admission Co-ordination Centre to co-ordinate medical admissions to hospitals in both areas. Daily admission data during December also reflected the increase in community respiratory morbidity.

CDSC (NI) is discussing with the Department, Boards and general practices how a spotter practice influenza surveillance programme, similar to that in Great Britain, could be developed in Northern Ireland before next winter. The spotter practice information would be combined with the existing laboratory based influenza surveillance and distributed by CDSC (NI) each week during the winter to the Department, Boards, Trusts, and GP co-operatives where it can be merged with medical admission and other information as described above. To ensure timeliness of this information, dissemination would be undertaken, as far as possible, electronically.

Influenza vaccination

Government policy is to offer influenza vaccine each year to those at most risk of serious illness or death should they develop influenza. This includes those of any age with: chronic respiratory disease, including asthma; chronic heart disease; chronic renal failure; diabetes mellitus; and immunosuppression. Also included are all those aged 75 years or over and those in nursing homes, residential homes and other long stay facilities where rapid spread is likely to follow introduction of infection.

Unfortunately uptake of influenza vaccine both in Northern Ireland and in Great Britain has been relatively low, though there has been a recent increase¹. It is estimated that the uptake in Northern Ireland among some of the high risk groups as outlined above during the 1998/99 winter was approximately 50%. During 1999 CDSC (NI) in conjunction with Medical Advisers from the Boards developed a uniform approach to the promotion of influenza vaccine. This included collecting vaccination details in a uniform manner which will provide more complete information on the extent of vaccine coverage among the high risk groups. This will therefore inform planning for next winter.

Reference

1. Irish C, Alli M, Gilham C, et al. Influenza vaccine uptake and distribution in England and Wales, July 1989-June 1997. *Health trends* 1998; 30 (2):51-55.



Natural history of hepatitis C infection

The hepatitis C virus was discovered in 1989. Although not as infectious as hepatitis B and HIV, as many as 80% of affected people can become chronically infected and risk serious long-term clinical complications including cirrhosis and hepatocellular carcinoma. WHO in 1998 described hepatitis C as a global health problem with an estimated 170 million people world-wide infected with the virus¹. This is equivalent to approximately 3% of the world's population.

Acute infection with the hepatitis C virus (HCV) is generally mild with only 20-30% developing symptoms. A small proportion of HCV infected individuals recover spontaneously but 70-80% will continue to have persistent viral infection. Approximately 20% of patients with chronic hepatitis C infection develop cirrhosis after 10-20 years. Factors contributing to the development of cirrhosis include: alcohol; co-infection with other viruses such as hepatitis B and HIV; and age at the time of infection as those who acquire infection at an older age seem to have a more progressive illness than younger patients². Hepatocellular carcinoma is one of the most serious complications of HCV infection. In Japan and Italy over 50% of cases of hepatocellular carcinoma are associated with HCV infection¹.

In industrialised countries, HCV is estimated to account for 20% of acute cases of hepatitis, 70% of cases of chronic hepatitis, 40% of cases with end-stage cirrhosis, 60% of cases of hepatocellular carcinoma and 30% of liver transplants². HCV costs \$600 million in medical bills and workloss each year in the United States³. Thus the human and financial cost from HCV infection is high.

The two main sources of infection are injecting drug use (IDU) and from blood or blood products. Sexual transmission can occur but is uncommon. In the UK blood products have been heat treated since 1985 and all blood donated since 1991 has been screened for HCV thus the main risk of acquiring HCV infection in the UK is through injecting drug use. Approximately 1 in 2,000 blood donors in the UK as a whole have been shown to be positive for HCV, the rate in Northern Ireland is lower - 1 in 3,500 donors⁴.

Treatment of HCV is with interferon but it is effective in only 20% of patients. At present there is no vaccine against HCV infection thus the emphasis must be on prevention.

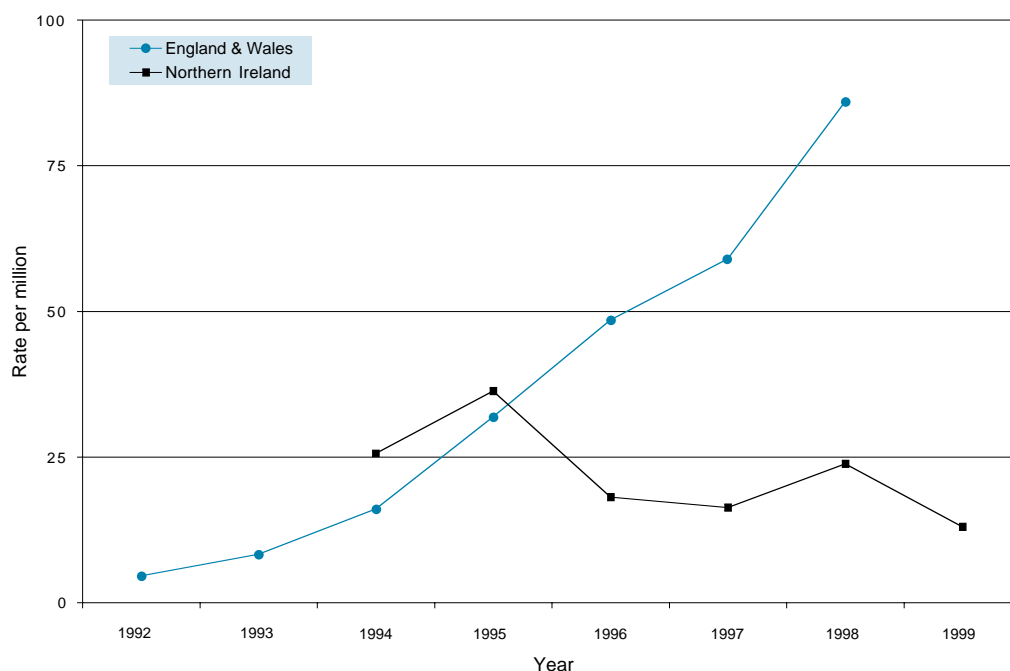
Northern Ireland

HCV is not a notifiable disease in Northern Ireland. Surveillance for HCV infection is based on laboratory reports from the Regional Virus Laboratory. A varying amount of clinical detail will be reported on the laboratory request form. This may include details of likely sources of infection but the absence of such information on the form does not mean that there were no suspect sources of infection.



During 1999, the Regional Virus Laboratory reported 23 cases of HCV infection. This is equivalent to a rate of 13.0 cases per million population. This was the lowest incidence rate since 1995. This is in marked contrast to the increasing rate of laboratory reported infection in England and Wales (Figure 8.1).

Figure 8.1:
Hepatitis C: rates of laboratory reports 1992-99, England & Wales, Northern Ireland



There have been 215 reports of HCV infection in Northern Ireland since January 1994 (Table 8.1). Risk factors were reported on the laboratory request form in 85 (40%) cases. Where a risk factor was reported, 61 (72%) had a history of injecting drug use. There has been a recent increase in the number of HCV infections associated with injecting drug use. As 60% of laboratory reports lacked risk factor information, the proportion of HCV infection due to injecting drug use could be higher. Seventeen reports of HCV infection were in individuals with haemophilia.

Table 8.1:
Hepatitis C laboratory reports: reported risks per year, 1994-99, Northern Ireland

Year	Reported risks			No reported risk		Total
	Haemophiliac	IDU	Other			
1994	9	5	0	0	41	
1995	6	5	1	46	58	
1996	0	7	2	20	29	
1997	0	14	0	12	26	
1998	2	16	3	17	38	
1999	0	14	1	8	23	
Total	17	61	7	103	215	

HCV infection and injecting drug use

Studies from a number of countries show that HCV infection is common in those who inject drugs and the likelihood of acquiring HCV infection increases the longer the person continues to inject drugs⁵. Studies of injecting drug users in England revealed that 59-67% had evidence of HCV infection^{6,7}.

In England and Wales there is an ongoing anonymous survey of blood borne viruses (HIV, hepatitis B and HCV) among injecting drug users who attend specialist drug agencies. In 1997, 18% of those who had injected in the month before participation in the survey reported sharing needles/syringes. The reported rate of sharing rose to 57% when the use of spoons, filters, water, and the practices of front/backloading (techniques used for sharing out drug mixtures) were included. This demonstrates that risk behaviour for transmission of blood borne viruses remains common⁸.

Implications for the future

There has been a marked change in the pattern of drug misuse in Northern Ireland in recent years with an increase in injecting drug use. At the end of December 1999, there were 131 individuals on the Northern Ireland Drug Register with a history of injecting drug use. This total underestimates the size of the injecting drug population as not all will have been reported and others will not have presented for medical care. The number of cases of HCV infection linked to injecting drug use is increasing. Experience from other countries suggests that drug related HCV infection in Northern Ireland will therefore further increase. This will result in future years with increasing numbers of individuals requiring treatment for chronic liver disease.

New drug prevention and control initiatives are being developed locally in response to this growing problem. This must include measures to prevent the spread of blood borne viruses especially HIV, hepatitis B and HCV. Surveillance of HCV infection in Northern Ireland needs to be strengthened if the proportion of infection due to injecting drug use is to be quantified. This will also provide useful information on trends and the impact of public health interventions.

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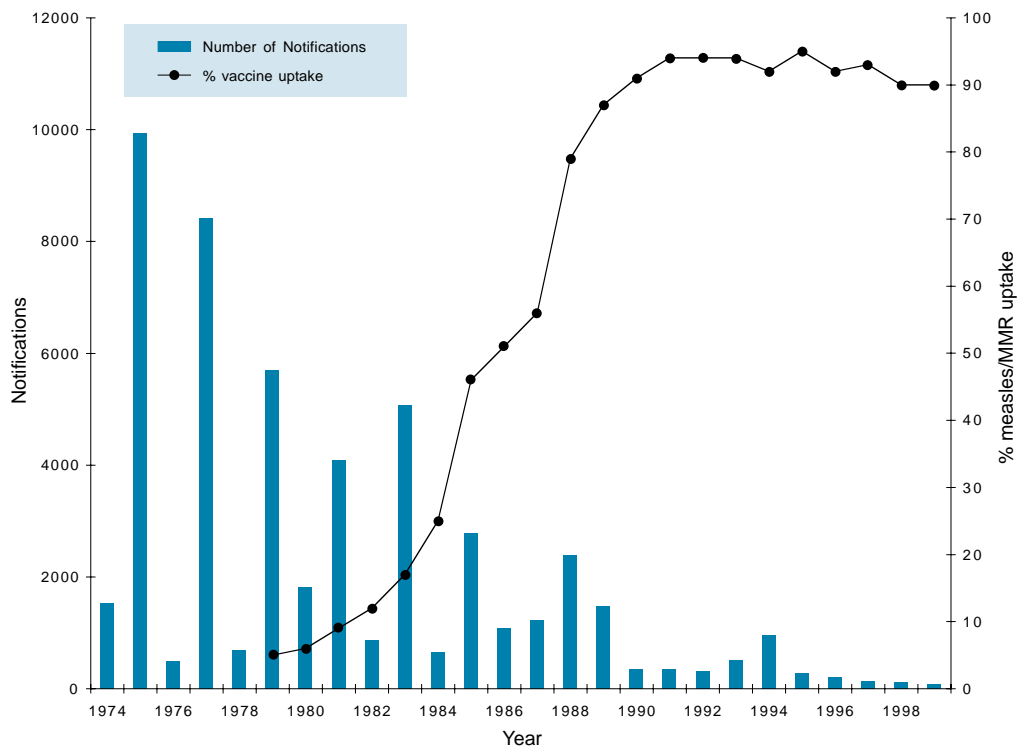
Before measles vaccine was introduced the World Health Organisation estimated that around 5.7 million people worldwide died each year from measles¹. By 1995 this total had fallen by 88%. Nevertheless measles was still causing approximately 800,000 deaths annually, 500,000 occurring in Africa alone.

Measles is not just a Third World problem for until very recently it was causing significant morbidity and mortality in the UK. Many people forget that measles is not a trivial childhood illness with 1 in every 15 cases developing complications. These include otitis media, bronchitis, pneumonia, convulsions and encephalitis. Complications are more common and severe in poorly nourished and chronically ill children hence it is particularly important such children are immunised. Measles can also be life threatening in immunosuppressed children being treated for malignant disease. Between 1970 and 1983, 19 children in the UK in remission from acute lymphatic leukaemia died from measles, and of 51 children who died in their first remission in 1974-84 measles was the cause of death in nearly one third². Similar experiences were noted in the USA when 130 children died and more than 5,000 were admitted to hospital between 1989 and 1991 as a result of a measles epidemic.

Vaccination uptake rates

Measles vaccine was introduced into the national immunisation programme in 1968 with measles, mumps, rubella vaccine (MMR) being introduced twenty years later. It is therefore hard to believe that in 1979 only 5% of two-year-old children in Northern Ireland had received measles vaccine. It is thus perhaps not surprising there were nearly 5,700 notifications of measles that year in the Province and Northern Ireland had one of the lowest uptake rates of measles vaccine in the United Kingdom. Measles epidemics were occurring on alternate years.

Figure 9.1:
Measles: notifications and vaccine uptake, 1974 - 1999, Northern Ireland



The 1999 vaccine uptake rate is for July - September.

Twenty years on and much has changed. As measles and then MMR vaccination uptakes increased the notifications of measles began to fall and the interval between epidemic years began to increase. In 1999 there were only 79 notifications of measles in Northern Ireland and 90.0% of children had received MMR vaccine by their second birthday. Uptake rates in the Province for MMR and other childhood vaccines are now among the highest in the UK. It is note worthy that most of the improvement in measles vaccine uptake rate occurred during the 1980s before the introduction of MMR vaccine in 1988 with its associated professional and public awareness campaign, the computerised Child Health System and the revised GP contract with vaccination targets.

Table 9.1:
Vaccination coverage statistics: completed primary vaccinations by 24 months;
July- September 1999, United Kingdom

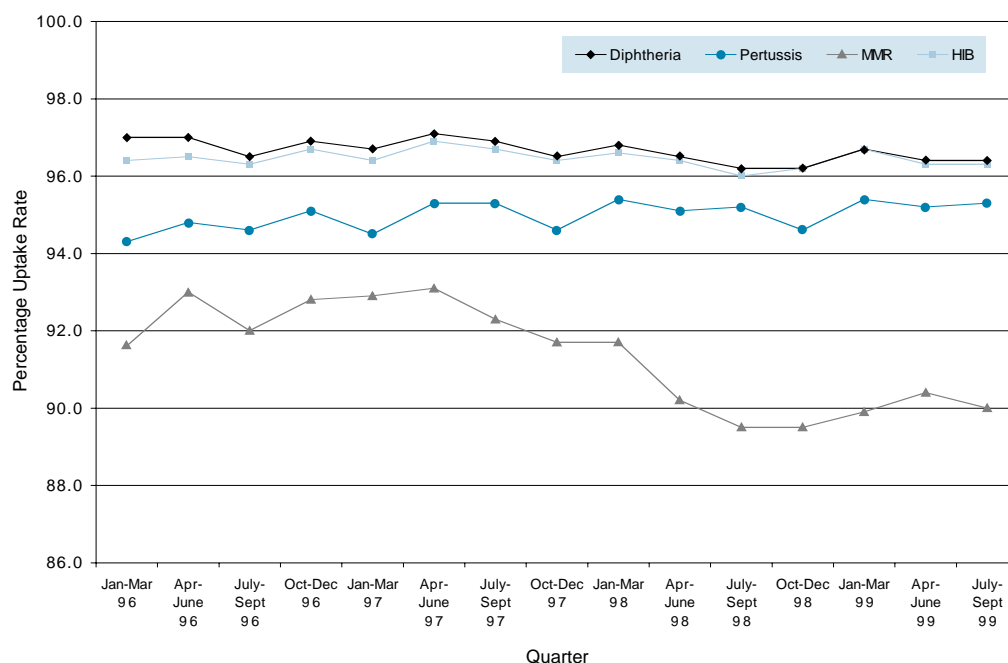
	Diphtheria	Pertussis	Hib	MMR
England	94.7%	93.7%	94.3%	87.3%
Wales	95.6%	93.3%	95.4%	84.4%
Northern Ireland	96.4%	95.3%	96.3%	90.0%
Scotland	97.0%	96.1%	96.7%	92.3%
United Kingdom	95.0%	93.9%	94.6%	87.7%

Source: CDSC (Colindale)

You might therefore consider that the era of poor vaccine uptake has gone and we should be focusing our attention elsewhere. Recent events have shown that it is very easy to become complacent. Many will be familiar with the misleading media coverage in March 1998 concerning MMR vaccination and possible links with bowel disorders. This caused significant concern among parents throughout the UK and was associated with a national reduction in MMR vaccination uptake rates. All the available evidence has been carefully reviewed by the independent expert committees, which routinely advise on the safety of medicines, and on immunisation policy. They concluded that this research³ contained a number of methodological limitations and the evidence cited did not support the suggested associations or give cause for concern about the safety of MMR or MR vaccines. Strenuous efforts were made by the Chief Medical Officer, CsCDC and others to ensure GPs and others involved in childhood immunisation received all the relevant background information, including expert commentary on the original research article, to allow them to respond to parental fears.

Nevertheless the media coverage of this story coupled with that from an earlier article in August 1997 was associated with a sustained fall in uptake of MMR vaccine in Northern Ireland. Uptake levels fell from 93.1% in April/June 1997 to a low of 89.5% during July/December 1998 before making a small recovery to currently stand at 90.0% (July/September 1999).

Figure 9.2:
Vaccination uptake rates at 24 months, 1996-1999, Northern Ireland



Despite media attention on the MMR vaccination programme, there was little discernible impact on the other elements of the childhood vaccination programme. Since 1996 diphtheria vaccination uptake rates in Northern Ireland among children by their second birthday have been constant at 96-97%. Similarly pertussis vaccination uptake rates have ranged from 94-95% over the same period. Haemophilus Influenzae Type b (Hib) vaccine coverage was also relatively constant at 96-97%. This demonstrates parents were being selective as to which vaccines should be administered to their children.

Parental attitudes to vaccination

Parental attitudes can vary depending on vaccine, experience from an earlier vaccination and the support they receive from local health professionals. Attitudes will also change with time⁴. The parental decision making process that concludes with a child receiving its vaccine at the appropriate time is complex but a thorough understanding of the underlying issues is essential if parents are to receive appropriate information and support from local health care professionals. Following the decline in MMR vaccination uptake levels it was agreed there should be a regular survey in Northern Ireland among mothers to continuously monitor their attitudes to vaccination. This study was performed as part of the Northern Ireland Omnibus Survey and results were published in late 1998⁵. The Health Education Authority in England and Wales has undertaken a similar tracking survey for a number of years.

In the Northern Ireland survey, 30% of mothers thought MMR vaccine to be completely safe while 68% thought it was associated with a slight risk. This should be compared with 56% and 41% respectively for diphtheria.

Seventy two per cent of mothers had discussed immunisation issues with their GP, health visitor or midwife before their baby was due its immunisation. Sixty-nine per cent of mothers had discussed immunisation with their partner, 19% discussing it with friends or with the child's grandmother (18%).

Among the steps taken to reverse the recent decline in MMR vaccine uptake rates was to ensure mothers received written information material specifically addressing the issues, which had been highlighted in the media. Seventy-three per cent of mothers recalled receiving such material and 87% stated they were informed about the benefits of vaccination with 81% also being informed about side effects. Mothers were also asked if they had another child would he/she be fully immunised: 73% strongly agreed; 17% agreed; 3% disagreed; 4% strongly disagreed.

This survey has revealed valuable information. It confirms the important role health professionals have in providing balanced information on immunisation and the extent to which mothers discuss it with family and friends. However there are no grounds for complacency as only 90% of mothers stated their next child would be fully immunised. The current Departmental target for childhood vaccines is 95% uptake in those reaching their second birthday. Unless and until more parents consent their children for immunisation this target will not be met and population immunity will be insufficient to prevent further spread of these vaccine preventable infections. Health professionals need to be able to understand parental concerns and encourage debate and discussion so that parents feel they are making a fully informed decision. This highlights the need for continuing professional education focusing not just on the technical aspects of immunisation but on more holistic issues such as communication and interpersonal skills. This process will be informed by a survey, currently being undertaken by CDSC (NI), of general practitioners and community nursing staff.

Enhanced surveillance of measles, mumps and rubella infection

Notifications of measles throughout the UK are now at very low levels. Children frequently present to their GP with fever, rash and upper respiratory symptoms and there is an understandable reluctance to take blood from a child to confirm the clinical diagnosis. As measles becomes less common it is to be expected that an increasing proportion of notified cases will not be due to measles infection. Other infections such as rubella, parvovirus B19, enteroviruses and Epstein-Barr virus can produce clinical features, which may be difficult to distinguish from measles.

Following the measles rubella vaccination programme in 1994 enhanced surveillance of measles, mumps and rubella infection was introduced throughout the UK. When the CCDC receives a notification of one of these infections a swab is sent to the notifying clinician requesting they obtain a sample of saliva in which the relevant antibodies can be measured. The sponge swab is designed to be used like a toothbrush: saliva is collected by rubbing the sponge firmly along the gum (at the base of the teeth, if present) until the sponge swab is wet. This takes about a minute. The swab is then placed in the tube and posted to the Central Virus Laboratory, London. Studies have shown there is good agreement between the traditional serum specimens and this new saliva based technique with 93% of paired samples giving concordant results⁶.

Table 9.2:
Salivary antibody testing results 1999, Northern Ireland

	Board	Notifications	Salivary kits sent to GP	Salivary test completed	Evidence of recent infection
Measles	NHSSB	26	24	16	0
	SHSSB	11	11	7	0
	EHSSB	31	9	3	0
	WHSSB	11	10	4	0
	Total	79	54	30	0
Mumps	NHSSB	33	23	15	3
	SHSSB	12	11	8	1
	EHSSB	22	10	3	0
	WHSSB	26	26	16	8
	Total	93	70	42	12
Rubella	NHSSB	16	12	4	1*
	SHSSB	11	11	5	0
	EHSSB	36	1	1	0
	WHSSB	10	10	5	0
	Total	73	34	15	1*

**inconclusive
EHSSB resumed salivary antibody testing from April 1999*

This table describes the number of notifications of measles, mumps and rubella infection in Northern Ireland and the outcome of salivary antibody testing. There were 79 notifications of measles in 1999, compared with 112 in the previous year, but none of those tested had serological evidence of recent infection. There was a rise in mumps notifications, particularly towards the end of 1999 in Northern and Western Boards, and this was associated with 12



serologically confirmed cases. In 1998, salivary testing was performed on 19 of the 79 individuals notified with mumps and no recent infections were detected. Rubella notifications decreased from 111 in 1998 to 73 in 1999 and of those tested none had conclusive evidence of recent infection.

The traditional statutory notification system is based on clinical suspicion and laboratory confirmation is not required as a condition of notification. Thus it lacks the precision required for effective disease control. However, the addition of this simple non-invasive test linked to the notification process will provide a more accurate measure of the incidence of measles, mumps and rubella and thus also assist in the monitoring of the effectiveness of the vaccination programme.

With MMR vaccination uptake levels remaining around 90% it is particularly important that all notifications of measles, mumps and rubella infection are followed up to ascertain if the clinical diagnosis is confirmed in order to gain a better understanding of the incidence of these infections in the community. As stated earlier, should vaccine uptake rates remain at this level for a sustained period they will be insufficient to prevent the spread of these infections in the community. It is disappointing to note that in 1999 only 35% of those notified had salivary antibody testing undertaken with considerable variation between Boards. General practitioners and community nursing staff need to be reminded of their role in this enhanced surveillance programme if we are to be successful in detecting an early increase in these infections.

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HIV and AIDS

HIV infection and its sequelae are global issues. While their incidence and prevalence in Northern Ireland may be low compared to many other countries, there are no grounds for complacency with, on average over the past five years, twelve new reports of HIV infection each year in the Province. Before discussing in detail the local epidemiology of HIV infection it is worth reflecting on the scale of AIDS and HIV infection world-wide.

International

In December 1999, the Joint United Nations Programme on AIDS (UNAIDS) and WHO¹ estimated that 33.6 million people are living with HIV infection. An estimated 5.6 million individuals became infected during 1999. This equates to an incidence rate of over 15,000 per day.

Sub-Saharan Africa remains the region most affected by HIV infection (23.3 million infected) and while it only comprises 10% of the world population, it includes 69% of all those living with HIV infection. In some countries within that region up to 30% of adults aged 15-49 years are infected with HIV. This is causing widespread morbidity and mortality. The impact of this on the workforce is having a marked effect on the national economies of these countries.

In 1999, 2.3 million new infections occurred in women and 570,000 in children aged under 15 years. Almost all of the new childhood infections are due to mother to child transmission, either before or during childbirth, or through breastfeeding. The UNAIDS/WHO report estimates that 11.2 million children have lost their mothers due to AIDS and many of these children will also have infected fathers. It concludes the most effective method of reducing HIV infection in children is to protect their mothers from becoming infected in the first place.

The report also describes the significant reduction in numbers of AIDS cases and deaths in western Europe and North America that have resulted from new anti-HIV treatment. Longer survival and large numbers of new infections mean that the prevalence of HIV infection is increasing in these regions.

United Kingdom

In the United Kingdom, surveillance of HIV and AIDS is mainly based on confidential reports from laboratories and clinicians to the PHLS AIDS and Sexually Transmitted Disease Centre in London and to the Scottish Centre for Infection and Environmental Health. Information is sought on the probable mode of infection and relevant clinical features. By the end of December 1999, a total of 40,312 individuals had been reported with HIV infection in the UK² (Table 10.1). A total of 16,813 individuals with AIDS had also been reported.



Table 10.1:
HIV infection: cumulative data to end December 1999, United Kingdom

Region	Total HIV infected individuals	Cumulative rate per 100,000 population
England	36,692	74.4
Wales	596	20.6
Scotland	2,832	55.5
Northern Ireland	192	12.0
UK	40,312	68.4

This table includes individuals with laboratory reports of infection, plus those with AIDS or death reports from whom no matching laboratory report has been received.

Northern Ireland

By the end of 1999, there were known to be 192 individuals first reported from Northern Ireland with HIV infection. Eighty-two individuals have been diagnosed with AIDS over the same period. These totals therefore exclude those first diagnosed and reported elsewhere in Great Britain but who may now reside in Northern Ireland and attend specialist clinics.

Table 10.2:
HIV infected individuals and exposure category to 31 December 1999, Northern Ireland

Exposure Category	Male	Female	Total
Sexual Intercourse			
Between: men	116	-	116
Between: men & women	19	27	46
Injecting drug use	4	3	7
Blood/tissue factor or blood factor	19	1	20
Other/undetermined	3	0	3
Total	161	31	192

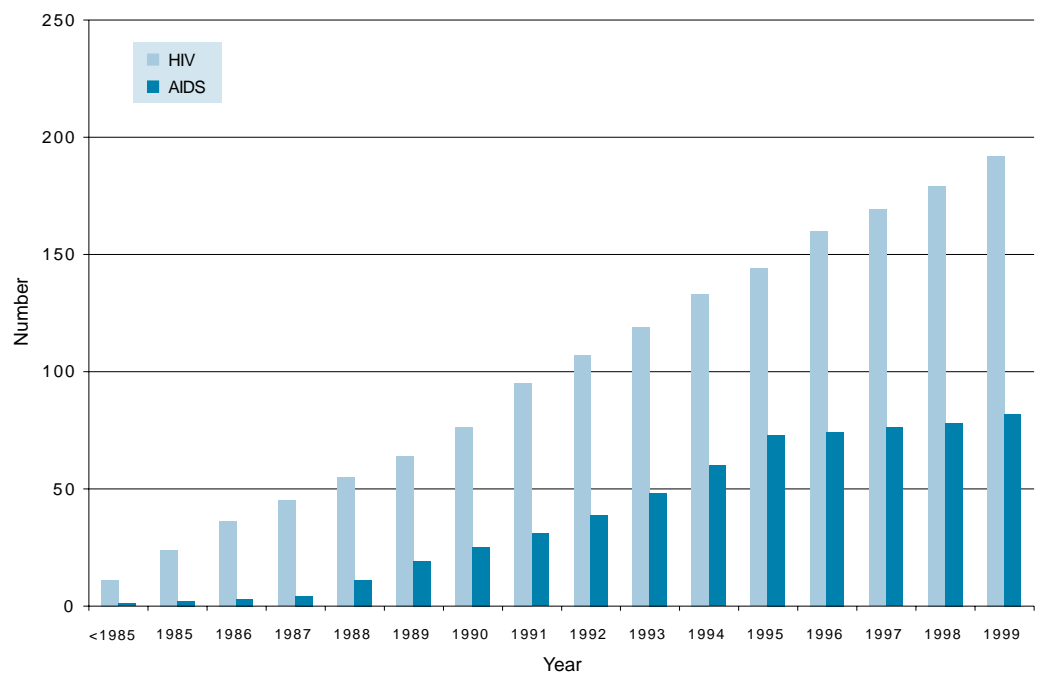
This table includes individuals with laboratory reports of infection plus those with AIDS or death reports for whom no matching laboratory report has been received.

Table 10.3:
AIDS cases by exposure category to 31 December 1999, Northern Ireland

Exposure Category	Male	Female	Total
Sexual intercourse			
Between: men	50	-	50
Between: men & women	6	8	14
Injecting drug use	1	2	3
Blood/tissue factor or blood factor	12	1	13
Other/undetermined	2	0	2
Total	71	11	82

Between 9 - 19 new cases of HIV infection have been reported each year in Northern Ireland since start of HIV/AIDS surveillance (Figure 10.1 and Figure 10.2). Thirteen new reports of HIV infection were received in 1999. The main risk factor for acquiring HIV in Northern Ireland is sex between men and this accounts for 60% of the Northern Ireland total. This proportion has remained relatively constant since 1994 and is very similar to that in the UK (59%). Forty-six individuals (24%) probably acquired infection from sex between men and women. There has, as yet, been little change over the past decade in the number of people who are considered to have acquired HIV infection through injecting drug use (Figure 10.3). Only 3.6% of those infected with HIV in Northern Ireland are reported to have injected drugs. This contrasts with Scotland where 43% of HIV infection is considered to be related to injecting drug use.²

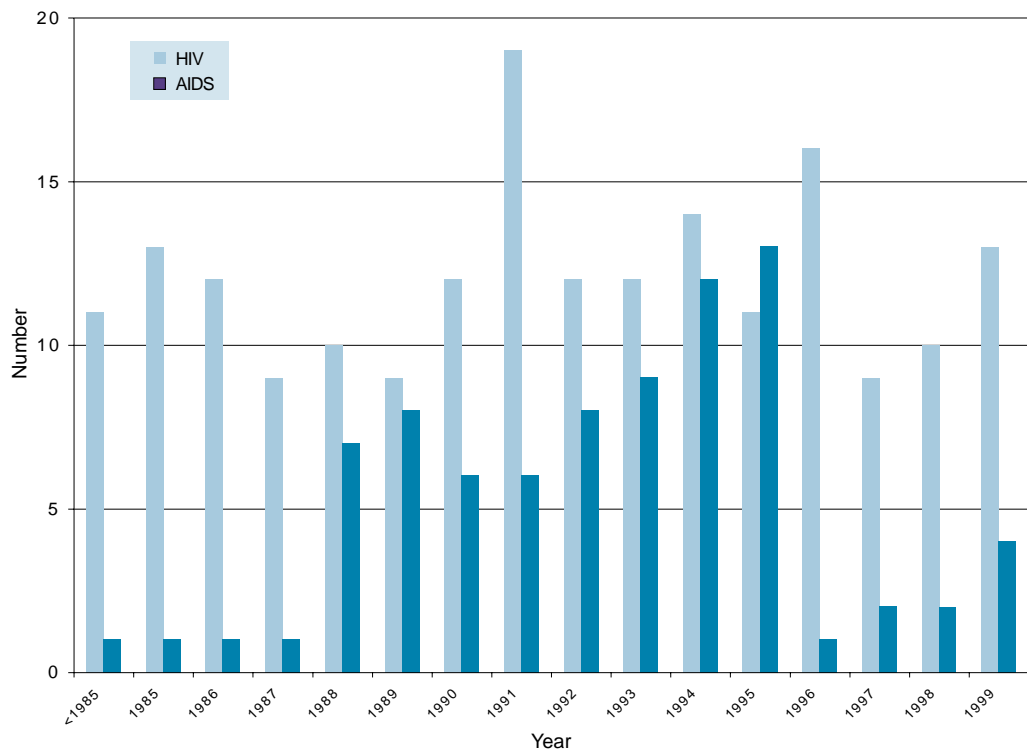
*Figure 10.1:
HIV and AIDS: cumulative total by year of diagnosis, 1985-1999, Northern Ireland*



Source: CDSC (Colindale)

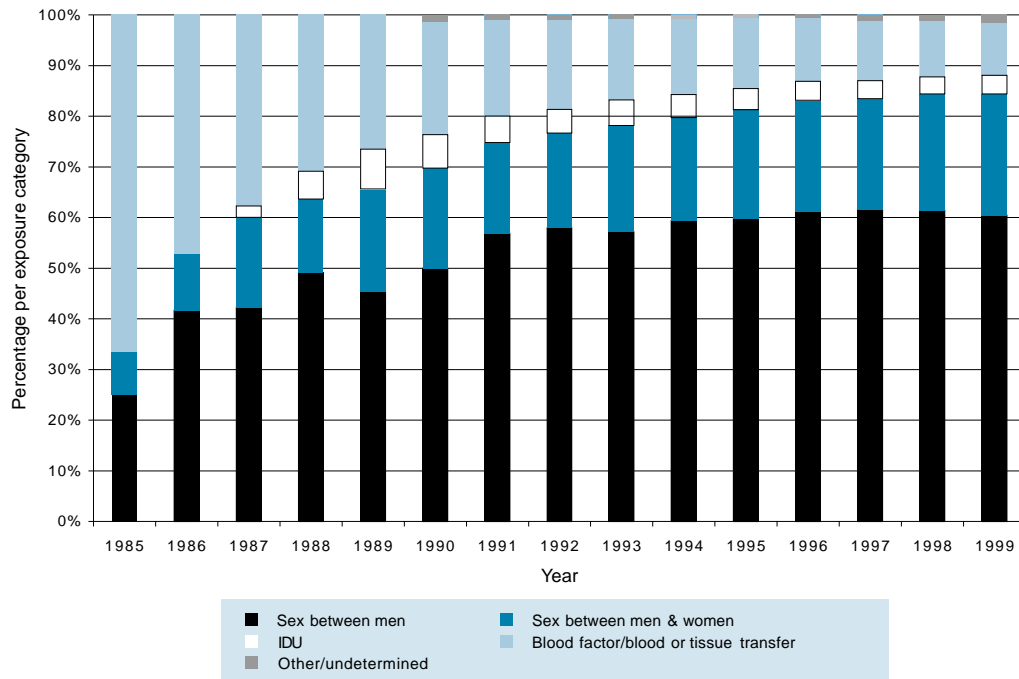


Figure 10.2:
HIV infected individuals and AIDS cases by year of diagnosis, 1985-1999, Northern Ireland



Source: CDSC (Colindale)

Figure 10.3: Cumulative cases of HIV by exposure category, 1985-1999, Northern Ireland



Source: CDSC (Colindale)

Since 1996 the numbers of diagnoses of AIDS reported each year in the Province has sharply fallen compared to the numbers of new infections of HIV. This pattern has been noted throughout the United Kingdom and is attributable to the effect of the introduction of highly active antiretroviral therapy (HAART) in delaying the onset of AIDS in those whose HIV infection was already recognised, and in delaying death in those who had already developed AIDS.

Other sexually transmitted infections

Individuals with signs and symptoms of sexually transmitted infections (STIs) may attend their general practitioner, genitourinary medicine (GUM) or family planning clinics or be referred to gynaecology outpatients. STIs are not included amongst the list of notifiable diseases but there is a requirement for GUM clinics to provide data to DHSS&PS on numbers of patients attending and the main diagnostic categories (form KC60). There are four GUM clinics in Northern Ireland which provide free, confidential, sexual health services including the diagnosis and treatment of STIs. They are open access in that it is not necessary to be referred by a general practitioner.

Compared to HIV and AIDS, surveillance for other STIs is less well developed. Table 10.4 summarises the number of initial contacts by major diagnostic category for 1998/99. Unfortunately recording problems at one of the main GUM clinics during 1996/97 and 1997/98 means that it is not possible to provide or comment at a regional level on recent trends. As individuals may be diagnosed with more than one infection, either at their first or subsequent attendance, they may be included more than once in the clinic returns.

In 1998/99 there were 24,853 attendances at GUM clinics with 9,382 (37.8%) being a first attendance. Total diagnoses were 10,293 in males and 7,447 in females (ratio 1.4:1). 5,459 acute STIs were diagnosed: 3,914 (72%) in males and 1,545 (28%) in females.

Box 10.1: *Acute sexually transmitted infections*

- Infectious syphilis
- Post-pubertal gonorrhoea
- Complicated gonorrhoea
- Chancroid/lymphogranuloma venereum(LGV)
- Donovanosis
- Uncomplicated chlamydia infection
- Uncomplicated non-gonococcal /non-specific urethritis in males
- Complicated non-gonococcal/non-specific infection
- Herpes simplex (first attack)
- Wart virus infection
- Molluscum contagiosum
- Trichomoniasis
- Scabies/pediculosis pubis



There were no reported cases of infectious syphilis during the reporting period in Northern Ireland. Seventy-three reports were of uncomplicated gonorrhoea with 84% of them in males compared to 67% in England³. Five of these were thought to be homosexually acquired. Forty-nine (67%) of the 73 diagnoses of gonorrhoea were in those aged 20-34 years and ten (14%) were in the 16-19 age group.

Table 10.4:
Total diagnoses of acute STI: number and rate per 100,000 population, 1998-1999, England and Northern Ireland

	England*		Northern Ireland**	
	Number	Rate	Number	Rate
Uncomplicated gonorrhoea	12,393	25.1	73	4.6
Uncomplicated chlamydia	44,196	89.6	708	41.9
Herpes simplex first attack	15,706	31.9	170	10.1
Anogenital warts first attack	59,973	121.7	2,247	133.1
Other	375,387		14,542	
Total	507,655		17,740	

* 1998 data³

** April 98-Mar 99 data

There were 708 diagnoses of chlamydia with 53% occurring in males (compared with 43% in England). Nearly 74% occurred in the 20-34 age group and 18% were in the 16-19 year age group. Despite there being an overall equal sex distribution regarding chlamydia diagnoses from the GUM clinics, of the 128 diagnoses in the 16-19 age group 72% were female. In England the rates of chlamydia infection among females in the 16-24 age group have steadily increased between 1993 and 1998.

Anogenital warts accounted for 3,934 (22%) of the 17,740 diagnoses made at the GUM clinics. Seventy-two per cent were in males. Diagnoses of first attacks of anogenital warts were most numerous in 25-34 year old men and in 20-24 year old women. This is similar to the age/sex pattern noted in England although the overall rate in Northern Ireland for first attacks of anogenital warts, unlike the rate for other acute STIs, is greater than the rate reported from GUM clinics in England.

Information is also collected on attendances associated with HIV antibody counselling and testing. During 1998/1999 this was undertaken on 1,053 occasions with the most common age group (40%) being the 25-34 age group in both sexes. Six hundred and twenty males received counselling and testing and 63 (10%) had a history of sex with men. This compares with 15% in the English clinics.

Caution is required when interpreting the local data. It reflects the workload at the four GUM clinics over one year as recorded on the KC60 form. That year could be atypical as there is no recent trend data for comparative purposes. The data also reflects the varying availability and accessibility of GUM services within the Trusts. It will be important in future years to document the trends in acute STIs by enhancing surveillance, focusing particularly on the patterns and rates of infection in the younger age groups. This information can then be linked to sexual health promotion programmes. Surveillance information should inform this work and contribute to the evaluation of specific interventions.

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APPENDIX 1: Notifications of Infectious Diseases, 1990-1999, Northern Ireland

Disease	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
Acute Encephalitis (a)	0*									
Acute Meningitis (b)	52*									
Acute Encephalitis/Meningitis:Bacterial**	66	110	89	105	119	96	86	74	48	82
Acute Encephalitis/Meningitis:Viral**	40	59	29	17	21	18	19	17	16	17
Anthrax	0	0	0	1	0	0	0	0	0	0
Chickenpox **	2744	3685	9934	3957	6141	4785	7004	5253	4907	4584
Cholera	0	0	0	1	1	0	0	0	0	0
Diphtheria	0	0	0	0	0	0	0	0	0	0
Dysentery	51	71	174	129	137	272	155	29	18	10
Food Poisoning	818	634	914	954	1006	1267	1456	1534	1942	2033
Gastro-enteritis (persons under 2)	1155	1106	1068	1379	889	1072	745	896	1371	1121
Infective Hepatitis (c)	69*									
Hepatitis A**	80	230	194	245	229	92	49	33	91	62
Hepatitis B**	5	9	14	7	7	9	15	8	1	4
Hepatitis Unspecified:Viral**	159	201	94	43	30	21	15	15	16	12
Legionnaires Disease**	0	1	2	1	1	1	0	2	2	2
Leptospirosis**	2	3	1	3	3	0	1	1	2	1
Malaria**	3	8	14	8	6	5	14	16	23	13
Measles	335	346	302	495	950	263	197	120	112	79
Meningococcal Septicaemia**	2	19	27	35	40	44	67	56	87	145
Mumps***	187	193	156	115	103	93	67	68	79	93
Paratyphoid Fever	0	0	1	1	2	0	0	1	1	0
Plague	0	0	0	0	0	0	0	0	0	0
Polio (paralytic)	0	0	0	0	0	0	0	0	0	0
Polio (acute)	0	0	0	0	0	0	0	0	0	0
Rabies	0	0	0	0	0	0	0	0	0	0
Relapsing Fever	0	0	0	0	0	0	0	0	0	0
Rubella***	543	364	293	528	408	221	190	127	111	73
Scarlet Fever	772	581	523	575	519	502	478	425	486	432
Smallpox	0	0	0	0	0	0	0	0	0	0
Tetanus	0	0	0	0	1	0	0	1	0	0
Tuberculosis (Pulmonary)	95	71	65	69	62	65	51	57	43	44
Tuberculosis (Non Pulmonary)	37	27	18	20	29	20	25	19	18	17
Typhoid	0	0	0	1	0	0	1	1	2	0
Typhus	0	0	0	0	0	0	0	0	0	0
Viral Haemorrhagic Fevers	0	0	0	0	0	0	0	0	0	0
Whooping Cough	287	243	205	134	234	131	148	135	100	108
Yellow Fever	0	0	0	0	0	0	0	0	0	0

* First Quarter data only

** Only notifiable from 16 April 1990

*** Only notifiable from October 1988

(a) Acute Encephalitis became notifiable under the heading Acute Encephalitis/Meningitis: Bacterial on 16 April 1990

(b) Acute Meningitis became notifiable under the heading Acute Encephalitis/Meningitis: Viral on 16 April 1990

(c) Infective Hepatitis became notifiable under the headings Hepatitis A, Hepatitis B and Hepatitis Unspecified: Viral on 16 April 1990

APPENDIX 2: Trends in specific reported pathogens, 1990-1999, Northern Ireland

	1990	1991	1992	1993	1994	1995	1996	1997	1998	1999
<i>Gastro-intestinal tract infections</i>										
Campylobacter	244	306	412	361	440	557	653	778	775	861
Clostridium difficile toxin	23	70	80	135	259	323	412	423	481	574
Cryptosporidium	204	149	58	177	89	81	98	82	180	181
Escherichia coli O 157	1	2	1	2	3	7	14	25	24	51
Giardia lamblia	69	49	63	58	40	49	45	24	21	37
Rotavirus	220	272	297	580	176	443	379	585	521	356
Salmonella Total (excl S.typhi & S. paratyphi)	259	159	224	178	280	451	413	430	531	688
Salmonella enteritidis	178	47	131	113	131	261	171	169	272	462
Salmonella enteritidis PT 4	75	31	108	89	101	226	113	123	207	397
Salmonella typhimurium	32	34	47	35	60	119	169	185	177	124
Salmonella typhimurium DT 104	0	0	2	4	19	56	121	134	142	66
Salmonella other serotypes	49	78	46	30	89	71	73	76	82	102
Shigella	20	45	131	111	108	259	154	24	14	12
Small Round Structured Virus (SRSV)	8	23	35	17	28	31	7	11	35	9
<i>Respiratory tract infections</i>										
Coxiella burnetii	60	75	38	21	45	53	62	51	44	53
Epstein-barr Virus (EBV)	423	461	467	454	485	519	613	535	376	425
Influenza A	62	1	39	89	7	92	131	156	259	419
Influenza B	13	51	0	26	2	96	4	88	5	158
Respiratory Syncytial Virus (RSV)	189	478	196	583	578	420	903	1070	651	782
Hepatitis A	170	213	143	181	164	91	40	37	70	67
Hepatitis B	37	28	34	22	33	30	31	22	18	24
Hepatitis C	0	0	0	0	41	58	29	26	38	23
Staphylococcus aureus Total	148	187	188	177	231	209	283	239	271	307
MRSA	0	0	0	0	0	5	29	31	52	85
Streptococcus pneumoniae	108	118	80	92	122	126	126	128	105	111
Neisseria meningitidis	36	32	38	38	36	56	46	45	68	102
Haemophilus Influenzae type B	28	29	27	8	3	0	0	1	1	3
Mycobacterium bovis	0	0	0	0	7	2	4	2	0	3
Mycobacterium tuberculosis	63	48	52	40	49	65	50	37	32	38

In line with PHLS reporting guidelines, the figures quoted for Staphylococcus aureus are for CSF and blood specimens only, unless the organism is methicillin resistant; all MRSA specimens are included. The total S. aureus figure includes MRSA. The figures quoted for Hib are for CSF and blood specimens only.

This is not a complete list of all organisms reported to CDSC (NI), but further information is available on request.

APPENDIX 3: Selected organisms reported to CDSC (NI) 1999

Organism	No of Lab Reports	Organism	No of Lab Reports
Adenovirus (faecal specimens)	187	Mycobacterium kansasii	7
Adenovirus (non-faecal specimens)	96	Mycobacterium malmoense	6
Bordetella pertussis	7	Mycobacterium scrofulaceum	1
Brucella abortus	3	Mycobacterium tuberculosis	38
Brucella sp	1	Mycobacterium xenopi	1
Campylobacter sp	861	Mycoplasma pneumoniae	20
Respiratory Chlamydia	23	Neisseria gonorrhoeae	19
Chlamydia trachomatis	167	Neisseria meningitidis B	45
Clostridium difficile toxin	574	Neisseria meningitidis C	35
Clostridium perfringens	6	Neisseria meningitidis ungrouped	19
Coxiella burnetii	53	Neisseria meningitidis W135	2
Cryptosporidium	181	Neisseria meningitidis Y	1
Cytomegalovirus (CMV)	54	Pseudomonas aeruginosa	65
Epstein-barr virus (EB Virus)	425	Pseudomonas alcaligenes	1
Escherichia coli O157	51	Pseudomonas cepacia	1
Giardia lamblia	37	Pseudomonas maltophilia	19
Haemophilus influenzae type B	3	Pseudomonas fluorescens	2
Hepatitis A	67	Pseudomonas pickettii	1
Hepatitis B	24	Pseudomonas putida	2
Hepatitis C	23	Pseudomonas sp	9
Herpes simplex virus type 1	115	Respiratory syncytial virus (RSV)	782
Herpes simplex virus type 2	64	Rotavirus	356
Influenza A	419	Rubella virus	1
Influenza B	158	Shigella flexneri	3
Leptospira hardjo	1	Shigella sonnei	9
Listeria monocytogenes	1	Small round structured virus (SRSV) (Norwalk)	90
Mumps virus	2	Staphylococcus aureus (MRSA)	307 (85)
Mycobacterium avium-intracellulare group (MAI)	13	Staphylococcus coagulase negative	214
Mycobacterium bovis	3	Streptococcus pneumoniae	111
		Varicella zoster	44



APPENDIX 4: Salmonella reports 1992-1999, Northern Ireland

	1992	1993	1994	1995	1996	1997	1998	1999
Salmonella aberdeen	-	-	-	-	-	-	2	-
Salmonella abony	-	-	-	-	-	-	1	-
Salmonella adelaide	-	-	-	-	-	-	1	-
Salmonella agama	-	-	1	-	-	-	-	-
Salmonella agona	8	5	4	11	7	5	2	4
Salmonella alachua	-	-	-	-	-	-	1	-
Salmonella anatum	1	-	-	-	-	-	1	2
Salmonella bareilly	1	-	-	1	-	4	-	1
Salmonella barry	1	-	-	-	-	-	-	-
Salmonella blockley	1	-	-	-	-	-	1	1
Salmonella bonn	-	-	-	-	1	-	-	-
Salmonella bovis-morbificans	-	-	-	-	2	1	-	-
Salmonella braenderup	-	-	-	3	-	1	1	5
Salmonella brandenburg	1	2	-	-	1	-	-	-
Salmonella bredeney	1	-	31	9	10	20	4	10
Salmonella california	1	-	-	-	-	-	-	-
Salmonella chester	-	-	1	-	-	-	-	-
Salmonella coeln	-	-	-	-	-	1	-	-
Salmonella corvallis	-	-	-	-	-	-	3	1
Salmonella derby	-	-	1	1	-	-	-	-
Salmonella dublin	-	-	2	2	3	1	3	1
Salmonella emek	-	-	-	1	-	-	1	-
Salmonella enteritidis untyped	13	7	3	10	7	12	10	6
Salmonella enteritidis PT 1	5	-	4	7	9	16	18	25
Salmonella enteritidis PT 1A	-	1	-	-	-	-	1	-
Salmonella enteritidis PT 2	-	-	-	-	-	1	-	-
Salmonella enteritidis PT 3	-	1	-	-	-	-	-	-
Salmonella enteritidis PT 4	108	89	101	226	113	123	207	397
Salmonella enteritidis PT 4A	-	-	-	1	-	-	-	-
Salmonella enteritidis PT 5	-	-	1	2	-	-	2	2
Salmonella enteritidis PT 5A	-	1	-	3	-	-	3	-
Salmonella enteritidis PT 5B	-	-	-	-	-	-	-	1
Salmonella enteritidis PT 6	1	3	5	5	3	-	5	3
Salmonella enteritidis PT 6A	4	11	7	2	5	8	9	8
Salmonella enteritidis PT 6B	-	-	-	-	-	-	-	2
Salmonella enteritidis PT 7	-	-	-	1	-	1	-	2
Salmonella enteritidis PT 8	-	-	3	1	11	5	2	6
Salmonella enteritidis PT 9	-	-	-	-	1	-	-	-
Salmonella enteritidis PT 11	-	-	1	1	-	-	2	-
Salmonella enteritidis PT 13A	-	-	-	-	-	-	6	-
Salmonella enteritidis PT 14B	-	-	-	-	2	1	1	-
Salmonella enteritidis PT 15	-	-	-	-	-	-	1	-
Salmonella enteritidis PT 16	-	-	-	-	-	-	1	-
Salmonella enteritidis PT 20	-	-	-	-	-	-	-	1
Salmonella enteritidis PT 21	-	-	4	-	3	1	1	3
Salmonella enteritidis PT 24	-	-	1	-	16	-	-	-
Salmonella enteritidis PT 29	-	-	-	-	-	-	1	-
Salmonella enteritidis PT 34	-	-	1	1	1	1	1	3
Salmonella enteritidis PT 35	-	-	-	1	-	-	1	-
Salmonella enteritidis PT 44	-	-	-	-	-	-	-	2
Salmonella enteritidis untypable	-	-	-	-	-	-	-	1
Salmonella fallowfield	-	-	-	-	-	-	1	-
Salmonella gold-coast	1	-	-	-	-	-	-	-
Salmonella grumpensis	-	-	-	-	-	-	-	1
Salmonella haardt	-	-	1	-	1	-	1	1
Salmonella hadar untyped	1	-	1	1	4	4	2	2
Salmonella hadar PT 1	-	-	-	-	-	-	2	1
Salmonella hadar PT 2	-	-	-	-	-	2	2	-
Salmonella hadar PT 9	-	-	-	1	-	-	-	-
Salmonella hadar PT 11	-	-	-	-	-	1	-	1
Salmonella hadar PT 13	-	-	-	-	-	-	-	1

APPENDIX 4 cont.: Salmonella reports 1992-1999, Northern Ireland

	1992	1993	1994	1995	1996	1997	1998	1999
Salmonella hadar PT 14	1	-	-	-	-	-	-	-
Salmonella hadar PT 21	-	-	-	-	1	-	-	1
Salmonella hadar PT 32	-	-	-	-	-	-	1	-
Salmonella haifa	-	2	-	1	-	-	-	-
Salmonella hartford	-	-	-	-	-	-	-	1
Salmonella heidelberg	2	1	4	5	2	4	2	4
Salmonella herston	1	-	-	-	-	-	-	-
Salmonella hidalgo	-	-	-	-	-	-	-	2
Salmonella hillbrow	-	-	-	-	-	-	-	1
Salmonella ibadan	-	1	-	-	-	-	-	-
Salmonella indiana	1	-	-	1	1	-	-	1
Salmonella infantis	3	2	-	3	-	1	2	2
Salmonella java	-	1	-	-	1	-	-	4
Salmonella javiana	-	-	-	-	1	-	-	1
Salmonella kapemba	-	-	-	1	-	-	-	-
Salmonella kedougou	-	-	-	-	-	-	-	1
Salmonella kentucky	-	-	2	4	-	3	1	-
Salmonella kisii	-	-	-	-	-	-	-	1
Salmonella kottbus	-	-	-	-	2	-	1	-
Salmonella labadi	-	-	-	1	-	-	-	-
Salmonella lagos	-	-	1	-	1	-	-	-
Salmonella livingstone	-	-	-	-	-	-	1	1
Salmonella london	-	-	-	1	1	-	-	1
Salmonella manhattan	-	-	-	-	-	1	-	-
Salmonella mbandaka	1	1	2	1	1	-	-	2
Salmonella montevideo	1	-	-	1	-	-	-	1
Salmonella muenchen	-	-	1	-	-	-	2	1
Salmonella muenster	-	1	-	-	-	-	1	-
Salmonella ndolo	-	-	1	-	-	-	-	-
Salmonella newport	-	1	1	1	3	3	2	-
Salmonella ohio	-	-	2	-	-	-	1	1
Salmonella oranienburg	-	-	-	1	-	-	3	-
Salmonella orion	-	-	-	-	1	1	-	-
Salmonella panama	1	-	1	-	-	2	-	1
Salmonella poona	-	-	-	-	1	1	-	1
Salmonella remo	-	-	-	-	-	2	-	-
Salmonella rissen	-	-	-	1	-	-	-	-
Salmonella rubislaw	-	-	-	-	1	-	-	-
Salmonella saint-paul	-	-	1	3	-	-	2	-
Salmonella schwarzengrund	-	-	3	2	2	-	2	-
Salmonella senftenberg	-	-	1	-	-	1	1	-
Salmonella shubra	1	-	-	-	-	-	-	-
Salmonella sinstorf	-	-	-	-	-	1	-	-
Salmonella sp	2	-	9	4	8	5	8	15
Salmonella stanley	-	-	-	-	2	2	2	4
Salmonella tennessee	-	-	-	-	-	-	-	1
Salmonella thompson untyped	-	-	5	-	1	1	-	-
Salmonella thompson PT 1	-	-	-	-	-	-	-	1
Salmonella thompson PT 2	-	-	-	1	-	-	-	-
Salmonella thompson PT 6	-	-	-	-	-	-	-	3
Salmonella thompson PT 43	-	-	-	-	-	1	-	-
Salmonella tounouma	-	-	-	-	-	-	-	1
Salmonella tshiongwe	-	-	-	-	-	1	-	-
Salmonella typhimurium untyped	15	5	3	11	8	6	14	7
Salmonella typhimurium DT 1	1	-	2	-	-	-	1	3
Salmonella typhimurium DT 2	-	-	-	-	-	-	-	3
Salmonella typhimurium DT 4	-	1	1	1	-	-	-	2
Salmonella typhimurium DT 8	-	-	-	-	-	-	-	2
Salmonella typhimurium DT 9	2	-	-	-	-	-	-	-
Salmonella typhimurium DT 10	-	2	-	-	-	-	-	-



APPENDIX 4 cont.: Salmonella reports 1992-1999, Northern Ireland

	1992	1993	1994	1995	1996	1997	1998	1999
Salmonella typhimurium DT 12	-	1	-	1	2	2	1	4
Salmonella typhimurium DT 17	-	-	-	1	-	-	-	-
Salmonella typhimurium DT 32	-	1	-	-	-	-	-	-
Salmonella typhimurium DT 41	-	-	-	-	-	1	-	1
Salmonella typhimurium DT 49	-	-	-	-	-	-	-	1
Salmonella typhimurium DT 49A	-	-	-	1	-	-	-	-
Salmonella typhimurium DT 56	1	-	-	-	-	-	-	-
Salmonella typhimurium DT 69	1	-	-	-	-	-	-	-
Salmonella typhimurium DT 85	-	-	-	-	-	-	-	1
Salmonella typhimurium DT 97	-	1	-	-	-	-	-	-
Salmonella typhimurium DT 99	-	-	-	-	1	-	1	1
Salmonella typhimurium DT 101	-	-	-	-	-	-	1	-
Salmonella typhimurium DT 103	-	-	1	-	-	-	-	-
Salmonella typhimurium DT 104	2	4	19	56	121	134	142	66
Salmonella typhimurium DT 104A	-	-	1	-	-	-	-	-
Salmonella typhimurium DT 104B	3	1	1	6	4	15	3	6
Salmonella typhimurium DT 104C	-	-	-	-	-	1	-	-
Salmonella typhimurium DT 108	-	-	-	-	1	-	-	-
Salmonella typhimurium DT 110	-	-	1	-	-	-	-	-
Salmonella typhimurium DT 120	-	-	-	1	-	-	1	3
Salmonella typhimurium DT 124	-	-	-	1	-	-	-	-
Salmonella typhimurium DT 135	-	-	5	3	-	-	-	-
Salmonella typhimurium DT 141	1	-	-	-	-	-	-	-
Salmonella typhimurium DT 145	-	-	-	-	1	-	-	-
Salmonella typhimurium DT 146	-	-	-	-	-	-	-	1
Salmonella typhimurium DT 161	-	1	-	-	-	-	-	-
Salmonella typhimurium DT 167	-	-	-	-	1	-	-	-
Salmonella typhimurium DT 170	1	1	3	9	-	1	-	3
Salmonella typhimurium DT 177	5	1	-	-	-	-	-	-
Salmonella typhimurium DT 186	-	-	-	-	-	-	-	1
Salmonella typhimurium DT 193	10	3	10	12	17	8	5	10
Salmonella typhimurium DT 195	-	1	-	4	3	2	2	-
Salmonella typhimurium DT 197	-	1	-	-	-	-	-	-
Salmonella typhimurium DT 204	-	1	6	1	-	-	-	-
Salmonella typhimurium DT 204A	1	6	-	-	1	-	1	-
Salmonella typhimurium DT 208	2	2	6	9	6	14	1	5
Salmonella typhimurium RDNC	1	-	-	-	-	1	2	-
Salmonella typhimurium U	-	-	-	-	-	-	-	1
Salmonella typhimurium U 285	-	2	-	-	-	-	-	-
Salmonella typhimurium U 288	-	-	-	1	-	-	-	-
Salmonella typhimurium U 296	-	-	-	-	-	-	2	-
Salmonella typhimurium U 303	-	-	-	-	-	-	-	1
Salmonella typhimurium U 310	-	-	-	-	-	-	-	1
Salmonella typhimurium untypable	1	-	1	1	3	-	-	1
Salmonella tyresoe	-	-	1	-	-	-	-	-
Salmonella unnamed	2	-	1	-	1	1	3	4
Salmonella virchow untyped	12	5	4	5	6	3	12	9
Salmonella virchow PT 4	-	-	-	1	-	-	-	-
Salmonella virchow PT 8	-	1	4	2	5	1	-	3
Salmonella virchow PT 23	-	1	-	-	-	-	-	-
Salmonella virchow PT 25	-	5	-	-	-	-	-	-
Salmonella virchow PT 26	1	-	-	-	2	-	3	-
Salmonella virchow PT 31	-	-	1	-	-	-	-	-
Salmonella virchow PT 45	-	-	2	-	-	-	-	-
Salmonella weltevreden	-	1	-	-	-	-	2	-
Salmonella worthington	-	-	-	-	-	1	1	1
Salmonella zanzibar	-	-	-	1	-	-	-	-
Total	224	178	280	451	413	430	531	688

APPENDIX 5: List of Reporting Laboratories, Northern Ireland

	Erne Hospital
	Mater Infirmorum Hospital
Altnagelvin Area Hospital	Musgrave Park Hospital
Antrim Laboratory	Regional Mycology Laboratory
Belfast City Hospital	Regional Virus Laboratory
Belvoir Park Hospital	Royal Victoria (Bacteriology)
Causeway Laboratory	Ulster Hospital

APPENDIX 6: Personnel at CDSC (NI)

Dr Brian Smyth	<i>Regional Epidemiologist</i>
Dr Isabelle Bonmarin	<i>EPIET Fellow</i>
Ms Audrey Lynch	<i>Information Manager</i>
Ms Grainne McLaughlin	<i>Personal Assistant</i>
Ms Ruth Fox	<i>Secretary/Information Assistant</i>



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