COMMUNICABLE DISEASE REPORT

Quarterly Report

Volume 29, Number 1 March 2012

Diseases Transmitted by Direct Contact and Respiratory Route Vectorborne and Other Zoonotic Diseases

This edition of the NL Communicable Disease Report will focus on diseases transmitted by direct contact with an infectious individual, via the respiratory route and vectorborne and zoonotic diseases. These diseases are reportable to the Regional Medical Officer of Health (RMOH). Metapneumovirus and California serogroup viruses are not notifiable diseases but are included in this report for information purposes.

The reports in this edition include those reported up to and including March 31, 2012.

Table 1: Diseases Transmitted by Direct Contact and Respiratory Route and Vectorborne and Other Zoonotic Diseases 2003 to March 2012.

Disease	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
Creutzfeldt-Jakob Disease	0	0	0	1	1	1	0	0	3	0
Group B Streptococcal Disease of Newborn	0	0	0	1	3	1	0	1	0	0
Invasive Group A Streptococcal Disease	1	0	5	4	9	3	5	6	1	2
Invasive *Haemophilus influenzae* non-type b Disease	0	0	0	0	0	0	0	1	0	0
Invasive *Haemophilus influenzae* type b Disease	0	0	0	0	0	1	0	2	2	0
Invasive Meningococcal Disease confirmed	5	0	4	5	7	5	5	3	1	0
Invasive Pneumococcal Disease (IPD)	11	11	11	24	13	37	37	23	17	8
Legionellosis	0	0	0	1	0	0	0	0	0	0
Lyme disease	0	1	0	0	1	0	0	1	0	0
Malaria	3	3	0	3	1	0	4	1	2	0
Tuberculosis	7	7	9	12	7	8	22	8	9	1

Table 2: Laboratory confirmed influenza in Newfoundland and Labrador, 2002-2003 season* to March 2012 (*influenza seasons run from September to August).

Disease	2002-2003	2003-2004	2004-2005	2005-2006	2006-2007	2007-2008	2008-2009	2009-2010	2010-2011	2011-2012
Influenza A	13	128	166	37	182	75	205	966	207	49
Influenza B	12	2	0	38	0	122	24	0	43	186

Tuberculosis

Tuberculosis (TB) is caused by a bacterium, *Mycobacterium tuberculosis,* that most often affect the lungs. TB is preventable and curable. The infection spreads to others by coughing, sneezing, singing or sometimes even by just talking. The disease can cause symptoms such as fever, persistent cough, fatigue, weight loss, night sweats and chest pain.

The World Health Organization (WH0)[1] describes tuberculosis as second only to HIV/AIDS as the greatest killer worldwide due to a single infectious agent. Other global facts reported by WHO:

- In 2010, 8.8 million people were diagnosed with TB and 1.4 million died
- Over 95% of TB deaths occur in low and middle income countries; it is among the top three causes of death in women aged 15 to 44
- In 2009, approximately 10 million children were orphaned as a result of TB deaths among parents
- In 2010, approximately half a million children (ages 0-14 years) were diagnosed with TB, and 64 000 children died
- TB is a leading killer of people living with HIV causing one quarter of all deaths

- In 2010 the Center for Disease Control[2] reported an overall rate of TB in the United States of 3,8 per 100,000 population; rates varied by State from 0.6 per 100,000 in Maine to a high of 8.8 per 100,000 in Hawaii
  - Foreign-born persons accounted for 60% of the cases reported

- In Canada a rate of 4.6 cases per 100,000 population was reported in 2010[3]; this was the lowest rate since the data collection began in 1924
  - The rate varied by province/territory with a low of 0.7 per 100,000 reported by Prince Edward Island and a high of 304 per 100,000 reported by Nunavut, the result of an ongoing outbreak
  - Foreign-born individuals accounted for 66% of all reported cases
  - 21% of cases were among Canadian-born Aboriginal people
  - Individuals between the ages of 25 and 44 years accounted for 18% of the total cases

- Newfoundland Labrador (NL) reported a TB rate of 1.8 per 100,000 in 2011
  - Since 2001 the rate in NL has been predominantly less than 2.0 per 100,000 population
  - Outbreaks in the years 2001 and 2009 among Aboriginal people resulted in a rate of 3.6 and 4.3 per 100,000 population for these years respectively
  - The number of cases by year in NL is shown in Figure 1
  - Individuals age 70+ accounted for the largest number of cases in the years 2001-2011, followed by the 15-24 year age group
  - The age groups for TB cases in NL is shown in Figure 2

Figure 1: Number of TB cases by year in NL, 2001- 2011

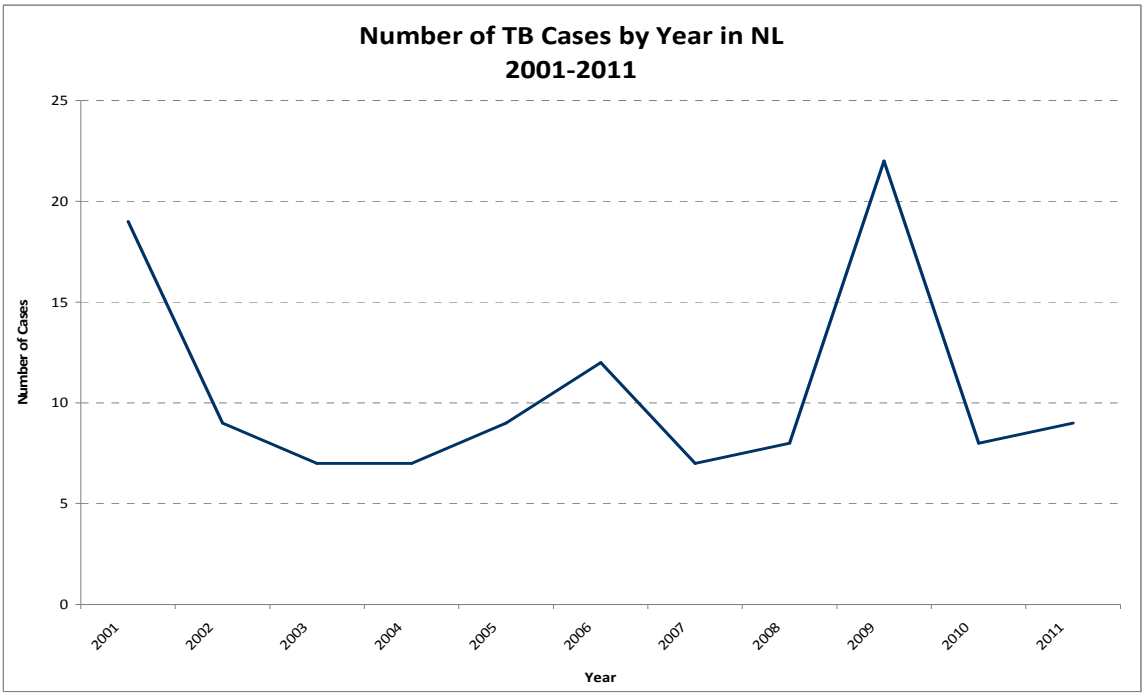
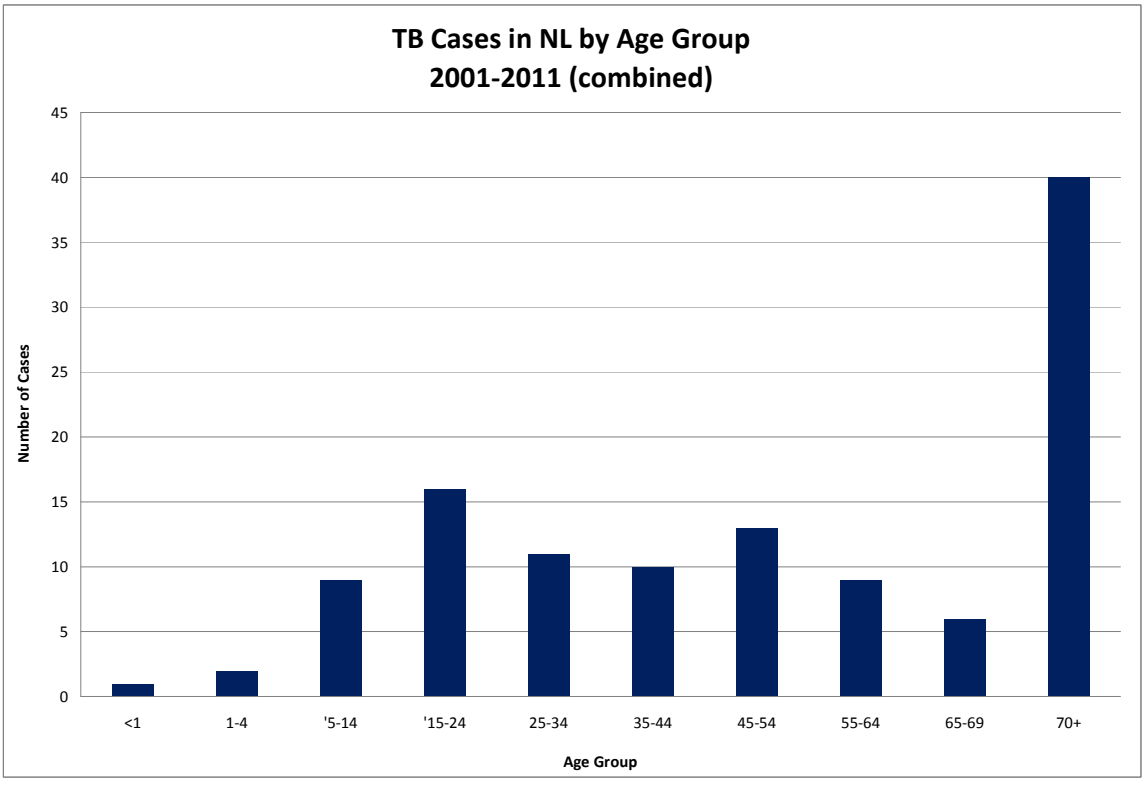


Figure 2: Number of TB cases by age group in NL, 2001- 2011



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1. World Health Organization. (2011). Global tuberculosis control: WHO report 2011. Available from http://www.who.int/tb/publications/global_report/2011/gtbr11_full.pdf
2. Center for Disease Control. (2010). Reported tuberuculosis in the United States 2010. Available from http://www.cdc.gov/tb/statistics/reports/2010/pdf/report2010.pdf
3. Public Health Agency of Canada. (2010). Tuberculosis in Canada 2010, Pre-release. Available from http://www.phac-aspc.gc.ca/tbpc-latb/pubs/tbcan10pre/index-eng.php

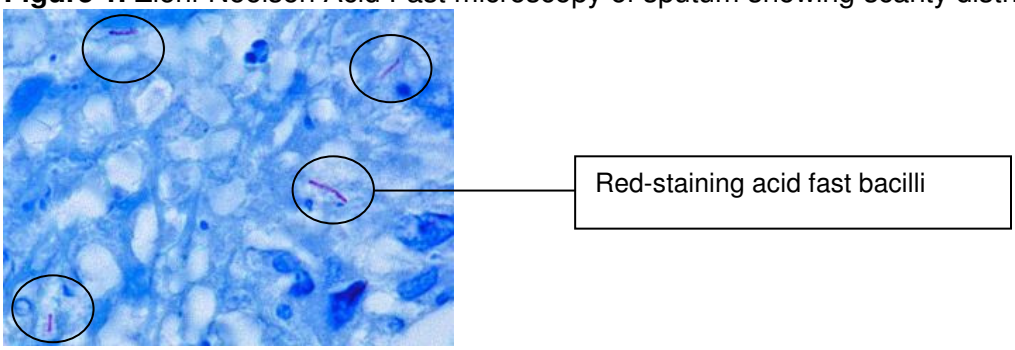
Cough to Cure: Critical aspects of tuberculosis diagnosis

Submitted by Dr. Lourens Robberts

Tuberculosis, a disease with devastating consequences to those infected and those affected, is a preventable and treatable disease. Laboratory testing includes standardized acid fast smear microscopy, culture, and nucleic acid amplification (PCR) procedures in the laboratory. However, laboratory testing is only as good as the specimen received for testing. For tuberculosis testing specimen volume, number of specimens and specimen quality is paramount. Tuberculosis bacilli are slow growing and are often times overgrown with normal flora during prolonged transport time and loose viability when exposed to adverse conditions such as temperature, pH, and ultraviolet light.

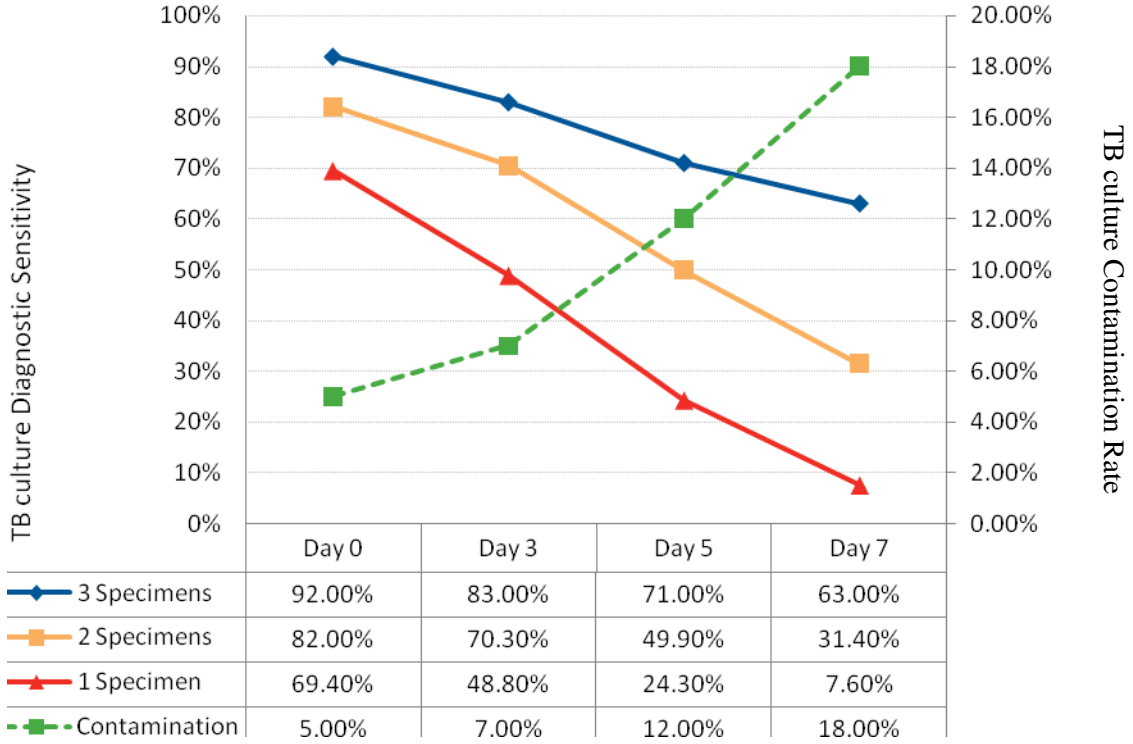
Due to the nature of sputum production and the often times scanty distribution of TB bacilli in sputum, a minimum of three properly collected sputum specimens are required to exclude a diagnosis of TB. Considering three properly collected sputum specimens as the standard for detecting 100% cases; submission of only two specimens detects 92% of cases whereas a single properly collected specimen detects only 82% of cases (1). It is important to note that these figures represent studies employing adequate specimen collection procedures (deep cough) and at minimum 5 – 10 ml of sputum per specimen. Ideally the three specimens should include at least one early morning sputum. Sputum cannot be pooled by the laboratory, therefore each specimen collected needs to be at minimum 5 ml. Specimens should not be held/stored until the required three are collected as this would delay processing and will negatively affect sensitivity. As soon as a specimen is collected it must be sent refrigerated (2 – 8℃) to the PHL.

Figure 1. Ziehl-Neelsen Acid Fast microscopy of sputum showing scanty distribution of TB bacilli



As mycobacteria are slow growing and easily overgrown by normal flora, prolonged transport time allows normal flora to suppress mycobacterial growth leading to failure of culture in the laboratory. Storage/transport time affects TB viability significantly; the proportion of culture positivity is reduced from 92% before storage to 83% at 3 days, 71% at 5 days and 63% at 7 days. In addition to decrease detection rates, the contamination rate increases proportionally from 5% (day 0), 7% (day 3), 12% (day 5), and to 18% at day 7. Therefore prompt submission of a specimen is essential. Figure 2 illustrates the detrimental effect of the combination of too few specimens collected and prolonged transport/storage time on diagnostic sensitivity.

Figure 2. Effect of number of specimens collected and transport time on TB culture diagnostic sensitivity*



	Day 0	Day 3	Day 5	Day 7
3 Specimens	92.00%	83.00%	71.00%	63.00%
2 Specimens	82.00%	70.30%	49.90%	31.40%
1 Specimen	69.40%	48.80%	24.30%	7.60%
Contamination	5.00%	7.00%	12.00%	18.00%

* Combined data from Harvell *et al*. (1) and Paramasivan *et al*. (2).

Provincial Quality Indicators

To afford Canadians the best healthcare and population protection the Canadian Tuberculosis Standards address minimum requirements for microbiological testing for tuberculosis. The PHL, as part of the laboratory quality management program, audits the quality of tuberculosis specimen submissions. The aim of the quality audit is to identify areas for improvement, provide education and training where needed, and subsequently evaluate the performance of improvement efforts. The following section outlines the pre-analytical tuberculosis quality indicators for 2011.

Number of Specimens Submitted

The number of specimens submitted from regional health authorities for tuberculosis diagnosis was analyzed. The vast majority of submissions from Burin, Carbonear, Corner Brook, Gander, Health Sciences, Grand Falls/Windsor, and Grenfell region were a single sputum specimen collected per patient (Figure 3). This is of particular concern given that a single, good quality specimen may only be ~70% sensitive - if received at the PHL and processed on the same day. Labrador, however, submitted ≥3 specimens from the vast majority of patients. This is encouraging given the nature of the geography and demographics of the region. The average number of specimen submissions per patient is alarmingly low, except for Labrador region attaining an almost perfect 3 specimens/patient (Figure 4).

Figure 3. Proportion of adequate specimen submissions per client by location.

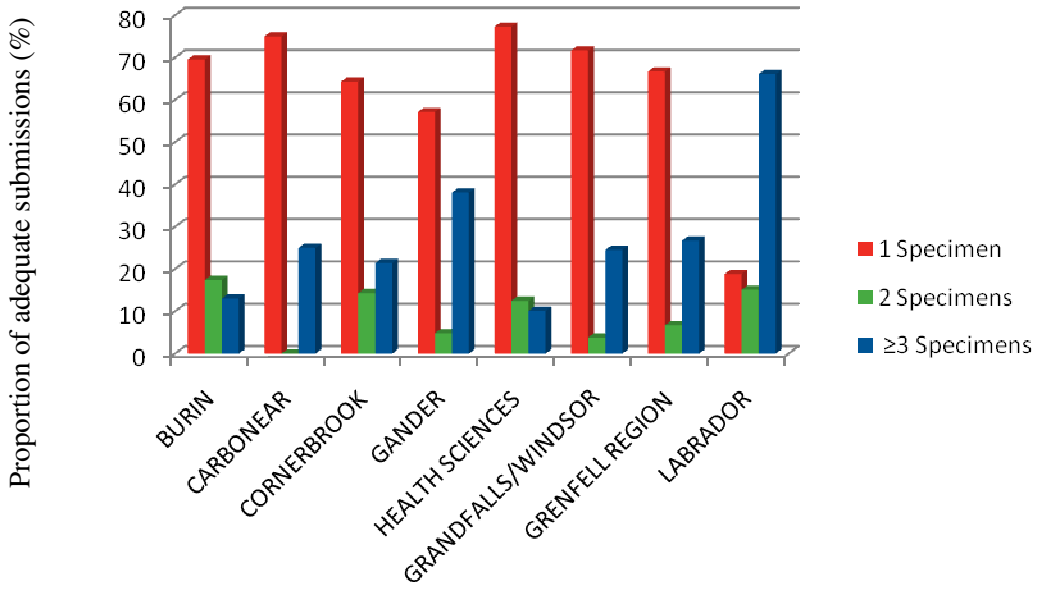
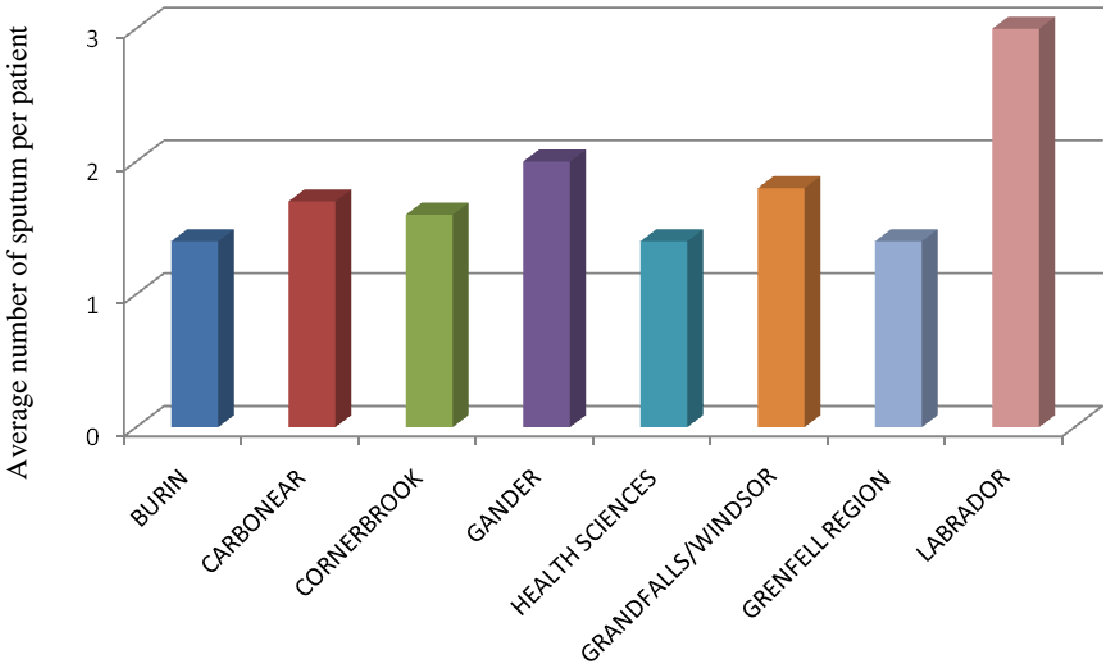


Figure 4. Average Number of Specimen submissions per Client by location



Transit time

The Canadian tuberculosis standards require a 24-hour transit time, the time from specimen collection to specimen receipt at the laboratory. Review of Newfoundland and Labrador transit time for TB specimens suggest a significant shortfall. Table 1 summarizes the mean transit time by submitting location. Table 2 summarizes both the average number of specimens received and the average transit time by submitting location.

Table 1. TB specimen submission transit time (days)*

	BURIN	CARBONEAR	CORNER BROOK	GANDER	HEALTH SCIENCES	GRAND FALLS/ WINDSOR	GRENFELL REGION	LABRADOR
Average (days)	**2**	**2**	**3**	**6**	**1**	**3**	**4**	**5**
Maximum (days)	7	6	8	36	7	8	7	14
Minimum (days)	1	0	1	1	0	0	1	0

* Time from specimen collection to time received in laboratory (days).

Table 2. TB specimen submission quality summary

	BURIN	CARBONEAR	CORNER BROOK	GANDER	HEALTH SCIENCES	GRAND FALLS/ WINDSOR	GRENFELL REGION	LABRADOR
Transit time (days)	2	2	3	6	**1**	3	4	5
Number of specimens/patient	1.4	1.7	1.6	2	1.4	1.8	1.4	**3**

Summary

TB specimen collection and submission quality indicators provide a means to assess the level of service provided to residents of the Province by each of the Regional Health Authorities. The optimal number of sputum specimens to collect is 3. More than 3 may be submitted if the clinical suspicion is high and inconsistent with laboratory findings. Fewer submissions are unacceptable and provide misleading information of the presence of tuberculosis in a patient. Transit time is unacceptably long for most of the specimens received at the PHL. Although the incidence of tuberculosis is low in Canada and in NL, molecular epidemiological evidence of M. tuberculosis strains from NL suggests ongoing active transmission of TB in the Province. Early diagnosis is key to breaking the transmission cycle of TB. In addition, the value of a microbiological culture, drug susceptibility testing and molecular epidemiological characterization of strains provide information essential for eliminating the disease from the Province. Given the combination of too few specimens collected, and the prolonged transit time, every effort should be made by the Regional

Health Authorities to address compliance with the basic minimum standards set out by the Canadian Tuberculosis Standards.

References

1. Harvell, J.D., W.K. Hadley, and V.L. Ng. 2000. Increased Sensitivity of the BACTEC 460 mycobacterial radiometric broth culture system does not decrease the number of respiratory specimens required for a definitive diagnosis of pulmonary tuberculosis. J Clin Microbiol. 38:3608 – 3611.
2. Paramasivan, C.N., A.S.L. Narayana, R. Prabhakar, and M.S. Rajagopal. 1983. Effect of storage of sputum specimens at room temperature on smear and culture results. Tubercle 64:119-124.
3. Wolfe, J., K. Antonation, and M. K. Sharma. Mycobacteriology Laboratory Standards: Services and Policies. In Long, R., and E. Ellis. The Canadian Tuberculosis Standards. 6th ed. Ottawa: Canadian Lung Association and Health Canada; 2007. p. 17-36. Available: http://www.phac-aspc.gc.ca/tbpc-latb/pubs/tbstand07-eng.php
4. Menzies, D., and K. Khan. Diagnosis of Tuberculosis Infection and Disease. In Long, R., and E. Ellis. The Canadian Tuberculosis Standards. 6th ed. Ottawa: Canadian Lung Association and Health Canada; 2007. p. 17-36. Available: http://www.phac-aspc.gc.ca/tbpc-latb/pubs/tbstand07-eng.php

Metapneumovirus

Human metapneumovirus was first isolated in 2001. It is the second most common cause of lower respiratory tract infection in young children surpassed only by the respiratory syncytial virus (RSV). It can also cause pneumonia, asthma exacerbation, croup and upper respiratory tract infection. In Newfoundland and Labrador the Public Health Laboratory started testing for this virus in 2012.
Metapneumovirus facts:

- It is a single stranded RNA virus of the Parmyxoviridae family.
- Symptoms of infection include:
  - Rhinorrhea, congestion, cough dyspnea and tachypnea
- Usually symptoms are mild, but in certain populations such as those with immunodeficiency, preterm birth and cardiopulmonary disease, more severe disease can occur
- All children are usually affected by age 5 years
- Infection usually occurs during the influenza season, late winter early spring
- Incubation period is 3-5 days
- The virus is spread via droplet through direct or indirect contact
- Treatment is mainly supportive; infants with severe symptoms need monitoring in hospital
- Preventative measures include strict adherence to hand hygiene in all setting and efforts to contain the illness

Pneumococcal Disease and Success of Vaccines

In 2003 Pneumococcal conjugate 7 valent vaccine was approved for infants in Canada. A limited program was introduced in isolated communities in the Labrador, with immediate benefits recognized in the communities. They reported a decrease in ear infections and air ambulance for respiratory infections. In 2005 a provincial publicly funded program became part of the childhood schedule administered at 2, 4, 6 and 18 months. As vaccines became available with coverage for other serotypes these were introduced, in 2008 Pneumo-C-10 and in 2010 Pneumo-C-13.

In Newfoundland and Labrador the serotypes have been varied each year, the most commonly reported is 19A (4); all others have one or two cases reported over this time period. All cases reported since 2011 have been in ages 14 years and over.

Vectorborne and Zoonotic Diseases

Submitted by Dr. Hugh Whitney

Animal Rabies

Fox rabies appears in unpredictable cycles in Labrador, descending from further north where it exists on a permanent basis in the Arctic fox population. Prior to 2012, the most recent recorded outbreak was in 2005. In outbreak years, if the disease descends far enough south in Labrador, and there is a sufficient bridge of sea ice, there is a risk that it can cross over onto the island of Newfoundland, most likely in Arctic foxes. The high number of polar bears sighted this year on the island attests to the ability of such northern mammals to enter the island, indeed Arctic foxes often follow closely behind polar bears looking to scavenge from seal kills. The island of Newfoundland has seen fox rabies enter twice in recent history, in 1988 and in 2002. In both cases a large scale eradication program was initiated.

To date this year, we have had 12 confirmed cases of rabies in red foxes in Labrador West (Labrador City and Wabush) and one case in Hebron. Further samples continue to arrive so this is not necessarily the final number. Past outbreaks in Labrador have extended well into the summer.

Bat rabies also exists in this province though not commonly reported. A fox was found dead with this strain of the virus on the south coast in 1989 and a bat was removed from a house in Cartwright (Labrador) in 2004 that was later confirmed with rabies. All cases, with maps, are available on the web at http://www.nr.gov.nl.ca/nr/agrifoods/animal/animal_health/rabies.html

Lyme disease

Classical Lyme disease, caused by the bacterium *Borrelia burgdorferi*, and spread by the black-legged tick, *Ixodes scapularis*, has not been reported in humans to date in this province. Increasingly it is being seen serologically and clinically in pets, predominantly dogs. Passive surveillance has been underway for many years now to determine whether there are any permanent populations of these ticks and none have been found though the tick is becoming increasingly well established in the Maritimes (NB and NS). Migratory songbirds are considered to be the primary vector for bringing these ticks into the province every spring and by late winter they have likely all died. Every year we are seeing more such ticks. In 2011, 36 *Ixodes scapularis* removed from animals were submitted to the Animal Health Laboratory for identification, of which 24 were positive for *Borrelia burgdorferi* and 4 positive for *Anaplasma phagocytophilum*.

In Europe, another form of Lyme disease, caused by the bacterium *Borrelia garinii*, and spread by the seabird tick, *Ixodes uriae*, is considered to be an emerging disease. Research has been initiated in 2012 with Memorial University and the Public Health Agency of Canada to study this emerging form of the disease in our province.

Of the three reported human cases of Lyme disease in NL since 1991 (1996, 2004 and 2007, respectively), all had a travel history outside of NL prior to onset of illness. The diagnosis of Lyme disease is a combination of lab information and clinical history, a final diagnosis is made by the attending physician.

California serogroup viruses

There are numerous mosquito-borne viruses that pose a potential health threat to humans, usually as incidental infections outside of the normal life cycle of the virus. The California serogroup of viruses contains two such zoonoses that have been reported in our animal population. These are Jamestown Canyon virus and Snowshoe hare virus. Though serological evidence of human and animal exposure exists in this province, the clinical importance is currently not understood. Clinical cases have been found elsewhere in Canada. Research is ongoing with these viruses to better understand their distribution and importance.

Malaria

There were four reported cases of malaria in NL in 2009 (0.8 per 100,000 population), all travel related. Three of the four cases were reported in males. One case was reported in Central Regional Health Authority (RHA); one in Western RHA and two in Eastern RHA. The NL rate continued to be below the Canadian rate.

Q- Fever

The only cases of Q fever in NL were reported between 1999-2000, when 73 cases were reported among goat farmers in rural NL. These cases were gathered as a result of an epidemiological investigation. The investigation indicated the incidence may be greater than reported due to the mildness of many cases. Canadian rates are not available as Q fever is not a nationally notifiable disease.

Newfoundland and Labrador Communicable Disease Surveillance
Monthly Disease Report: March 2012

DISEASE CLASS	DISEASE NAME	TOTAL			EASTERN			CENTRAL			WESTERN			LABRADOR GRENFELL		
		Mar	YTD 12	YTD 11	Mar	YTD 12	YTD 11	Mar	YTD 12	YTD 11	Mar	YTD 12	YTD 11	Mar	YTD 12	YTD 11
Enteric, Food and Waterborne	Amoebiasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Botulism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Campylobacteriosis	2	5	8	2	4	8	0	1	0	0	0	0	0	0	0
	Cryptosporidiosis	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
	Cyclosporiasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cytomegalovirus	1	2	1	1	1	0	0	0	0	0	1	1	0	0	0
	Giardiasis	2	6	7	0	0	1	0	0	2	2	6	3	0	0	1
	Hepatitis A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Listeriosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Norovirus Infection	23	56	11	1	4	2	2	6	7	14	39	2	6	7	0
	Salmonellosis	8	16	15	2	6	8	2	2	2	2	3	3	2	5	2
	Shigellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Typhoid/Paratyphoid Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Verotoxigenic Escherichia coli	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Yersiniosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Diseases Transmitted by Direct Contact and Respiratory Route	Creutzfeldt-Jakob Disease (CJD)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Group B Streptococcal Disease of Newborn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Influenza Virus of a Novel Strain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Influenza A, Laboratory Confirmed	39	47	131	13	15	65	20	23	13	3	4	30	3	5	23
	Influenza B, Laboratory Confirmed	87	179	4	62	74	1	16	25	1	8	42	0	1	38	2
	Invasive Group A Streptococcal Disease	0	2	1	0	1	0	0	1	0	0	0	1	0	0	0
	Invasive Haemophilus Influenza non-type B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Invasive Meningococcal Disease (IMD), Conf	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0
	Invasive Meningococcal Disease (IMD), Prob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Invasive Pneumococcal Disease (IPD)	5	8	4	3	5	2	1	1	0	1	1	2	0	1	0
	Legionellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Meningitis, Bacterial (other than Hib, IMD or IPD)	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
	Meningitis, Viral	0	0	2	0	0	2	0	0	0	0	0	0	0	0	0
	Nontuberculosis Mycobacterial Disease	0	5	4	0	5	3	0	0	0	0	0	0	0	0	1
	Severe Respiratory Illness, unknown origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tuberculosis, non-respiratory	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1

Newfoundland and Labrador Communicable Disease Surveillance
Monthly Disease Report: March 2012

DISEASE CLASS	DISEASE NAME	TOTAL			EASTERN			CENTRAL			WESTERN			LABRADOR GRENFELL		
		Mar	YTD 12	YTD 11	Mar	YTD 12	YTD 11	Mar	YTD 12	YTD 11	Mar	YTD 12	YTD 11	Mar	YTD 12	YTD 11
	Tuberculosis, respiratory	1	1	2	0	0	1	0	0	0	1	1	0	0	0	1
Sexually Transmitted and Bloodborne Pathogens	Chlamydia	73	214	136	44	122	76	4	11	11	9	22	10	16	59	39
	Gonorrhoea	1	6	3	0	2	1	0	0	0	0	0	0	1	4	2
	Hepatitis C	6	26	19	4	20	15	0	0	1	2	6	3	0	0	0
	HIV Infection	0	1	1	0	1	1	0	0	0	0	0	0	0	0	0
	Syphilis, infectious	0	0	3	0	0	3	0	0	0	0	0	0	0	0	0
	Syphilis, non-infectious	0	0	1	0	0	1	0	0	0	0	0	0	0	0	0
Vectorborne & Other Zoonotic Diseases	Lyme disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Malaria	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Q Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Toxoplasmosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Trichinellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	West Nile Virus Infection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vaccine Preventable	Chickenpox	58	246	77	4	15	10	26	142	7	28	86	59	0	3	1
	Congenital Rubella Syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hepatitis B	1	4	4	1	4	3	0	0	1	0	0	0	0	0	0
	Invasive Haemophilus Influenza type B (Hib)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mumps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Communicalble Disease Control System, Department of Health and Community Services, Government of Newfoundland and Labrador

Date verified: 17-Apr-2012

Disclaimer: Data are subject to continuous updates; small variations in numbers may occur.

Note: Prior to January 2011, "Invasive Meningococcal Disease, Probable" was included under the heading "Invasive Meningococcal Disease"