

Syphilis Outbreak Investigation Report

Office of the Chief Medical Officer of Health

Table of Contents

Summary	1
Acronyms.....	1
Introduction	2
1. Outbreak epidemiology	2
1.1. Surveillance	2
1.1.1. <i>Case finding / enhanced surveillance</i>	2
1.1.2. <i>Case definitions</i>	2
1.2. <i>Epidemiological Summary</i>	3
1.2.1. <i>Epidemiological reports</i>	6
1.2.2. <i>Social Network Analysis</i>	6
1.2.3. <i>Declaring the outbreak over</i>	6
2. Laboratory	6
3. Public Health Measures	6
4. Communications	7
5. Coordination	8
5.1. <i>Internal OCMOH outbreak team</i>	8
5.2. <i>Provincial meetings</i>	8
6. Key Learnings	8

Summary

In late 2009, Regional Public Health (PH) in Moncton region reported to the Office of the Chief Medical Officer of Health (OCMOH) a sustained transmission of syphilis among males. The outbreak started in the Moncton area and quickly spread across New Brunswick. The outbreak lasted from November 2009 to December 2012.

A total of 121 cases of infectious syphilis¹ were reported to Public Health in that time period; 112 of these cases were male and 9 cases were female. More than a quarter of the cases were between 15 and 24 years old.

All New Brunswick regions were affected however Moncton, Fredericton and Saint John were the most affected regions. The annual number of cases peaked in 2011 with 58 cases. During that same year, the incidence rate in New Brunswick was higher than the Canadian rate: 7.7 vs. 5.1 per 100 000

An outbreak control team (OCT) was established with members from the OCMOH and the Regional Health Authorities regional communicable disease coordinators. A total of 16 teleconferences were held, the last one in January 2013. This was in addition to internal meetings.

The public health response to this outbreak involved many aspects including developing guidelines on testing, treatment and contact tracing; communications with community clinicians, government sectors, community organizations and the public ;and innovative social marketing initiatives.

Acronyms

CD	Communicable Diseases
CDC	Communicable Disease Control
OCMOH	Office of the Chief Medical Officer of Health
OCT	Outbreak Control Team
STI	Sexually Transmitted Infections
STBBI	Sexually Transmitted Infections and Blood Borne Pathogens

¹ Among the 121 cases considered to be infectious, 8 did not meet a strict infectious case definition. Due to the outbreak context and because it was not possible to confirm that those cases were not infectious, they have been kept as potentially infectious in our database.

Introduction

This report contains a brief description of the syphilis outbreak epidemiology, public health measures that were implemented, the communication strategy, the coordination efforts and the lessons learned.

1. Outbreak epidemiology

1.1. Surveillance

1.1.1. *Case finding / enhanced surveillance*

Routine provincial reporting of new cases of syphilis occurs through a passive, laboratory-based surveillance system. However during this increase in disease activity the system was limiting in the timeliness of reporting as well as the quality and usefulness of the surveillance data. To ensure a more timely and consistent reporting to detect and monitor the incidence of syphilis in October 2010 the OCMOH collaborated with regional public health to design and implement an enhanced surveillance system for syphilis. The enhanced system consisted of Regional Public Health completing an enhanced surveillance form for investigation of cases and contacts. After completion, the enhanced surveillance forms were faxed to OCMOH without personal information. A field epidemiologist was responsible for data entry at OCMOH.

Clinicians were asked to report positive syphilis cases to regional Public Health. Regional Public Health was responsible for the investigation of syphilis cases and contact tracing of their sexual partners.

1.1.2. *Case definitions*

The following case definitions were used for this outbreak:

Confirmed Case Definition Primary Syphilis

Laboratory confirmation of infection:

- identification of *T. pallidum* by dark-field microscopy, fluorescent antibody, nucleic acid testing, or equivalent examination of material from a chancre or a regional lymph node
OR
- presence of one or more typical lesions (chancres) and reactive treponemal serology, regardless of non-treponemal test reactivity, in individuals with no previous history of syphilis
OR
- presence of one or more typical lesions (chancres) and a fourfold or greater increase in the titre over the last known non-treponemal test in individuals with a past history of syphilis treatment

Confirmed Case Definition Secondary Syphilis

Laboratory evidence of infection:

- identification of *T. pallidum* by dark-field microscopy, fluorescent antibody, nucleic acid testing or equivalent examination of mucocutaneous lesions, condylomata lata and reactive serology (non-treponemal and treponemal)
OR
- presence of typical signs or symptoms of secondary syphilis (e.g. mucocutaneous lesions, alopecia, loss of eyelashes and lateral third of eyebrows, iritis, generalized lymphadenopathy, fever, malaise or

splenomegaly) AND either a reactive serology (non-treponemal and treponemal OR a fourfold or greater increase in titre over the previous known non-treponemal test

Confirmed Case Definition Early Latent Syphilis (< 1 year after infection)

Laboratory confirmation of infection:

- an asymptomatic patient with reactive serology (treponemal and/or nontreponemal) who, within the previous 12 months, had one of the following:
 - non-reactive serology
 - symptoms suggestive of primary or secondary syphilis
 - exposure to a sexual partner with primary, secondary or early latent syphilis

Confirmed Case Definition Late Latent Syphilis (> 1 year after infection or of unknown duration) Laboratory confirmation of infection:

- an asymptomatic patient with persistently reactive treponemal serology (regardless of non-treponemal serology reactivity) who does not meet the criteria for early latent disease and who has not been previously treated for syphilis

Confirmed Case Definition Neurosyphilis infectious (< 1 year after infection)

Laboratory confirmation of infection:

- Fits the criteria in 3.2, 3.3 OR 3.4 above AND one of the following:
- reactive CSF-VDRL in non-bloody cerebrospinal fluid (CSF)
- clinical evidence of neurosyphilis AND either elevated CSF leukocytes OR elevated CSF protein in the absence of other known causes

Confirmed Case Definition Neurosyphilis non-infectious (> 1 year after infection)

Laboratory confirmation of infection:

- reactive treponemal serology (regardless of non-treponemal serology reactivity) AND one of the following:
- reactive CSF-VDRL in non-bloody CSF
- clinical evidence of neurosyphilis AND either elevated CSF leukocytes OR elevated CSF protein in the absence of other known causes

Confirmed Case Definition Tertiary Syphilis (other than Neurosyphilis)

Laboratory confirmation of infection:

- reactive treponemal serology (regardless of non-treponemal test reactivity) together with characteristic late abnormalities of the cardiovascular system, bone, skin or other structures, in the absence of other known causes of these abnormalities (*T. pallidum* is rarely seen in these lesions although, when present, it is diagnostic)

AND

- no clinical or laboratory evidence of neurosyphilis

1.2. Epidemiological Summary

A total of 121 cases of infectious syphilis were reported to Public Health from November 2009 to December 2012. Before 2009, the annual case count ranged between 0 and 3, for an average of 1. During the first complete year of the outbreak (2010), case count reached 38 and peaked in 2011 with 56 cases (Figure 1).

During that same year, the incidence rate in New Brunswick was higher than the Canadian rate: 7.7 vs. 5.1 per 100 000 persons (Figure 2). This was almost 20 times higher than the average rate observed between 2002 and 2008 (0.42 per 100 000).

The outbreak started in the Moncton region at the end of 2009 and spread across the entire province in 2010 and 2011. All regions were affected. Moncton, Fredericton and Saint-John regions were the most affected with a total of 46, 44 and 20 cases (Table 1). Most cases were men (92%) having sex with men (75%) (Figure 4). Almost half of the cases (40%) were between 40 and 59 years old with the 15-24 year olds having the highest rate: 12.4 per 100 000 compared to 7.1 per 100 000 for the 40-59 (Figure 3). Fortunately, no cases of congenital syphilis were reported during this outbreak.

Figure 1.

Case count of infectious syphilis by sex and reporting month and year, New Brunswick, November 2009 to December 2012 (N=121)

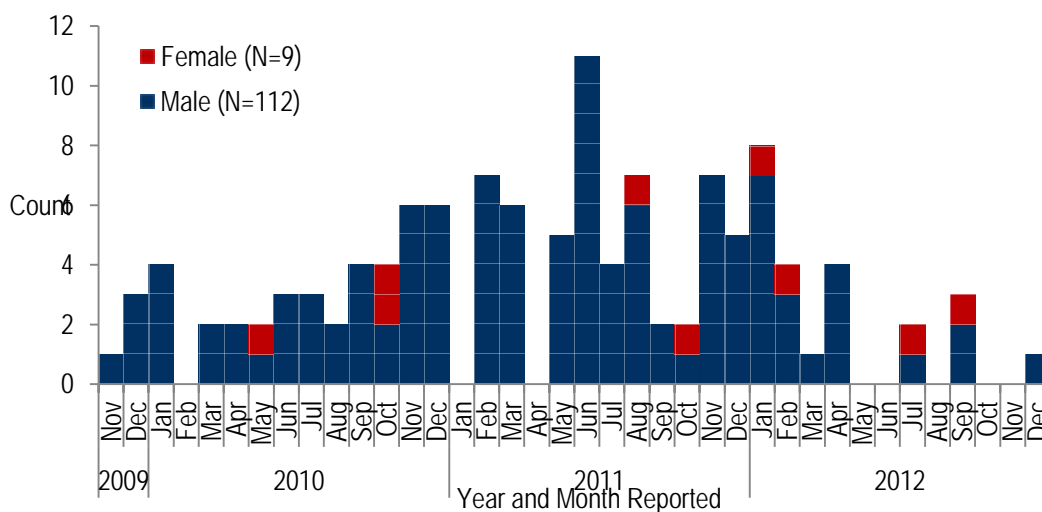


Figure 2.

Incidence rate (per 100 000) of infectious syphilis by gender and year, New Brunswick and Canada, 2002 to 2012.

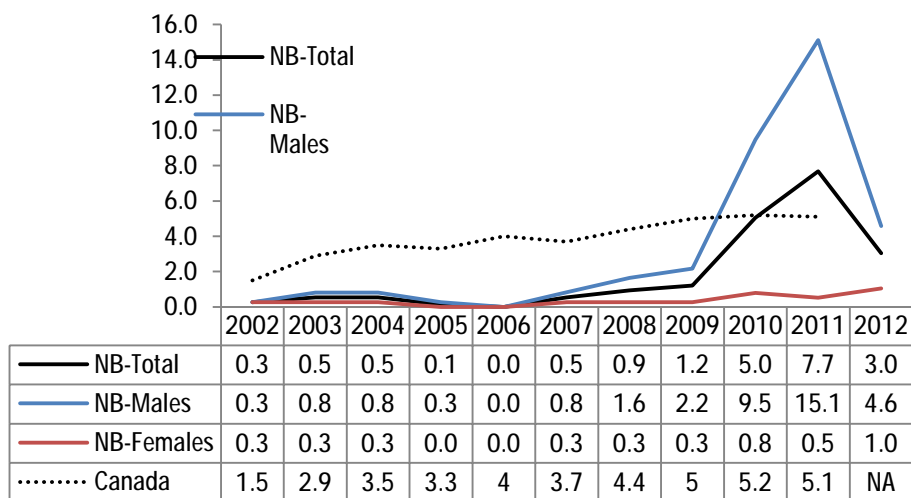


Table 1. Case counts and incidence rate of infectious syphilis by Health Region, New Brunswick, Nov. 2009 to Dec. 2012-2012

Health Region	2009		2010		2011		2012	
	N	Rate	N	Rate	N	Rate	N	Rate
1	4	NA	17	8.3	16	7.7	8	3.8
2	0	NA	3	1.7	11	6.2	6	3.4
3	0	NA	13	7.5	23	13.1	8	4.5
4	0	NA	3	6.1	0	0.0	1	2.1
5	0	NA	0	0.0	0	0.0	0	0.0
6	0	NA	2	2.6	4	5.2	0	0.0
7	0	NA	0	0.0	2	4.5	0	0.0

Health Region	2009		2010		2011		2012	
	N	Rate	N	Rate	N	Rate	N	Rate
1	4	NA	17	8.3	16	7.7	9	4.3
2	0	NA	3	1.7	11	6.2	6	3.4
3	0	NA	13	7.5	23	13.1	8	4.5
4	0	NA	3	6.1	0	0.0	1	2.1
5	0	NA	0	0.0	0	0.0	0	0.0
6	0	NA	2	2.6	4	5.2	0	0.0
7	0	NA	0	0.0	2	4.5	0	0.0

Figure 3. Incidence rate of infectious syphilis by age group and gender, 2010 to 2012

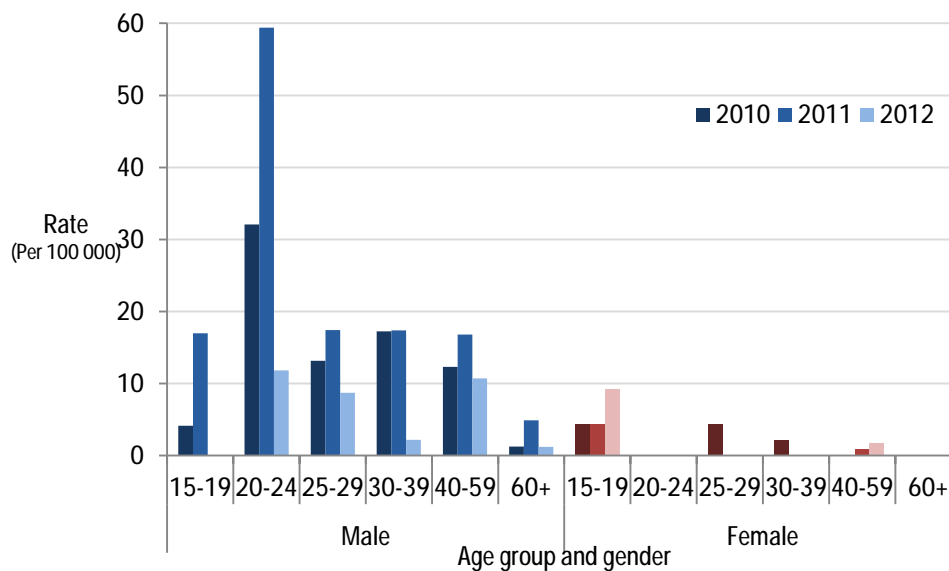
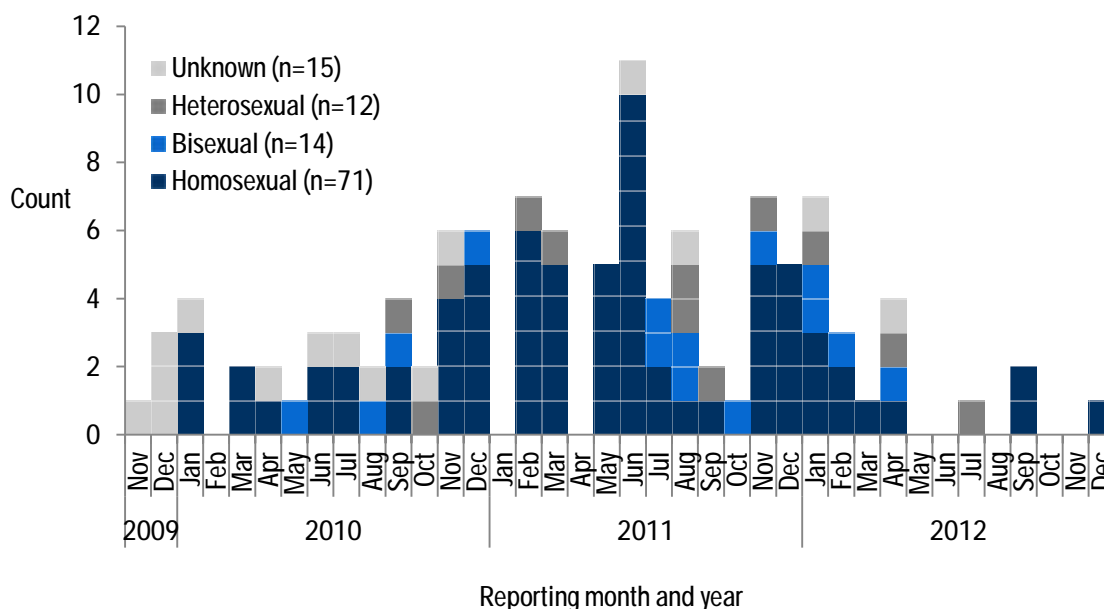


Figure 4. Case count of infectious syphilis by sexual orientation and year, males only, November 2009 to December 2012 (N=112)



1.2.1. Epidemiological reports

Epidemiological updates were provided prior to each meeting of the syphilis outbreak control team.

1.2.2. Social Network Analysis

A social network analysis was conducted in April, July and September 2011. This analysis provided information on the venues that cases frequented and on the number and sex of sexual partners. This information was very useful for the development of the public health social marketing response.

1.2.3. Declaring the outbreak over

The outbreak was declared over in February 2013. Based on epidemiological data, there was no sustained transmission observed from the summer of 2012 and onwards. The end of the provincial outbreak was communicated to the members of the OCT and to clinicians by providing them with a letter which included a syphilis primer. A technical briefing for the media was organized on June 20, 2013.

2. Laboratory

The regional laboratories were informed of the outbreak and asked that all syphilis detection testing be performed and reported quickly. All laboratories provided Public Health with their testing methods for the creation of the questionnaire. Laboratory testing numbers were collected for the last year of the outbreak, but they showed no variation from the beginning of the year to the end.

3. Public Health Measures

An enhanced surveillance system, a questionnaire, and disease specific guidelines were developed for this outbreak. Investigation data was entered into the database for analysis.

Community clinicians (family physicians and nurse practitioners) were asked when appropriate to consult with infectious disease specialists for treatment. One-time funding was provided to the clients to ensure access to free syphilis treatment for those who were unable to pay. For the free-access treatment, \$ 21,000 was transferred from the OCMOH budget to the Health Regions in 2010-2011. The amount each region received depended on the population of that region.

4. Communications

The aim of the communication strategy was to ensure the dissemination of information consistently across New Brunswick, the use of evidence-based guidelines in the management of cases and contacts and sharing information with those with a need to know.

Marketing campaign

A marketing campaign was planned with input from, amongst others, the gay community. The focus of the marketing campaign, named '*who knew*', was on raising awareness regarding the outbreak and other sexually transmitted infections, prevention messages and to encourage people to get tested and treated. The campaign was launched in January 2011.

The marketing campaign consisted of the following:

- § Information on syphilis was posted on the Office of the Chief Medical Officer of Health's website (www.gnb.ca/whoknew). The website contained information on symptoms, testing and treatment of both chlamydia and syphilis. The site also included a list of community clinicians who have accepted to enhance access to Sexually Transmitted Infection (STI) testing and treatment to those at risk who didn't have a primary care provider. From June 2011 to August 2011 the website was visited by 7,459 people.
- § Online ads were posted on Facebook (February/March 2011) and online dating sites (Manhunt December 2011-March 2012). The Facebook page linked to the '*who knew*' website. Most visits on the website were a click-through from the Facebook ad (58%).
- § Posters with message: '*syphilis outbreak among men in New Brunswick*' were developed. The posters were displayed at gay bars, pride events, sex stores, 'safe rooms' etc.
- § Condom matchbooks were printed with the logo '*syphilis outbreak among men in New Brunswick*' on them. These matchbooks were handed out at gay bars, pride events etc.
- § T-shirts with the logo '*syphilis outbreak among men in New Brunswick*' were printed and worn by well-known/ respected gay men and staff at gay bars and seasonal events.
- § Video titled '*who knew*' with information on syphilis was developed and posted on YouTube, the '*Who Knew*' website and websites from other stakeholders. In addition the video was circulated on DVD to Regional Public Health and stakeholders.

The campaign materials were distributed to various partners in the community such as hospitals, after-hour clinics, infectious disease specialists, universities, colleges, escort services, homeless shelters, health-care centres, First Nations, sex shops, methadone clinics, etc. Regional Public Health was also present with information booths at various events (e.g. gay pride) and high schools, colleges and universities.

Communications with clinicians

Letters were sent to all community clinicians (e.g. general practitioners, microbiologists, infectious disease specialists) on December 2010, February 2011 and August 2012. The letters contained guidelines and recommendations on case and contact management and syphilis outbreak updates. STI incidence and a description of the safer sex marketing campaign was included in the November 2010 [Disease Watch Bulletin](#). Updates on the syphilis outbreak were provided in Disease Watch in June 2011 and January 2012. When the outbreak was declared over, clinicians received a letter and the syphilis primer, a resource with information on the disease, testing for and treatment of syphilis.

PHAC/ other jurisdictions

Alerts on the syphilis outbreak were provided to partners across Canada on the Canadian Network for Public Health Intelligence (CNPHI) in December 2010 and July 2011.

Media

There were multiple requests for information on syphilis made by the media. They are located at: <http://www.cbc.ca/news/canada/new-brunswick/syphilis-outbreak-in-new-brunswick-could-get-worse-1.1285844>
<http://www.cbc.ca/informationmorningfredericton/2012/02/28/sti-outbreak/>

5. Coordination

5.1. Internal OCMOH outbreak team

The internal OCMOH team consisted of a field epidemiologist, the STI epidemiologist, a Medical Officer of Health, the STBBI senior program advisor, the CDC Branch director and the lab liaison technical officer. This team led, facilitated and monitored the public health response across the province. Funding was approved for social marketing initiatives and for syphilis treatment.

5.2. Provincial meetings

The initial outbreak assessment meeting within the CDC Branch was held on September 16, 2010. Following this, an outbreak was declared and the team was extended to include health regions 1 and 2. By December 2010, all health regions were included in the team.

The syphilis outbreak control team (OCT) consisted of the OCMOH outbreak team, a communicable disease coordinator from every Health Region and one microbiologist/ infectious disease specialist from Health Region 1. A total of 16 OCT meetings were held via provincial teleconferences in the period from September 2010 until January 2013.

6. Key Learnings

The debrief session was held on January 29, 2013 via a provincial webinar. The following is a list of areas for improvement based on the team's feedback.

OCT Operations

For long outbreaks it is recommended to incorporate regular reviews throughout the outbreak period which could allow for identification of any challenges and finding optimal solutions during the response.

Key process steps such as determination of the agenda, length of time and frequency required for meetings, required participants, and a communication plan that specifies the audience, frequency of reporting etc. should be decided at the beginning of the outbreak. This could be incorporated into a standardized template for outbreak-response teams' terms of reference that is adapted to each situation upon convening the team.

Surveillance

OCMOH provision of regular situational and epidemiological updates to the team is a recommended strategy for all provincial lead outbreaks and response situations.

Reporting

Discussion and agreement on enhanced reporting timelines and processes should occur at the outset. This should attempt to balance the reporting requirements of OCMOH with regional needs while meeting the requirements as per the *PHA* and regulations.

Investigation

It would be beneficial for regional Public health staff including those working for the Regional Health Authority to have access to social media such as Facebook and other networking and dating websites as this would assist with contact tracing as follow up can be a challenge. Using social network analysis would be useful to establish any marketing campaigns and other targeted communications needed.

Control measures

It is recommended that supporting the treatment and eventual health outcome of those clients testing positive through funding provision was important.

Communications

A communication risk based plan with timeframes, targeted audiences and pro and reactive media lines should be developed early in the outbreak and updated as needed. The use of social network analysis for similar outbreaks is recommended however clarifying and agreeing upfront on the required information would provide consistency in data collection. Regions need access to social media tools.

It is important to communicate with clinicians early in the response for the purposes of notifying them of the outbreak and requesting their help in identifying cases.

It is recommended that communication materials for clinicians be brief and infrequent and that using other modalities such as Grand Rounds and Disease Watch Bulletin may be more engaging than print material and available more readily and efficiently.