Mumps Outbreak in Prairie Mountain Health and the Province of Manitoba

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Introduction

Mumps is a vaccine preventable viral illness caused by the mumps virus, which is highly contagious. Transmission typically occurs through respiratory droplets or direct contact, and is easily spread amongst individuals in close quarters.[1] The characteristic clinical picture of an individual presenting with a mumps infection is swelling of the parotid gland, however this is not present in all cases.[2]

While mumps is vaccine preventable, there have been a number of outbreaks in both North America and Europe over the past decade. The most common demographic groups affected are both school-aged children and college-aged young adults.[1] The average annual incidence of mumps in Canada, between 1991 and 2015 was 0.85 cases per 100,000 persons (see Figure 1). Outbreaks of mumps have been reported in numerous settings including high schools, colleges and universities, work places, summer camps, etc.[1]

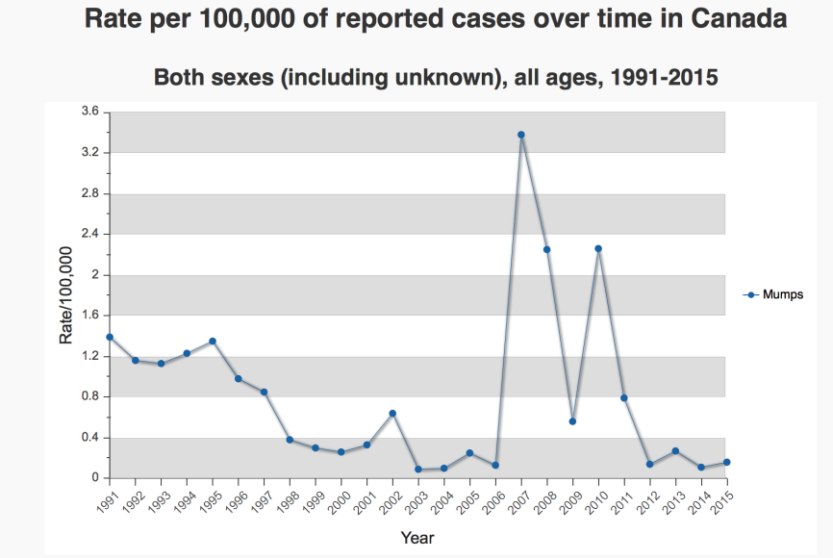

Figure 1. The annual rate of mumps in Canada between 1991 and 2015.[8]

The incubation period of mumps is typically 16 to 18 days, with individuals being infectious for roughly 12 days, beginning 3 days before the onset of symptoms. The clinical manifestations usually begins with general symptoms of malaise, including fever, headache, myalgia, etc.[1] Within 1-2 days of the development of these symptoms, swelling of the parotid gland (unilateral or bilateral) often occurs, giving the stereotypical mumps presentation. The parotitis can last for up to 10 days. The most common serious complication of mumps infection is orchitis/oophoritis. Other serious complications include neurologic manifestations through aseptic meningitis, encephalitis or deafness[2]. Symptomatic adults are more likely to develop serious complications than symptomatic children.

Diagnosis of a mumps infection can be achieved through multiple ways. One such diagnostic method is through serum antibody testing for the mumps immunoglobulin (IgM).[3] Another way to confirm diagnosis is through detection of the mumps virus via reverse transcriptase PCR.[3] Finally, mumps can also be diagnosed via isolation of the virus in a clinical specimen, which is typically a buccal/oral swab.[3] In the clinical scenario, it is necessary to collect both a blood sample and oral/buccal swab in any patient with a suspected case of mumps. All positive cases of mumps must be reported to Manitoba Health, or the analogous agency in other provinces.

Once an individual has had diagnostic confirmation of a mumps infection, the treatment is merely supportive care with acetaminophen commonly being the pharmacologic agent of choice. Depending on the incidence of serious complications in individuals with a mumps infection, the prognosis is generally very good as the infection is self-limited, with individuals recovering within a few weeks. Since mumps is not treatable once an individual develops it, vaccine prevention is the intervention of choice. The vaccine is known as MMR or MMRV, and is a live attenuated vaccine that provides protection against measles, mumps, rubella and possibly varicella, depending on the combination.[4] The Manitoba Immunization Schedule includes MMRV at 12 months, which is repeated at 4-6 years of age.[4] Individuals who did not receive the vaccine as children should have it as adults.

In the fall of 2016 and winter of 2017, there was a known mumps outbreak in the province of Manitoba, across all health regions. This reports looks at the incidence of mumps over the past year in both the province as a whole and the Prairie Mountain Health region, and comments as to the possible cause of the outbreak.

Materials and Methods

The data for this report was obtained from the Manitoba Health website on surveillance data of communicable diseases.[5]

Data and Results

From May 2016 to May 2017, the province of Manitoba had 616 confirmed cases of mumps, with 65 of these cases coming from the Prairie Mountain Health Region. In the previous decade in Manitoba, the average monthly incidence of mumps was 1. Figure 2 depicts the monthly incidence of mumps from September of 2016, when the first case was reported, until May of 2017. As seen it Figure 2, the peak incidence rates in Manitoba occurred in March, April and May, while the peak incidence for Prairie Mountain Health Region occurred in February and March.

Based on reports from the World Health Organization, Canada had 309 cases of mumps in 2016, compared to Manitoba which had 118 (see Figure 3).[6] Of Manitoba's 118 cases, which account for more than one third of the total cases in Canada, 117 of those cases occurred in the months of October, November and December, thereby indicating the begin of the outbreak.

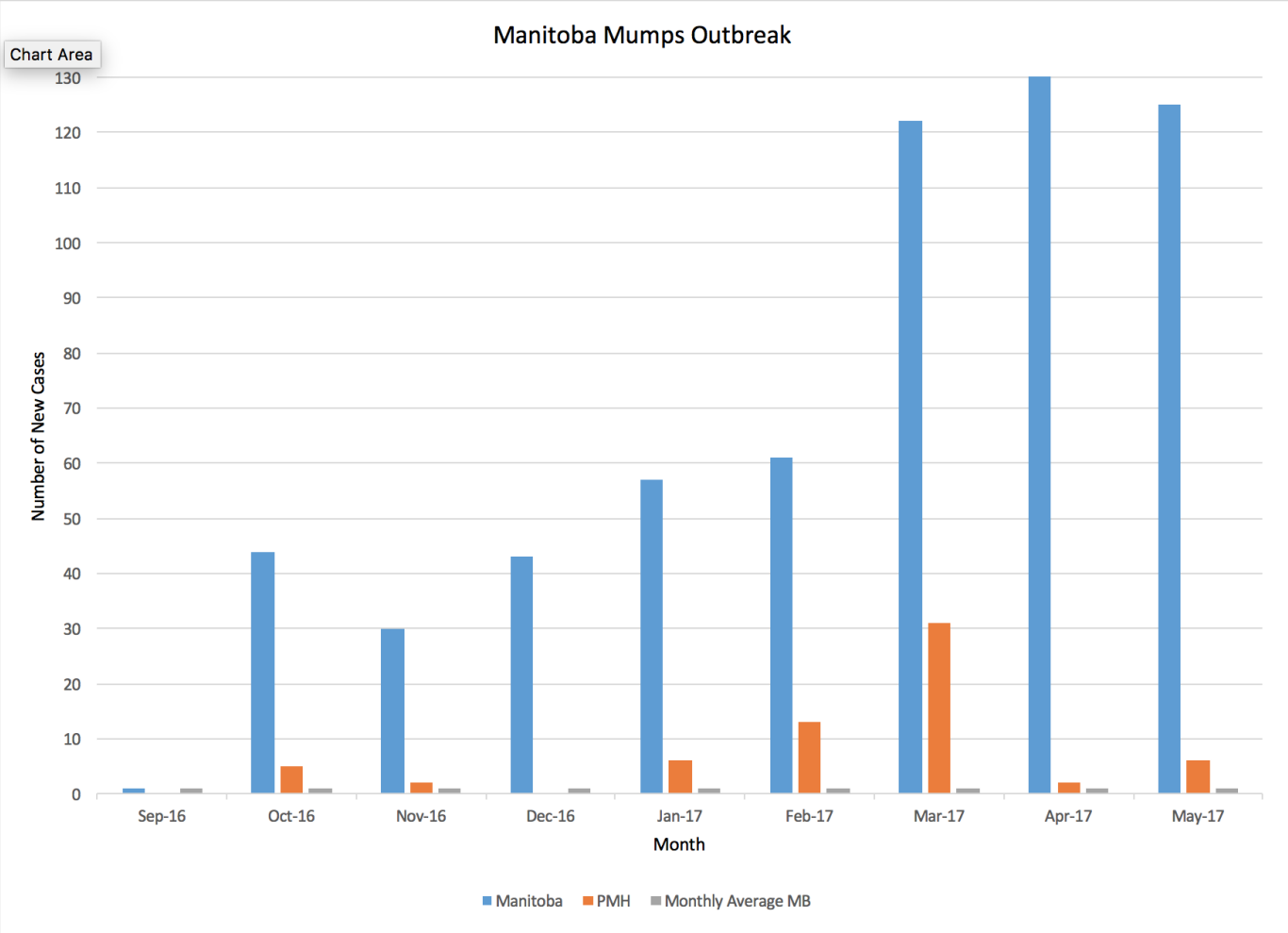

Figure 2. Monthly incidence of mumps from September 2016 to May 2017 for the province of Manitoba and the Prairie Mountain Health Region, as compared to the monthly average for Manitoba.

Figure 3. The total incidence of mumps in 2016, comparison between Manitoba and Canada shows that more than 1/3 of cases resulted from the combined number of cases in Manitoba in October, November and December.

Discussion

The outbreaks of mumps in Manitoba began in October of 2016, with the incidence continuing to rise into May of 2017. Lack of data past May 2017 prevents further evaluation of the outbreak, therefore we do not know for sure if the outbreak is declining. While the source of the outbreak has not been officially confirmed, there has been discussion that the outbreak began with a student at the University of Manitoba. Afterwards, the mumps infection spread through the Western Hockey League, including players of the Brandon Wheat Kings, a team located in the Prairie Mountain Health region.[7] While this seems to fit the common demographic of college-aged adults, it would be interesting to obtain demographic data on the outbreak to see whether this in fact does hold true. More detailed information regarding the patient population affected by mumps in the Prairie Mountain Health region could not be obtained due to privacy concerns.

Furthermore, it would be interesting to know the clinical conclusion of the cases of mumps in Prairie Mountain Health and whether any patients developed serious complications. As mentioned earlier, the most common serious complications are orchitis/oophoritis, however

aseptic meningitis and encephalitis can also occur. Since the infection cannot be treated further than symptomatic management, the number of serious complications would not be an indicator of whether appropriate health care was provided in each case. Instead, the number of serious complications would help to indicate the potential severity of mumps and thus the importance of engaging preventative measures, such as vaccines. A single dose of the MMR vaccine is up to 80% effective, with the additional booster significantly increasing the efficacy further.[2] Patient education at both the individual and public level is critical to preventing outbreaks from occurring in the future. In keeping with the theme of vaccines and outbreak prevention, it would be interesting to determine the percentage of population in Prairie Mountain Health that is not immunized against mumps. Furthermore, a survey could be conducted to better understand why some individuals are not immunized and whether it is due to personal beliefs, lack of understanding, or social/financial considerations. Perhaps with this information we could increase the uptake of vaccines/immunizations and thus further reduce the risk of outbreaks in the future.

With the previous average new cases of mumps per month being one for the province of Manitoba, the data from Figure 2 indicates the severity of the outbreak. At its peak, Prairie Mountain Health had 31 new cases of mumps in a single month. While the incidence of mumps in Prairie Mountain Health declined from March to May, we hope that this trend continues onwards to the point where we can declare the outbreak over. Unfortunately, the incidence of mumps for the province of Manitoba was steady at its peak from March to May. This suggests that while the outbreak may have declined in Prairie Mountain Health, it is not yet over in Manitoba. Therefore, physicians must continue to maintain clinical suspicion for mumps in Prairie Mountain Health until the outbreak has subsided throughout the entire province. Hopefully with improved preventative measures, we can further reduce the risk of another outbreak in the future.

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