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EPIDEMIOLOGY OF MEASLES OUTBREAK IN BRITISH COLUMBIA — FEBRUARY 1997

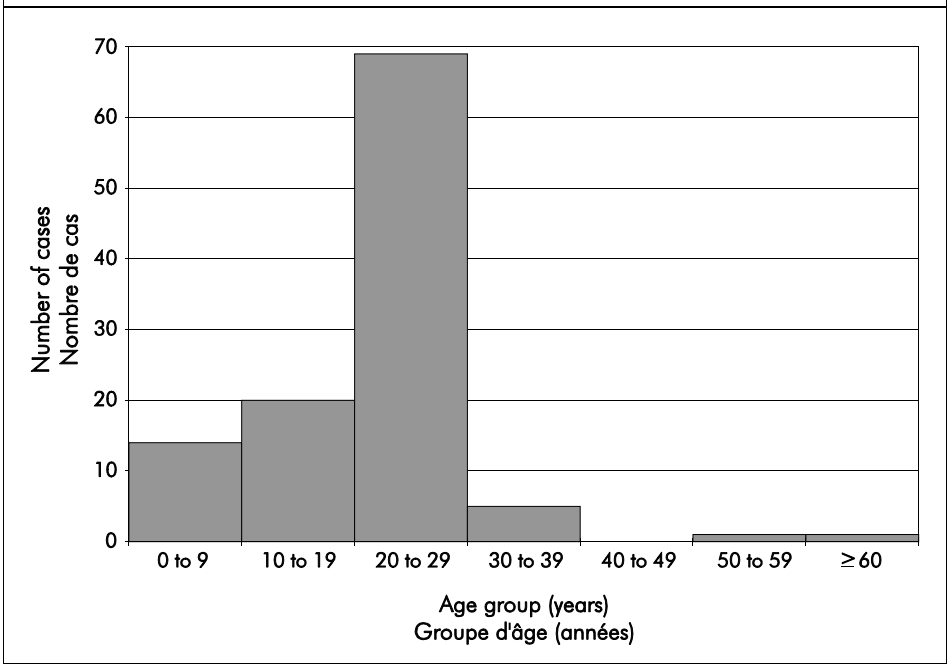
On 28 January 1997, three clinical cases of measles among students attending Simon Fraser University (SFU) were reported to the British Columbia Centre for Disease Control. These cases were subsequently confirmed by the presence of measles-specific IgM on acute serology. Because several more clinical and suspect cases had been identified by the following day, a decision was made to offer measles-containing vaccine to all staff and students of SFU. This mass vaccination program was delivered on campus from 31 January to 7 February 1997 and resulted in > 85% uptake among estimated susceptibles.

To date, 107 cases of measles have been reported, 56 of whom have a link to SFU. Forty cases have been confirmed either through the presence of IgM on acute serology or an epidemiologic link with a laboratory-confirmed case. The remaining cases were either clinical (40 cases) or suspect (27 cases).

Figure 1 presents the age distribution of cases; the majority have been between 19 and 29 years old. One case in this age group had previously received two doses of measles-containing vaccine, 26 had received one dose, and three had received no doses. Immunization histories were unknown for the remaining 34 cases. There were 15 cases between 1 year to 18 years old. Four of these (three clinical cases and one suspect case) had received two doses of measles- containing vaccine previously, eight had received one dose of vaccine, and three had received no doses.

Figure 2 presents the epidemic curve for measles cases reported up to February 13. Cases with a link to SFU are separate from those with no link. Case prodrome onset dates have occurred in two waves. The first wave peaked on 24 January and was made up primarily of cases linked to SFU. The second wave of cases started on 2 February and peaked on 5 February. New case reports will

Figure 1
Age distribution of measles cases in British Columbia, 20 January – 12 February 1997



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change the shape and size of this second wave. Forty-one cases had prodrome onset dates on or after 2 February. Nine (22%) of these were linked to SFU and four (three clinical cases and one suspect case) were linked to other post-secondary educational institutions. Twenty-eight (68%) of the 41 cases had no reported association with an educational institution.

Figure 3 presents the age distribution of cases with prodrome onset dates in the second wave (on or after 2 February). The majority of these cases were also among those aged between 19 and 29 years.

Conclusions

Early transmission of the virus in this outbreak was mainly among individuals aged 19 to 29 years who had an association with SFU. To date, considerably fewer SFU-linked cases have been identified in the second wave, which suggests that transmission has been reduced but not yet eliminated at SFU.

Most children and adolescents <18 years old who were reported as cases were not immunized or were under-immunized. The number of cases in this group was lower than otherwise expected; this is probably related to an 85% uptake of a second dose of measles-rubella vaccine offered to those from 19 months of age to end-of-high- school age group in 1996.

Transmission of the measles virus has started to occur in the greater Vancouver area in young adults (19 to 29 years old), some of whom attend other post-secondary institutions. One confirmed case has been identified as an inmate of a provincial correctional facility.

Control Measures

The British Columbia Ministry of Health has authorized funding to support the measles immunization of all staff and students in post-secondary educational institutions, and all inmates and staff of provincial and federal correctional facilities in British Columbia. As well, all health-care workers in acute-care settings will be offered measles vaccine. Susceptible persons in the general population have been advised to ensure that they have received at least one dose of measles-containing vaccine.

Figure 2
Measles prodrome onset dates for SFU-linked and non-SFU-linked cases

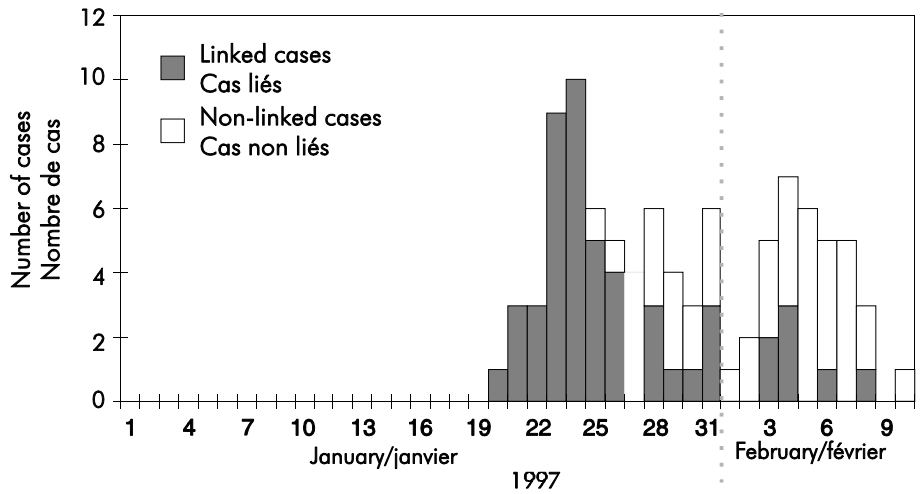
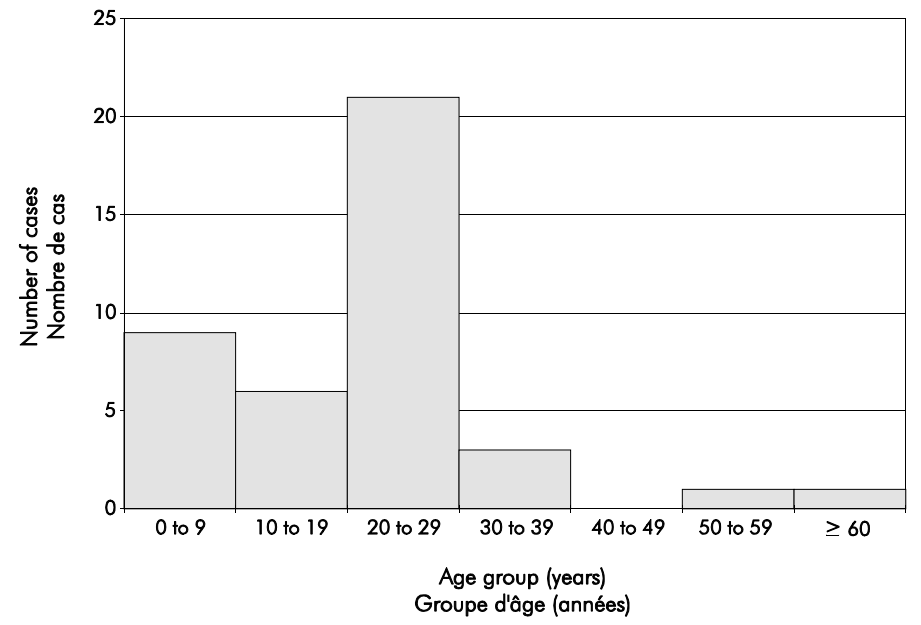


Figure 3
Age distribution of second-wave measles cases in British Columbia, 2 – 12 February 1997



Source: *A Bell, MD, A King, MD, K Pielak, RN, BSN, Communicable Disease Epidemiology Services, British Columbia Centre for Disease Control, Vancouver, BC; M Fyfe, MD, Field Epidemiology Training Program, Bureau of Surveillance and Field Epidemiology, LCDC, Ottawa, ON.*

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We would like to thank the staff in health units throughout British Columbia, and the Viral Serology Section, British Columbia Provincial Laboratory.

Editorial Comment

This outbreak in BC highlights that, in the beginning of 1997, measles has taken a new direction in Canada where, historically, university-based outbreaks are seldom reported. Moreover, this is the first time a significant change has been reported in the age distribution of measles cases, i.e. shifting to an older age group in Canada.

Canadian measles-control strategy, including immunization recommendations by federal, provincial, and territorial public-health authorities, has focussed mainly on the school-aged children or pre-schoolers. Unlike many universities in the United States, screening for immunization against measles is not systematic in Canada nor is documentation for measles vaccination compulsory for university attendance. Most recent university students who have gone through Canadian school systems are likely to have received at least one dose of measles vaccine in all regions across Canada. Single-dose coverage in this population is likely to be very high, perhaps almost comparable to that of high-schools.

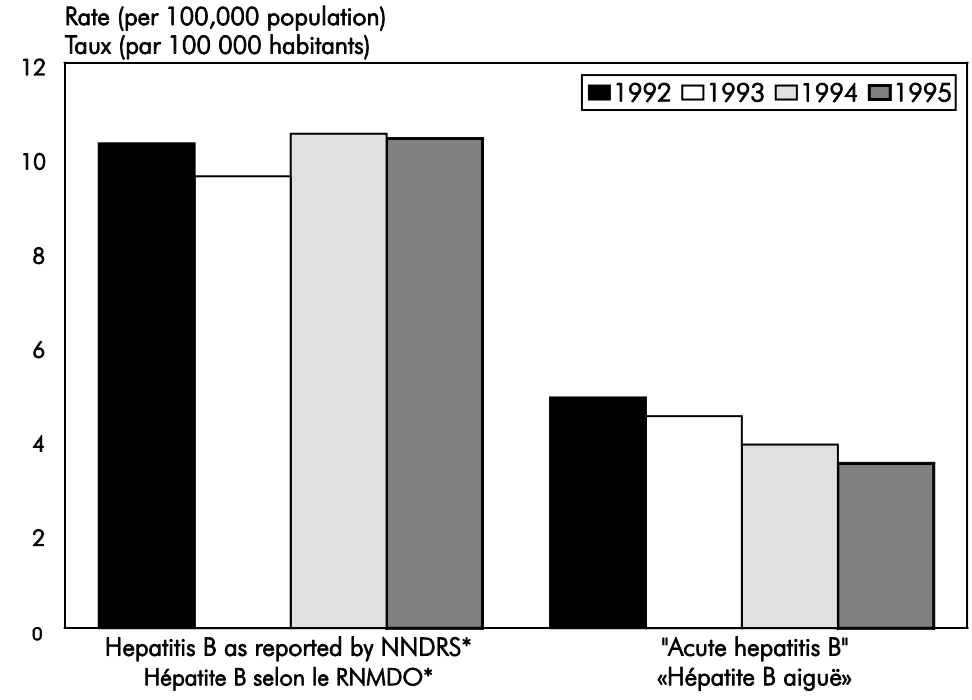
In 1996, provinces and territories (with the exception of New Brunswick), representing 97% of the Canadian population, introduced a second-dose measles vaccination at either 18 months or 4 to 6 years of age. In addition, six provinces and territories (Ontario, Quebec, British Columbia, Prince Edward Island, Yukon, and Northwest Territories), representing 80% of the Canadian population, have already completed a mass second-dose catch-up program for all school-aged children. These children may have the highest rate of protection in this country. Approximately 4 million have been immunized through the catch-up campaign. Many school-aged children in other regions have received the second dose of measles vaccine in the past, following threats of an outbreak. It is certain that only a two-dose measles vaccination can protect individuals and society from the threat of measles.

"ACUTE HEPATITIS B" INCIDENCE IN CANADA

Hepatitis B virus (HBV) infection surveillance information has been reported to the Laboratory Centre for Disease Control (LCDC) National Notifiable Diseases Registry System (NNDRS) since 1969. This information has been included in the ***Notifiable Diseases Annual Summary*** published by LCDC. The annual summary for 1994[1] indicates that there has been little change in the reported cases (average of 2,868 per year, from 1990 to 1994) and rates (average of 10.3 per 100,000 per year, from 1990 to 1994) in Canada over the last several years (Figure 1). According to data from the NNDRS, males have a consistently higher crude rate of reported HBV than females (12.2 vs 8.8 per 100,000 in 1994). The highest age-specific rates of reported HBV are in persons 20 to 39 years of age, with low rates among those ≥ 60 years old and very low rates among persons < 15 years of age.

However, despite a promulgated case definition for national surveillance[2], there have been (and are) substantial differences in what aspect of HBV infection is reported from the provinces and territories to the NNDRS. For example, since 1990, Ontario excludes "carrier cases"; Quebec and British Columbia report "acute cases," "chronic cases," and "indeterminate cases" of which the "acute" and "indeterminate" are combined when entered in the NNDRS database and henceforth cannot be separated. Further, national statistics are driven by the large number of cases reported from British Columbia, which has reported 40% of all the cases in Canada from 1990 to 1994. Therefore, it would be difficult to draw conclusions regarding

Figure 1
Annual crude rates of hepatitis B in Canada, 1992-1995, as reported by NNDRS* and for "acute hepatitis B"



* NNDRS — National Notifiable Diseases Registry System
* RNMDO — Registre national des maladies à déclaration obligatoire

Figure 2
Annual crude rates of "acute hepatitis B" in Canada, 1992-1995, by provinces and territories (P/T)

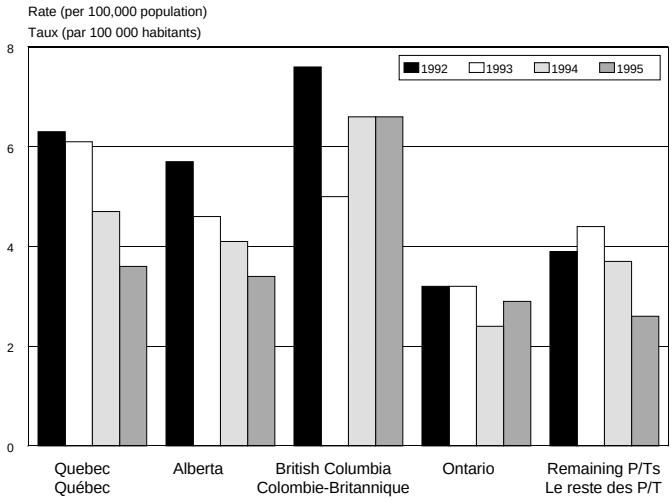
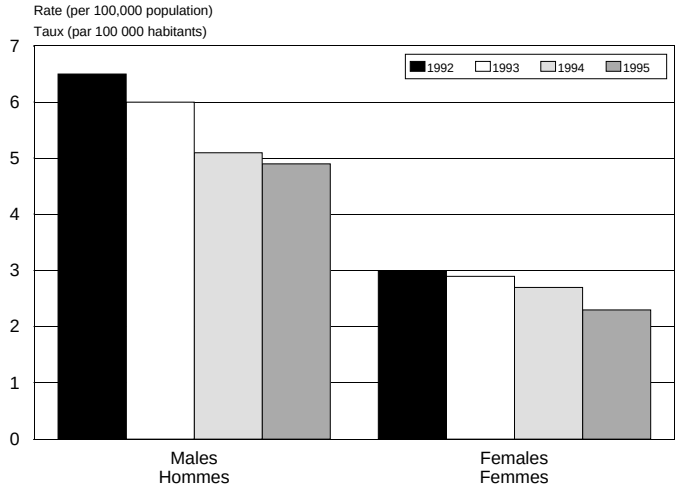


Figure 3
Annual crude rates for "acute hepatitis B" in Canada, 1992-1995, by sex



trends in the incidence of HBV infection in Canada based on NNDRS data.

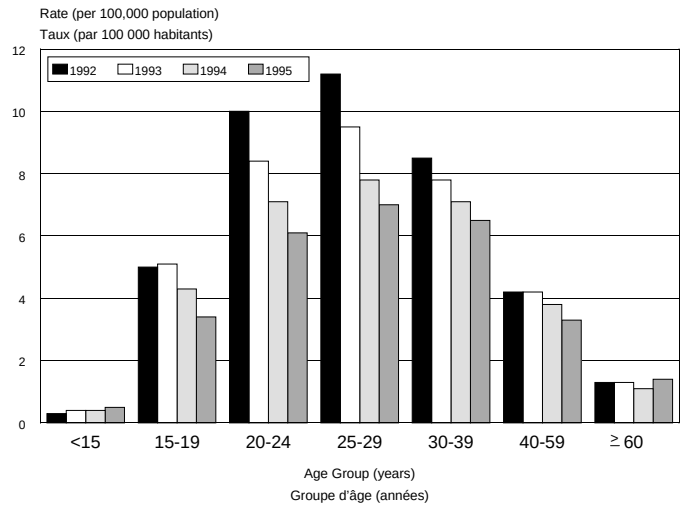
Through contact with provincial and territorial epidemiologists, both directly and by a mail survey in the summer of 1996, it has been possible to assemble information in recent years for all jurisdictions regarding annual reported cases where the case has been determined as not likely to be a chronic carrier, i.e. "acute hepatitis B" (although the criteria for such determination varies among jurisdictions). In contradistinction to the NNDRS data, Figure 1 indicates that crude rates of "acute hepatitis B" have fallen 29% in Canada between 1992 and 1995. In the larger provinces (> 2 million population), the trend of "acute hepatitis B" incidence has been as follows: strongly downward in Alberta; seemingly downward in Quebec; mildly downward in Ontario; and no upward or downward trend in British Columbia (Figure 2). For the other provinces and territories combined, there is a moderate downward trend (Figure 2). The downward trend for the incidence of "acute hepatitis B" is evident for each sex (Figure 3), although it is stronger for males. There is a downward trend for each age group from 15 to 59 years of age (Figure 4); this trend is strongest among those 20 to 29 years old. The highest annual rates are among those 20 to 39 years old, as is the pattern in the NNDRS.

Caution is necessary when interpreting these data, especially for Quebec. For example, there may have been important changes in the provincial and territorial surveillance systems; only 4 years are involved and surveillance data are known to underestimate the actual rates. Still, the data in this report likely reflect an encouraging picture of declining incidence of HBV infection in Canada in recent years. The reasons for this apparent decline remain speculative. A "high-risk group" approach to the use of hepatitis B vaccine has been in place in Canada since 1982[3] and prenatal screening, at first targeted at "high-risk" pregnant women and later at all pregnant women, has also been in place since 1982[3].

A downward trend for the incidence of HBV in the early 1990s has also been reported in the United States and has been partly ascribed to declining transmission among injection drug users, possibly as a result of safer needle-using practices[4]. However, there has been some concern about a recent increase in the US rate perhaps related to missed opportunities to vaccinate high-risk persons[5].

The recent implementation of universal, mainly school-based, hepatitis B vaccination programs in all provinces and territories except Manitoba is expected to continue (or accelerate) the downward trend of HBV incidence in the future. It will be

Figure 4
Annual rates for "acute hepatitis B" in Canada, 1992-1995, by age group



important to monitor this trend to assess the effectiveness of these programs.

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Source: *M Tepper, MD, MHSc, Blood-borne Pathogens Division, Bureau of Infectious Disease, LCDC, Ottawa, ON.*

International Notes

AIRPORT MALARIA — SWITZERLAND

A 54-year-old man died in the Geneva Cantonal Hospital on 16 July 1996 following a *Plasmodium falciparum* infection. The disease lasted only a few days: it began with influenza-type symptoms; he was admitted to hospital with fever and tremor; this was followed by convulsive fits, shock, anemia, thrombocytopenia, and kidney failure. He died 2 days after admission in spite of appropriate treatment with intravenous quinine.

The investigation ruled out risks such as travel, transfusion, and drug abuse. The fact that the patient lived approximately 2.5 km from Geneva Cointrin Airport (in Chambésy) suggests that he was bitten by an infected mosquito that had been brought by plane from an endemic zone.

Airport malaria is known in Europe, but it is very rare. In Switzerland, four cases were detected around Zurich in 1970 to 1972 and five in Geneva in the summer of 1989.

Physicians should be alerted to the possibility of malaria even in the absence of travel to a tropical area. When there is a fever of unknown origin, tests should be made for *Plasmodium*, especially in people living near or passing by an airport.

Source: *WHO Weekly Epidemiological Record, Vol 71, No 47, 1996.*

Announcement

INTERNATIONAL TRAVEL AND HEALTH
Vaccination Requirements and Health Advice

The 1997 edition of ***International Travel and Health*** has just been published in English and French. This booklet is addressed to national health administrations, practising physicians, tourist agencies, shipping companies, airline operators, and other bodies who are called upon to give health advice to travellers.

In addition to summarizing the vaccination requirements of individual countries, the booklet indicates the main areas where malaria transmission occurs and where *Plasmodium falciparum* is resistant to drugs. The recommended chemoprophylactic regimen is also given for each country with malarious areas.

Other chapters cover certain health hazards to which the traveller may be exposed and indicate the areas in which these hazards are most likely to occur. The booklet also recommends a number of precautions that the wise traveller should take when visiting unfamiliar places.

This booklet can be obtained from the **Publications Department, Canadian Public Health Association, 400-1565 Carling Avenue, Ottawa, Ontario, K1Z 8R1, (telephone: (613) 725-3769)**. Price per copy is $20.87 (including postage, handling, and GST). The 1997 edition will be available at the end of April 1997.

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