mologous to the JRA1 isolate [3], which we had reported to be a presumably Japan-indigenous strain. Thus, HEV may have been circulating domestically in Japan for a substantial amount of time. Further “archeological” research is needed for us to fully elucidate the history of HEV in Japan.

In addition to the genetic relatedness between the JRA1 and HE-JO strains, they also share a geographic relatedness that deserves our attention: JRA1 was obtained from a patient living in Tokyo and HE-JO from a resident of Ibaraki Prefecture, which is adjacent to Tokyo. This is reminiscent of our previous observation that the 2 genotype III isolates from Hokkaido (JKN-Sap and JMY-Haw [1]) were closely related to each other but significantly distant from the Tokyo isolate (JRA1), as shown in figure 1. Moreover, we sequenced an HEV isolate from a patient living in Kanagawa, which is adjacent to Tokyo, and found it to be a close relative of JRA1 (data not shown). These observations suggest that HEV strains of polyphyletic origins have been circulating and spreading in Japan in a limited, region-restricted manner.

On the other hand, 3 isolates from Tochigi Prefecture (the swine-derived swJ681 and swJ570 [2, 4] and the human-derived HE-JI3 [2]) were significantly diverse (figure 1). This suggests that different strains of HEV have been circulating even in small geographic regions (at least in Tochigi Prefecture).

Little is known about the routes of HEV transmission in Japan (except the importation route); thus, it is important to obtain HEV isolates for sequencing from humans, swine, and as many other animals as possible in every region of Japan. Comparative analyses of those sequences could address the following questions: First, do geographic differences exist among human isolates? Second, is there an animal isolate that matches nearly 100% to a human isolate? Last and most important, is zoonotic transmission involved in the human cases of HEV infection and, if so, to what extent?

Shunji Mishiro,1 Kazuaki Takahashi,1 Jong-Hon Kang,2 Sachiyoh Ohnishi,3 and Kunihiko Hino1
1Department of Medical Sciences, Toshiba General Hospital, Tokyo,
2Center for Gastroenterology, Teine Keijinkai Hospital, Sapporo,
and 3Delta Clinic, Saitama, Japan

References

Reprints or correspondence: Dr. Shunji Mishiro, Dept. of Medical Sciences, Toshiba General Hospital, 6-3-22 Higashi Oh-i, Shinagawa-ku, Tokyo 140-8522, Japan (shunji.mishiro@po.toshiba.co.jp).

The Changing Age and Seasonal Profile of Pertussis in British Columbia, Not Canada

To the Editor—Skowronski et al. [1] composed a comprehensive and elegant description of recent epidemiological trends of pertussis in the province of British Columbia in western Canada. However, the article describes trends in pertussis disease in only 1 of the 13 provinces and territories in this country. Some of the findings from this province are similar to the national picture, but others are not.

Trends in pertussis disease in Canada have followed the increasing incidence observed in other developed countries since the late 1980s [2–4.] Incidence rates have increased in all age groups, including in children aged 10–14 years. On the other hand, incidence rates have been decreasing in children aged 1–4 years since 1996. In these respects, the data presented by Skowronski et al. [1] reflect the Canadian trends.

However, unlike British Columbia, where incidence among children aged 10–14 years has surpassed that among infants, in Canada as a whole, infants continue to experience the highest incidence of disease. There are geographical variations in incidence rates and outbreaks, with peaks occurring in different years in different jurisdictions (e.g., British Columbia was the only province that experienced an outbreak in 2000). The trend of increasing incidence over the last decade or so has only been observed in approximately one-half of the provinces and territories. Prior to the introduction of acellular pertussis vaccine in 1997-1998, jurisdictions used different pertussis vaccine products introduced at different times. There is some evidence that this may have affected pertussis incidence differently in those jurisdictions. Although the British Columbia Centre for Disease Control laboratory has been using polymerase chain reaction (PCR) as a pertussis diagnostic tool since 1998, most provincial public health laboratories either are only now in the process of introducing PCR or have yet to introduce it. PCR-based diagnosis of pertussis may also have contributed to changes in the number or proportion of cases identified.

Skowronski et al. [1] did not present evidence demonstrating that the pertussis trends observed in British Columbia are similar to those seen in the rest of Canada. The Canadian pertussis
data, with comparisons between provinces, have recently been analyzed and are being submitted for publication.

Eleni Galanis,¹ ² Arlene King,¹ and Paul Varughese²
¹Division of Immunization and Respiratory Diseases and ²Field Epidemiology Training Program, Health Canada, Ottawa, Ontario, Canada

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Reply

To the Editor—Trends identified in British Columbia have been observed in other provinces of Canada and can be considered generalizable. This includes the province of Quebec [1], which alone reported 46% of all pertussis cases in Canada between 1990 and 1999 [2]. The increasing incidence of pertussis in adolescents, with a rate even surpassing that of infants, has also recently been noted outside Canada [3]. What is unique about the changing profile witnessed in some provinces of Canada, however, is the yearly progression of involvement of successively older age groups. This pattern suggests a specific cohort effect that may be attributed to a poorly protective vaccine introduced in Canada between 1981 and 1985. Ultimately, that vaccine was used in all provinces, but with different dates of introduction. We can, therefore, anticipate that the timing of the trend observed in British Columbia may differ between provinces, but not the trend itself.

Polymerase chain reaction (and other diagnostic tests, such as serologic tests [4]) paints a more complete picture of the epidemiology of pertussis, particularly in adolescents and adults [5]. We encourage its standardization and incorporation as a routine diagnostic tool in identifying and characterizing pertussis across all age groups. Until then, the population profile of pertussis will appear to be driven by those experiencing the most classic and severe symptoms, namely, infants. Where atypical pertussis has been investigated with all available surveillance and diagnostic tools, the importance of pertussis in older age groups has clearly emerged [4–5].

We are confident that Galanis et al. [6] would agree that adolescent and adult pertussis warrants better identification, understanding and control across Canada. We hope their review at the national level will provide useful insight in that regard.

Danuta M. Skowronski,¹ Gaston De Serres,² David M. Patrick,¹ and Scott Halperin³
¹University of British Columbia Centre for Disease Control, Vancouver, British Columbia, ²Institut National de Sante Publique de Quebec, Beaufort, Quebec, and ³Dalhousie University, Halifax, Nova Scotia, Canada

References

Reprints or correspondence: Dr. Danuta M. Skowronski, University of British Columbia Centre for Disease Control, Epidemiology Services, 655 W. 12th Ave., Vancouver, British Columbia V5Z 4R4, Canada (danuta.skowronski@bccdc.ca).

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