INFLUENZA SEROSURVEY FOR 1991-1992 SEASON
Prevalence of Antibody to Current Influenza Virus Strains in a 1991 Canadian Serosurvey

As part of a Provincial Laboratory, Laboratory Centre for Disease Control collaborative influenza surveillance program, sera with age and geographic area identifiers were submitted to the Bureau of Microbiology by Provincial Public Health Laboratories. These sera were tested against the antigens of current influenza vaccine strains: A/Taiwan/1/86 (H3N2), A/Beijing/353/89 (H3N2) and B/Panama/45/90 as well as B/Yamagata/16/88. Provincial Laboratories selected 40 sera from 4 age groups (0-14, 15-34, 35-64 and 65+) from among specimens received for various tests during a 1-week sampling period, beginning 4 June, 1991. The Northern Branch and Southern Branch Provincial Laboratories of Alberta each submitted 40 sera. For Ontario and Quebec, a 4-week collection period was used so that their relatively larger populations would have a corresponding larger representation in the total data. The sera collection times were chosen to fall between influenza seasons and to precede the 1991 vaccine release date.

Table 1 shows a comparison between the 1990 and 1991 influenza survey data for sera having titres 1:40 or greater by the hemagglutination-inhibition (HI) test. HI titres of 1:40 or greater following vaccination have been associated with reduced influenza illness and infection and are widely presumed to indicate some degree of protection against similar strains. Sera with this titre or greater were considered to be positive.

Influenza B

From the data of Table 1, it can be seen that for age group 0-14 there was more than a 4-fold increase (from 6% in 1990 to 25% in 1991) in the percentage of sera showing protective antibody to B/Yamagata/16/88. The percentage of positive samples with protective antibody to B/Yamagata/16/88 in the 15-34-year-age group, also increased from 15% in 1990 to 21% in 1991. The percentage of immune individuals in the 35-64 and the over 65 years age groups remained essentially unchanged. Increases in the percentage of individuals with protective antibody to influenza B in those aged 0-14 and 15-34 years suggest that the majority of influenza B infections in the past season occurred in the younger age groups. This observation is confirmed by surveillance data collected by the Bureau of Communicable Diseases Epidemiology, which indicated that, of 886 reported laboratory diagnoses of influenza B where ages were known, 56% and 20% involved individuals aged 0-14 and 15-34 years, respectively.

Enquête sérologique sur la grippe (saison 1991-1992)
The greatest potential for continued influenza B activity may be in the Atlantic Provinces, where a very low number (10%) of samples in the 0-14-year-age group showed protective antibody (Table 2).

Influenza A (H3N2)

There were no reports of influenza (H3N2) activity in the 1990-1991 season. Consistent with this observation, it can be seen from Table 1 that the percentage of samples with protective immunity to A/Taiwan/1/86 (H3N2) declined in every individual age group, and, overall, dropped from 60% in 1990 to 45% in 1991. Regional and age group variation is seen in the percentage of samples with protective antibody to A/Taiwan/1/86 (Table 2).

The percentage of samples showing immunity to A/Taiwan/1/86-like strains has dropped to 45% (Table 1) because of the relative absence of H3N2 activity in Canada in the last 2 influenza seasons. However, the prevalence of antibodies to A/Taiwan/1/86 is still higher than the percent immunity to influenza B (19%) or A (H3N2) (22%) strains expected this winter. This, together with the failure of influenza A (H3N2) virus to develop epidemic strains with significant antigenic variation from A/Taiwan/1/86, suggests that any H3N2 activity this winter should only be light to moderate.

Table 1 also shows that, while the percentage of antibody to B/Panama/45/90 is relatively low, the 19% immunity rate in samples from the 0-14-year-age group is about 3 times higher than the 6% of samples that showed protective antibody to B/Yamagata/16/88 before the start of the 1990-1991 influenza season during which influenza B was so prominent.

Therefore, while there is real potential for continued influenza B activity this winter, the number of cases in the younger age groups is unlikely to match the number of cases that occurred last season. The greatest potential for continued influenza B activity may be in the Atlantic Provinces, where a very low number (10%) of samples in the 0-14-year-age group showed protective antibody (Table 2).

On voit aussi au Tableau 1 que bien que le pourcentage de sérums présentant des anticorps contre B/Panama/45/90 soit relativement peu élevé, le taux d'immunité de 19 % constaté dans le groupe des 0 à 14 ans est quelque 3 fois supérieur au taux d'immunité contre B/Yamagata/16/88 de 6 % observé avant le début de la saison grippale 1990-1991, au cours de laquelle la grippe B a été si répandue.

Par conséquent, bien qu'il y ait un véritable danger que l'activité grippale B se poursuive cet hiver, il est peu probable que le nombre de cas chez les sujets jeunes atteigne celui de la saison dernière. L'activité grippale B risque surtout de frapper les provinces atlantiques où très peu d'échantillons (10 %) venant de la tranche 0 à 14 ans démontrent un taux protecteur d'anticorps (Tableau 2).

Grippe A (H1N1)

Aucun rapport d'activité grippale (H1N1) n'a été reçu pendant la saison 1990-1991. On comprend donc que le pourcentage d'échantillons démontrent une immunité protectrice à l'égard de A/Taiwan/1/86 (H1N1) a baissé dans toutes les tranches d'âge (tableau 1); le taux global de cette immunité est passé de 60 % en 1990 à 45 % en 1991. On constate des différences selon les régions et les tranches d'âge dans les pourcentages d'échantillons montrant un taux protecteur d'anticorps contre A/Taiwan/1/86 (Tableau 2). C'est chez les sujets de 35 à 64 ans que ce taux a tendance à être le plus bas, probablement parce qu'ils ont moins souffert de grippe H1N1 au cours des dernières années.

Le pourcentage d'échantillons montrant une immunité à l'égard de souches analogues à A/Taiwan/1/86 a baissé à 45 % (Tableau 1), à cause de l'absence relative d'activité H1N1 au Canada au cours des 2 dernières saisons grippales. Il reste cependant plus élevé que le pourcentage d'immunité à l'égard des souches B (19 %) et A (H3N2) (22 %) prévus pour cet hiver. Si l'on ajoute à ces données le fait que le virus grippal A (H1N1) n'a pas réussi à produire de souches épidémiques qui présentent des variations antigéniques marquées par rapport à A/Taiwan/1/86, on peut penser que l'activité H1N1 cet hiver ne sera pas très forte.
Influenza A (H3N2)

From Table 1, it can be seen that relatively few samples (22% overall) had protective antibody to A/Beijing/353/89 (H3N2) in 1991. In 1990, 38% had protective antibody to A/Shanghai/16/89 (H3N2). This difference is mainly due to the relative lack of (H3N2) activity in the 1990-1991 influenza season and to antigenic variation between these 2 related strains.

The data of Table 2 indicate the percentage of sera in each age group and region of Canada having hemagglutination-inhibiting antibody to current influenza strains at a titre of 1:40 or greater. It can be seen that the percentage of samples showing protective antibody to A/Beijing/353/89 (H3N2) is low in all regions but lower in every age group in Ontario and Quebec than in the other 2 regions.

From May through September, 1990, influenza A (H3N2) was active in the southern hemisphere and isolates were predominantly similar to an new variant A/Beijing/353/89, previously detected only in northern China. During the 1990-1991 influenza season, a limited number of isolates available for testing from North America and Japan were more closely related to A/Beijing/353/89 than to the 1990-1991 vaccine strain A/Shanghai/16/89 (H3N2). In the spring of 1991, 8 isolates of A(H3N2) received from late season activity in Ontario and Alberta most resembled A/Beijing/353/89(2). This suggests that this strain could be widely seeded in Canada at the start of the 1991-1992 influenza season. This information, together with the relatively low percentage of samples having protective antibody to the new H3N2 subtype strain A/Beijing/353/89, makes it reasonable to expect considerable influenza A (H3N2) activity this coming winter season.

Conclusions
Sample size, selection, origin of specimens within a province and variation inherent in HI tests limit the degree to which the percent immunity figures can be taken to represent the precise level of immunity in any one province and individual age group. However, past experience has shown that the serological data tend to reflect the past year’s influenza activity or lack of it for the

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Gripped A (H3N2)
Il ressort du tableau 1 qu'en 1991 relativement peu d'échantillons (22 % de l'ensemble) possédaient l'anticorps protecteur contre A/Beijing/353/89 (H3N2), tandis qu'en 1990, 38 % possédaient l'anticorps protecteur contre A/Shanghai/16/89 (H3N2). Cette différence s'explique surtout par l'absence relative d'activité H3N2 au cours de la saison grippale 1990-1991 et aux différences antigéniques entre ces 2 souches apparentées.

Le tableau 2 donne le pourcentage de sérum qui, par tranche d'âge et par région du Canada, présentent un titre d'anticorps H3 d'au moins 1:40 contre les souches grippales courantes. On constate que le pourcentage d'échantillons affirmant l'anticorps protecteur contre A/Beijing/353/89 (H3N2) est bas dans toutes les régions. En Ontario et au Québec, il est encore plus bas que dans les 2 autres régions, pour toutes les tranches d'âge.


Conclusions
La taille des échantillons, leur méthode de sélection et leur lieu d'origine dans une province, joints à la variation inhérente à l'épreuve d'HI, limitent jusqu'à un certain point la capacité des pourcentages signalés ici de représenter avec précision le niveau réel d'immunité dans chaque province et dans chaque tranche d'âge. Toutefois, l'expérience nous a appris que les données sérologiques de cette sorte ont tendance à refléter l'activité grippale
country as a whole and to indicate the potential for activity in the coming year.

Relatively low percentages of protective hemagglutination-inhibiting antibodies for A/Beijing/353/89 (22%) and B/Panama/45/90 (19%) suggest that there is significant potential for activity by these strains in the coming influenza season. Therefore, for individuals at higher risk for serious illness or death from influenza, vaccination should be encouraged as being the most effective way of preventing or attenuating the effects of it.

Acknowledgements

The collaboration of provincial laboratory directors in sending sera for testing and the technical assistance of Carol Murano, Bureau of Microbiology, were essential in making this report possible.

References


Source: John M Weber, PhD, Head, Surveillance, Influenza and Viral Exanthema, National Laboratory for Special Pathogens, Bureau of Microbiology, LCDC, Ottawa.

International Notes

INFLUENZA SURVEILLANCE

Chile (12 August 1991): The influenza activity which had started with sporadic cases in Santiago in June developed into a moderate outbreak which reached a peak in the second week of July. Some activity has also been reported in a region outside Santiago. All cases confirmed in the laboratory have been influenza B.

New Zealand (31 August 1991): Outbreaks ended in the South Island in mid-August while scattered outbreaks continued to be reported in the North Island at the end of the month. Most influenza activity has been associated with influenza B viruses but a few cases of influenza A(H1N1) were also diagnosed in July and August.