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2008

INFO-VACCINE

Hosted by:
Public Health Agency of Canada
Agence de la santé publique du Canada

In collaboration with:
CAIRE Canadian Association for Immunization Research and Evaluation / Association Canadienne pour la recherche et l'évaluation en immunisation
Canadian Paediatric Society / Société canadienne de pédiatrie
CPHA ACSP

8TH Canadian Immunization CONFERENCE

Tuesday Edition
8th Canadian Immunization Conference
November 30 – December 3, 2008
Sheraton Centre / Toronto, Ontario

Please note that due to time constraints, we were unable to make the full INFO-*Vaccine* available in French. However, full French copies in pdf will be available online at www.publichealth.gc.ca following the Conference.

Veuillez noter qu'étant donné le court échéancier, il nous est impossible d'offrir la version française complète du INFO-Vaccine. Cependant, après la conférence, les copies complètes en version française en format pdf seront disponibles en ligne www.santepublique.gc.ca

Please Plan to Attend:
CIConf 2008 ACCREDITED SYMPOSIA

Tuesday, December 2

Update on the Control of Invasive Meningococcal Disease in Canada and the Use of a Quadrivalent Meningococcal Polysaccharide Diphtheria Toxoid Conjugate Vaccine Against Serogroups A, C, Y, and W-135
(Dominion Ballroom) 6:30 - 8:30 am

Zoster and Post-Herpetic Neuralgia: Is This a Disease Worth Preventing? A Burning Question
(Civic Ballroom) 6:30 - 8:30 am

Wednesday, December 3

Advances in Protection Against Pneumococcal Disease
(Civic Ballroom) 7:00 - 8:30 am

ADDENDA TO FINAL PROGRAM

Authors of posters #068 and 069 are L Fang, JA Buxton and A Yu.

Posters #014 and 016 (page 39) can be viewed in the Exhibition Hall Tuesday, December 2.

Monday's Plenary II session, standing room only!
From left to right: Greg Hammond, Alexandra Simniceanu, Harold Rode, Simon Dobson

Innovative vaccine initiatives strike balance between efficacy and cost-effectiveness

Dr. Philippe De Wals

The province of Quebec is leading the way with a number of innovative vaccine initiatives that are aiming to strike a balance between efficacy and cost-effectiveness. Dr. Philippe De Wals, Professor and Head, Department of Social and Preventive Medicine, Université Laval, Quebec City, and consultant with the Institut national de santé publique du Québec, will expand on these initiatives during his lecture in Plenary Session V, "Vaccine Effectiveness – Evidence of Impact."

Public health authorities have a responsibility to ensure that immunization programs are reaching their target population, that vaccines are safe, and that the program is also achieving expected results. "This is all the more important when the immunization schedule being used is not the one which is approved by the manufacturer or recommended by the National Advisory Committee on Immunization (NACI)," Dr. De Wals told INFO-*Vaccine*.

Rather than follow the immunization book, public health authorities in Quebec have been exploring alternatives between maximum effectiveness as recommended by manufacturers and a schedule that achieves a balance between efficacy and cost-effectiveness. For example, three doses of the meningococcal vaccine are recommended by both manufacturers and NACI for maximal protection. But having carefully evaluated the immunogenicity of a

Continued on page 2

Programmes de vaccination novateurs alliant efficacité et efficience

Le Québec innove en proposant plusieurs programmes de vaccination qui se veulent à la fois efficaces et efficients. Le Dr Philippe De Wals, professeur titulaire et chef du Département de médecine sociale et préventive, Université Laval, Québec, et consultant auprès de l'Institut national de santé publique du Québec, donnera, dans le cadre de la plénière V, une conférence intitulée «Efficacité des vaccins – Faits relatifs à l'incidence».

Les responsables de la santé publique doivent s'assurer que les programmes d'immunisation rejoignent la population cible et produisent les effets escomptés, et que les vaccins sont sûrs. «Cela est encore plus important lorsque le calendrier de vaccination n'est pas conforme aux recommandations du fabricant ni à celles du Comité consultatif national de l'immunisation (CCNI)», précise le Dr De Wals.

En effet, au lieu de suivre à la lettre les recommandations des fabricants, axées sur l'efficacité maximale, les responsables québécois de la santé publique ont exploré la voie de l'équilibre entre l'efficacité et l'efficience. À titre d'exemple, les fabricants et le CCNI recommandent, aux fins de protection maximale, l'administration de trois doses du vaccin antiméningococcique. Or, après l'étude minutieuse de l'immunogénicité d'une dose unique du vaccin, les autorités sanitaires ont décidé de ne l'inoculer aux enfants qu'une seule fois, à 12 mois, âge où le système immunitaire est plus mature. La stratégie s'est révélée

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single dose of the vaccine, public health officials made a decision to administer a single dose of the vaccine at the age of 12 months, when a child's immune system is more mature. This strategy has proved to be "quite effective" as Dr. De Wals, characterized, "and the one-dose approach is now being adopted in the majority of the other provinces here in Canada and in many European countries as well."

Similarly, Quebec researchers determined that four doses of the pneumococcal vaccine, also recommended by both the manufacturer and NACI, were not needed to achieve good protection against pneumococcal disease and they implemented a three-dose schedule instead, giving the vaccine at two, four and 12 months, not at six months as the four-dose schedule dictates.

"This, too, has proved to be very successful and we are currently evaluating the effect of these programs on vaccination coverage," Dr. De Wals revealed. Again, many countries have decided to follow suit, including the United Kingdom, Switzerland and Belgium, he added.

Vaccination against the human papillomavirus also calls for three official doses. In Quebec, however, public health officials are giving two doses of the HPV vaccine at nine years of age, prior to a girl's sexual debut, when it will be most protective against future HPV infection, along with a booster at 15 years of age. "Our expectation is that this schedule will very much prolong the duration of protection against HPV," Dr. De Wals observed.

Quebec is also the first province to offer the dual hepatitis A/hepatitis B vaccine to grade 4 students, an age when the immune response to vaccination is most robust. At the same time, they are buying adult doses of the dual vaccine and dividing the dose into two parts, so that two children can receive children's doses from a single vial of the adult vaccine. "We're also vaccinating children with two doses of the hepatitis A/B vaccine instead of three," Dr. De Wals added, "and at the end of the day, this is a huge saving."

Researchers are currently evaluating the impact that the modification to recommended schedules is having on disease protection. They have also set aside considerable funds for such evaluation, as researchers must ensure changes in immunization schedules are thoroughly evaluated. But with very possibly one of the best epidemiology research teams in the world to explore these changes—a team led by the late Dr. Bernard Duval—public health in Quebec is carving out a very unique niche in the implementation and delivery of vaccines. ❑

Dr. De Wals will deliver his presentation during Plenary V, "Vaccine Effectiveness – Evidence of Impact," on Tuesday, December 2, 10:30-12:30, Grand Ballroom West/Centre.

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«très efficace» et, poursuit le Dr De Wals, «la majorité des provinces canadiennes et de nombreux pays européens l'ont maintenant adoptée».

De même, les chercheurs québécois ont estimé qu'il n'y avait pas lieu d'administrer quatre doses du vaccin antipneumococcique, soit la quantité recommandée tant par le fabricant que par le CCNI, pour assurer une bonne protection. Ils ont donc prévu une vaccination en trois temps, soit à deux, à quatre et à 12 mois, laissant de côté la dose de rappel normalement prévue à six mois.

«Voilà une autre mesure qui a connu un franc succès. Nous évaluons actuellement l'effet de ces programmes sur la couverture vaccinale», souligne le Dr De Wals. Encore une fois, de nombreux pays nous ont emboîté le pas, notamment le Royaume-Uni, la Suisse et la Belgique, enchaîne-t-il.

Officiellement, l'immunisation contre le virus du papillome humain (VPH) se fait en trois doses. Au Québec, cependant, on s'en tient à deux doses : une première à l'âge de neuf ans, avant le début de l'activité sexuelle des jeunes filles et au moment où l'effet protecteur est maximal, puis une dose de rappel à l'âge de 15 ans. «Nous nous attendons à ce que la protection contre le VPH soit ainsi notablement prolongée», fait observer le Dr De Wals.

Par ailleurs, le Québec est la première province à offrir le vaccin bivalent contre les hépatites A et B aux élèves de 4e année du primaire, âge où la réponse immunitaire à la vaccination est la plus vigoureuse. Toutefois, les autorités achètent des doses d'adultes du vaccin combiné, puis les divisent en deux, si bien que deux enfants sont vaccinés à l'aide d'une seule fiole. «Ici encore, nous inoculons aux enfants deux doses du vaccin au lieu de trois. L'économie réalisée est énorme», ajoute le Dr De Wals.

Les chercheurs mesurent actuellement les répercussions de cette modification des calendriers sur la protection vaccinale. Ils disposent à cette fin de sommes considérables, car les effets de tels changements doivent faire l'objet d'une évaluation minutieuse. Pour mener ce travail exploratoire, les autorités québécoises en santé publique peuvent compter sur l'une des meilleures équipes du monde en recherche épidémiologique, à n'en pas douter. Grâce à ces chercheurs, auparavant dirigés par feu Dr Bernard Duval, le Québec est en voie d'acquérir une expertise sans pareille en instauration de programmes publics d'immunisation. ❑

Le Dr De Wals donnera sa conférence intitulée «Efficacité des vaccins – Faits relatifs à l'incidence», le mardi 2 décembre, de 10 h 30 à 12 h 30, dans la salle Grand Ballroom Ouest/Centre.

Vaccine recommendations rooted in societal values, not science

As Dr. Gaston De Serres, Professor of Medicine, Université Laval, and medical epidemiologist, Institut national de santé publique du Québec, Quebec City, will discuss later today, making a recommendation for a vaccine strategy is not a scientific action, but one that is deeply rooted in personal, professional and societal values.

When developing any vaccine, manufacturers provide data sets but they might not be comprehensive, given the constraints under which companies must operate. "This means that public health must have the capacity to generate evidence for itself," Dr. De Serres told INFO-*Vaccine*.

Dr. Gaston De Serres

One such example spearheaded by the late Dr. Bernard Duval, in whose honour Dr. De Serres is giving the Distinguished Lecture in Canadian Immunization this year, was a cost comparison of four vs. three doses of the pneumococcal conjugate vaccine. When the Quebec-based research team compared the two schedules, they estimated that it would cost on average $149,000 to prevent one case of pneumococcal disease with a 99% protection rate against infection with the four-dose schedule. In contrast, it would cost on average $109,000 to prevent one cast of pneumococcal disease with the three-dose schedule, with a protection rate of between 96% and 98%. In other words, it would cost an additional $11 million per case of pneumococcal disease averted; for a single death averted, the four-dose schedule would cost an additional $562 million over the three-dose schedule.

"This is marginal cost-effectiveness," Dr. De Serres notes, "and this has been the basis upon which we've introduced many novelties in our vaccine schedules in Quebec." In fact, there are a number of conditions that might justify an immunization schedule different from one recommended by the manufacturer.

If, for example, the goal of a program is to reduce the burden of disease by 95%, then offering a second mumps vaccine to adolescents minimally reduces the burden of disease from mumps—already extremely low to begin with—but at great expense. Rather than dedicating funds to implementing a second dose of mumps vaccine, Quebec has opted for cost efficiencies through innovations based on the science that two doses of the combined hepatitis A and B vaccine achieves a highly acceptable rate of protection—97% against hepatitis B and 100% protection against hepatitis A—rather than the added cost of a third dose of the hepatitis B vaccine.

Dr. De Serres will also make a case that vaccine schedules need to be Canadianized when the epidemiology of a disease and the health objectives of a vaccination program differ from those in the US. "There is a misconception that when you do not consider cost, you are being scientific, and when you consider cost, you are not being scientific," Dr. De Serres remarked. "But we're not in an environment where money is infinite and we have to use our vaccines to protect our children as much as we can, but not at an extravagant cost for small additional amounts of protection." ❑

Dr. De Serres will be delivering the Distinguished Lecture in Canadian Immunization during Plenary V on Tuesday, December 2, 10:30-12:30, Grand Ballroom West/Centre.

Immunization outreach for refugees, immigrants: act early

The best strategy to ensure that refugees and new immigrants receive required immunizations is to get them early into the clinic, when they are more receptive to receiving the vaccines they need for "catch-up" status.

Dr. Meb Rashid, Access Alliance Multicultural Community Health Care, Toronto, and colleagues are aware that rates of immunization for refugees and immigrants here and elsewhere are lower than they are for the general population and there is a real need to offer them an opportunity to "catch-up" with required vaccines on their arrival. In fact, "With the expansion of the immunization schedule, it's quite possible new immigrants have significantly lower immunization rates [than the general public]," he told INFO-*Vaccine*.

Yet at the same time, public health officials have observed a decrease in the delivery of required vaccines among refugees and immigrants the longer they stay in the country. "Studies have in turn shown that people are more compliant with immunization upon arrival, so we argue that it does become beneficial to target people as soon upon arrival as impossible to increase immunization rates," confirms Dr. Rashid.

Refugees and immigrants often do not know where their immunization records are and what their immunization status is. Some of the data collected by Access Alliance indicate that about one out of seven people surveyed have incomplete protection against measles, mumps and rubella (MMR). Although Canada has experienced mumps and measles outbreaks in recent history, the general level of MMR vaccination in Canada is high, so it important that new arrivals to Canada are properly immunized to reduce the risk of a case of MMR being introduced into the community.

Luckily, a large part of Access Alliance's public health practice involves government-assisted refugees. These are individuals whose refugee status was assessed before they were brought to Canada—some 750 to 800 such individuals a year in Toronto alone—all of whom must pass through a receptor centre.

"This means that we have access to all of these people in an organized fashion and it makes a huge difference as we have them soon after their arrival," Dr. Rashid explains.

The team at Access Alliance is then able to provide its clients with the vaccines they need in order to protect themselves from preventable diseases. ❑

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The ethics of immunization

Public health officials may not discuss ethics per se in their practice but they do make a number of ethical decisions just by deciding whom and how to immunize, as Dr. Monika Naus, Associate Director (Epidemiology), British Columbia Centre for Disease Control, and Assistant Professor, Health Care and Epidemiology, University of British Columbia, will discuss in her presentation on Tuesday afternoon. There are a number of frameworks that officials can use when examining ethics in public health but from her own perspective, Dr. Naus believes public health needs to consider issues relating to autonomy, justice, beneficence and nonmaleficence.

Dr. Monika Naus

"Like every other publicly funded program, there is some rationing in public health and we don't always make everyone happy," she told INFO-*Vaccine*. For example, the pneumococcal conjugate vaccine program was launched in September 2003 in British Columbia; children born July 1, 2003, and later were eligible to receive the vaccine but others were not. This year, the province is offering the human papillomavirus vaccine to girls in grades 6 and 9, but girls in other grades are not eligible for publicly funded immunization. Not all vaccines recommended for use in Canada are available through publically funded programs, and as Dr. Naus observed, a new vaccine series can represent a real expense for families.

"The other part of the process is the informed consent process—the autonomy and non-malfeasance part of the ethics framework," Dr. Naus continued. Informed consent ensures that people understand the benefits of any given vaccine; what it is intended for, as well as any material risk.

On the other hand, public health does recognize that while vaccines are safe and effective in reducing disease, there is a minimal risk of adverse events following immunization. To mitigate individual risk, public health takes every precaution to identify those individuals who may have a contraindication to a specific vaccine—for example, the immunosuppressed to a live vaccine or the egg-allergic person to the influenza vaccine. "We do not knowingly give a vaccine to someone who can be harmed by it," as Dr. Naus emphasized. If someone does have a serious reaction, "it is often one of those idiosyncratic outcomes that nobody can predict and are not known to be causal," she stated.

She acknowledged that ethicists challenge public health officials to be more transparent in their decision-making and to develop means by which to engage the public in decision-making for important immunization policy issues, such as who will receive a vaccine during a pandemic and which values are being used to make these decisions.

"It is a fair criticism that current processes are insufficiently transparent. Nevertheless, we do establish reasonable criteria; we do assess the burden of illness from a disease, we do make sure a vaccine is safe and effective and then, in terms of the politics of these issues, we always need to consider the health economics of the intervention," she said. ❑

Dr. Naus will present "Overview - Ethical Issues in Canada," on Tuesday, December 2, 13:30-15:00, at Toronto City Hall.

Global HIV Vaccine Enterprise: unique in science

Dr. Alan Bernstein

The Global HIV Vaccine Enterprise is probably "unique" in science, according to its inaugural Executive Director Dr. Alan Bernstein, also founding president of the Canadian Institutes of Health Research, in its attempt to bring the funders together with the scientists of the world in an effort to protect people against HIV, arguably the most important health issue of our time.

The Global HIV Vaccine Enterprise is an alliance of independent organizations around the world, all dedicated to accelerating the development of a protective HIV vaccine through several strategic features. As Dr. Bernstein outlines on the Enterprise's web site (www.vaccineenterprise.org), these strategies include implementation of a shared scientific plan for HIV vaccine research that spans vaccine discovery, development and testing in clinical trials.

The Enterprise must mobilize new funding to realize this scientific plan and it must also promote more efficient ways for researchers to share successes and failures—and avoid duplications of efforts—to achieve its ends. "Since HIV was identified more than two decades ago, scientists have been working to develop a vaccine but progress has been far too slow," Dr. Bernstein writes.

It is truer that researchers have made important gains in understanding the fundamental biology of HIV. However, only one large-scale efficacy trial is currently ongoing now in Thailand and as Dr. Bernstein himself notes, "We are still learning how this virus interacts with our immune system." He is nevertheless confident the Enterprise holds the elements it needs to succeed.

The Global HIV Vaccine Enterprise is home to some of the world's brightest scientists, all willing to explore new ideas, take new approaches and learn from other fields to overcome the global menace of HIV. It has a coherent strategy for HIV vaccine development and has considered all of the ancillary factors that are needed to take vaccine discovery through production and clinical trials. And it is highly motivated: in 2007, more than 2.5 million people around the world were newly infected with HIV, and over 2.1 million others died of it in the same year.

Canada is making a contribution to the global search for an HIV vaccine through the Canadian HIV Vaccine Initiative, a collaboration between the Government of Canada and the Bill and Melinda Gates Foundation which aims to aid in the development of a safe, effective and globally accessible HIV vaccine.

"A safe and effective vaccine remains the world's best hope for halting the spread of HIV," confirms Dr. Bernstein. "No one can put a timeline on when we will have one but working together, we will get there." ❑

Recent pneumococcal disease outbreak contained among the homeless

The recent outbreak of invasive pneumococcal disease among the homeless in Calgary appears to be under control thanks to an innovative, two-part initiative undertaken by the Alberta Health Services-Calgary Health Region.

Surveillance data indicated that a new serotype of pneumococcal disease, serotype 5 (ST5) was appearing in the general population starting in 2005 and that it was increasing in 2006. "Looking at those affected, we found a higher risk of this ST5 in homeless people and those with hepatitis C," Dr. Judy MacDonald, deputy medical officer of health for the service told INFO-*Vaccine*. So that summer, the polyvalent pneumococcal vaccine was approved for use in the homeless and the public health team went to work.

Initially, they offered the vaccine through their harm reduction program which was already established in shelters and at various sites throughout the city. Despite their initial efforts, the surveillance team observed a sudden spike in invasive pneumococcal disease in late November and early December of the same year, likely the result of the homeless moving into crowded shelters to get out of the cold, as Dr. MacDonald speculated. A decision was then made to offer a targeted pneumococcal vaccination campaign to the homeless right in the shelters for them.

Over a four-day blitz, public health nurses vaccinated as many homeless as they could in clinics set up in the shelters, an effort that resulted in approximately 1000 homeless in Calgary receiving the vaccine from the start of the earlier initiative to the end of the four-day campaign. A second initiative followed, this time an outreach program run by the Alberta Health and Wellness program but again targeted to the homeless who had not yet received the pneumococcal vaccine.

To expand their access to target recipients, the Alberta Health Services partnered with a number of different organizations than they normally do. "For example, we've made connections with street-involved youth organizations and women's service organizations so we are going into places we haven't been before and offering scheduled clinics," Dr. MacDonald said.

Evidence suggested that the outreach program facilitated not only vaccine uptake but helped increase the homeless' trust for health services in general, not something they normally warm to. The outreach program will be continued to March of 2009. "But so far, it has been well received and early evaluation suggests that 100% of the recipients thought it was a good idea and we should continue," she said. ❑

Meeting at a Glance

Tuesday, December 2

08:30-10:00
Plenary IV. Celebrating Canadian Innovation in New Vaccines and Vaccine Delivery
(Grand Ballroom West/Centre)

10:00-10:30
Health Break – Exhibit and Poster Viewing
(Osgoode Ballroom)

10:30-12:30
Plenary V. Evidence Base for Immunization Programs including the Distinguished Lecture in Canadian Immunization
(Grand Ballroom West/Centre)

12:30-13:30
Lunch - Exhibit and Poster Viewing
(Osgoode Ballroom, Sheraton Hall)

12:30-13:30
Lunchtime Workshops
Writing for Journals
(Windsor West)

12:30-13:30
Cold Chain Strategies -
"Tips and Tricks of the Trade"
(Grand Ballroom East)

13:30-1500
Concurrent Sessions (1 to 7)
(Dominion Ballroom North)
Please see final program for details

15:00-16:00
Health Break – Exhibit and Poster Viewing
(Osgoode Ballroom)

16:00-17:30
Concurrent Sessions (1 to 7)
(Dominion Ballroom North)
Please see final program for details

Wednesday, December 3

08:30-10:00
Plenary VI. Pandemic Influenza: Critical Knowledge Gaps and Canadian Efforts to Bridge Them
(Grand Ballroom West/Centre)

10:00-10:30
Health Break – Poster Viewing
(Osgoode Ballroom)

10:30-12:20
Plenary VII. The Bottom Line: Hot Topics & Ask the Experts
(Grand Ballroom West/Centre)

12:20-12:30
Closing Remarks

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Evil synergy between HIV and tuberculosis dictates need for more effective vaccine

Dr. Marcel Behr

Rates of tuberculosis (TB), while low and reasonably stable in Western countries, are increasing in the former USSR and they are skyrocketing in areas of Africa where rates of HIV infection are high.

There is an "evil synergy" between HIV infection and tuberculosis (TB) and the need to develop a more effective vaccine against TB is great in those countries where TB is on the rise. "HIV infection accelerates progression of TB infection to disease," confirms infection and immunity researcher Dr. Marcel Behr, Associate Professor, The Research Institute of the McGill University Health Centre, "while *Mycobacterium tuberculosis* infection accelerates progression of HIV to AIDS." Thus, HIV infection poses a "considerable challenge" to a vaccine-based control strategy against TB.

The currently available Bacille Calmette-Guérin TB vaccine is a live attenuated vaccine which is not sufficiently effective for widespread population use. It presents a risk of TB infection, particularly in individuals who are immunocompromised.

Many laboratories have turned their attention to the development of a more efficacious vaccine against TB, and the Bill and Melinda Gates Foundation have a funding process in place for TB vaccine development. The Aeras Global TB Vaccine Foundation and the Grand Challenges Program are both involved in TB vaccine development and several candidate vaccines are now in various stages of clinical trials.

Indeed, the world's leading candidate vaccine developed by Oxford University is likely to begin phase IIb studies in 2009 and will involve some 3000 infants. "Data will dictate future steps," as Dr. Behr notes, "but the need is great, particularly where HIV/TB co-infection exists." ❑

Health promotion in immigrants/ refugees needs to become a priority

Health promotion among immigrants and refugees needs to become a priority for healthcare providers in order to ensure newly arrived adults close frequent gaps in their immunization history.

Dr. Christina Greenaway, Assistant Professor, McGill University, will discuss on Tuesday how adult immigrants are often susceptible to common infectious diseases when they arrive in Canada. For example, in a study she and her colleagues carried out in adult immigrants, mean age of 32, investigators found that 36% of the cohort were susceptible to measles, mumps or rubella.

The reasons why adult refugees and immigrants to Canada are still susceptible to vaccine-preventable diseases vary considerably, Dr. Greenaway noted. Immigrants and refugees may come from countries that offer suboptimal vaccination programs. They may also have been at an age when they missed what programs were being offered, or they may not have had access to a vaccination program because of their migration route. Infrastructures in many war-torn regions have collapsed and the chance for vaccination programs along with them.

Disease epidemiology may also be different elsewhere than it is here in Canada. In the tropics, for example, onset of varicella infection is about 10 years later than in Canada. In other words, varicella infection shifts upwards to around the age of 20 in tropical countries, "so you end up getting a cohort that is more susceptible to varicella at an older age," Dr. Greenaway explains.

When adults become infected with varicella, they have worse outcomes than children. Women are more likely to develop severe varicella and, if pregnant with active varicella at the time of delivery, transmit it to their infant, with potentially dire consequences.

Transmission of an infectious illness among immigrant populations is also facilitated by the fact that they often work and live together in crowded circumstances. In one rubella outbreak in the early 1990s, for example, US investigators tracked the outbreak to a meat packing plant where many Hispanics from central and South America were working. Once the organism was introduced into the community, many individuals were susceptible to it and it was readily transmitted not only within and without the workplace but also to American children who had missed their vaccinations.

Compounding the problem for many immigrants and refugees is the fact that infectious diseases may be endemic at home, such as hepatitis B in certain Asian countries.

"It's not simply susceptibility to infections diseases; the reasons for their susceptibility are often quite different and primary care physicians need to be aware that there are a number of issues surrounding vaccine-preventable diseases in immigrants and that they need to pay attention to them," Dr. Greenaway emphasized.

The Canadian Collaboration on Immigrant and Refugee Health is currently assembling evidence-based guidelines for specialists and family physicians to ensure that immigrants receive appropriate healthcare tailored to their immunization, physical and mental health needs. ❑

Dr. Greenaway will present "Vaccine-preventable Disease Susceptibility in Adult Immigrants and Recent Immunization Recommendations from the Canadian Collaboration for Immigrant and Refugee Health" during the concurrent session on Tuesday, December 2, 16:00-17:30, Dominion Ballroom South.

DELEGATES' CORNER

Q: So far at this meeting, what have you heard that could make a difference to your practice?

Denise LeBlanc, Public Health Services Nova Scotia: I think it is important to get in touch with the science again, to make sure you understand it well, which the meeting has totally done for me. We've also heard that it's important to be able to listen to parents; you have to understand where they are coming from if you are going to have a valuable exchange between the two of you.

Gordean Bjornson, CAIRE Coordinating Centre, Vancouver: I don't think I've heard anything that will change my practice because I'm involved strictly with vaccine research. But it was reassuring to hear that so much of what we do is appropriate. What I did learn today, though, is that the movement towards listening to our partners and collaborators much more is really the right way to go, and this was reaffirmed as well.

Dr. Simon Dobson, BC Children's Hospital, Vancouver: From this morning's session, we heard that you have to listen very carefully to parents' concerns, although I think most of us do that in public health and pediatric practice. As well, we have to bolster the levels of science education through regular school education—easy to say but difficult to pull off.

Adenikay Smith, Calgary Health Region: All of the sessions I have attended have been quite relevant to my practice, so they have enhanced my knowledge, or at least confirmed the knowledge I already had; they have been confirmatory and definitely reassuring. For example, I attended the travel health session yesterday and that is where I work, in travel medicine, so it was helpful. And the pneumococcal satellite symposium was informative, too, as was the session on the media, where we heard how important it is to address people's fears and see it from their perspective, which we tend to forget as professionals.

INFO-*Vaccine* is published three times by Medical Education Network Canada Inc. for the 8th Canadian Immunization Conference. The purpose of **INFO-*Vaccine*** is to promote events organized by the CIConf, and to bring delegates closer together by fostering a sense of community spirit at the meeting.

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Clinical Supplement

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8th Canadian Immunization Conference
Toronto, Ontario / November 30-December 3, 2008

Improving Quality of Life for Women and Society: Why the HPV Vaccine Will Make a Difference

Toronto - The burden of disease related to infection by human papillomavirus (HPV) has been well documented. Not only does infection cause cervical cancer and high-grade vulvar and vaginal lesions, but HPV types 6 and 11 cause genital warts, lower-grade vulvar and vaginal lesions, and laryngeal papillomatosis in infants. School-based vaccine programs for young girls can protect them against HPV infection and many provinces have successfully implemented these programs with widespread uptake of the vaccine. Family physicians must be well prepared to address parental concerns, primarily about the safety of the vaccine, and to work with parents so that they understand the significant advantages that vaccination against HPV offers.

By Pam Harrison

The story of human papillomavirus (HPV) and its prevention with HPV vaccination is the subject of several prominent sessions during the 2008 CIConf and featured in many clinical abstracts of the scientific program. Indeed, the quadrivalent vaccine has attracted attention not only from health care professionals and public health authorities, but the public at large. As a physician who treats women infected with HPV, Dr. Marc Steben, member of the HPV Scientific Group, Institut national de santé publique du Québec, Quebec City, and a lead researcher in the field, is passionate about protecting women against HPV infection. "Genital warts are one of the main reasons young adults consult physicians," he confirmed.

In the placebo cohort of the large-scale FUTURE trials in which the quadrivalent HPV vaccine was evaluated, the incidence of genital warts was almost 1% per year in low-risk women who had had on average only two sexual partners on randomization into the trials.

Genital warts—90% of which are caused by HPV types 6 and 11—are too frequently considered a nuisance by physicians. "Patients with genital warts often have to go to physicians many times to have these warts removed by whatever painful means so it is a large burden for the healthcare system and a lot of psychosocial and sexual discomfort for patients," Dr. Steben remarked. Both vulvar intraepithelial dysplasia (VIN 1) and vaginal intraepithelial neoplasia (VAIN 1) are linked to HPV 6 and 11 as well, as is a small proportion of cervical intraepithelial neoplasia (CIN) 1. Regardless of whether CIN is related to 6 or 11 or the more oncogenic types 16 and 18, "You do not know if CIN is associated with 6 or 11 or 16 or 18, so you have to do the same work-up and repeat colposcopy. In the US, it is estimated that there may be as many as 160,000 cases of CIN 1 a year," Dr. Steben said.

Physicians are also seeing an increase in warts on the vocal cords in young adults as a result of HPV transmission during oral sex, with HPV 6 and 11 being implicated. A direct link has also been established between anal cancer and HPV 16 and 18, and the risk of anal cancer is high in the presence of anal warts. According to data from Quebec, anal cancer is more common in women than in men at every age group.

Benefit in Younger Women

High-grade vulvar cancer in younger women is mostly associated with the oncogenic strains of HPV. Nevertheless, in the FUTURE studies involving women under the age of 25, "We were astonished to see clear benefits from the vaccine by the end of the study against high-grade VIN and VAIN because we thought that vulvar cancer was a disease of older women," reported Dr. Steben. Right now, the incidence of high-grade vulvar lesions is increasing in industrialized countries, to the great detriment of quality of life for young women in whom the aftermath of treatment can be devastating. The majority of cervical cancer is again directly linked to HPV types 16 and 18.

As is true elsewhere in the world, cervical cancer disproportionately affects women in lower socioeconomic classes here in Canada, including those who drop out of school early and who therefore would not be present when HPV school-based vaccine programs are accessible. "When you look at what is expected in terms of the fastest return on investment, 97% of the economy provided by the quadrivalent vaccine in the first five years of an adolescent vaccine program will be from protection against the 6 and 11 components in the vaccine," Dr. Steben remarked. "I think this vaccine has something more to offer than just protection against many cancers and warts and that it is very important in terms of quality of life for women and quality of life for society."

School-based Vaccine Programs

With clear cost implications associated with HPV infection—in British Columbia alone, HPV-related disease costs an estimated $50 million a year—school-based vaccine programs initiated prior to a girl's sexual debut appear reasonable. In Quebec, there are two school-based programs, one targeting fourth-graders and the second targeting 15-year-olds. A third catch-up program in the community is for girls under the age of 18 years who are sexually active but who will not be covered quickly enough by the school-based program.

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In British Columbia, girls in both grade 6 and grade 9 are currently receiving the vaccine, expectations again being that once grade 6 girls reach grade 9, the grade 9 program will no longer be needed. Uptake of the vaccine in both of these provinces has been excellent. Despite controversial media coverage, Newfoundland and Labrador were able to achieve high coverage rates following implementation of their school-based program for grade 6 girls (85% after the first year), the result of a concentrated effort by regional health authorities to educate public health and communicable disease nurses by obstetricians and oncologists to ensure they were well prepared for any concerns that parents or teachers might have about the vaccine.

Uptake has been less then optimal in Ontario, where only about 50% of eligible girls had received the vaccine. However, efforts are now underway to ensure a clear and consistent educational message is delivered to Ontario parents to address any safety concerns they may still have about the vaccine.

Uptake Issues and Successes

Indeed, being well prepared to address any concerns that parents may have about HPV vaccination appears to be critical to the success of the program. "Parents are getting mixed information about this vaccine and they are confused about it so physicians need to be prepared to answer their questions," stated infectious disease specialist Dr. Shelly McNeil, Canadian Centre for Vaccinology, Dalhousie University, Halifax, Nova Scotia. For example, somewhat surprising to public health, concerns about vaccine safety (when to their knowledge, there were no safety issues with the HPV vaccine) continue to fuel media controversy and physicians need to reassure parents that the vaccine is safe. Over thirty million doses of the HPV vaccine have been administered worldwide, and there is still no safety signal after widespread uptake.

Physicians also need to explain that there is a difference between an adverse event that is causal and one that is temporal. "If you give the vaccine and something bad happens, that adverse effect is not necessarily related to the vaccine," noted Dr. McNeil. Yet it may be reported as such and parents need to understand that the adverse-event reporting system is a passive surveillance system to which anyone—provider, parent, school nurse—can report any adverse event following vaccination but which does not imply the vaccine was causal, she added.

Healthcare professionals also need to impress upon parents just how effective the vaccine has proven to be. Very large numbers have demonstrated robustness of response in a pooled analysis of the 18,174 female adolescents and young women between 16 and 26 years of age who received three doses of the vaccine. Findings demonstrated that it was 98.2% effective against HPV 6-, 11-, 16- and 18-related high-grade cervical lesions and 100% effective against HPV 6-, 11-, 16- and 18-related high-grade vulvar and vaginal lesions (both per protocol population receiving all planned doses) at an average follow-up of 44 months. Moreover, the vaccine had the same efficacy for all strata of women, regardless of the baseline characteristics, including number of partners, smoking history and hormonal contraceptive use. The same vaccine is also 99% effective against genital warts.

"There are going to be parents who balk at having their daughters immunized, but physicians need to bring them back and make sure they have good information about the safety and efficacy of the vaccine," Dr. McNeil emphasized, "and if they provide this information to parents in a way they understand, it is very likely that parents will eventually have their daughters vaccinated. They just need to give some parents time." ❑

Other related presentations of interest during these scientific sessions:

Plenary II. "New Vaccines in Canada - From Concept to Implementation: The HPV Story." A Simniceanu, G Hammond, S Dobson. Monday, December 1, 2008, 8:30-10:30, Grand Ballroom West/Centre, Sheraton Centre Toronto Hotel.

Plenary III. "Communicating the Benefits and Risks with Clarity and Confidence." S Lawley. Monday, December 1, 2008, 10:30-12:00, Grand Ballroom West/Centre, Sheraton Centre Toronto Hotel.

Please plan to attend:

"The Evidence for Program Decisions: Surveillance, Epidemiology, Disease, Impact, Modeling, Economics." B Henry. Monday, December 1, 2008, 16:00-17:30, Dominion Ballroom North, Sheraton Centre Toronto Hotel. *(This session is repeated on Tuesday, December 2, at the same time and location.)*

"Ontario Experience with HPV." I Gemmill. Tuesday, December 2, 2008, 16:00-17:30, Essex Ballroom, Sheraton Centre Toronto Hotel.

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Meningococcal Disease and Influenza: New Solutions for Challenging Times

Toronto - *Neisseria meningitidis* is the leading cause of invasive bacterial infections in Canada today. IMPACT data indicate that serogroups B, C and Y still cause most meningococcal disease in Canada, but this is age-dependent, with Y and W-135 serogroups responsible for one in five cases seen in older children and adolescents. The meningococcal C conjugate vaccine has led to a sixfold decrease in serotype C incidence rates in provinces where the vaccine program was initiated early. Meanwhile, meningococcal disease from Y and other serogroups is on the rise elsewhere, suggesting that a broader-spectrum vaccine may better protect at-risk groups, notably adolescents, some of whom are already receiving this broader serogroup protection in Canada. Debate continues as to whether the influenza vaccine is directly responsible for reducing hospitalization rates and mortality during the winter months among the elderly or whether these reductions are a reflection of confounding variables. Yet an improvement in vaccine efficacy is called for, especially for the elderly. Improvements in vaccine technology are emerging and they all appear to offer some advantages over standard influenza immunization, as speakers discuss here this week.

By Pam Harrison

Five serogroups—A, B, C, Y and W-135—are responsible for invasive meningococcal infection, but the incidence of each serogroup is continually changing, notes Dr. Julie Bettinger, Assistant Professor of Pediatrics, Vaccine Evaluation Centre, University of British Columbia, Vancouver. Currently there are three surveillance networks that monitor invasive meningococcal disease in Canada, with IMPACT (Immunization Monitoring Program ACTive), providing the most recent information.

As Dr. Bettinger reports here this week, IMPACT data demonstrate that serogroups B, C and Y still cause the majority of meningococcal disease across the country but the distribution of the three serogroups varies significantly among adults and children. Between 2002 and 2006, for example, IMPACT found that serogroup B disease accounted for approximately 80% of all meningococcal disease in children under the age of two years, 64% of the disease in children between 2 and 9 years of age and about half of the disease in children 10 years of age and older. The remaining disease in children between the ages of 10 and 19 years was caused by serogroups C (23%), Y (19%) and W-135 (2%). Together, serogroups Y and W-135 accounted for 23% of meningococcal disease in adults 20 years of age and older.

At the same time, the incidence of group C disease has decreased sixfold between 2002-2003 and 2006 in the three provinces where vaccine programs were initiated early. Incidence rates of meningococcal disease from serotypes not contained in the meningococcal conjugate C vaccine have not been affected by the meningococcal conjugate C programs. IMPACT did not identify the incidence of disease caused by serogroup A in any age group other than adults.

While IMPACT surveillance data indicates that meningococcal disease from serogroups Y and W-135 has been relatively stable here in Canada, the same cannot be said about Y disease in the US, where it has increased "quite dramatically," as Dr. Scott Halperin, Associate Professor of Pediatrics and Microbiology, Dalhousie University, Halifax, Nova Scotia, notes. Outbreaks from W-135 have also been identified in various parts of the world.

In anticipation that disease from both serogroups may well increase in the foreseeable future here, Prince Edward Island, New Brunswick and the Northwest Territories are offering "catch-up" programs for adolescents by vaccinating with the new multivalent conjugate vaccine containing A, C, Y and W-135. With Y and W-135 disease causing approximately one in five cases of invasive meningococcal disease in older children and adolescents, the number of cases averted through the use of the multivalent conjugate vaccine should approximately double that over the meningococcal C conjugate vaccine alone.

"If parents in other provinces want to maximize protection against meningococcal disease, to me, [the multivalent conjugate vaccine] is a worthwhile investment," Dr. Halperin notes.

Influenza Vaccination

Estimates from the US suggest that each year, 36,000 patients die from influenza and 200,000 require hospitalization. Influenza also disproportionately affects the very young and the old, with morbidity and mortality increasing from the age of 45 onward, a reflection of the presence of underlying illnesses. It is clear that older people, especially the frail elderly, do not respond to the influenza vaccine as well as younger patients, notes Dr. Arnold Monto, Professor of Epidemiology, School of Public Health, University of Michigan. "As a result, the efficacy of the vaccine is not as high as we would like in older patients," he comments.

Because it is unethical to conduct placebo-controlled trials of the influenza vaccine in the elderly, researchers have been unable to directly ascertain how much

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vaccination prevents hospitalization and mortality in the elderly, if at all. "On the one hand, you have some groups saying that the vaccine reduces winter mortality by 30% to 50% among the elderly and other groups saying that they cannot find any reductions in hospitalizations attributable to the influenza vaccine," Dr. Monto reports.

Fuelling the debate are observations that influenza uptake rates have risen dramatically in older patients, yet mortality from pneumonia and influenza has not appreciably declined. This may reflect the fact that older patients who are most likely to die are not being vaccinated against influenza, Dr. Monto observes. But other potential confounders in these observational studies may be that cases of illness documented to occur during the influenza season are not confirmed cases and therefore may not be influenza at all.

People who choose to get vaccinated may also do so for a reason: they have chronic respiratory disease, for example, and feel they have more to gain from getting the influenza vaccine vs. healthy elderly persons who feel they have less to gain from vaccination. "We know the vaccine is working in healthy younger adults and it would be hard from a biological standpoint to think it is not working at all in older patients, so the message is not to not vaccinate but to find a better vaccine," Dr. Monto concludes.

Novel Administration Routes

As discussed by Dr. Fred Ruben, former Professor of Medicine, University of Pittsburgh, Pennsylvania, intranasal vaccines have already been developed, one of which contains a live virus. Currently, the live virus intranasal influenza vaccine is indicated for healthy children and adults between the ages of two and 49 but it is not recommended for patients with chronic underlying disease. "It seems to work better in children than adults," Dr. Ruben observed, "but it works pretty well and it is comparable to the standard influenza vaccine." Boosting immunogenic responses through the use of adjuvanted vaccines that "rev up" the immune system may help ensure individuals are better primed to recognize a new virus such as the H5N1 virus or a pandemic strain of influenza virus that could threaten global health.

So, too, may increasing the dose of vaccine. In one study, participants aged ≥65 years mounted a significantly higher immunogenic response to the highest doses of an intramuscular (i.m.) influenza vaccine compared to those who received the lowest dose, suggesting that high-dose influenza vaccine should enhance protection against influenza among the elderly population (Keitel et al. *Arch Intern Med* 2006;166(10):1121-7).

New vaccines have also been developed that are delivered directly into the skin as opposed to the muscle. "The skin is the most potent immunological organ we have; it is loaded with immune cells so when you put the vaccine into the skin, you do not have to use as much vaccine and it generates a very good immune response, even possibly in the elderly or those who are immunosuppressed," Dr. Ruben explained.

In another study here this week, Dr. Mélanie Saville, Marcy L'Étoile, France, and researchers compared the immunogenicity and safety of the novel intradermal trivalent inactivated influenza vaccine with a similar vaccine given via the standard i.m. route. A total of 2249 subjects under the age of 60 were vaccinated with either the intradermal vaccine or the i.m. vaccine late in the fall of 2006. Results showed that both vaccines were equally immunogenic, providing virtually identical seroprotection rates against H1N1, H3N2 and B strains of the influenza virus. "The needle they use with the intradermal vaccine is so small you can hardly see it and it is virtually painless," Dr. Ruben observed, "so it is easy to give this vaccine and it would be very attractive to people who do not like needles."❑

This report is based on the following sessions:

"Update on the Control of Invasive Meningococcal Disease in Canada and the Use of a Quadrivalent Meningococcal Polysaccharide Diphtheria Toxoid Conjugate Vaccine Against Serogroups A, C, Y and W-135." Chair: R Bortolussi. Tuesday, December 2, 07:00-08:30, Dominion Ballroom, Sheraton Centre Toronto Hotel.

"Advances in Influenza Vaccination." Chair: J Scott. Monday, December 1, 06:30-08:30, Dominion Ballroom, Sheraton Centre Toronto Hotel.

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