Proceedings of the

CANADIAN NATIONAL IMMUNIZATION CONFERENCE

Canada's National Immunization Strategy: From Vision to Action Victoria, British Columbia, December 1-3, 2002
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The 5th National Immunization Conference was organized by the Centre for Infectious Disease Prevention and Control, Population and Public Health Branch, Health Canada, and the Canadian Paediatric Society (CPS), with financial support from the private sector, and the provinces of Alberta, British Columbia and Quebec.

The theme of the conference, Canada's National Immunization Strategy: From Vision to Action, was chosen in order to allow discussion of the progress that has been made towards achieving this initiative's goal to optimize the safety, effectiveness and efficiency of immunization programs in Canada. The key components of the proposed National Immunization Strategy (NIS) are vaccine safety, immunization registries, vaccine procurement, national goals and objectives, and collaborative program planning. In support of these activities such as public education/communication, professional education, research, approaches to special populations, and vaccine preventable disease surveillance will be undertaken.

The conference opened with an overview of national immunization initiatives from other countries and the Canadian NIS itself, followed by presentations from provincial/territorial/local and Health Canada representatives about their perspectives on the NIS.

On the second day, collaborative approaches to program planning were discussed as well as advocacy, surveillance and immunization registries. Break out sessions were held in the afternoon of this and the third day.

Vaccine safety, immunization research and professional education were topics addressed on the final day of the conference.

Over the 3 days, many display booths were available for viewing. One of these was presented by the Canadian Immunization Awareness Program, which exhibited posters from the National Immunization Poster Competition, designed to educate children above the importance of immunization.

This report provides a brief account of the presentations made at the conference.
Welcome and Introduction

Dr. Paul Gully, Senior Director General, Population and Public Health Branch, Health Canada, opened the conference with a reminder of the importance of immunization as a central public health activity. He dedicated the meeting to the memory of Dr. John Waters, in recognition of his invaluable contribution to public health programs in Alberta throughout his career. Dr. Arlene King, Director, Division of Immunization and Respiratory Diseases, Health Canada, welcomed everyone to the conference and acknowledged the work of the members of the Planning Committee in organizing the event. Dr. Doug McMillan, President of the Canadian Paediatric Society, pointed out that the work of the NIS has just begun. Stakeholders and all levels of government must maintain efforts to ensure that the NIS recommendations are implemented, in particular the goal of equitable access to vaccines for all children. The Provincial Health Officer for British Columbia, Dr. Perry Kendall, informed participants of the unqualified support for the conference of the Ministers of Health for B.C.

Keynote Address: Towards a Global Immunization Strategy

Dr. Yves Bergerin, UNICEF

From 1990 to 2000, the global mortality rate among children <5 years decreased dramatically, although in Sub-Saharan Africa it was essentially unchanged. Immunization coverage in this area reached a maximum of about 60%, but the rate declined during the 1990s and is now <50%. Global child survival goals developed in 2000 were to reduce the <5 mortality rate by two-thirds from 1990 to 2015 and by at least one-third during the present decade. Part of the strategy to achieve this will be immunization:

- by 2010, full immunization of at least 90% of children <1 year nationally, with at least 80% coverage in every district;
- by 2005, the global eradication of polio;
- by 2005, reduction in deaths due to measles by half; and
- by 2005, elimination of maternal and neonatal tetanus.

The partners involved are the World Health Organization (WHO), UNICEF, the Pan-American Health Organization, the Centers for Disease Control and Prevention (CDC), and the Global Alliance for Vaccines and Immunization.

With regard to polio, by 2000 there had been a 99% reduction in polio activity globally since 1988. Currently, polio is present in six to eight countries, including India and Nigeria. Maternal and neonatal tetanus is still present in Africa and south Asia, and requires basic immunization of female children and catch-up programs in later life and pregnancy.

From approximately 6 million deaths due to measles in the pre-vaccine period the number has dropped to <700,000 in 2002. In 2001 and 2002 there were no measles deaths reported after immunization campaigns. In the campaign carried out in Afghanistan, 75% of those <5 years were immunized and given vitamin A. Canada provides the vitamin A capsules for programs in developing countries, and these are given at the same time as the vaccines. Other interventions that can be usefully included at this point include reinforcing the message about breastfeeding, educating mothers about complementary feeding with breastfeeding at about 6 months after birth, and supplying bed nets treated with insecticide.

Challenges to achieving the global immunization strategy include the high cost of the newer vaccines, which affects the supply of all vaccines, security of
supply (the number of suppliers falling from eight to 10 in the 1990s to two to four in 2002) and vaccine safety, which is being addressed with the use of autodisabled syringes or single-use devices for immunization.

With increased interdependence among the nations of the world, achieving the goals of the global immunization strategy will benefit not only children in developing countries but also those people living in the developed world. Canada has been a good contributor to the global strategy but could do more, possibly through an international component included in the NIS at some point.

**National Immunization Strategies**

Dr. Diane Simpson, CDC, Atlanta, United States

With the resurgence of measles in the U.S. at the beginning of the 1990s, there was a recognition that children were not being immunized, or not being immunized as early as necessary. A new system was put in place, which provided alternative opportunities for immunization of those children without medical insurance coverage or whose insurance did not cover vaccination: the Vaccines for Children Program and the 317 program for supply of vaccines to the States. As well, the National Immunization Program developed a strategic plan, with the mission of preventing disease, disability and death in children and adults through immunization.

The first goal of the plan was to eliminate vaccine preventable diseases (VPD) and deaths in the U.S. and globally; this entails the use of effective surveillance systems, including those of programs such as the global polio eradication strategy. The second goal, to increase and maintain vaccine coverage levels (including eradication of ethnic differences in coverage level), will be achieved through use of the immunization registry and other proven methods of monitoring rates as well as through a secure supply of vaccines. The third goal is to involve new partners in the strategic plan. The fourth is to conduct immunization research and to use the results as a basis for policy making. The fifth goal is to implement effective immunization systems with core functions, and technical and administrative capacity. The sixth goal, to promote optimal safety of vaccines and immunization practices, involves surveillance (e.g. adverse event reporting systems), research, and the communication of research results and the benefits/risks of immunization.

Successful implementation of the strategic plan involves a number of challenges, one of which is the need to work towards these goals not only in the U.S. but globally. Others are the high cost of new vaccines and the concerns about vaccine safety.

**Canada’s National Immunization Strategy**

Dr. Arlene King, Director, Division of Immunization and Respiratory Diseases, Health Canada

Dr. Greg Hammond, Director, Public Health Branch, Manitoba Health

Immunization is one of the most cost-effective preventive measures in public health, but with the high-tech developments in vaccine production, greater number of vaccines available, more complicated vaccine schedules and growing safety concerns it is facing fresh challenges. New vaccines expected within the next 3 to 6 years include a nasal influenza vaccine and vaccines against Streptococcus, rotavirus, respiratory syncytial virus (RSV), human papillomavirus, and meningococcus. Although the federal government is responsible for approval of vaccines and the National Advisory Committee on Immunization (NACI) recommends which ones should be included in immunization programs, a shared, organized and national approach is necessary if these challenges are to be met.

At present there is no national process for adopting and implementing recommended goals and objectives that have been arrived at through consensus conferences and no mechanism for moving from the NACI recommendations on individual vaccines to a coordinated national response. This leads to a lack of equity – for instance, Albert is the only province/territory that will fund immunization with the vaccines against pneumococcus, meningococcus and
varicella. Vaccine procurement practices at present are a mix of the national Bulk Purchase Program (BPP) and individual purchase systems in those provinces large enough to benefit from opting out of the BPP. This means that there is difficulty in ensuring that all provinces/territories get the best value or that the supply of vaccines is secure. With regard to vaccine coverage, provinces/territories have been developing their own registries. At present, however, there are no comprehensive national data on who has been immunized, against what and when, and thus no capacity for follow-up and no denominator data for evaluating vaccine safety.

The proposed federal/provincial/territorial NIS has five components intended to address these gaps:

- national goals and objectives;
- equitable access, through collaborative program planning;
- vaccine procurement;
- immunization registries; and
- immunization safety.

Activities in support of the components are research, communication/promotion, professional education, initiatives for special populations, and VPD surveillance. The components and activities will be integrated, iterative and synergistic. A central body with a secretariat is proposed that would have several responsibilities, including development of immunization goals, evaluation of candidate vaccines and recommendation of core immunization programs; joint policy recommendations would then go to the provinces/territories. Working groups would be in place on the five components, and the supporting activities would be undertaken by nongovernment organizations (NGOs) such as professional associations.

The NIS has been in development since 2000. In 2001 the components and activities were approved and in 2002 developed further; as well, costs and benefits were defined. Professional education and special populations await development in 2003. There has been a tremendous contribution from all levels of government, NGOs, experts, international consultants and industry.

Opening Federal/Provincial/Territorial/Local Response

Dr. Richard Massé, Assistant Deputy Minister of Health and Social Services, Quebec

Quebec’s initiatives in the field of immunization involve creation of the Quebec Immunization Committee, responsible for evidence-based, scientific guidance for policy makers; implementation of central databases for VPD surveillance, reporting of adverse events and immunization coverage; availability of an immunization protocol through which immunization practices are standardized; and encouragement of applied research on immunization issues. Influenza vaccine is offered, meningococcal vaccine to those aged 2 months to 20 years, conjugate pneumococcal vaccine and hepatitis A vaccine to groups at risk, and varicella to caregivers and day care workers. There is a compensation program for severe vaccine related events, which has reviewed 130 requests in 10 years.

In terms of working within the NIS, Quebec will keep its surveillance systems but will develop its immunization registry in conjunction with the other provinces/territories, since there is a need for common standards and better information sharing. Quebec has pursued an independent course in the purchase of its vaccines (except influenza vaccine) and is looking for security of supply and reduction of costs as well as vaccine development that better matches the needs of public health. Quebec believes that the NIS will provide for faster implementation of new vaccines, better coordination, security of supply, attractive markets for industry, equity of access for the population and shared experience for program development. Challenges that remain include the need to clarify the roles and responsibilities of all partners involved and to establish appropriate funding and communication mechanisms.

Dr. Perry Kendall, Provincial Health Officer, British Columbia

Canada is one of the few developed countries without a national immunization strategy, and this leads to problems in tracking immunization status and to inequitable access. If vaccines against
meningococcus, pneumococcus and varicella were available in immunization programs across the country, many deaths, cases of illness, physician visits and hospital admissions could be averted, at a cost not out of line with the costs of other health care services. Without a national immunization strategy in place, establishing these programs will proceed in a piecemeal fashion and take several years. Although the Romanow report is supportive of the NIS, no details about funding are provided. The federal government needs to take the initiative in the area of funding and in support of the infrastructure necessary for a national strategy.

Dr. Paul Gully, Senior Director General, Population and Public Health Branch, Health Canada

There are few countries with a health system similar to that of Canada with respect to the federal and provincial/territorial areas of jurisdiction; Australia may be the closest. Health Canada is responsible for national surveillance, health promotion, disease prevention and control, regulation of vaccines and First Nations health. The process of developing the NIS has proved to be a valuable exercise, and a lot has been achieved. However, there needs to be continuing discussion on federal funding and accountability on the part of the provinces/territories. Implementing the NIS will require a careful balancing of public health requirements and political considerations; this may take some time.

Dr. André Corriveau, Chief Medical Health Officer, Department of Health and Social Services, Northwest Territories

Implementation of the NIS must take account of the special needs of the territories with regard to immunization programs. The Northwest Territories has a population of 41,606 people scattered over 34 communities and has eight official languages. Supplies, including vaccines, must be flown in. Government is by consensus. Accomplishments over the last 5 years include introduction of a hepatitis B vaccination program, pneumococcal vaccination for seniors and high-risk people, second-dose measles vaccination and catch-up programs, introduction of Pentacel, varicella vaccination initially for health care workers and more recently as a universal program for infants, and meningococcus vaccination targeted at students leaving the territories; as well, the Immunization Certification Program has been implemented. Vaccine coverage rates have dropped slightly. A critical issue at the moment is the shortage of health professionals and particularly nurses, who are key providers for a large range of services, including immunization. The Northwest Territories strongly supports the NIS but does have concerns about the area’s special needs and ability to keep pace with other jurisdictions.

Dr. Richard Stanwick, Chief Medical Health Officer, Vancouver Island Health Authority

There are five regional health authorities in British Columbia, which vary in the immunization programs that they offer as a funded service. All jurisdictions are looking at how and when they will be able to implement publicly funded immunization against varicella, and pneumococcal and meningococcal group C infection. One possibility, in the face of insufficient funds, is to target children in low income groups only, although this has been rejected on the grounds that it stigmatizes certain groups and undermines the importance of the program. Media support is important in the campaign to establish such programs, but the amount of media coverage varies considerably over time. In the last week, a coroner has recommended that a universal program should be put in place against meningococcal disease, a suggestion that echoed a previous recommendation in 2000.

Panel Discussion: There was discussion on the need to provide solid data on the current burden of disease so that the costs of the newer vaccines can be put in perspective against the costs to the health care system of disease, for example, illnesses due to Streptococcus pneumoniae. Outbreaks and deaths get attention quickly, but political decision makers should be educated about the implications of other diseases and why particular public health decisions need to be made. When the provinces/territories differ with regard to the priorities on their agenda, then it is difficult for those outside public health to understand why particular recommendations are made.
Levelling the Playing Field: Equitable Access to Immunization in Canada

Dr. Philippe De Wals, Medical Consultant to the National Institute of Public Health, Quebec

A long-term Quebec study has been gathering information on the structures and processes in place in Canadian provinces/territories for decision making on public immunization programs. It is clear that there is wide variation across the country in the programs offered, the schedules for individual vaccines and the way in which decisions on programs and implementation are arrived at. In many provinces/territories there are no formal structures or communication networks through which decisions are made. As well, there is a lack of structure at the federal level for interprovincial coordination. An analytic framework was developed that could be used as a first step in standardizing the decision making process. The framework considers various dimensions that need to be considered in arriving at decisions about immunization programs: burden of disease, vaccine characteristics, immunization strategy, cost-effectiveness, acceptability of programs, feasibility of the program (i.e. whether it can be implemented given the funds available), ability to evaluate the program, research questions, program equity, ethical considerations, legal considerations, conformity of the program (whether it fits with what is done elsewhere) and political considerations. This framework could be made available to all provinces/territories and committees, and to the central body of the NIS.

New Vaccines and the NIS

Dr. Monika Naus, British Columbia Centre for Disease Control

The 1990s were a golden era for immunization programs in Canada, with the introduction of the Haemophilus influenzae type b (Hib) vaccine, hepatitis B vaccine, acellular pertussis vaccine, influenza and pneumococcal vaccine, all of them cost-beneficial when the costs of treatment and time off work are taken into account. There have been dramatic reductions in the incidence of all VPD except pertussis. Over the past decade there has also been greater emphasis on keeping costs down accompanied by growing geographic variation in terms of which vaccines are publicly funded. Many new vaccines are being developed with new methods, such as recombinant technology, live vectors and microencapsulation. This will have implications for the choices to be made by public health programs on which vaccines or combination of vaccines should be offered for which diseases. Clear evidence on the safety and economic benefits of these new vaccines together with collaboration among jurisdictions will be necessary for the right decisions to be made. The newer vaccines are more expensive than the cheap vaccines that Canadian provinces/territories have been used to. Suggestions that have been made for manufacturers to offset the costs of production include tax credits for research and development, reciprocity for regulatory submissions, reduced bulk purchasing power and extended patenting terms.
Conjugate Meningococcal Vaccine

Dr. David Salisbury, Principal Medical Officer, Communicable Disease Branch, Department of Health, London

The increasing rates of group C meningococcal disease in the U.K. prompted a collaboration between industry and government to accelerate the development and availability of a group C conjugate vaccine. A study was conducted before the immunization program was implemented in order to evaluate the effects of the vaccine in circumstances similar to those of routine use. Information was sought on the effectiveness of the vaccine from an early age, its ability to induce immunologic memory and its fit with the schedules of existing vaccines. The study involved 2,500 babies, toddlers, children and students, and the results showed excellent protection, no serious side effects, compatibility with other vaccines, and the stimulation of antibodies after 3 years. In July 1999 the campaign was launched. Infants were given a dose of the vaccine along with the other usual vaccines at 2, 3 and 4 months, and a catch-up program for older children was initiated. At present, everyone < 25 years is vaccinated.

The results of the program indicate that meningococcal disease in the age groups vaccinated has been drastically reduced, with overall reductions between 87% and 97%. The number of deaths in those 20 years had been increasing but has gone down in 2002; in those < 20 years there has been a much greater reduction in the number of deaths. Furthermore, there is evidence of herd immunity and no data suggesting that the vaccine has created a shift from group C to group B disease.

Conjugate Pneumococcal Vaccine

Dr. Joanne Embree, Department of Pediatrics and Child Health, University of Manitoba

The incidence of invasive pneumococcal infection is 108 per 100,000 among children <2 years; among those <5 there are 65 cases of meningitis, 700 cases of bacteremia, 2,200 cases of hospitalization for pneumonia, 9,000 cases of nonhospitalized pneumonia and approximately 12 to 14 deaths per year in this population. Pneumococcal infection is responsible for about 1 million cases of acute otitis media yearly. These are some of the epidemiologic data that were considered in the decision to recommend conjugate pneumococcal vaccine in immunization programs. Efficacy studies have shown that four doses of vaccine at 2, 4, 6 and 12-15 months reduced by 97% the amount of severe illness caused by the vaccine serotypes; for those with frequent otitis media the incidence was reduced by 11%; and there was a significant reduction, of 25%, in tube placement. Reactions to the vaccine have been mild and transient.

NACI has recommended the conjugate pneumococcal vaccine for routine use in all children <24 months. To reach the goal of reduced incidence of invasive disease, otitis media and the prevalence of antimicrobial resistant pneumococcal isolates, immunization with the vaccine should be recommended in every province/territory (under the NIS, the NACI recommendation should make implementation automatic). There need to be adequate supplies to cover 95% of the birth cohort. There should be the capacity to track use of the vaccine through the immunization registry, and surveillance through the IMP-Act (Immunization Monitoring Program – Active) system of its effect on disease.

Acellular Pertussis Vaccine

Dr. Scott Halperin, Professor of Pediatrics, Dalhousie University

Over the past 10 years, disease surveillance in Canada and the U.S. has shown that an increasing proportion of those with pertussis are adults or adolescents, and this pattern is also being found in other countries. Furthermore, it is known that the disease in these age groups is substantially under-reported. For the first time, a pertussis outbreak in Vancouver in 2000 involved higher incidence rates and numbers of cases among 10 to 14-year-olds than among infants or children. There is some evidence that with greater age the number of complications increases. It is believed that adolescents contract the infection from within the community and from household contacts, parents are infected by their school age children, and parents and adolescents pass it on to infants.
Two acellular vaccines against pertussis have been manufactured for adults and adolescents, combining pertussis vaccine with diphtheria and tetanus toxoids. Both have been shown to be safe, with only mild adverse events, and immunogenic, producing antibody levels in excess of those in immunized children. One of the vaccines, Adacel, is available in Canada. NACI recommends that adult formulation acellular pertussis vaccine combined with diphtheria and tetanus toxoids be substituted for diphtheria and tetanus toxoids for the mid-adolescent booster dose. A goal set at a consensus conference on pertussis in May 2002 was to decrease the morbidity and mortality due to pertussis across the entire life span, with a priority of improved control in infants, young children and adolescents. At present, only Newfoundland and Nunavut routinely administer this product.

Vaccines Against Bioterrorism

Dr. Jon Abramson, Chair, American Academy of Pediatrics

Potential biological weapons include smallpox, anthrax, brucella, botulinum toxin, plague and the viruses associated with hemorrhagic fever. The smallpox virus, eradicated in 1980, has an incubation period of 7 to 17 days. Clinical features include fever, malaise, headache, vomiting and rash starting on the face and spreading over the body in the following 7 days with a synchronous pattern: macules to vesicles to pustules to scabs. Unlike chickenpox, there may be rash on the palms and soles. The transmission is person to person, and there is a 30% associated mortality (90% to 100% with hemorrhagic forms).

Vaccines are the best tool we have to decrease the risk of bioterrorism, together with an expanded antimicrobial arsenal, and rapid and sensitive surveillance systems. The available smallpox vaccine is a live vaccinia virus; however, this does not confer lifelong immunity, and it has side effects. There are approximately 25 serious adverse events per 100,000 vaccinations, and the death rate is about 1 per 1 million among those not previously vaccinated. Vaccinia immune globulin is effective in treating many of the serious side effects but is not effective against encephalitis. If the vaccine were used for the entire U.S. population, > 250 deaths could be expected and many long-term serious effects. In the U.S., preparedness for bioterrorism includes pre-attack practice, whereby a number of health care workers in each State will be vaccinated against smallpox and will have the task of providing 24 hour care for a few adults and children over 7 days. There are many questions that remain about this exercise, such as what categories of health care worker should be involved, who will pay, and what patients will be told about the risk of the virus being transmitted to them.
Getting the Point Across: Advocacy for Immunization

Political Advocacy
Mr. Sean Moore, Gowling Lafleur Henderson LLP, Ottawa

The challenges to political advocacy of immunization are (a) the huge health care reform movement already under way, with many issues on the agenda, (b) concerns about precedents being set, (c) the question of funding, (d) liability issues and (e) the lack of leadership in advocacy efforts. There is a need to view issues in the way that governments view them (horizontally, fiscally, administratively), use guidelines on how governments make decisions, and find sponsors and allies in government who can make the case for immunization. It is important to understand the process and the steps in political decision making in order to know how to position the issue and to whom information should be provided. Precedent – administrative, policy and political – can ensure fairness, uniform application and ease of interpretation. The broad view should be taken on the political aspects of advocacy, so that underlying factors not immediately apparent are recognized. An understanding of relations between the federal and provincial/territorial governments would help the advocacy effort.

An advocacy plan should be put in place with a team that understands the process and can direct the activities. There should be a clear, practical strategy, which includes consideration of whether and how immunization is an issue that can be “sold” to leadership candidates. Finally, it is very important to make the case for immunization many times and in many different venues.

Provider Advocacy
Ms. Mary Anne Carson, Halton Regional Health Department, Ontario

Advocacy of immunization at the grass roots level requires informing the general public (messages available on the Internet, through advertisements), the mass media, potential partners and policy decision makers, who must all be working together for any advocacy effort to be successful. Since many consumers prefer to obtain information from their physician, it is essential that physicians be on side; they need easily accessible, reliable information. A physician “champion” would be able to lead the change in attitude and be a partner in disseminating messages. Halton Regional Health Department has such a champion. As well, it publishes fact sheets on immunization, which are also available on a Web site.

Nurses in physicians’ offices are often seen as gatekeepers, and they need to be involved, possibly through education at “nurses’ evenings”.

As well, it is important to be aware of the obstacles to immunization advocacy, for instance chiropractors, and to be ready to rebut any false information. Other barriers include storage and transportation if non-publicly funded vaccines are purchased at a pharmacy some time before the visit to the physician. Cost and sources of funding are problems that will have to be dealt with under the NIS. With regard to the inequitable access to certain recommended vaccines, all the arguments available must be used to ensure universal coverage – for instance, the fact that immunization against pneumococcal disease will likely lead to reduced incidence of antibiotic resistant pneumococcal strains.
Ethics of Inequity

Mr. Paul Muirhead, Williams McEnery, Ottawa

It has been found that 92% of parents believe that governments should pay for immunization and, if they do, then immunization must be important. Ethics is concerned with what is right and what is wrong and, in the case of immunization, it may contribute a judgement on whether differences in access to particular immunization programs across the country can be justified.

Ethical principles are nonmaleficence (doing no harm), beneficence (doing good), utility (greatest benefit to the greatest number if there is conflict between nonmaleficence and beneficence), justice and autonomy. Legal considerations are value-based and so vary over time and culture. Laws prescribe what is allowed and what is not allowed. With regard to immunization, characteristics that must be borne in mind are that (a) governments have endorsed childhood immunization programs, (b) unlike other health care issues, disease can and does cross borders, (c) delivery of programs is a provincial/territorial responsibility, and funding has to be negotiated between all levels of government and (d) the risks and benefits of programs must be considered.

After applying ethical principles to immunization programs, it is clear that they avoid needless harm, are beneficial to health, offer the greatest benefit to the greatest number and are just (similar cases treated similarly). The only reasons for not providing universal immunization are political ones. Thus, since children are not treated equally across the country with respect to particular vaccines, there is an inequity that cannot be justified.
Measuring Up: Surveillance for Success

Vaccine-preventable Diseases
Dr. Monique Douville-Fradet, Quebec Ministry of Health and Social Services

Surveillance is an essential component of the NIS, in that it detects new disease; monitors the effects of disease, the groups most affected and any changes over time; helps evaluate and adjust programs; raises hypotheses; describes health determinants and risk factors; and warns of impending outbreaks and epidemics. Surveillance data collected by the provinces/territories are shared. However, not all provinces/territories report on the same illnesses, and the form of the data as well as the software used for collection vary across the country, complicating analysis.

Health Canada has invested in the development of a surveillance network, which operates according to several principles: support the users first; enter the data once and use them often; ensure that there is security in the capture, retention and transfer of data; avoid duplication. The Working Group on Surveillance Standards has been established to develop the best methods to allow laboratory, epidemiologic, interventional and other data to be fed into the network. One of its tasks is to standardize the data that are collected, for instance through core variables for disease surveillance and definitions for laboratory surveillance. Another initiative is a collaborative project with the CDC.

Vaccine-associated Adverse Events (VAAE)
Dr. Yves Robert, Quebec Ministry of Health and Social Services

Safety concerns on the part of the public have increased as VPDs become less visible, and they will continue to be at the forefront with the many new vaccines that become available. Canada has a system of passive surveillance, with related databases, an active surveillance system in place for children (IMP-Act), and an Advisory Committee on Causality Assessment (ACCA). The goals of an effective VAAE surveillance system are to maintain confidence in vaccines, detect serious adverse events, assess them for timely action, detect changes in common VAAEs, and detect problems in the quality control of vaccines. The NIS provides an appropriate framework in which such a system can operate.

Eleven surveillance principles will help to ensure that vaccines are safe: each jurisdiction must have a VAAE passive reporting system; VAAEs must be reportable by all vaccinators; VAAE reporting should be internationally standardized (Canada participates in the Brighton Collaboration, which aims to standardize case definitions of adverse events); databases at all levels (federal/provincial/territorial) must be compatible, linked and accessible at all levels; databases are needed not only for VAAEs but also for immunization registries and product inventories; vaccine safety assessment is a continual process beginning at the prelicensure stage; passive and active surveillance systems should be improved (e.g. active systems for adults); VAAE data should be used in decision making (to improve licensure, for investigation, tracing, recall, program adjustment); VAAE data must be validated, analyzed and provided to users in a timely fashion; there must be a link between surveillance and investigational resources in order to follow up warning signals; and there must be a link between surveillance and community resources, in order to offer timely advice to the public and to deal with controversies (e.g. there should be one group taking primary responsibility about disclosure of VAAE information).

Vaccine Coverage in Canada
Ms. Heather Schouten, Centre for Infectious Disease Prevention and Control, Health Canada

In the fall of 2002, a telephone survey was conducted to determine the immunization history of children aged 2 and 7 years, parental knowledge of and atti-
tudes towards immunization, missed opportunities for immunization, and preferred sources of information. Overall, 99% of parents reported at least one immunization; 94% of parents of 2-year-olds and 96% of parents of 7-year-olds believed that their children's immunizations were up to date; and the majority reported that their children were receiving the recommended vaccines. Reasons for not having children immunized were concerns about safety, side effects and effectiveness, and lack of inclination.

From the survey data, national estimates of coverage among 2-year-olds with DTaP, and Hib and IPV vaccine were 90%+ for three doses of DTaP, 75% for four doses of DTaP, 64% for four doses of Hib, and 87% for three doses of IPV; for MMR, the proportion of children covered by one dose was 94%. A similar trend of decreasing coverage with each immunization was found in the 7-year-old group. However, given the limitations of the survey these estimates cannot be viewed as accurate.

Most parents (86%) felt they received enough information about immunization: 58% obtained information from the physician, 25% from the public health nurse, 21% from the media, 15% from family and friends, 14% from pamphlets, 11% from hospital and 10% from Internet sites. The child's immunization record was at the home in 85% of cases, and the reasons given for not having the record were that it was at the physician's office, had never been received or had been lost. About half the parents were in favour of having access to the record through the Internet, if it was secure, and concerns expressed by the parents not in favour were privacy issues, lack of access to the Internet, and the fact that the information is already available.

Knowledge, Attitudes and Behaviour

Ms. Janet Brown, Environics Canada, Alberta

Survey research is carried out to obtain information on people's opinions and behaviour. It consists of two approaches, qualitative and quantitative. Qualitative measures include the use of focus groups and in-depth interviews in order to explore issues in some detail, whereas quantitative surveys target larger, representative samples of the population of interest so that they can obtain statistically accurate estimates of the responses to the issues raised. The main quantitative instrument is the questionnaire. The choice between the approaches depends on the aim of the survey, what the target population is, what factors could influence the responses, how complex the issues are, and how big a sample is required.

Some specific tools are telephone surveys, which can cover a wide geographic area and allow a quick turnaround time but must be short and cannot include complex questions. Mailed questionnaires provide privacy and more time for respondents to consider their answers but often have low response rates, incorrect responses and a long turnaround time. Intercept (face to face) interviews have the advantage that the interviewer controls the quality of data collection, but they target people who happen to be in a certain location at a particular time, and this may lead to biased results. Internet surveys combine the advantages of both mailed and telephone surveys. As well, they can give respondents the chance to see visual images, and they allow for complex survey designs. The disadvantages are that only people with access to the Internet can participate, speed of access may be a problem, and confidentiality may be an issue for some respondents.
**Group 1: Influenza**

There is a great deal of international interest in Canadian influenza immunization activities, including (1) the Ontario Universal Influenza Immunization Program (UIIP) (2) the Canadian Pandemic Influenza Plan, including the vaccine strategy and (3) the newly recognized oculo-respiratory syndrome (ORS) occurring after receipt of influenza vaccine.

The challenges and lessons learned from the implementation and delivery of the UIIP for the provincial and local health unit levels were presented. The overall vaccine coverage for the first season of the immunization program was 44%. One of the achievements highlighted was the increase in vaccine coverage for people 65 years of age with high-risk medical conditions. The Public Health Research, Education and Development program (PHRED), in collaboration with other partners, evaluated the implementation, effectiveness, and organizational and community impact of this program. The importance of partnerships at the local level, public awareness campaigns specific to each area, and sharing of the lessons learned among health units was emphasized. There is a need now for a comprehensive evaluation of the impact of the UIIP on influenza morbidity, mortality and health care utilization.

Influenza vaccine has a high safety profile. The majority of VAAEs reported at the federal level have been minor, and serious events temporally associated with vaccine administration, such as Guillain-Barré syndrome, are rarely reported. The results of surveillance, special investigations and response to the ORS outbreak first identified in the 2000-01 influenza season were presented.

At the time of a pandemic, vaccine remains the main public health intervention. The Canadian pandemic vaccine strategy is one of the most advanced in the world and includes the development of a pandemic vaccine readiness capacity; guidelines for the use of vaccine in short supply; strategies for delivery and administration; monitoring of distribution uptake, wastage and effectiveness; and surveillance of VAAEs. Protocols for pandemic vaccine clinical trials are in development.

**Group 2: Future Vaccines and Vaccine Delivery Systems**

This breakout session began with Dr. Gaston de Serres describing the impact of RSV lower respiratory tract infections on all infants. Most are infected by the time two winter seasons have passed. The protective immunity to RSV is not fully understood. Differing vaccine development strategies are being attempted, including use of live attenuated virus and protein sub-units. Although these vaccines show promise, their implementation is at least 5 years away.

Dr. Stephen Klein, from the Canadian Network for Vaccines and Immunotherapies (CANVAC), discussed agents that potentiate the immune system. These include novel adjuvants and immunostimulatory molecules. Their use was illustrated by possible therapeutic HIV vaccines to rescue T cell anergy and by the breaking of self-tolerance for use in cancer vaccines.

The director of the Veterinary Infectious Disease Organization, Dr. Lorne Babiuk, introduced the audience to the wide vistas of genetically engineered vaccines with the possibilities of more effective and safer vaccines. These designer vaccines depend on a choice of target antigen and the production of a balanced immune response. Both can be predicted by gene array technology. Lastly, he discussed ways of presenting these vaccines to the immune system through the skin, by patches or with the use of injector guns. Intranasal sprays and oral vaccines stimulate mucosal immunity.

There seems to be no limit to the ingenuity with which vaccines can be formulated and presented to the immune system.
Group 3: Non-routine Immunizations: Special Patients, Special Needs

Dr. Ron Gold reviewed the safety of vaccines in pregnancy and the indications for their use for women during this period of their lives. Dr. Joanne Langley followed with a discussion of the special immunization needs of the premature infant. She specifically discussed the passive immunization provided to premature infants to prevent illness due to RSV. Dr. Noni MacDonald discussed the complexities related to determining the immunization status of children and youth who “come from away” – from more than 100 countries – each year. Finally, Dr. Brian Ward entertained and informed attendees about a variety of issues related to individuals who travel abroad.

Group 4: The Canadian Immunization Registry Network: Moving Forward Together

Preliminary results from the National Immunization Coverage Survey revealed that there are many limitations to the use of surveys for assessing immunization coverage. How far are we from using data from immunization registries to monitor and evaluate immunization programs?

Dr. Richard Schabas reflected on the discussions from previous immunization conferences and the Consensus Conference for a National Immunization Registry Network. The goals identified in these meetings were to be achieved by 2003, yet a scan of registries reveals that we are far from this. However, working together with clear leadership and funding resources we may be able to realize these goals.

Dr. Monika Naus followed with a presentation on bar coding initiatives in Canada. Given the increasing complexity of immunization schedules and new vaccines in the pipeline, the transcribing of vaccine information may be compromised. Dr. Naus showed that nearly every industry uses bar codes, with the exception of public health, although they could be used to capture most of the required information according to NACI recommendations on vaccines. The bar code, as read from a Vaccine Identification Database System, will be able to capture vaccine (antigen), trade name, manufacturer, lot number and expiry date.

Health Canada’s Public Health Information System (i-PHIS) is an automated, integrated, client health record and reporting system that supports public health provider interventions, tracking, follow-up, case management, reporting and surveillance. It is designed to be used centrally, providing secure access to one client record by multiple health providers and programs, and allowing communicable disease surveillance and immunization information to be shared.

It was originally developed for use as an application by the British Columbia Centre for Disease Control, and Health Canada has continued to develop enhancements to i-PHIS with direction from the Canadian Integrated Public Health Surveillance (CIPHS) Collaborative, a group of F/P/T partners that includes public health officials, information technology professionals and program managers. As a result, Health Canada has made the i-PHIS application available without any licensing fees to all public health jurisdictions across Canada (currently, 10 jurisdictions have applied to be part of the pilot project). As a public health case management tool, i-PHIS is a key component of Health Canada’s CIPHS project.
Putting the Plan Into Action: Getting Immunization on the Radar Screen

The Theory
Ms. Margaret Bateman, Calder Bateman Communications Ltd., Alberta

It is likely that making immunization issues more visible will involve social marketing, to increase public awareness; health promotion, to inform and encourage appropriate action by parents; and issues management and advocacy, to counteract anti-immunization fears. Theoretical models suggest that a number of analytic steps are required to develop communications strategies: defining outcomes (e.g. positive base of public support for immunization), developing a situational analysis (e.g. the public’s concerns and opinions, measured by polling data), setting overall targets and targeting specific audiences (e.g. the health media).

Broad strategies to promote immunization include being proactive, responding appropriately to the anti-immunization lobby, using targeted, research-based strategies, using physicians and nurses as spokespeople, reassuring parents through effective health promotion, demonstrating interprovincial and federal solidarity, and developing a consistent and overarching identity. Health promotion and social marketing must be put to work together, and this will require techniques involving the mass media, targeted media, new media (Internet with linkages) and videos, among others. Countering anti-immunization arguments calls for advocacy of harmonization, vaccine safety and vaccine use, and consistent responses to other, counterproductive positions. A strategic plan is necessary for the short and long term that makes use of any current opportunities, for example, announcement of the NIS.

The Practice
Ms. Linda MacDougall, Vaccine Preventable Disease Program, Toronto Public Health

Health information for the public is usually written at a grade 6 reading level, but this may not be appropriate for particular groups. In fact, U.S. surveys have found that parents with high school education or less were more likely to rate immunization as extremely important whereas those with a higher educational level were the ones most likely to opt out, or to at least want much more information. A 2001 national Canadian survey found that 38% of parents with children <7 are not completely sure that immunization is beneficial, 82% actively seek the most recent information, and 45% go to the Internet for health information.

Toronto Public Health’s response to a growing demand for information has been to develop an aid for parents at higher literacy levels to help in their decision making about childhood immunization. The aid is related to the MMR vaccine and gives an overview of the three diseases (measles, mumps, rubella), including risks and incidence, a comparison of the effects of the disease and the effects of the vaccine, factors to consider about personal risk of exposure to the disease, herd immunity, an overview of MMR vaccine and autism, a description of the immune system, common questions asked, a section on legislation and exemption, and a discussion of immunization options. The results so far from focus groups have been promising. More focus group testing will be carried out, the feedback incorporated, and the aid made readily available.
Moving Forward: Affirming Vaccine Safety

Misconceptions and Information Gaps: Professionals
Ms. Tara Mawhinney, Communicable Disease Control Unit, Manitoba Health

Manitoba has two anti-immunization lobby groups, the Association for Vaccine Damaged Children and the Eagle Foundation. A 2001 survey in Manitoba targeted provincial immunization coordinators (n = 15), and physicians and nurses (n = 707, 38% physicians). Overall, there was a high degree of confidence in the safety and efficacy of vaccines, but there were differences noted from region to region, between nurses and physicians, between different groups of professional practitioners, and between regional health authorities and First Nations communities.

The lowest support for immunization came from nurses in long-term care facilities and the highest from pediatricians and general practitioners. Over 70% of respondents agreed that the anti-immunization movement had decreased acceptance of vaccines (except in First Nations communities, where there was little perceived impact). More than 90% agreed that patients fear the side effects of vaccines, and 82% agreed that patients are asking more questions now. By contrast, for the First Nations coordinators, the main barriers were unknown immunization status and patients not showing up for appointments. Over 50% of respondents reported that sometimes they could not answer patients' questions, particularly about the long-term side effects of vaccines, specific anti-vaccine myths and rates of serious adverse events. Respondents' suggestions for further resources included fact sheets for different parent target groups (e.g. low literacy level, information seekers) on safety, side effects and anti-immunization stories; and for providers, a national database of research on anti-immunization issues, a binder of information on each vaccine, hot line for questions, and more continuing education.

Misconceptions and Information Gaps: the Public
Dr. Paul Ritvo, Cancer Care Ontario, Toronto

CANVAC was created as a national Centre of Excellence in 2000 and has four “themes”, one of which is the social science theme. In January 2002, a telephone survey of 1,300 adults was carried out under the auspices of this theme. Only 10% (of 1,057 who responded) agreed that vaccine safeguards are slack and ineffective, but 56% did not know or disagreed; and 67% agreed that vaccines are carefully tested for safety, but one-third did not know or disagreed. Most of the respondents knew that vaccines are among the most effective of treatments. Seventy four percent said that they would be immunized against hepatitis C, 69% against HIV and 67% against smallpox; 44% would not be vaccinated against influenza.

A survey of attitudes towards pediatric vaccines among students of complementary medicine showed that 12.8% would refuse to recommend these vaccines at all, 74.4% would recommend some, and 12.8% would recommend them all. Unwillingness to recommend the vaccines stemmed from concern about harm, lack of benefit and philosophical objections.

There is clearly no room for complacency. Messages about safety and effectiveness need to be targeted to the public in combination with an advocacy campaign. Research is required to determine what kind of information will be the most persuasive.

Vaccine Safety Strategy for Canada
Dr. Monika Naus, British Columbia Centre for Disease Control

Vaccine safety, a crucial component of the NIS, will become increasingly important as new vaccines are made available and the target populations for them expand to include vulnerable groups, such as the elderly and pregnant women. Several recommenda-
tions were developed at a vaccine safety conference held in 2000, and these were revisited and refined at a second conference in 2002, with consideration of the weaknesses that came to light during the outbreak of ORS during the 2000-2001 influenza season.

With regard to the safety infrastructure of the NIS, it was proposed at the 2002 meeting that part of the safety component would be an Advisory Committee on Immunization Safety, a technical body that would be responsible for reviewing surveillance data, identifying potential safety issues, reviewing cases or clusters of concern, acting as a consultant in emergencies and reviewing the scientific evidence. ACCA, in an expanded form, might fill this role. The Committee would report on safety issues, through a secretariat, to a National Immunization Committee and on immunization advisory issues to NACI. Another part of the safety component that was proposed was a network of provincial/territorial immunization safety representatives, who would work together to develop protocols for the management of problem cases and collect data on outcomes. Another recommendation was that a guide be developed for the management of adverse reactions.

**IMP-Act (Immunization Monitoring Program - Active)**

Ms. Heather Samson, Dalhousie University, Nova Scotia

IMP-Act was established in 1990 to provide reliable data, primarily of a neurological nature, on VAAEs. Its mandate has since been expanded to cover surveillance of other VAAEs, vaccine failures and certain VPDs occurring in pediatric hospitals across the country. At present there are 12 such sites, covering 90% of pediatric tertiary care admissions in Canada. A nurse monitor at each site surveys daily admissions, emergency visits and laboratory results, and enters the appropriate data on standard report forms. The reports are shared with the federal and provincial governments and, for certain severe adverse events, with ACCA. IMP-Act also reports rare diseases to the CPS.

IMP-Act is well positioned to monitor the effects of new immunization programs. For instance, it documented the marked reduction in Hib infections after the new vaccine was introduced: only four cases of Hib were reported in the year 2000 as compared with 485 cases admitted to IMP-Act centres in 1985. It is also able to relate cases of disease with a history of missed or under-vaccination. Another success has been the monitoring of febrile seizures after the switch from whole cell to acellular pertussis vaccines in 1997, showing a decrease in incidence of 80%.

**ACCA (Advisory Committee on Causality Assessment)**

Dr. Barbara Law, Chair of ACCA, University of Manitoba

ACCA was created in 1994 to provide the Division of Immunization with ongoing information on serious VAAEs. It comprises representatives from a mix of public health, infectious diseases, neurology, rheumatology and immunology and is in liaison with representatives from the CDC, Food and Drug Administration and the Vaccine Adverse Event Reporting System in the U.S. ACCA has a set of criteria that it applies for case selection, and cases (without identifying information) are reviewed for the adequacy of their accompanying data. If the data are inadequate for an assessment, then more information is requested; if all the necessary data are available, then the Committee attempts to reach consensus on whether the VAAE was a result of vaccine administration. For each event, consideration is given to the background frequency of such events, the known causes, whether the interval between vaccination and the event are compatible with causality and whether the event could be explained by the biological properties of the vaccine. The kind of events selected are deaths, anaphylaxis, encephalitis, seizures, paralysis, thrombocytopenia and arthritis.

ACCA meets twice yearly and reviews 50 to 100 cases each time. A category is assigned after review, depending on whether the VAAE is considered very likely/certain, probably, possibly or unlikely to be related to the vaccine, or unrelated/unclassifiable. From 1994 to 1998, 10% of cases reviewed were deemed very likely related, and in 1999 to 2001 the proportion was 20%. ACCA suffers from a lack of
resources (human and financial), is impeded by data-base problems and poor communication flow, and is consequently unable to provide rapid assessment when there is a need.

**Current and Emerging Vaccine Issues**

Dr. Philippe Duclos, Department of Vaccines and Biologicals, WHO

Vaccine safety issues are an increasing concern not only in Canada but also worldwide. The WHO has put into place the Global Advisory Committee on Vaccine Safety (GACVS) to respond independently and with scientific rigour to vaccine safety issues of global importance; to review the most up-to-date information in all fields, ranging from basic science to epidemiology, concerning any aspect of vaccine safety in collaboration with other partners; and to determine causal relations between vaccines and/or their components and adverse events attributed to them. GACVS can also consult with experts on an ad hoc basis and commission research.

Issues that have been reviewed include the role of thimerosal (in hepatitis B vaccine) in acute lymphoblastic leukemia. Although there is no evidence of a causal relation it is a matter that must be kept under review. As of 2001, over 600 cases of central demyelinating disease had been reported to the French authorities. Overall, nine epidemiologic studies were carried out to investigate the association between vaccination with hepatitis B vaccine and the risk of occurrence of multiple sclerosis (MS). The analysis of data from spontaneous reports and the results of epidemiologic studies did not suggest a causal relation. The conclusion from GACVS and from the U.S. Institute of Medicine was that any association is probably coincidental. The association between Bell’s palsy and a new intranasal vaccine was investigated, and results from three epidemiologic studies showed a significantly increased risk after intranasal immunization with inactivated influenza vaccine. The committee recommended that any novel intranasal vaccine be tested on large numbers of subjects with follow-up in clinical trials extended to 3 months. In December, GACVS will be reviewing the putative link between MMR and inflammatory bowel disorder/autism and discussing ORS.
Research and Professional Education

Immunization Research Strategy
Dr. Bernard Duval, National Institute of Public Health, Quebec

There is an ongoing need for good data to support the current immunization programs and any new ones that are recommended as well as to rebut the claims of those campaigning against immunization. Research provides these data. As well, research studies may be necessary to deal with urgent issues that need clarification. During the outbreak of ORS, a survey was carried out within days of the first cases being reported in British Columbia, comparing rates in vaccinated and nonvaccinated populations. When cases began to occur in Quebec, a descriptive study was conducted in four regions within a week. In the following influenza season, there were investigations into the rate of recurrence of ORS, both in B.C. and Quebec, so that recommendations could be made as to which vaccines should be used. The information obtained from all these studies was passed on to the appropriate public health authorities, Health Canada and NACI. Funding for the research came from the province, industry and, for one study, the federal government.

The ORS outbreak demonstrated that research studies are essential tools for making the appropriate decisions in difficult circumstances and that they can be conducted quickly when necessary. The work was carried out primarily by those in public health rather than academic research, an orientation geared more towards problem-solving and practical problems. Public health research is also different from university-based research in that it has to respond to public and political needs, the timelines are short, and resources are uncertain. Time spent in research is time not available for programs. Another problem encountered at the time of the ORS was that industry funding came with some constraints.

Vaccinology Research Training Program
Dr. Barbara Law, University of Manitoba

A new vaccinology training workshop for medical residents was held this month, funded by GlaxoSmithKline. The objectives were to help participants to communicate about the impact of vaccines, counter misconceptions, explain the differences between temporal and causal association, critically evaluate evidence, and locate and evaluate Web-based vaccine sites. The components of the course included pre-course homework, lectures and workshops. There were 64 trainees (32 in pediatrics, 19 in family practice, 8 in community medicine and 5 in infectious diseases). Homework assignments were to interview an older colleague about his or her vaccine education, and to evaluate three Web sites with respect to content, targeted user, quality of appraisal methodology, relevance to Canada, potential biases, and description of information retrieval method. The results of residents’ interviews with colleagues showed that the change in public demands has outpaced the training in vaccine that they once received. Another useful exercise was for residents to role play communicating with parents about vaccines, for example the issue of overloading the immune system and the allegation that MMR causes autism.

It is hoped to continue the course next year, with modifications, and to adapt the course to a Web-based program or CD ROM format. There is also a need to evaluate the effectiveness of the course.
Current Research Challenges

Too Much At Once? Antigens and Injections
Dr. Scott Halperin, Professor of Pediatrics, Dalhousie University

Between 16 and 22 injections are involved in delivering all the recommended vaccines during childhood, and the number per visit can be up to four injections. This is likely to increase with the new vaccines expected. There has been a concern as to whether children receive too many antigens and too many injections.

The evidence shows that the antibody response to vaccine antigens is the same whether several vaccines are given separately on the same day or separately on separate days. The response to combination vaccines may be the same, lower or higher than the response when each vaccine is given individually, and even when it is lower this has not been found to be due to overload of the immune system. It has been estimated that every infant would theoretically have the capacity to respond to 10,000 vaccines at any one time. Giving 23 vaccines would use up only <0.1% of the immune system's capacity. Furthermore, over time, with the changes in vaccine schedules that have taken place there are actually fewer proteins/polysaccharides being given to children even though there are many more vaccines. With regard to injections, both health care workers and parents prefer combination vaccines, but parents would be willing for their children to have multiple injections if this meant better protection against disease. The disadvantages of combination vaccines are that they are more costly and they decrease program flexibility.

Options for the future include implementing the new vaccines regardless of the number of injections, waiting for combination vaccines to become available or working towards noninjectable vaccines. Changes to the immunization schedule and new delivery systems are areas for further research, along with investigation of the attitudes of parents and health care providers to vaccine delivery.

Canadian College Students and Meningococcal Vaccine
Dr. Philippe De Wals, Director, Department of Social and Preventive Medicine, Laval University

Meningococcal disease tends to thrive in a university environment and particularly among new students living in university accommodation, probably as a result of the frequency and degree of intimacy that such conditions entail. In a 1997 study in Nottingham, England, the asymptomatic carriage rate for all strains among freshmen in residence was 7%, and 1 week later it was 23%; by the end of the semester it had increased to 34.2%. On multivariate analysis, the risk factors were found to be being male, a smoker, visiting a university bar, French kissing and going to a nightclub. In another U.K. study, the incidence of meningococcal disease was 13 per 100,000 in the first year of university, as compared with 5.5 per 100,000 among young adults of the same age not attending university. U.S. studies have also found an increased risk among students living in catered accommodation. An economic analysis carried out in the U.S. indicated that immunization of first year students with a polysaccharide vaccine would cost between $0.6 and $1.9 million per case avoided.

In Canada, the overall incidence of meningococcal disease is high among infants 0 to 2 years of age, declines during childhood, and then increases from age 12, with the highest rates in the age group 18 to 20. One option is to immunize all students at the beginning of their university career with either a polysaccharide or conjugate C vaccine. Another is to immunize children with the conjugate vaccine at the beginning of high school, which would protect them through school and possibly university. The best strategy would be to immunize everyone at a young age.
What's Going On? Preschool Boosters and Local Reactions

Dr. David Scheifele, B.C. Children’s Hospital, Vancouver

Data from IMP-Act have shown that since the acellular pertussis vaccine was introduced across the country there have been fewer hospital admissions for pertussis among children <5 years, an 80% reduction in febrile seizures, a 67% reduction in hypotonic-hyporesponsive episodes and no cases of encephalopathy after vaccination. Nevertheless, there are still some concerns about injection site reactions, which increase in frequency and severity with each dose in the series. In one study it was found that by the fifth dose, 33% of those vaccinated exhibited redness ≥ 50 mm, 30% had swelling ≥ 50 mm, 10% experienced severe tenderness, 4% had limited motion and 13% reported itchiness. A further study surveyed parents shortly after vaccination for their estimates of adverse events: redness of ≥ 46 mm was reported by 21% and swelling of ≥ 46 mm by 14%. Only 3% reported interference with activities, and 2% sought medical attention. However, more than 90% of parents said that they would recommend a fifth dose to others.

Although parents appear to accept these local reactions, a warning should be given routinely before immunization to reduce concern. Possible remedies include reducing the antigen content of the booster dose, delaying its administration or reducing the number of doses in the childhood series. In terms of the mechanism behind these reactions, no consistent correlation has been found with antibody levels before and after vaccination. There is some preliminary evidence of a link with cell-mediated immunity – possibly the vaccine is boosting waning antibody levels and at the same time is encountering cell-mediated mechanisms that are not waning to the same degree.
**Group 5: What’s New? Resources for Parents and Health Care**

The first presentation in this breakout group was about the 6th edition of the Canadian Immunization Guide released earlier this year. An overview of the chapters on the newly licensed vaccines provided participants with valuable information. As well, the new sections on talking with parents about immunization will provide added suggestions to health care providers involved in educating parents on the importance of immunization. The second presentation was on the second edition of Your Child's Best Shot, which was launched at the conference. A wealth of information in a format easily read and interpreted by the lay population will be an excellent added resource for educating parents about old and new vaccines available in Canada. To round out the focus on education, the resources available through the Canadian Immunization Awareness Project (CIAP) were highlighted. These were noted to be readily accessible through the CIAP Web site at <http://www.immunize.cpha.ca>.

**Group 6: Access to Immunization: Reaching Out and Inviting In**

Dr. Brian Ward described the need for vigilance in addressing the health needs of immigrants and refugees, a large and growing proportion of the Canadian populace. Many of these new Canadians’ vaccination status is suboptimal, and they are also at higher risk of a wide range of health problems. Dr. Ward emphasized that the health needs of these vulnerable Canadians need to be appraised, starting with changes in immigration protocols and finishing with enhanced education of susceptible people in their destination communities.

Dr. Meena Dawar provided a perspective on immunization coverage of First Nations children on reserves, which is lower than that of Canadian children. She discussed a number of strategies that have been tried to improve the immunization rate, such as a Communicable Disease Certification Program for nurses, ongoing nursing education, and development of culturally specific information for community members. Many challenges remain, including the need for adequate nursing resources, continuity of nursing coverage on reserves, and provision of programs responsive to community needs. Dr. Dawar reflected that the ultimate vision is to have a National First Nation and Inuit Health Branch Immunization Strategy within the context of the NIS.

Dr. Tan provided data reflecting a high coverage rate across Canada for vaccines that are publicly funded. He identified three vaccines for which under-immunization in the pediatric population occurs, mainly new vaccines that are not currently publicly funded, i.e. pneumococcal conjugate, meningococcal conjugate and varicella vaccines. Dr. Tan indicated that the goal should be to identify those under-immunized pockets and target them for more intensive immunization. For religious groups who object to immunization, it is important to identify elders who support immunization and to involve them in individual parents’ decision-making processes.

**Group 7: Private Profit - Public Good**

Dr. Rob VanExan proposed that private profit equaled public good. The high social value that society gives to vaccines contrasts with their low economic value. Manufacturing expenses have risen significantly as a result of increasing regulation and safety concerns. Increasing costs and decreasing revenues cause consolidation in the vaccine manufacturing market. In Canada, a monopolistic situation exists, and demand for cheap products may be detrimental to development of new vaccines. There is a strong argument for more partnerships between industry and public health.

Dr. Ross Findlayer recognized areas in which manufacturing interest and public interest coincided. However, areas of difference exist; recognizing these areas helps to make partnerships more effective. Enthusiasm for a NIS should be tempered with the need to
recognize the opportunity costs of implementing new programs. Although vaccines are still very cost-effective, this may not be true in the future. New vaccine programs must be assessed in the same way as other new health care technologies.

Mr. Muirhead, representing an ethical perspective, started by reviewing the principles in ethical analysis, focusing on distributive justice and equitable access. He concluded that implementation of an immunization strategy with collaboration between manufacturer and public health could be achieved satisfying both these principles.

The audience debate was lively. Observations were made on the need to consider the cost of vaccines as investments rather than expenses; the need for public health to work with manufacturers so that they are aware of where the needs lie and, being market driven, would then be more likely to respond to them; and the lessons to be learned from the international scene, in which the desire to reduce costs may have compromised the security of supply. The debate needs to continue, and we need to define an appropriate partnership with industry as part of the NIS.

Group 8: Mass Immunization

This session focused on the planning, delivery and evaluation of mass immunization. Anne McNicholas outlined the New Zealand strategy to immunize 90% of the population <20 years of age with a strain-specific group B meningococcal vaccine. Faced with the epidemic and serious outcomes of disease, New Zealand will follow a rapid trial and approval process rather than the usual routine vaccine licensure strategy. Anne described the additional surveillance systems that will be implemented to monitor vaccine safety.

Dr. Bryna Warshawsky presented the experience of the Middlesex-London Health Unit mass immunization for serogroup C meningococcal disease in 2001. Planning parameters used during implementation of this mass immunization campaign included a staffing formula; a supply, packing and transport mechanism; and a method of allocating segments of the population to designated clinics.

Dr. Horacio Arruda’s presentation focused on the importance of communication and evaluation during mass immunization. He also reviewed factors related to epidemiologic surveillance, decision making, program planning, crisis management, purchasing and management of vaccine stocks, and research.
Dr. Victor Marchessault, Chair, NACI

The proposed NIS has been under discussion and in development over the past 2 years, and at every level of consultation, despite differences of opinion on other matters, there has always been agreement about the need for a national strategy in Canada. Until the system is changed, there will continue to be discrepancies in the immunization programs offered across the country, duplication of effort, lack of crucial surveillance data, differences in purchasing power between small and larger provinces/territories, and inadequate communication mechanisms.

Federal leadership and funding is required, so that all provinces/territories are able to implement the immunization schedules recommended by NACI in a timely manner. These programs must always be based on evidence, and a framework has been described within which they can be evaluated and the results communicated to policy makers. NACI relies on surveillance data in order to make appropriate recommendations, and yet Canadian data are often inadequate. Immunization registries will help to fill the gaps.

A sustained advocacy effort by all the partners involved (including consumer groups) is necessary now in order to demonstrate the importance of immunization and the necessity for the NIS to be implemented as soon as possible.