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The United States—The Netherlands Round Table Conference on Immunization. Summary Report

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SYNOPSIS

A group of public health scientists from the United States and The Netherlands met at a Bicentennial Round Table Conference December 1–2, 1982, to discuss the latest developments in immunization against infectious diseases, focusing on pertussis, poliomyelitis, measles, and rubella.

The major differences in immunization practices in the two countries are: (a) In The Netherlands, inactivated polio vaccine is used exclusively; in the United States, the oral polio vaccine is used. Poliomyelitis has virtually disappeared from both countries. (b) In The Netherlands, the pertussis component of DTP (diphtheria, tetanus, pertussis) is not given to children over the age of 1 year, whereas in the United States, it is given to children up to their seventh birthday. (c) Rubella vaccine is given only to girls at ages 11–12 years in The Netherlands, but to all children at ages 12–15 months in the United States. (d) Mumps vaccine is not administered to children in The Netherlands, but in the United States it is given routinely to children at 12–15 months (in combination with measles and rubella vaccine).

The participants concluded that both the United States and The Netherlands have effective immunization programs that have significantly reduced the impact of these diseases.

As a part of the commemoration of the bicentennial of diplomatic relations between the United States and The Netherlands, the Round Table Conference on Immunization was held December 1–2, 1982, at the Rijksinstituut voor de Volksgezondheid in Bilthoven, The Netherlands. The participants are listed at the end of this report. Discussions covered all aspects of immunization, from technical issues in vaccine production through the development and implementation of vaccination policies. This article summarizes the major discussions and the conclusions reached.

The immunization schedules in use in the two countries were reviewed (see table). Major differences are that inactivated polio vaccine (IPV) is used in The Netherlands and oral polio vaccine (OPV) is used in the United States; that the pertussis component is not administered to children over the age of 1 year in The Netherlands but is given to children up to their seventh birthday in the

Recommended immunization schedules for The Netherlands and the United States

Antigen	The Netherlands		United States	
	Age	Given as	Age	Given as
Diphtheria	3, 4, 5, 11–14 months	DTP-polio	2, 4, 6, 18 months	DTP
	4 years, 9 years	DT-polio	4–6 years	DTP
Tetanus	3, 4, 5, 11–14 months	DTP-polio	2, 4, 6, 18 months	DTP
	4 years, 9 years	DT-polio	4–6 years	DTP
Pertussis	3, 4, 5, 11–14 months	DTP-polio	2, 4, 6, 18 months	DTP
			4–6 years	DTP
Polio—IPV	3, 4, 5, 11–14 months	DTP-polio	.....	....
	4 years, 9 years	DT-polio	.....	....
Polio—OPV	.....	.....	2, 4, 18 months, 4–6 years	....
Measles	14 months	.....	15 months	MMR
Rubella	11 years (female)	.....	15 months	MMR
Mumps	.....	.....	15 months	MMR

NOTE: DTP-diphtheria, tetanus, and pertussis
MMR-measles, mumps, and rubella

United States; that rubella vaccine is administered only to girls at 11–12 years in The Netherlands, but is given to all children at 12–15 months in the United States; and that mumps vaccine is not administered to children in The Netherlands but in the United States is routinely administered (in combination with measles and rubella vaccine) to children 12-15 months old.

Poliomyelitis

Different preparations of polio vaccine are used in the two countries. In the United States, oral live attenuated polio virus vaccine is used almost exclusively. In The Netherlands, only inactivated polio vaccine has been used, except in certain outbreak settings.

Major improvements in the production of inactivated polio vaccine have been developed at the Rijksinstituut. These have included the development of a microcarrier culture system along with a technique using tertiary monkey kidney cells that markedly improves the yield. These advances have permitted the production of large quantities of vaccine with a higher concentration of virus, with the use of fewer monkeys for the cell substrate. Additional investigations have been carried out concerning the use of continuous cell lines (such as vero cells) and the use of polypeptides to induce immunity to poliomyelitis. In addition, considerable field research has been undertaken, particularly in the developing world, concerning the utility of an immunization regimen of only two doses of IPV given 6 months apart.

The use of IPV in The Netherlands has resulted in the virtual disappearance of the disease with the exception of rare importations, such as in 1978 when 110 cases of poliomyelitis (80 paralytic) occurred among members of a religious group who had rejected vaccination. Since 1968, all cases of poliomyelitis in The Netherlands have occurred in persons who have never been vaccinated.

In the United States, IPV was used during the period 1955–61. Since 1961, however, only OPV has been used except for the limited use of IPV for immunizing adults or immunocompromised individuals. Poliomyelitis has been virtually eliminated from the United States and, during the period 1969–82, only three outbreaks (totaling 40 cases) have occurred. Two of these outbreaks occurred among members of religious groups who had rejected vaccination.

In recent years, approximately one-half of all cases of poliomyelitis in the United States have been associated with OPV, occurring either in vaccine recipients or their contacts. Following extensive discussions of many issues relating to polio vaccines and their use, the conference participants came to the following conclusions:

1. Both OPV and IPV have been highly effective in reducing the incidence of poliomyelitis. The relative merits of the two vaccines continue to be evaluated.

2. In the production of IPV, the use of subcultured monkey kidney cells has proven advantageous. The use of vero cells or other continuous cell lines as alternative substrates has possible merit in allow-

ing large-scale production at low cost, providing the safety of vaccine produced in such cell lines can be established.

3. There is a need for further standardization of the potency of IPV as related to its clinical efficacy.

4. There is some question whether IPV can inhibit the transmission of wild polio virus to the same extent as OPV. However, circulation of wild virus has been interrupted in countries that have maintained high immunization levels using IPV exclusively.

5. The practical importance of the theoretical advantage of OPV in extending protection beyond vaccinees by spreading to unvaccinated individuals is still not known.

6. Further studies to distinguish polio virus isolates as to vaccine or nonvaccine strains are important from an epidemiologic point of view.

7. Further developments in both IPV and OPV are anticipated as full advantage is taken of new technological methods including genetic manipulation of viruses and synthetic antigen production.

8. Field studies using modern IPV indicate the possibility of simplified immunization schedules, particularly in developing countries.

9. The American delegation expressed its admiration for the work done by the Rijksinstituut in improving the production and efficacy of IPV and its assessment under field conditions.

Pertussis

In both countries an inactivated whole cell vaccine is used for pertussis and is administered to children in combination with diphtheria and tetanus toxoids, beginning at 2–3 months of age. There is only a minor difference between the schedules used in infancy (see table); however, in The Netherlands the pertussis component is not administered to children after the age of 14 months, whereas in the United States it is given to children through the seventh birthday. In The Netherlands, DTP vaccine is combined with inactivated polio vaccine. In both countries pertussis vaccination has substantially reduced the occurrence of disease. In both countries there has been concern, nevertheless, about the uncommon adverse events associated with pertussis vaccination, specifically the rare occurrence of permanent brain damage (an estimated frequency in The Netherlands of 1 per 350,000 children vaccinated) and the somewhat more common occurrence of collapse (shock) and convulsions. In The Netherlands, the estimate of the frequency of each of these latter complications is 1 per 2,500 children vaccinated; in a study in the United States the frequency was 1 per 1,750 vaccinations (*1*). Immunization coverage in both countries is high, exceeding 90 percent.

Concerns about adverse events following vaccination led to a reduction in the potency of the Dutch vaccine in 1974 from 16 to 10 opacity units (from 6–9 international units to 4 international units per dose). This change has not been associated with a decrease in the occurrence of shock or convulsions. In recent years there has been a slight increase in the incidence of pertussis in The Netherlands; however, this is believed to be due at least in part to increased numbers of introductions of the organism from England and West Germany, where pertussis incidence has increased.

In view of the increased circulation of the pertussis organisms in The Netherlands, possible changes in vaccination policies, including the following three options, were discussed: (*a*) increasing the pertussis component in DTP-polio vaccine; (*b*) commencing vaccination prior to 3 months of age; and (*c*) including pertussis in the DT-polio dose given at 4 years of age.

Studies in The Netherlands have indicated that an immunoglobulin A antibody to a saline extract of whole cells is found in the serum of persons who are convalescent, but not in vaccinees' serum. This finding offers potential benefits in differentiating between infection- and immunization-induced antibodies. Conclusions of the group about pertussis were as follows:

1. Pertussis vaccine prevents pertussis.

2. Although the vaccine protects against disease, it is accompanied by a limited number of adverse reactions. In The Netherlands, this consequence has led to a decrease of the pertussis antigen concentration in the vaccine.

3. Improvement of pertussis vaccine is of high priority and will involve basic research to identify and purify the protective antigens while reducing or removing toxic effects.

4. Laboratory models for potency testing of the vaccine should be based on a better understanding of the pathogenesis of pertussis.

5. Studies of the epidemiology of infection should be expanded, and the use of serological methods (such as serum IgA determination) to discriminate between infection and immunization may be quite useful.

6. Systematic notification of suspected adverse effects of vaccination should be continued and improved. Notification should be based on valid reports, and reported cases should be evaluated to assess the probability of vaccine association. Periodic summaries of suspected adverse effects should be prepared and published.

7. Knowledge is not yet available that would permit reduction in the number of doses given in the primary vaccination series.

Measles

Measles vaccine was introduced into widespread use in the United States in 1963 but not until 1976 in The Netherlands. In both countries there has been a marked reduction in the occurrence of measles, and in the United States a program has been undertaken to eliminate indigenous measles. The elimination program in the United States has three strategic components: high immunization levels enforced by State law, effective surveillance systems, and aggressive responses to cases. The conferees concluded the following:

1. Measles vaccine prevents measles.
2. Vaccination has had a major impact in decreasing the incidence of acute measles, measles encephalitis, and subacute sclerosing panencephalitis in both countries.
3. Currently available live measles virus vaccines yield long-lasting, probably lifelong, protection after a single dose.
4. Elimination of indigenous measles from the United States is anticipated in 1983.
5. The availability of heat-stable measles vaccines makes global elimination of measles technically feasible. This goal should be pursued.
6. To achieve global elimination, increased professional and public awareness of the seriousness of the disease is essential.

Rubella

In the United States, rubella vaccine was introduced in 1969, and vaccination of all children of both sexes occurs at 12–15 months of age, usually using combined measles, mumps, and rubella vaccine (MMR). This practice has resulted in a marked reduction in the occurrence of acute rubella disease, prevention of epidemic rubella and, in recent years, a substantial decline in the endemic occurrence of congenital rubella infection.

In The Netherlands, vaccination to prevent rubella began in 1974, and vaccination practices are aimed at reaching girls 11 years of age to provide protection during early childbearing years. In the United States, efforts are now underway to eliminate rubella infection entirely by increasing emphasis on vaccination of the group at highest risk—women of childbearing age—while maintaining the immunization of children. The conclusions of the group follow:

1. Currently available live rubella vaccines induce, long-lasting, probably lifelong, protective immunity against congenital rubella infection after a single dose.
2. To monitor the effectiveness of rubella vaccination programs, serologic surveillance studies, combined with registration of congenital rubella infections, are essential.
3. The preferred strategy for rubella vaccination would be to provide immediate protection to the population at risk (women of childbearing age) as well as to break transmission by immunization of the whole population at an early age.
4. Use of rubella vaccine in combination with measles and mumps vaccine is highly advantageous.

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Conference Participants

United States

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HMO Members and Clinicians Rank Health Education Needs

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SYNOPSIS

Before expanding a health education program, the staff of the George Washington University Health Plan conducted a needs assessment of members. Patients in the HMO's adult care and parents in pediatric waiting areas answered survey questions, and a random sample of members was polled by mail. Patients rated their interest in a list of 45 topics, and plan clinicians chose from the same list topics which "would be of greatest help in your practice."

Anxiety/stress was the most popular topic among patients and those who responded by mail. Depression, physical fitness, CPR, and nutrition also rated high. Only 4 topics appeared among the top 10 choices of both plan members and clinicians. After discussion of the patients' choices, the clinicians were asked, several weeks later, to rate the topics again. Clinicians' choices in the second round much more closely approximated the choices of the members.

The most frequently chosen method of instruction was "written material," although videotape and other, more expensive media were also listed. When seminars geared to the members' top choices in the survey were offered, the response was so enthusiastic that additional seminars—a total of 12 in 6 weeks —were held.

HEALTH MAINTENANCE ORGANIZATIONS have been looked to for emphasis on disease prevention and health promotion activities; indeed, their organizational structure, with a stable, accessible member population, and their avowed objectives of preventive health care make the HMO an ideal laboratory for testing and developing ideas about health education.

At the George Washington University Health Plan, a university-affiliated HMO in Washington, D.C., with approximately 21,000 members, the health education program had been structured around the information that clinicians and administrators believed patients should learn. Before expanding the plan's health education program, the authors conducted a needs assessment of both members and clinicians of the HMO. The survey determined the degree of interest and topics of greatest concern to members and clinicians. It proved to be an efficient and economical device to guide the expansion of the health education program and utilize the HMO's own resources. Findings underscored the desire of the HMO members for health education that was prevention-focused rather than disease-oriented.

Methods

The survey listed 45 possible health education topics, as well as an option of writing in other sub-