EPI Newsletter

Expanded Program on Immunization in the Americas

Volume XVII, Number 2 **IMMUNIZE AND PROTECT YOUR CHILDREN** April 1995

Measles Elimination: The Americas Receive Boost During World Health Day 1995

On April 7, 1995, under the auspices of the American Association for World Health (AAWH), the United States of America celebrated World Health Day, "A World Without Polio" at the Pan American Health Organization (PAHO) headquarters in Washington DC. Presiding over the festivities was Richard Wittenberg, President of the AAWH, along with the guest speakers Dr. George O. Alleyne, Director of PAHO; Dr. Marlene Kelly, Acting Commissioner of the Washington D.C. Commission for Public Health; and Dr. Jo Ivey Boufford, Principal Deputy Assistant Secretary for Heath at the U.S. Department of Health and Human Services. The keynote speaker was Mrs. Hillary Rodham Clinton, the First Lady of the United States.

First Lady, Mrs. Hillary Clinton announces USA support of Measles initiative during Word Health Day Ceremony

Several awards were given to those people and organizations, both national and international, who played key roles in mobilizing diverse groups in the immunization effort. The national awards went to The All Kids Count Program, represented by Mr. William C. Watson, Deputy Director, for their work in developing innovative ways to reach those parents and children who fall behind their immunization schedules; the Group Health Association of America (GHAA), represented by Ms. Karen Ignagni, President and CEO of GHAA, for their Childhood Immunization Program which recruited 325 health maintenance organizations from across the U.S. in their efforts; Every Child By Two, represented by Mrs. Betty Bumpers, and founded by Mrs. Bumpers and the former First Lady Mrs. Rosalyn Carter, who formed a network of influential women to raise awareness both locally and nationally to influence policies about immunization systems; and to Dr. Walter A. Orenstein, Director of the National Immunization Program of the Center for Disease Control and Prevention, who has helped make resources available for improving the immunization status of American children. The recipients of the international awards were Mr. Gustavo Gross, president of the PolioPlus Committee for Peru, who won the 1995 Macedo Award for his work in mobilizing political will and resources at the national level among Rotarians and the

In this issue:

political leaders throughout the Americas in support of polio eradication efforts; and the National Vaccination Council of Mexico (CONAVA), represented by Dr. Rafael Alvarez Cordero, General Director of International Affairs of the Ministry of Health of Mexico, received the Alleyne Award for their contribution to the eradication of polio in Mexico. The final award was presented to Mrs. Clinton, and was inscribed "To Hillary Rodham Clinton, First Lady, in recognition of her many years of dedicated concern for the health, education and sustained well-being ofchildren."

Mrs. Clinton, along with the other speakers, congratulated the efforts made by all those who participated in the campaign against polio, and helped to realize the goal of eradicating polio in the Americas. The elimination of polio in the Region came as the result of a concerted effort on the part of health care workers, governments, and non-governmental organizations, who succeeded in forming a partnership for mobilizing large sectors of their societies. As a result, people were not only educated as to the benefits of immunizing their children, but also access to immunization was facilitated by the health care workers who went directly to the target population, especially during National Immunization Days and the house-to-house "mop-up" operations. Mrs. Clinton said, "All of you here should take pride in that achievement.... Now the work must continue in other parts of the world and in our region we must turn our attention to another major health threat to children: measles".

Mrs. Clinton stated that at the Summit of the Americas held last December (1994), commitments were made to provide both opportunities and justice for all children. Government leaders endorsed the goal of making basic health services available to all citizens. In reference to a symposium held by the first ladies of the Region during the Summit, Mrs. Clinton said "Today these women across the Americas are turning rhetoric into reality by helping launch PAHO's historic campaign to eliminate measles from our hemisphere by the year 2000....The campaign to eliminate measles is vital to all of our futures. It will save the lives of countless children in every country and will bring primary health care to every single village in our hemisphere.... The important aspects of PAHO's campaign to eliminate measles is that it will advance all of our immunization efforts...and carries forward the Summit of the Americas plan of action."

As part of launching the Measles Elimination Effort, Mrs. Clinton said that through the United States Agency for International Development (USAID), the United States will join in partnership with PAHO for this campaign by contributing US$ 8 million directly to PAHO's Expanded Program on Immunization. She stated, "While ushering children into the world is the province of families, protecting them from avoidable diseases must be viewed as the shared responsibility of our larger human family.... That is why it is our responsibility as a community of nations to insist that all children receive the health care they need."

Polio Control Activities in Canada Since the Last Importation

In spite of heightened surveillance for cases of acute flaccid paralysis, no case of poliomyelitis has been detected in the Americas since August 1991, when the last case occurred in Junín, Peru. Certification of the eradication of polio in the Western Hemisphere was formally announced on 29 September 1994. However, the countries of the Americas, as well as other industrialized countries that have succeeded in eliminating indigenous polio, must be alert to the continuing threat of importation of wild poliovirus from polio-endemic regions. If not recognized promptly and controlled, importation of wild poliovirus could lead to widespread transmission and potentially the subsequent re-establishment of indigenous disease.

The last case of wild paralytic poliomyelitis in Canada occurred in 1988 as a result of virus importation. This isolated case of imported polio occurred in a fully immunized nine-month old male child, born in Canada but with close household contact with visitors from polio-endemic countries (Iran, India and Egypt). A diagnosis of wild poliovirus type 1 infection was confirmed by positive stool culture and the virus characterized as resembling poliovirus strains from the Indian subcontinent.

Two other instances of wild poliovirus importation serve to illustrate the continuing risk of importation to polio-free countries. Both instances involved well-defined communities which, for religious reasons, do not accept immunization and followed outbreaks of poliomyelitis in The Netherlands among similarly non-immunized religious communities.

The first instance of poliovirus importation followed an outbreak of poliovirus type 1 infection in The Netherlands in 1978 and resulted in 11 paralytic cases in three provinces of Canada (Alberta, British Columbia and Ontario) during 1978 and 1979. All the paralytic cases involved people who had refused immunization for religious reasons.

From September 1992 to February 1993, another polio outbreak occurred in The Netherlands among the same non-immunized religious communities affected by the outbreak 14 years earlier (68 cases had been reported by the end of the outbreak). During this outbreak, active surveillance was carried out in the non-immunized religious communities in Alberta, British Columbia, and Ontario affected by the 1978 outbreak. Surveillance included both community (blood and stool) sampling and environmental (sewage) sampling. Wild

virus importation was confirmed in Southern Alberta but no clinical cases were detected despite heightened surveillance. Using generic and specific primer sets for genomic analysis, the type 3 virus isolated was shown to be closely related to the virus strain identified in The Netherlands outbreak. In addition, contact between members of the two communities was documented. Resampling of stool in Alberta in August 1993 did not reveal the presence of the virus, thus suggesting limited circulation of the imported strain.

Acute flaccid paralysis surveillance is currently carried out using IMPACT, an active surveillance system involving all pediatric hospitals in Canada. Heightened laboratory surveillance was initiated in Canada in 1994 and provincial laboratories were asked to send all polio isolates, including those from non acute flaccid paralysis cases, to the National Reference Centre for Enteroviruses for testing. Since then, despite continuous surveillance and typing of 84 poliovirus isolates, no wild virus has been detected. All 84 isolates sent to the Reference Centre were found to be vaccine strains. The number of poliovirus isolates is however expected to decrease as all but 2 Canadian provinces now use inactivated polio vaccine as part of the routine immunization schedule. As this happens, it will be important to remind laboratories to make sure all poliovirus isolates are further investigated.

Over 24 months after the last wild polio virus importation and 6 months after certification of the Americas as polio free, the Canadian Working Group on Polio Eradication met, on March 13 1995, to review the current situation and consider the recommendations for further action made by the National Certification Commission. These recommendations are to maintain high immunization coverage levels and to strengthen surveillance activities for polio.

National goals and targets for vaccine preventable diseases of infants and children have recently been developed in Canada through consensus conferences. Goals for poliomyelitis are to maintain elimination of wild indigenous poliomyelitis and to prevent future import-related cases. Targets are to achieve and maintain by the year 1997: immunization with > = 3 doses of polio vaccine by the second birthday in 97% of children and up-to-date poliomyelitis immunization by the seventh birthday in 99% of children. Although the current coverage level is at 89% at 2 years as indicated in a recent nationwide study, this falls short of the target and further effort is needed. The working group emphasized the importance of ongoing information from the provinces on immunization levels, particularly those at 2 years of age, to monitor polio vaccine coverage and maintain awareness of the targets. The use of combined vaccines utilizing inactivated polio vaccine in all but 2 provinces will assist in maintaining high coverage levels.

To strengthen surveillance, the working group made recommendations so that the detection and investigation of acute flaccid paralysis cases would be improved. The current IMPACT system was supported and measures were recommended to expand the catchment area for case surveillance and to ensure that all cases of acute flaccid paralysis are fully investigated. In addition, it was recommended that an active surveillance system involving all pediatricians and using a monthly postal return be developed. This system would be similar to the British Paediatric Unit Surveillance system and could be used for a number of conditions as well as acute flaccid paralysis thus enhancing its usefulness. The Laboratory Centre for Disease Control and the Canadian Paediatric Society will collaborate to develop this system in the coming year.

The working group also reaffirmed viral stool cultures rather than neurophysiological tests as the basis for initial investigation of all acute flaccid paralysis and suspect polio cases.

To strengthen efforts to keep health care workers, particularly physicians, informed about the continuing risk of poliovirus importation, as well as the proper case investigation and outbreak control measures including notification of public health authorities, it was recommended that both the Laboratory Centre for Disease Control and the Canadian Paediatric Society take the lead role and work through the college of Family Physicians and the Canadian Medical Association. The organizations will be asked periodically to inform their members about the Canadian and international polio situation. This information bulletin will be an opportunity to reinforce the importance of proper investigation including stool samples for poliovirus in all cases of acute flaccid paralysis under the age of 15 years. The possibility of organizing a national immunization awareness week was discussed.

The achievement of the ultimate goal of global eradication is dependant on the efforts of all Member States of the World Health Organization. The long-term benefits of the polio eradication campaign cannot be fully realized until the time when polio vaccine is no longer necessary. Good communication between countries and prompt exchange of information about the occurrence of polio are both crucial to the maintenance of polio free zones.

Until wild poliovirus is eradicated globally, polio-free countries will need to maintain strict surveillance for possible wild virus importation. Detection of such importations followed by prompt outbreak control measures should avert extensive outbreaks of infection. To further prevent the transmission of imported virus in the general population, it is also essential that high levels of immunization are maintained to minimize the number of susceptible persons.

Source: Working Group on Polio Eradication and the Laboratory Centre for Disease Control, Canada, Dr. J.A.K. Carlson, Chair; Dr. Philippe Dulcos, et al.

Vaccination Coverage of 2-Year-Old Children—United States, January-March, 1994

The Childhood Immunization Initiative (CII)* was initiated to increase vaccination coverage among 2-year-old children. The 1996 objective is to have at least 90% coverage for four of the five critical vaccines routinely recommended for children (i.e., one dose of measles-mumps-rubella vaccine [MMR] and at least three doses each of diphtheria and tetanus toxoids and pertussis vaccine [DTP], oral poliovirus vaccine, and *Haemophilus influenzae* type b vaccine [Hib]), and at least 70% coverage for three doses of hepatitis B vaccine (Hep B)[1]. These objectives are an interim step toward the year 2000 goal of at least 90% coverage for the recommended series of vaccinations and are being monitored on an ongoing basis. This report presents national estimates of vaccination coverage among 2-year-old children derived from provisional data from the National Health Interview Survey (NHIS) for the first quarter of 1994 and compares these with the last two quarters of 1993.

* The purposes of CII are to 1) improve delivery of vaccines to children; 2) reduce the cost of vaccines for parents; 3) enhance awareness, partnerships, and community participation to improve vaccination coverage; 4) monitor vaccination coverage and occurrence of disease; and 5) improve vaccines and their use.

The NHIS, a probability sample of the civilian, noninstitutionalized U.S. population, provides quarterly data that enables calculation of national coverage estimates[2]. Quarterly estimates for children aged 19-35 months were based on sample sizes of 483 (third quarter 1993), 490 (fourth quarter 1993), and 608 (first quarter 1994). Children included in the survey during the first quarter of 1994 were born during February 1991-August 1992; their median age was 27 months. For the last two quarters in 1993, 37% of NHIS respondents used a vaccination record for reporting vaccination information; for the first quarter of 1994, the use of vaccination records increased to 52%. For the other respondents, such records were unavailable, and information was based on parental recall. Overall, 12%-16% of respondents were excluded because they either reported not knowing whether a child had received a particular vaccination or did not know the number of doses the child had received. Confidence intervals were calculated using SUDAAN.

During the first quarter of 1994, vaccination coverage level for children aged 19-35 months ranged from 89.6% for measles-containing vaccine (MCV) to 25.5% for Hep B vaccine (Table 1). Coverage for the most critical doses for

TABLE 1. VACCINATION LEVELS AMONG CHILDREN AGED 19-35 MONTHS, BY SELECTED VACCINES—United States, Third and Fourth quarters 1993 and first quarter 1994

	Third quarter 1993		Fourth quarter 1993		First quarter 1994	
Vaccine	**%**	**(95%CI*)**	**%**	**(95%CI)**	**%**	**(95%CI)**
DTP/DT†						
≥3 Doses	89.9	(86.9%-93.9%)	88.1	(84.6%-91.6%)	87.0	(83.2%-90.8%)
≥4 Doses	74.8	(69.9%-79.7%)	71.6	(66.4%-76.7%)	67.2	(62.8%-71.7%)
Poliovirus						
≥3 Doses	80.4	(75.8%-84.9%)	78.5	(73.9%-83.0%)	76.0	(71.9%-80.2%)
Haemophilus Influenzae type b§						
≥3 Doses	60.3	(55.0%-65.7%)	58.3	(53.1%-63.5%)	70.6	(65.9%-75.3%)
Measles-containing vaccine (MCV)	85.9	(82.0%-89.8%)	86.9	(83.3%-90.5%)	89.6	(87.0%-92.2%)
Hepatits B¶						
≥ 3 Doses	15.7	(12.1%-19.2%)	22.5	(17.8%-27.1%)	25.5	(20.2%-30.8%)
3 DTP/3 Polio/1 MCV**	78.7	(74.2%-83.2%)	74.3	(69.4%-79.2%)	75.5	(71.1%-80.0%)
4 DTP/3 Polio/1 MCV††	71.6	(66.7%-76.4%)	66.4	(61.1%-71.7%)	66.0	(61.4%-70.6%)

* Confidence interval.
† Diphtheria and tetanus toxoids and pertussis vaccine/Diphtheria and tetanus toxoids.
§ January-March 1994 was the first time all surveyed children were born after the recommendation for the series.
¶ Children born after the recommendation for universal vaccination varied by quarter: 12% for third quarter 1993, 29% for fourth quarter 1993, and 47% for first quarter 1994.
** Three doses of DTP/DT, three doses of poliovirus, and one dose of MCV.
†† Four doses of DTP/DT, three doses of poliovirus, and one dose of MCV.

the 1996 objective ranged from 70.6% (3 doses Hib) to 89.6% (MCV). Coverage for the year 2000 goal for the combined series of four doses of DTP, three doses of polio vaccine, and one dose of MCV was 66.0%.

During the last two quarters of 1993 and the first quarter of 1994, vaccination levels have remained statistically unchanged for the combined series and individual antigens with the exception of Hib and Hep B. For the first quarter of 1994, coverage with three doses of Hib vaccine increased significantly from the third quarter of 1993 to a record high of 70.6%, and Hep B coverage increased from 15.7% in the third quarter of 1993 to 25.5% during the first quarter of 1994.

Reported by: Assessment Br, Div of Data Management, National Immunization Program, CDC, Atlanta, Georgia.

Editorial Note:

The findings in this report document recent statistically significant increases in the national vaccination levels for Hib and Hep B. In addition, vaccination levels are near the highest ever recorded for three doses of DTP, three doses of polio vaccine, and one dose of MCV and for the combined series. Despite these improved levels of coverage, however, the findings in this report indicate that coverage levels are 3-19 percentage points below the interim objectives for DTP, polio, and Hib. Coverage levels for Hep B vaccine are the furthest from the 1996 goal. However, because recommendations for universal Hep B vaccination of infants became effective in November 1991, only approximately half of the children in the survey were eligible for Hep B vaccine. An estimated 2 million children aged 19-35 months still need one or more doses of DTP, polio or MMR vaccine to be completely vaccinated with the combined series of four doses of DTP, three doses of polio vaccine, and one dose of MCV. The levels for three doses of DTP, three doses of polio vaccine, one dose of MCV, and for the combined series have been constant for three quarter, suggesting that coverage levels may have plateaued. However, such data should be interpreted with caution; the larger number of children in the annual samples provides greater precision for those estimates than the quarterly samples.

To achieve the interim objective for 1996, efforts to implement CII must be accelerated. In particular, as emphasized by the Standards for Pediatric Immunization Practices[3], providers should use all opportunities to vaccinate children, regardless of the reason for the visit (e.g., sick- or well-child visit)—taking advantage of missed opportunities potentially may increase coverage by 8-22 percentage points [4-5]. Because health-care providers may believe coverage levels within their practices are higher than actual levels [6], CDC recommends that providers conduct coverage level assessments; information obtained from such assessments will assist providers in recognizing undervaccination in their practices and in instituting measures to increase coverage. In addition, providers should inform parents about the specific number of vaccine doses needed before age two years (11-15 doses), and parents should be encouraged to review their child's vaccination status at each visit to a health-care provider.

References

1. CDC. Reported vaccine-preventable diseases—United States, 1993, and the Childhood Immunization Initiative. MMWR 1994;43:57-60.
2. Massey JT, Moore TF, Parsons VL, et al. Design and estimation for the National Health Interview Survey, 1985-94. Hyattsville, Maryland: US Department of Health and Human Services, Public Health Service, CDC, 1989 (Vital and health statistics; series 2, no. 110)
3. Ad Hoc Working Group for the Development of Standards for Immunization Practices. Standards for immunization practice. JAMA 1993;269:1817-22.
4. Dietz VJ, Stevenson J, Zell ER Cochi S Hadler S, Eddins D. Potential impact on vaccination coverage levels by administering vaccines simultaneously and reducing dropout rates. Archives of Pediatrics and Adolescent Medicine 1994;148:943-9.
5. CDC. Impact of missed opportunities to vaccinate preschool-aged children on vaccination coverage levels— selected U.S. sites, 1991-1992. MMWR 1994;43:709-11, 717-8.
6. Bushnell C, Link DA. Private provider assessment. In: 28th National Immunization Conference proceedings. Atlanta: US Department of Health and Human Service, Public Health Service, CDC. (in press).

Source: MMWR 1995, 44:142-143,149

SECOND NATIONAL CANADIAN IMMUNIZATION CONFERENCE ANNOUNCEMENT

It is with pleasure that the Laboratory Centre for Disease Control (L.C.D.C.), Health Canada, announces that it has begun the organization of its Second National Canadian Immunization Conference. The first 3 day conference, *Immunization in the 90s: Challenges & Solutions,* was held October 5-7, 1994, in Quebec City. Due to the overwhelming success of the conference, and the demand by many participants that a second conference be held, L.C.D.C. plans to hold the next national immunization conference December 8-11, 1996. The conference has been increased to four days and will be held at the Royal York Hotel in Toronto. It is anticipated that attendance may exceed 700 participants, and plans for the conference include an expanded exhibition and more poster presentations than the last conference. For further information or to be placed on the conference information mailing list, please contact Mr. Chuck Schouwerwou, Conference & Committee Coordinator, by phone at (613) 957-1352 or by fax at (613) 998-6413.

Polio Surveillance

Indicators for Evaluating Poliomyelitis Surveillance in Latin America, 1994*

	1	2	3	4
Colombia				
El Salvador				
Nicaragua				
Venezuela				
Bolivia				
Chile				
Ecuador				
Guatemala				
Honduras				
Paraguay				
Mexico				
Brazil				
Cuba				
Peru				
Dom. Rep.		-	-	-
Panama		-	-	-
Costa Rica		-	-	-
Haiti		-	-	-
Argentina	N.R.	N.R.	N.R.	N.R.
Uruguay	N.R.	N.R.	N.R.	N.R.

Meet criteria N.R. No Report Receeived - Zero Cases

1. 80% Weekly Reporting Units
2. 80% Investigated within 48 hours
3. 80% of Cases with 2 adequate stool samples taken
4. AFP Rate

* Data as of 25 February

Source: **EPI/PAHO (PESS)**

The Americas, the first Region in the world to eradicate polio, must continue high vaccine coverage and surveillance as long as wild poliovirus is circulating elsewhere. Importations present the risk of producing a polio outbreak, particularly in areas with low vaccine coverage and poor sanitary conditions. The poliovirus has in the past been very successful in locating pockets of susceptible persons, even in countries with high levels of vaccination coverage. It is also to our benefit to do what we can to facilitate the eradication of the poliovirus from polio-endemic countries since only global eradication of poliomyelitis can assure that poliovirus infection will not cause paralytic disease in the Americas once again. As was stated in the Report of the International Commission for the Certification of Poliomyelitis Eradication, "It would be tragic, if after the extraordinary efforts that have been made to free the Americas from polio, we were to let down our guard and allow the poliovirus to become established once again." Therefore countries which are not meeting polio surveillance criteria (see graph) should ensure that resources are targeted towards the opportune investigation of all probable AFP cases.

The Cold Chain: Curbing Chlorofluorocarbons

A major health concern of the people of the planet earth has been the depletion of the ozone layer— a protective layer of the earth's atmosphere which helps to filter some of the more harmful rays of the sun. Since studies have shown that the ozone layer of the earths atmosphere was being depleted, efforts have been made to curb the production of contaminants that are responsible for this depletion.

In 1987, The Montreal Protocol was established to phase-out the use of substances such as chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs) which cause depletion of the ozone layer of the atmosphere. CFCs and HCFCs are both common refrigerants. They were considered ideal because they are non-toxic, non-flammable, and stable in a range of pressure-temperature relationships which made them suitable for a wide variety of applications.

The initial goal of the Montreal Protocol was to reduce the use of CFCs by one half by the year 2000. However, as a response to new data regarding the rate of ozone depletion, the Montreal Protocol was strengthened in 1990, requiring the prohibition of CFC production with the target date subsequently changed to 1996 (Developing countries have an extended deadline of 2006.)

Since the adoption of the Montreal Protocol, global consumption of ozone-destroying CFCs dropped form 1.3 billion kilograms in 1988 to some 510 million kilograms in 1993 *(see graph pg. 8)*. As a further result, scientists have been investigating less harmful alternatives. Thermoacoustics, a technique that uses sound to produce cooling, may be one replacement for CFCs used in refrigeration. Another area of research which has shown promise is in chemical substitutes such as hydrofluorocarbons (HFCs). Because these substances do not contain chlorine, they do not damage the ozone layer, but they may be greenhouse gases, as are CFCs.

In compliance with the Montreal Protocol, WHO and UNICEF have agreed that EPI cold chain equipment (refrigerators, cold boxes, vaccine carriers, etc..) containing CFCs and HCFCs will not be purchased for international distribution after 1996. This type of equipment could still be purchased for local use or for supply to developing countries which agree to receive it if no other alternative is available. The market for these products will, however, diminish.

In order to facilitate the implementation of CFC-free alternatives within developing countries by the year 2006

Reported Cases of Selected Diseases

Number of reported cases of measles, poliomyelitis, tetanus, diphtheria, and whooping cough, from 1 January 1995 to date of last report, and the same epidemiological period in 1994, by country.

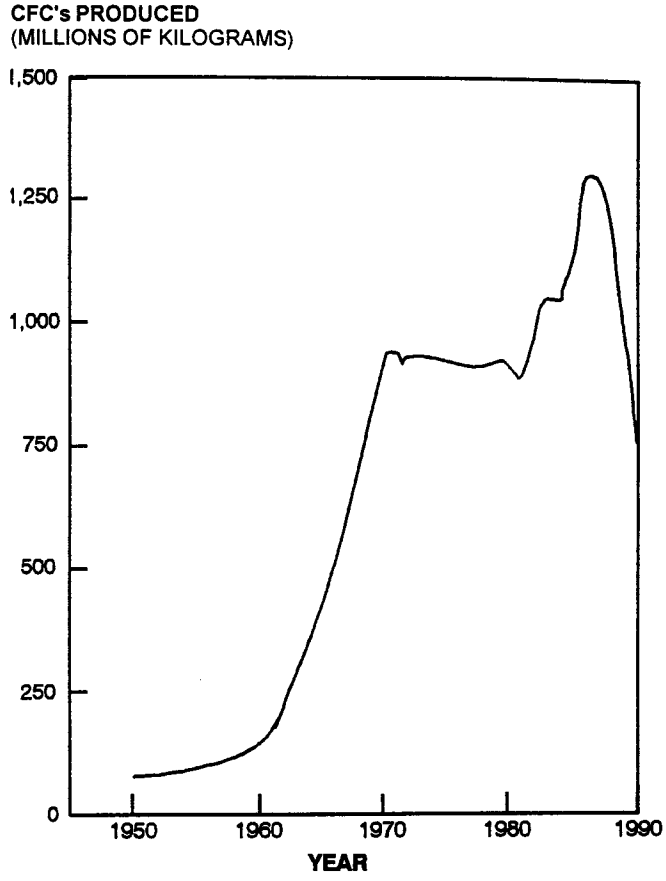
Subregion and country	Date of last Report	Measles				Poliomyelitis		Tetanus				Diphtheria		Whooping Cough	
		Reported		Confirmed				Non Neonatal		Neonatal					
		1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994	1995	1994
LATIN AMERICA															
Bolivia	25 Mar.	3	...	0	...	0	0	...	...	...	21	...	...	...	...
Colombia	18 Mar.	614	...	29	...	0	0	...	...	...	61	...	...	...	...
Ecuador	18 Mar.	381	...	...	380	0	0	...	..	...	57	...	14	...	62
Peru	11 Mar.	72	...	...	...	0	0	...	...	...	129	...	...	...	...
Venezuela	18 Mar.	146	4 486	16	4 486	0	0	...	...	...	14	...	0	...	133
Southern Cone															
Argentina	25 Mar.	48	88	2	88	0	0	...	1	...	9	...	2	...	173
Chile	25 Mar.	33	...	...	0	0	0	...	1	...	...	...	0	...	20
Paraguay	25 Mar.	2	32	1	17	0	0	...	7	...	18	...	1	...	17
Uruguay	07 Jan.	...	...	...	0	0	0	...	0	...	0	...	0	...	0
Brazil	07 Jan.	...	...	...	...	0	0	...	...	...	151	...	...	...	...
Central America															
Belize	25 Mar.	0	9	0	0	0	0	...	...	...	...	...	...	...	...
Costa Rica	25 Mar.	49	54	8	5	0	0	...	...	...	...	...	...	...	...
El Salvador	25 Mar.	93	2 201	0	0	0	0	...	...	...	8	...	...	...	...
Guatemala	25 Mar.	20	13	11	0	0	0	...	...	...	17	...	...	...	8
Honduras	25 Mar.	3	19	0	1	0	0	...	0	...	9	...	0	...	0
Nicaragua	25 Mar.	33	386	0	5	0	0	...	...	...	4	...	...	...	...
Panama	25 Mar.	8	11	1	0	0	0	...	...	...	2	...	0	...	35
Mexico	25 Mar.	86	220	5	34	0	0	0	16	0	81	0	0	0	32
Latin Caribbean															
Cuba	25 Mar.	14	...	0	...	0	0	...	...	...	...	...	...	...	...
Haiti	07 Jan.	...	...	...	...	0	0	...	...	...	...	...	...	...	...
Dominican Republic	25 Mar.	8	232	0	232	0	0	...	...	...	5	...	1	...	6
CARIBBEAN															
Antigua & Barbuda	25 Mar.	0	1	0	0	0	0	...	0	...	0	...	0	...	0
Bahamas	25 Mar.	0	3	0	0	0	0	...	0	...	0	...	0	...	0
Barbados	25 Mar.	2	13	0	0	0	0	...	0	...	0	...	0	...	0
Dominica	25 Mar.	4	4	0	0	0	0	...	...	...	...	...	...	...	...
Grenada	25 Mar.	2	1	0	0	0	0	...	...	...	...	...	...	...	...
Guyana	25 Mar.	6	0	0	0	0	0	...	...	...	...	...	...	...	...
Jamaica	25 Mar.	53	19	0	0	0	0	...	...	...	...	...	...	...	...
St. Kitts/Nevis	25 Mar.	1	2	0	0	0	0	...	...	...	...	...	...	...	...
St. Vincent	25 Mar.	0	0	0	0	0	0	...	...	...	...	...	...	...	...
Saint Lucia	25 Mar.	3	4	0	0	0	0	...	...	...	...	...	...	...	...
Suriname	25 Mar.	1	2	0	0	0	0	...	...	...	...	...	...	...	...
Trinidad & Tobago	25 Mar.	4	7	0	0	0	0	...	0	...	0	...	0	...	1
NORTH AMERICA															
Canada	25 Mar.	39	...	39	30	0	0	...	0	...	...	...	0	...	1 048
United States	25 Mar.	58	163	58	163	0	0	...	5	...	...	...	0	...	718

... Data not available.

the protocol signatories further established a $240 million fund in 1990. An additional $510 million was pledged two years later. So far only $226 million has been collected. Still, had the treaty not provided this money, countries such as India and China most likely would not have participated, and their use of CFCs would have continued to rise.

Source: "Making Environmental Treaties Work," by Hilary F. French. Copyright (c) 1994 by Scientific American, Inc. All rights reserved.

Editorial Note: WHO/PAHO, through its cold chain Focal Point, the Thermal Sciences Section at the University of Valle in Cali, Colombia, continues to test new cold chain equipment for the storage and transportation of vaccines. The new generation of equipment is being manufactured with different gases, however, testing of the new equipment has not yet been completed. All countries which manufacture refrigerators, freezers and cold boxes or vaccine type containers, which are purchased for use in the cold chain, should arrange for the testing of this equipment before their purchase. Only in this way can Ministries of Health know for sure the performance and quality of the cold chain equipment produced with the new gases. Countries that wish to know more about the testing of locally manufactured cold chain equipment can write to the editor of the EPI Newsletter for further information.



SOURCE: Du Pont, Worldwatch estimates

CORRECTION

The source of the article titled "International Importations of Measles from the Americas into the United States, 1990-1994" which appeared in the February 1995 EPI Newsletter, vol.17, no.1, was Charles Vitek, M.D., and Stephen Redd ,M.D., National Immunization Program, CDC, Atlanta, Georgia.

The *EPI Newsletter* is published every two months, in Spanish and English by the Special Program for Vaccines and Immunization (SVI) of the Pan American Health Organization (PAHO), Regional Office for the Americas of the World Health Organization (WHO). Its purpose is to facilitate the exchange of ideas and information concerning immunization programs in the Region, in order to promote greater knowledge of the problems faced and their possible solutions.

Special Program for Vaccines and Immunization
Pan American Health Organization
525 Twenty-third Street, N.W.
Washington, D.C. 20037
U.S.A.

Editor: Ciro de Quadros
Assistant Editor: Peter Carrasco
ISSN 0251-4729