EPI Newsletter

Expanded Program on Immunization in the Americas

Volume I, Number 4 IMMUNIZE AND PROTECT YOUR CHILD December 1979

Country Operations

Expanded Program on Inmunization in Brazil: Vaccination Coverage

A systematic procedure for collecting data at the national level on vaccination in Brazil was instituted in 1975 in order to supply the Public Health Services Foundation (Fundação SESP) of the Ministry of Public Health with information on vaccinations administered monthly in the states and territories of the country by age groups, doses, and vaccines administered.

The Expanded Program on Immunization (EPI) is being implemented by the departments of health of the states and territories, using vaccines distributed by the Drug Control Center (CEME) of the Ministry of Social Security and Welfare under a program established by the Ministry of Health.

In 1978 the Ministry of Health made the following recommendations regarding the use of regularly administered vaccines for the following basic immunization schedules and target groups (Ministerial Order No.452/RN of 6/12/76, amended by MO No. 221/Bsb of 5/5/78):

Vaccine	Basic Vaccination Course	Age Group
Poliomyelitis (oral)	3 doses	2 months to 4 years
DPT	2 doses*	2 months to 4 years
Measles	1 dose	7 months to 3 years
Tetanus toxoid**	2 doses	Schoolchildren (1st grade) and pregnant women
Intradermal BCG	1 dose	0 to 14 years

* With optional third dose
** Schoolchildren not already vaccinated with DPT and pregnant women from their fifth month of pregnancy on.

Vaccination against poliomyelitis, measles, tuberculosis, diphtheria, tetanus and whooping cough is compulsory during the first year of life.

In 1978 it was possible to obtain information from all 25 states and territories, compared with 22 of them in 1977, 16 in 1976, and only 10 in 1975. These figures attest to the steady progress of the system.

The following analysis chiefly covers the work done to immunize children under 1 year of age.

Table 1, below, presents condensed data for the major regions. Coverage was highest in the Southeast and lowest in the Northeast.

Table 1

Numbers and percentages of children under 1 year of age who completed the basic immunization with polio, DPT and measles vaccines in the major regions Brazil - 1978

Major Regions	Estimated population under 1 yr. of age in 1978	Vaccine					
		Polio		DPT		Measles	
		No.	%	No.	%	No.	%
North	169,296	48,452	28.6	68,965	40.7	61,139	36.1
Northeast	1,208,965	209,791	17.4	293,275	24.3	249,305	20.6
Southeast	1,249,388	940,805	75.3	889,926	71.2	795,864	63.7
South	632,280	280,276	44.3	313,760	49.6	283,780	44.9
West-Central	238,080	76,211	32.0	106,411	44.7	87,443	36.7
Brazil	3,498,009	1,555,535	44.5	1,672,337	47.8	1,477,531	42.2

Contents

Page

COUNTRY OPERATIONS
- Expanded Program on Immunization in Brazil: Vaccination Coverage 1

COLD CHAIN
- Summary of Refrigerator Testing 3

EPI REVOLVING FUND
- Summary of 1979 Operations 4

VACCINES
- Intervals between Successive Doses of Killed Vaccines: The Persistence of Immunological Memory and Implications for the Expanded Program on Immunization . 4
- International Symposium on Pertussis . . . 5
- Improved Stability of Freeze-dried Measles Vaccine 6
- Regional Self-Sufficiency in Vaccines for the EPI Program 6

REPORTED CASES OF EPI DISEASES IN THE AMERICAS 7

NEWSBRIEFS 8

Table 2 and Graph 1 show how the coverage for all three vaccines steadily improved throughout the country from 1975 to 1978.

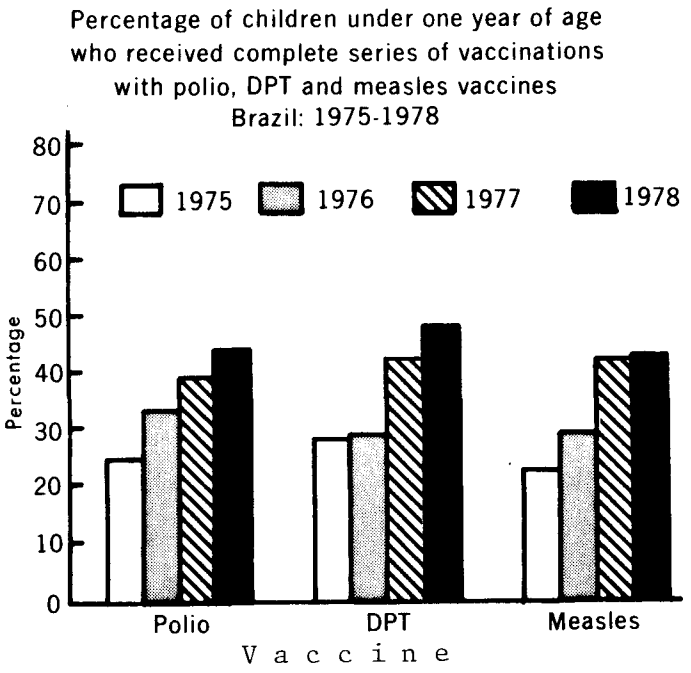
Table 2

Estimated percentages of vaccinated children under 1 year of age*
Brazil - 1975 to 1978

Year	Vaccine		
	Polio	DPT	Measles
1975	25.4	28.3	22.6
1976	34.1	29.2	29.2
1977	39.4	42.4	41.6
1978	44.5	47.8	42.2

*A child is counted as vaccinated if he has received three doses of polio, two doses of DPT, and one dose of measles vaccine.

Graph 1



Data has also been gathered on the comparative numbers of children who received the first and the last doses in the recommended course of polio and DPT vaccinations. It was found that, while in some states and territories the first dose was administered to a large proportion of the estimated population of children under 1 year of age, there was an evident lack of encouragement for the parents to take their children to the vaccination centers in order to complete the basic immunization series. It is estimated that nationwide (with the exception of São Paulo state, which is excluded from the analysis for lack of data) slightly over half (57.7 per cent) of the children who received the first dose of polio vaccine completed the series with a third dose. For DPT vaccine it is estimated that 76.1 per cent of the children who took the first dose also took the second and final one of the basic series. It is worth noting, however, that in the state of Rio Grande do Sul the basic polio and DPT vaccination series were completed for 83.0 and 88.1 per cent, respectively, of the children who received the first dose.

The data reported by the state departments of health on vaccinations in the first six months of 1979 show the following percentages of coverage for children under 1 year of age: polio vaccine, 43.8 per cent; DPT vaccine, 45.1 per cent; measles vaccine, 43.2 per cent; and intradermal BCG, 48.8 per cent.

It has been found that the coverage for all immunizations increased during the first half of 1979. This does not hold true for the Federal District, however, due to an adjustment in the estimate of the population to be vaccinated in 1979.

The same data are expressed as percentages in Table 3, which reflects the progress made by the program as a whole in vaccinating children during their first year of life.

Table 3

Comparison of percentages of vaccination series completed in children under 1 year of age during the first six months of 1979 and the same period of 1978 in Brazil

Vaccine	1978	1979	% Increase
Polio	40.7	43.8	7.6
DPT	42.1	45.1	7.1
Measles	37.3	43.2	15.8
BCG	30.8	48.8	58.4

The greatest percentage increases for immunization with polio, DPT and measles vaccines took place in the Northern region, while the greatest single advance in all major regions was made with intradermal BCG vaccination.

Source: Boletim Epidemiológico, Fundação Serviços de Saúde Pública, Divisão de Epidemiologia Estatística e Informação, Vol. (ano) XI, No.12, Semanas Nos. 23 e 24 (1979).

Editorial Note:

The data presented from 1978 and 1979 demonstrate the efforts made by the National Expanded Program on Immunization to increase coverage in Brazil, particularly in those regions which have had the lowest coverage in the recent past. Another important factor is the focus on children under 1 year of age, who make up the highest priority group for the Program. The evaluation of coverage in this age group will be an excellent indicator of the progress achieved by the Brazilian Program in the years ahead.

Cold Chain

Summary of Refrigerator Testing

PAHO/WHO, in their continuing effort to identify reliable cold chain equipment, have completed tests on a series of refrigerators for the storage of vaccines. Performance tests were carried out at continuous external temperatures of +32°C and +43°C and a daytime/night-time cycle of +43°C/+15°C. The refrigerators were loaded with vaccines and icepacks.

Results of the study demonstrate that of the absorption type refrigerators tested, only the Electrolux RC 65 is capable of maintaining vaccine storage temperatures at a continuous external temperature of +43°C. The RC 65 can be powered by either gas or kerosene. The gas powered version has the advantage of a thermostatic flame control which provides partial control of the internal temperature; the kerosene version, however, does not afford control of internal temperature.

Performance of the RC 65 following a power failure reveals that the vaccine load remains cool for 25 hours. An additional advantage is that it can be run as either a refrigerator or a freezer by adjusting the flame height. One drawback of this model, however, is its fuel consumption: about 75 liters of kerosene or 45 kgs of LP gas per month.

Taking into account its high fuel consumption, large vaccine storage capacity (142 liters) and lack of an icemaking compartment, it was concluded that the RC 65 would be suitable for use at central or regional stores.

The Electrolux TC 1150 had the highest performance of the electric compression type refrigerators tested. The TC 1150 is economical to operate and is suitable for vaccine storage in external temperatures of +43°C. It provides safe vaccine storage for 40 hours after a power failure and is, therefore, a good choice for vaccine storage at regional level where electricity may vary in voltage or may be interrupted each day for periods of up to 16 hours. The TC 1150 has a dial thermometer which is accurate to ±1.8°C.

For storage of vaccine at district levels, where only a small vaccine capacity is required, the Gelomatic Medinic performed adequately, maintaining satisfactory internal temperature control at +32°C and during daytime/night-time variations of +43°C to +15°C. However, the Medinic has a very short period (2.2 hours) of safe vaccine storage following a power failure. Furthermore, the Gelomatic Medinic has no icemaking facilities, which are normally required for vaccine carriers used at district centers.

A summary of test results on the nine refrigerators is shown in Table 1. A review of this table indicates that the RC 65 and TC 1150 outperformed all other refrigerators tested. The Gelomatic Medinic and the Electrolux RAK 100 had satisfactory test results, however the RAK 100 can only be recommended for use in conditions where the ambient temperature does not exceed +32°C. The Electrolux RAK 66 and RAK 36 can maintain vaccine storage temperatures at +32°C only when used with clean, high grade kerosene. Since this type of fuel is not readily available in many rural areas, these two models cannot be recommended for use unless the supply of clean, high grade kerosene is assured.

None of the other refrigerators tested can be recommended since they have wide fluctuations in internal temperatures or do not maintain the necessary temperature for the safe storage of vaccines.

Table 1

Results of Vaccine Refrigerator Testing

Make/Model/Type	Fuel source (a)	32°C AMBIENT: MAX/MIN internal temperature °C (b)	32°C AMBIENT: Hours to rise to +10°C (c)	32°C AMBIENT: Fuel or power consumed in 24 hours (d)	43/15°C AMBIENT: MAX/MIN internal temperature °C (e)	43°C AMBIENT: MAX/MIN internal temperature °C (b)	43°C AMBIENT: Hours to rise to +10°C (c)	43°C AMBIENT: Fuel or power consumed in 24 hours (d)
ELECTROLUX RAK 100 (Absorption)	K	+7/0	9	1.0 L	+10/0	+16/+11	0	1.6 L
ELECTROLUX RAK 66 (Absorption)	K	+4/0	10	0.7 L	+20/15	+15/+8	7	0.6 L
ELECTROLUX RAK 36 (Absorption)	K	+6/+2	6	0.6 L	+15/-5	+18/+13	0	0.4 L
ELECTROLUX RC 65 (Absorption)	G	-9/-19	25	0.9 KG	+3/-3	+2/-8	14	1.5 KG
	K	-9/-18	25	1.8 L	-10/-19	+3/-5	14	2.5 L
EXPO MACHINERY Tropicana 113 (Compression)	E	+14/+1	12	1.8 KWH	+11/-8	+22/+6	5	3.4 KWH
MERLONI Ariston TDF 280 (Compression)	E	+20/+8	2	2.0 KWH	Not determined	+25/+7	2	3.0 KWH
SIBIR Tropic (Absorption)	E	+15/+4	6	4.1 KWH	+7/-2	+27/-1	2	5.2 KWH
	K	← NO TEST →						
GELOMATIC Medinic (Compression)	E*	+8/+2	3	0.4 KWH	+7/+2	+11/+5	1.5	0.9 KWH
ELECTROLUX TC 1150 (Compression)	E	← NO TEST →			+6/0	+6/0	40	1.9 KWH

KEY

(a) Fuel source: K = Kerosene
G = Bottled gas
E = 220 volts AC electricity supply
E*= 110 volts AC 60 cycle electricity supply

(b) MAX/MIN internal temperature °C: Lowest and highest internal temperature of the vaccine load. Thermostat set at its maximum position and stabilized in designated ambient temperature.

(c) Hours to rise to +10°C: The measured rate of temperature rise from minimum internal temperature to +10°C--will be "0" hours if the minimum internal temperature is already above +10°C.

(d) Fuel or power consumed in 24 hours:

KWH = Kilowatthours per 24 hours
KG = Kilograms LP gas per 24 hours
L = Liters kerosene per 24 hours

(e) MAX/MIN internal temperature °C: Maximum temperature reached after 12 hours at +43°C, and minimum temperature reached after 12 hours at +15°C with constant, full vaccine load and thermostat at the maximum setting, during four 24-hour cycles.

The complete WHO report, entitled "Summary of Vaccine Refrigerator Testing: Consumers' Association: United Kingdom," may be obtained on request to PAHO/WHO. Please quote WHO document number EPI/CCIS/79.5 when making your request.

Source: WHO document EPI/CCIS/79.5.

EPI Revolving Fund

Summary of 1979 Operations

Fourth quarter operations of the EPI Revolving Fund surpassed all previous quarters, with the procurement of 10.3 million doses of vaccines worth over US$1.3 million. A final tally for all 1979 shows that more than 40 million doses of vaccines, costing in excess of US$2.1 million, were purchased through the Fund during its first year of operation. This figure represents some 3 million more doses than had been indicated by early 1979 estimates, however the Fund was able to meet all vaccine requirements, despite difficulties in maintaining adequate capitalization.

Of major importance in permitting the Fund to meet the 1979 vaccine requirements of all participating national EPI programs, were the Dutch donation of US$500,000, and the decision of the XXVI Directing Council to allocate US$800,000 from the Working Capital Fund to the Revolving Fund. However, estimates for 1980 show that vaccine requirements are up by 17%, or 6.8 million doses. This means that an additional US$1.2 million, at 1979 prices, will be needed for efficient operations in 1980. More importantly, the increased demands on Revolving Fund monies will require that participating countries reimburse the Fund promptly to ensure that sufficient funds are available for each quarter.

Overall, reimbursement to the Fund by participating countries was satisfactory in 1979. However, there were some instances of delinquent accounts, with certain countries accumulating as much as US$200,000 in overdue payments. Another problem causing delays in the flow of monies back to the Fund was the excessive length of time --averaging five weeks--between shipment of vaccine orders to countries and final billing by vaccine suppliers. New procedures are being developed to reduce the billing time for 1980 orders.

Out of approximately 200 shipments in 1979, only two were lost enroute to their respective consignees. Both lost shipments were destined to small islands in the Caribbean where communications are difficult. In order to avoid similar problems in the future, it has been suggested that the total annual vaccine requirements for the smaller islands in the Caribbean be sent in a single shipment during first quarter 1980. This possibility is currently being discussed with the appropriate Ministries of Health.

Most vaccines ordered through the Fund have been delivered on or ahead of schedule. In some cases vaccine deliveries were expedited to meet emergencies or special requests. For example, Honduras requested that its first quarter 1980 requirements be shipped in the last quarter of 1979. This rapid handling of urgent orders was aided by PAHO's contractual relationship with the various suppliers.

PAHO was able to extend the contracts for EPI vaccines until July 1980 when new contracts will take effect. Tenders for the new contracts are expected to go out in early 1980.

A summary of the participating countries and their 1979 vaccine requirements is shown in Table 1.

Table 1

EPI REVOLVING FUND SUMMARY FOR 1979

Vaccine orders placed (in thousand of doses) by participating countries and territories for calendar year 1979

Country	DPT	Polio	Measles	BCG	TT
Anguilla	2.0	2.0	--	--	.6
Antigua	6.0	6.0	--	0.2	10.0
Argentina	1,000.0	3,500.0	1,000.0	2,000.0	625.0
Bahamas	34.2	26.3	8.0	7.0	5.3
Barbados	18.0	20.0	8.0	10.0	12.4
Belize	--	--	60.0	14.0	60.0
Bolivia	200.0	565.0	40.0	--	--
Cayman Islands	1.2	1.2	1.6	1.0	1.6
Colombia	4,500.0	5,500.0	2,200.0	1,250.0	--
Costa Rica	--	100.0	40.0	--	--
Dominica	3.0	--	--	--	5.0
Dominican Rep.	600.0	800.0	400.0(a)	200.0	300.0
Ecuador	--	1,500.0	500.0	300.0	--
Guyana	264.2	233.76	--	10.0	17.15
Haiti	350.0(b)	--	15.5(b)	325.0(b)	232.0(b)
Honduras	375.0(c)	50.0	50.0(b)	180.0	--
Nicaragua	267.0(b)	958.0(a)	113.0(b)	107.0(b)	87.0(b)
Panama	200.0	1,175.0	180.0(a)	60.0	190.0
Paraguay	739.525	--	5.0(b)	--	--
Peru	1,100.0	2,000.0	840.0(a)	1,750.0	--
St. Vincent	59.22	39.66	19.4	22.4	22.2
Turks & Caicos Isl.	0.8	0.4	0.3	0.4	0.4
Uruguay	--	600.0	--	--	--
Total doses	9,720.145	17,077.32	5,480.8	6,237.0	1,568.65
Cost (US$)	307,054.04	334,330.40	1,237,422.00	189,411.00(d)	30,189.37

Cost of EPI vaccines	US$2,098,406.81
3% Administrative charge plus shipping costs	US$ 346,577.88
Subtotal	US$2,444,984.69
Cost of other EPI-related vaccines	US$ 164,104.98
Total cost in 1979	US$2,609,089.67

(a) Requirement partially procured with non-EPI funds.
(b) Total requirement procured with non-EPI funds.
(c) First quarter 1980 requirement procured fourth quarter 1979.
(d) Does not include cost of diluent.

Vaccines

Intervals between Successive Doses of Killed Vaccines: The Persistence of Immunological Memory and Implications for the Expanded Program on Immunization

INTRODUCTION(1)

Confusion appears to exist on the issue of immunological memory following one or more doses of killed vaccine utilized within the Expanded Program on Immunization. At seemingly opposite poles are the recent statements by the American Academy of Pediatrics ("interruption of the recommended schedule, with a delay between doses, does not interfere with the final immunity achieved, nor does it necessitate starting the series over again, regardless of the length of time elapsed") and statements recommending that a primary course be repeated in part, if not completely, once the following intervals are surpassed: two, three or six months between the first and second DPT/polio; six months between the second and third DPT/polio; 24 months between the third dose and booster injection of DPT/polio; six to 24 months between two doses of diphtheria and tetanus toxoid.

(1)This text was prepared on the basis of reports of 22 studies. References to aspects of this note may be obtained from the Expanded Programme on Immunization, WHO, Geneva.

1. TETANUS AND DIPHTHERIA TOXOIDS

- Fifteen men, 30-40 years old, who had received one dose of vaccine against tetanus, were given a booster dose 8-13 years later. Eight days after the booster dose all 15 persons responded with a titre at or above the protection level of 0.01 IU/ml.

- Tetanus toxoid received one to six years after a single toxoid injection gave a booster type reaction.

- Two small doses (1.4-2.0 Lf(2)) of adsorbed tetanus toxoid given at two year intervals resulted in high serum antitoxin titres.

- A two-injection immunization schedule with an interval of eight months or more between injections of conventional (10 Lf per dose) adsorbed tetanus toxoid in women, resulted in mean serum antibody levels similar to those obtained with three doses of toxoid.

- The second dose of adsorbed tetanus toxoid (12 Lf), given three years after the first dose in 24 children, gave the same titre of antibody as the second dose given at the interval of four to six weeks.

- The second dose of adsorbed tetanus toxoid (Pasteur Institute preparation, 30 Lf per dose) resulted in a high and rapid increase of serum antibodies, regardless of whether two months, one year or two years had elapsed after the first injection.

- Seven to 13 years after having received only one primary dose of DT, four subjects responded vigorously to the second dose, giving for diphtheria 20,000, 500, 130 and 42 fold rises respectively within two weeks' time and attaining titres of 0.01 IU/ml or more of diphtheria and tetanus antitoxin within one week. For tetanus, the rises in titre were 20,000, 1,200, 500 and 2 fold. Another 21 subjects with a history of two primary injections and 109 subjects with three initial injections all responded to late booster doses with diphtheria and tetanus antitoxin tires well above the protective level.

- A significant rise in diphtheria antitoxin titre well in excess of the protective level was demonstrated as a result of administration of booster doses of diphtheria toxoid to a group of individuals after a period of ten to 33 years since their last dose of diphtheria toxoid. Several of these individuals had received only a single primary injection with no subsequent boosters.

- After one dose of tetanus and diphtheria toxoids given to 27 elderly volunteers, mean age 80 years, the percent protected rose from 26% and 59% to 42% and 88% respectively. Following the second dose given after seven months, all persons immunized had protective levels.

- Immunization with two injections at 12 monthly intervals of DT vaccine (Pasteur Institute preparation, 30 Lf of each toxoid per dose) resulted in protective levels of circulating antibodies in all children.

- The second dose of DPT vaccine (30 Lf per dose of diphtheria toxoid and 10 Lf of tetanus toxoid) administered at 27 week intervals resulted in high and rapid increase of diphtheria and tetanus antitoxin titres.

(2)Lf. Limes flocculationis; the amount of toxin or toxoid which when mixed with one International Unit of antitoxin gives a Ramon flocculation in the shortest time.

2. PERTUSSIS VACCINE

- Two 0.5 ml doses of DPT vaccine given at intervals of three or more months resulted in levels of anti-pertussis agglutinins similar to those achieved following three doses given at approximately monthly intervals. It is suggested that for infants whose series of DPT immunizations has been interrupted, a single additional dose may be adequate to establish immunity regardless of whether one or two doses had been given earlier or regardless of the time that may have elapsed between the initial and subsequent doses.

- The second dose of concentrated adsorbed DPT vaccine (15 Lf per dose of diphtheria toxoid, 10 Lf of tetanus toxoid and 16 opacity units per dose of pertussis antigen) given at six month intervals ensured satisfactory serological response to all three components of the vaccine.

3. POLIOMYELITIS VACCINE (Inactivated)

The second injection of trivalent inactivated poliomyelitis vaccine performed at a one year interval after the first injection resulted in raising the number of triple-positive children from 35% to 82%.

CONCLUSION

The above studies indicate that an anamnestic (memory) response is observed when intervals between first and second doses of tetanus and diphtheria toxoids are much longer than those usually applied (one month to one year). Published observations concerning longer intervals for pertussis and poliomyelitis vaccines have not been found, and one would suspect that somewhat longer intervals than those shown above (six months for pertussis antigen and 12 months for inactivated poliomyelitis vaccine) would still elicit an anamnestic response. Yet caution in extrapolation must be exercised, recognizing the variation known to exist in the length of immunological memory induced by various antigens, and even by the different responses possible in different geographical regions of the world.

With respect to the application of the above findings to the Expanded Program on Immunization, one may conclude that the problem of maximum intervals between successive doses of diphtheria and tetanus toxoids can be safely ignored. Intervals of six and 12 months, respectively, are known to be acceptable for pertussis and killed poliomyelitis vaccines, and one might suspect that these intervals could be extended, although data on this point would be desirable. None of the above, which has examined the issue of duration of immunological memory, contradicts the desirability of completing effective series of immunizations as early in life as possible, respecting the need to maintain minimum intervals of at least four weeks between successive doses.

Source: Wkly Epidem Rec, 54:385-392, 1979.

International Symposium on Pertussis

The Third International Symposium on Pertussis was held 1-3 November 1978 in Bethesda, Maryland, USA; the two earlier symposia were held in Prague, Czechoslovakia and in Bilthoven, The Netherlands, in 1962 and 1969,

respectively. The Third Symposium was sponsored by the U.S. Bureau of Biologics and the International Association of Biological Standardization, among other organizations. The proceedings of the Third Symposium have been published and are available to interested scientists and public health administrators.(1)

Throughout the world the role of pertussis vaccines in the control of whooping cough is being reassessed. The pertussis vaccines in current use are crude whole-cell preparations whose efficacy is such that, in order to achieve an acceptable level of protection, it is necessary to accept a certain measure of toxicity which is inherent to the cells of which the vaccine is made.

An improved vaccine that is both safer and more potent than the one presently in use is no doubt needed. Field trials to evaluate possible candidates for a new vaccine would be fraught with all sorts of problems--moral, ethical, technical and logistical--unless it has first been fully characterized. It must be admitted that little is known about the immunochemistry and genetics of Bordetella pertussis, and still less about the host-parasite relationship. What is desirable is to launch a broad program of biomedical research on all aspects of B. pertussis and to coordinate such research at a global level.

Six main topics were discussed at the Symposium: pertussis infection and disease; Bordetella pertussis, including vaccine production; biologically active components of pertussis; control testing of pertussis vaccine; pertussis vaccine experience of different countries; and prospects for improved vaccines. Each main topic was covered by one or more position papers and a number of individual papers on current research. Each position paper presents a broad review of the assigned topic and is followed by a comprehensive bibliography for further reading or documentation. All authors have responded admirably and the collection of manuscripts that have been compiled in one book should serve as an important source document for those engaged or interested in the research and management of immunization programs.

Over 50 copies of the proceedings have been distributed to scientists and EPI Program Officers in the countries of Latin America. A limited number of complimentary copies are still available and may be obtained from:

Dr. Charles R. Manclark HFB-500
Bureau of Biologics
8800 Rockville Pike
Bethesda, Maryland 20205
USA

Editorial Note:

The need for more intensive research on vaccines has also been stressed by the Global Advisory Group on the Expanded Program on Immunization which met in New Delhi from 12 to 16 November 1979.(2) Among the priority recommendations they made, the Advisory Group pleaded for the "pursuance of research on the vaccines used in the EPI, particularly to produce more stable pertussis and poliomyelitis vaccines, and to produce more potent and less reactogenic pertussis vaccines."

(1)"International Symposium on Pertussis," DHEW Publication No. (NIH) 79-1830.

(2)WHO Draft Report EPI/GAG/79/REPORT (not yet published).

Improved Stability of Freeze-dried Measles Vaccine

Tests have recently been completed at a WHO Reference Laboratory comparing the heat stability of measles vaccine produced by several manufacturers. Vaccines stored for varying intervals at 37°C and 45°C were assayed using the microfocus method, with the results being expressed as plaque forming units (PFU) per single human dose. Two indices of stability were then calculated:

1. the half-life in days, indicating for each temperature the number of days required for the vaccine titre to fall to half its original level; and

2. the number of days required for the vaccine titre to fall to the minimally acceptable level of 10^3 per single human dose.

The data obtained indicate that wide differences in the stability of freeze-dried measles vaccines currently exist. At 37°C, half-lives range from 0.62 to 12.2 days, and the time required to reduce the titre to 10^3 PFU per single human dose ranges from 2.74 to 35.8 days. The best of the vaccines tested should, in the freeze dried form, be able to withstand exposure to 37°C for 15 to 30 days and to 45°C for four to eight days and still induce immunity, although such storage conditions are hardly to be encouraged.

The use of vaccines with stability characteristics similar to those cited above is recommended in countries in which problems with the cold chain exist. Purchasers of freeze-dried measles vaccines for use in such countries are encouraged to obtain stability data as well as copies of vaccine production and control protocols from the manufacturers.

Source: Wkly Epidem Rec, 46:354,1979.

Editorial Note:

All measles vaccines provided through the EPI Revolving Fund meet or exceed the stability characteristics described in the preceding article.

Regional Self-Sufficiency in Vaccines for the EPI Program

With a view to implementing Resolution WHA30.54, approved by the World Health Assembly in 1977, and under the auspices of the Hipólito Unanue Agreement, experts from the Andean Region met in Bogotá from 6 to 9 November to consider PAHO's proposal of establishing a Regional Laboratory for the Production and Control of Vaccines for the EPI program. After long deliberations, the experts concluded that, while it was desirable to have one regional laboratory which would dispense the polio and measles vaccines imported in bulk, the national laboratories should continue to manufacture the bacterial vaccines. Rather than duplicating what is already being done at the national level, the experts recommended that the Council of Ministers should seriously consider strengthening the individual national laboratories in Guayaquil, Lima and Bogotá. They recognized that control was the weakest link in the program, and were unanimous in requesting that the Council give high priority to their recommendation. The next meeting of the experts is scheduled for 1980 in Lima.

Reported Cases of EPI Diseases in the Americas

NUMBER OF REPORTED CASES OF MEASLES, POLIOMYELITIS, TETANUS, DIPHTHERIA AND WHOOPING COUGH
FROM 1 JANUARY THROUGH THE LAST PERIOD REPORTED IN 1979
AND FOR THE COMPARABLE PERIOD IN 1978, BY COUNTRY

COUNTRY	DATE OF LAST REPORT	MEASLES		POLIOMYELITIS		TETANUS		DIPHTHERIA		WHOOPING COUGH	
		1979	1978	1979	1978	1979	1978	1979	1978	1979	1978
ARGENTINA	06 OCT	6,274	5,961	13	--	180	201	110	214	12,409	11,089
BAHAMAS	15 DEC	1,640	221	--	1	2	1	--	--	--	2
BARBADOS	27 OCT	12	25	--	--	6	9	12	19	2	14
BOLIVIA	11 AUG	1,855	...	371	...	73	...	25	...	782	...
BRAZIL	06 OCT	33,622	29,147	1,672	1,041	1,832	2,131	3,238	3,715	18,301	21,639
CANADA	01 DEC	22,233	5,292	3	7	...	...	78	111	1,996	2,353
CHILE	10 NOV	29,639	7,236	--	--	...	...	327	501	331	840
COLOMBIA	12 AUG	12,887	12,166	352	217	...	...	105	127	7,692	10,330
COSTA RICA	17 NOV	6,091	319	--	--	20	34	--	--	227	83
CUBA	20 SEP	6,843	15,602	1	--	22	29	--	1	130	1,365
DOMINICA	13 OCT	177	--	--	--	1	3	--	--	--	43
DOMINICAN REP.	29 SEP	4,732	4,486	9	68	112	74	139	258	479	791
ECUADOR	27 OCT	3,869	606	5	15	71	106	16	19	1,749	1,785
EL SALVADOR	01 DEC	10,083	1,178	1	7	98	102	--	1	768	2,186
GRENADA	17 NOV	3	197	--	--	2	3	--	--	6[a]	--[a]
GUATEMALA	17 NOV	3,193	1,564	23	32	59	59	4	5	1,340	773
GUYANA	20 OCT	226	11	--	--	20	16	5[b]	1	...	...
HAITI	17 NOV	257	235	--	27	59	85	5	7	187	164
HONDURAS	03 NOV	4,303	4,425	224	18	43	...	2	--	2,079	1,405
JAMAICA	29 SEP	81	801	--	...	10	27	6	12	35	...
MEXICO	22 SEP	28,617	2,555	539	393	...	271	...	8	3,671	2,651
NICARAGUA	17 NOV	631	143	--	1	--	13	8	--	188	567
PANAMA	03 NOV	4,340	1,196	--	--	30	23	--	--	572	77
PARAGUAY	10 NOV	1,199	496	14	35	155	133	3	3	705	579
PERU	03 NOV	3,472	1,366	50	46	142	136	105	86	7,758	3,174
SURINAME	01 SEP	...	...	1	--	...	...	1	3	...	...
TRINIDAD & TOBAGO	17 NOV	377	729	--	--	17	9	1	--	42[c]	22[c]
U.S.A.	29 DEC	13,448	26,915	26[d]	4[e]	75	85	65	76	1,394	2,065
URUGUAY	30 SEP	1,050	438	1	--	10	19	--	--	169	938
VENEZUELA	24 NOV	19,673	15,060	51	16	...	...	2	27	1,604	3,982

[a] Figures for whooping cough up to 01 Sep.
[b] Suspected cases
[c] Figures for whooping cough up to 10 Nov.
[d] 22 paralytic cases
[e] Figure for 1978 up to 15 Dec.
-- No cases
... Figures not available

Newsbriefs

Second International Course on Tissue Culture Titration of Viral Vaccines

As announced in Vol. I, No. 3 of the EPI Newsletter (September 1979), the second International Course on Tissue Culture Titration of Viral Vaccines was held at the Malbrán Institute in Buenos Aires, Argentina, from 12 to 30 November 1979. A total of 12 participants from the following countries joined the three-week course: Argentina (4), Brazil (2), Costa Rica (1), Honduras (1), Jamaica (1), Mexico (1), Panama (1), and Venezuela (1). Because of their importance in Latin America, vaccines against two anthropozoonotic diseases were added to the course: rabies and 17D yellow fever. The titration of yellow fever vaccine was carried out both on mice and VERO cell line tissue culture. CEPANZO's contribution in conducting the module on rabies was greatly appreciated by all participants.

Scientists in charge of the control of veterinary biologics also participated in this course. As a follow-up activity, and in view of the interest shown by all course participants, it is planned to continue the training of those who attended the course in Mexico last year as well as those who were at the course in Buenos Aires, by having them participate in an inter-laboratory proficiency scheme for external control, to be conducted by the vaccine reference laboratories established by PAHO. Participants will have the option to join one or more of the following programs: polio, measles, yellow fever, rabies, diphtheria, tetanus, pertussis, and BCG.

Polio Epidemic in Honduras: Follow Up

Up through the 39th week of 1979 (which ended 29 September), 224 cases of polio had been reported in Honduras. During this polio epidemic, which began in late 1978, there have to date been a total of 267 cases, with 11 deaths. Seventy-one per cent of the cases have been reported in children younger than 24 months of age; 82.3% of the cases occurred in children who either were not vaccinated or had received only one dose of polio vaccine. (See EPI Newsletter Vol. I, No. 3.)

Source: Monthly Bulletin of Communicable Diseases, Sept. 79, Vol. 6. Department of Health, Epidemiological Division. Honduras.

PAHO Directing Council Resolutions on EPI

The XXVI Meeting of the Directing Council, which was held in Washington, D.C. from 26 September to 5 October 1979, approved two resolutions with regard to the Expanded Program on Immunization in the Americas.

By Resolution XXI the Directing Council resolved:

1. To approve the program objectives and policy statement presented in the progress report on the Expanded Program on Immunization in the Americas (Document CD26/10) and particularly to emphasize the importance of this program as the entry point for primary health care and extension of coverage of health services.
2. To urge Member Governments to reflect their immunization plans in their request for technical cooperation through the PAHO Programming and Evaluation System (AMPES).
3. To recommend that all Member Governments make use of the EPI Revolving Fund for the Purchase of Vaccines.
4. To recommend that the Director study the feasibility of reallocating funds and other resources from related programs to reinforce immunization activities.
5. To repeat the invitation to Member Governments and bilateral and multilateral agencies to contribute funds or their equivalent in equipment and supplies to ensure country programming on a five to ten year basis.
6. To request the Director to collaborate closely with Member Governments in applied research, health education, and training activities to strengthen program delivery at country level.
7. To request the Director to study the possibility of establishing a regional focal point for cold chain equipment development and testing in order to support these delivery systems.
8. To reiterate to the Member Countries the importance of bolstering informations systems as components of the epidemiological surveillance program in the evaluation of the impact of actions for the prevention and control of diseases in general, and of those covered by the Expanded Program on Immunization in particular.
9. To request the Director to inform the Directing Council regularly on the progress made in the Program, particularly in regard to its coverage of children under one year of age and its impact on disease incidence.

Resolution XVI authorized the Director to transfer $800,000 from the Holding Account to the Revolving Fund for the Expanded Program on Immunization.

The EPI Newsletter is a periodic publication prepared by the Expanded Program on Immunization (EPI) of the Pan American Health Organization, Regional Office for the Americas of WHO. Its purpose is to create a flow of ideas and information concerning immunization programs in the Region in order to facilitate a sharing of problems and solutions.

References to commercial products and the publication of signed articles in this newsletter do not constitute endorsement by PAHO/WHO, nor do they necessarily represent the policy of the Organization.

Editor: Dr. C. A. de Quadros
Assistant Editor: Mr. P. Carrasco
Editorial Assistant: Ms. K. Fitch

Contributors to this issue:

Dr. G. Tawil, PAHO
Dr. C. H. Tigre, PAHO

Expanded Program on Immunization
Pan American Health Organization
525 23rd St., N. W.
Washington, D.C. 20037
U.S.A.