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Accumulation of Measles Susceptibles: The Experiences of the English-speaking Caribbean, Suriname, and Paraguay

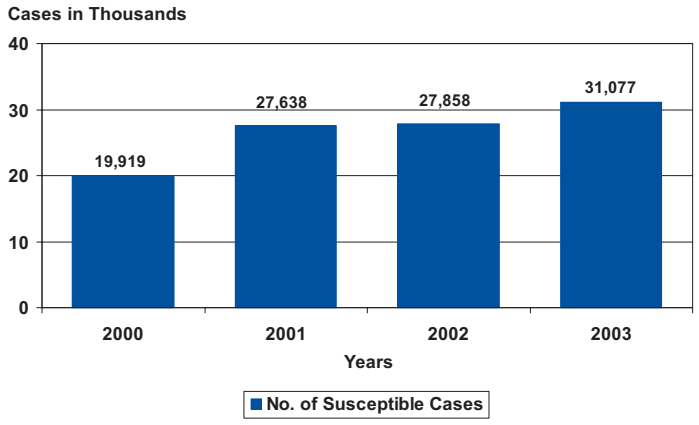
PAHO's Strategy for Measles Elimination

In 1994, the countries of the Region of the Americas established the goal of measles elimination from the Western Hemisphere. Subsequently, significant progress has been achieved, mainly through the intensification of routine vaccination, mass vaccination campaigns, and enhanced surveillance.

The Pan American Health Organization (PAHO) recommended a three-pronged vaccination strategy. Its driving principle is to provide a second opportunity for measles vaccination, not only to children who did not seroconvert at the time of the first administration (primary vaccine failure), but most importantly, to vaccinate children who had never received any measles vaccination. To rapidly interrupt measles transmission, PAHO recommends a one-time nationwide campaign targeting children aged 9 months to 14 years ("**catch-up**"). After this campaign, the interruption of measles virus transmission is maintained by keeping high population immunity through routine vaccination of children aged ≥1 year ("**keep-up**"), and through periodic mass vaccination campaigns every 3-4 years ("**follow-up**") targeting children aged 1-4 years, regardless of their previous vaccination status.

To determine the interval between "follow-up" campaigns, the countries can calculate the accumulation of susceptibles based on vaccination coverage and the estimated vaccine failure. The next campaign should be scheduled when the number of children susceptible to measles in the population approximates the number of children in an average birth cohort. This article illustrates such calculations and the consequent decision-making process in the cases of the English-speaking Caribbean, Suriname, and Paraguay.

Figure 1. Accumulation of Measles Susceptibles English-speaking Caribbean and Suriname, 2000-2003



Source: **Ministry of Health Reports to EPI/CAREC**

English-speaking Caribbean and Suriname

The Ministers of Health of the Caribbean Community (CARICOM) decided to eliminate measles from the sub-region in 1988. In 1991, all countries except Bermuda conducted "catch-up" campaigns. Since then, "follow-up" campaigns have been conducted by countries in 1995/1997 and 2000/2001. Routine use of a second dose of measles-containing vaccine has been implemented in most of the countries and/or territories.

All countries conducted mass vaccination campaigns between 1995 and 1997, except for Bermuda and the Cayman Islands. These two countries had introduced a second dose of measles-mumps-rubella (MMR) vaccine and considered the coverage of this second dose high; therefore, both countries

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Table 1. Measles "follow-up" campaigns in the English-speaking Caribbean and Suriname, 1995-1997

COUNTRY	YEAR OF CAMPAIGN	TARGET POP.	AGE RANGE	% POP. VACCINATED	VACCINE USED
Anguilla	1996	1,097	1-15 yrs	100	MMR
Antigua	1996	6,208	1-2 yrs	92	Measles
Bahamas	1997	100,000	4-40 yrs	80	MMR
Barbados	1996	19,054	1-5 yrs		Measles
Bermuda	No Campaign				
Belize	1995	25,258	1-5 yrs	85	Measles
British Virgin I.	1996	292	4-15 yrs	90	MR/MMR
Cayman I.	No Campaign				
Dominica	1996		2-10 yrs	≈100	MMR
Grenada	1996	10,620	1-5 yrs	81	MMR
Guyana	1996	84,839	1-5 yrs	90	MMR
Jamaica	1995-6	497,009	1-10 yrs	95	MMR
Montserrat	1996	735	4-10 yrs	100	MMR
St. Kitts	1996	3,060	1-5 yrs	100	MMR
St. Lucia	1996	9,000	2-5 yrs	85	Measles
St. Vincent	1995	10,860	1-4 yrs	84	MMR
Suriname	1997	45,000	1-6 yrs*	98	MMR
Trinidad & T.	1997	120,000	1-6 yrs	96	MMR
Turks & Caicos	1996	1,410	1-5 yrs	95	MMR

*Only data for children aged 1-6 years are presented

concluded that a vaccination campaign was not necessary. The target population for the "follow-up" campaigns was children aged 1-5 years in nine countries. Bahamas and Suriname had a much wider age range, ages 4 to 40 and ages 1 to 39, respectively. Measles vaccination coverage ranged from 80% to 100% (Table 1).

Between 2000 and 2001, countries were scheduled to implement measles "follow-up" campaigns. However, eight countries[1] were routinely administering two doses of MMR vaccine with the second dose given at 2 years or 4-5 years of age and attaining coverage levels over 84%. These countries decided to forgo a mass campaign with the commitment to target coverage for the second dose to be 90% or greater. For those countries that implemented the campaign, the target population was children aged 1-4 years. The coverage rate achieved in each country was ≥84%. Since 2001, routine annual vaccination coverage for the first dose of the measles-containing vaccine at country level has ranged between 90-100% for countries with a population <1 million inhabitants, while larger countries have had vaccination coverage levels ranging from 75 to 90% (Table 2).

[1] Anguilla, Antigua, Barbados, British Virgin Islands, Montserrat, St. Vincent, Trinidad and Tobago, Turks and Caicos.

Table 2. Measles vaccination activities in the English-speaking Caribbean and Suriname

COUNTRY	CAMPAIGN 9 MTHS-14 YRS		AVERAGE ROUTINE COVERAGE 2001-2003 (Keep Up)	2000-2001 CAMPAIGN 1-4 YRS (Follow-Up)		NEXT FOLLOW UP DUE (YEAR)
	Year	Coverage (%)		Year	Coverage (%)	
Anguilla	1991	99	97	2000	95*	2004
Antigua	1991	96	99	2000	90*	2004
Bahamas	1991	87	93	2001	Not available	2005
Barbados	1991	96	91	2001	50* [a]	2005
Bermuda [b]	Not Done		76	Not Available		--
Belize	1991	82	86	2000	95	2004
British Virgin I.	1991	88	100	2000	95*	2004
Cayman I.	1991	85	87	Routine 2nd dose = 90%		--
Dominica	1991	95	99	2000	99	2004
Grenada	1991	98	98	2000	88	2004
Guyana	1991	94	91	2000	84	2004
Jamaica	1991	71	83	2000	94	2004
Montserrat	1991	100	96	2000	99*	2004
St. Kitts	1991	98	98	2000	99	2004
St. Lucia	1991	97	93	2000	89	2004
St. Vincent	1991	97	97	2000	89*	2004
Suriname	1991	89	75	2000/1	90	2006
Trinidad & T.	1991	90	89	2001	96*	2005
Turks & Caicos	1991	81	92	2000	84*	2004

**For countries not conducting "follow-up" campaigns, coverage is calculated for routine 2nd dose*
[a] Last data available. In Barbados, the 2nd dose was initially given at 10 yrs, but this was changed to 4-5 yrs in 2000.
[b] Bermuda started using MMR vaccine in the 1970's and did not conduct a "catch-up" campaign

Accumulation of Susceptibles

In 2000, the target population for the measles vaccine (children aged 12-23 months) was 133,237, of which 125,909 were vaccinated, giving an average measles coverage of 94.5%. Consequently, the number of unvaccinated children was 7,328. In calculating the accumulation of the measles susceptible population, vaccine effectiveness of 90% was assumed. For the year 2000, the number of measles susceptibles in all the CARICOM countries was 19,919 (Figure 1). The unvaccinated populations of children aged 12-23 months for 2001, 2002, and 2003 were 16,017, 16,391, and 20,517, respectively.

The estimated number of children susceptible for measles at the end of 2003 was 106,412, corresponding to 86% of a typical birth cohort (123,176 in 2003). The next follow-up campaign should be scheduled no later than 2005. However, all countries except Suriname are now routinely administering a second dose of a measles-containing vaccine, therefore "follow-up" campaigns will not be conducted in the countries. Only Suriname is scheduled to conduct a campaign in 2006. Nevertheless, health authorities have decided that if the percentage coverage for the second dose of measles vaccine is less than 90%, countries should consider "mop-up" vaccination efforts (intensive vaccination activities, such as door-to-door vaccination, to reach underserved population segments). This will ensure coverage for the second dose will be ≥95% in children aged 1-4 years or in the age group targeted for the second dose in each country. Countries such as Jamaica, Barbados, and Guyana will have to plan and implement intensive vaccination activities to attain this goal.

Paraguay

Paraguay conducted its "catch-up" campaign in 1995, reaching 70% coverage. Its last confirmed measles case occurred in November 1998. Since 2002, routine measles vaccination using monovalent measles vaccine was replaced with one dose of MMR vaccine, administered to children aged 12 months. Thereafter, the average coverage rate through routine immunization has been 88.5%. Additionally, "follow-up" campaigns were conducted in 1998 and in 2003.

The 2003 campaign used measles-rubella (MR) vaccine and targeted children aged 1 to 4 years. Of the targeted 594,846 children, 551,933 (93%) were vaccinated. The regions that did not reach the goal of 95% coverage were identified (Concepción, San Pedro, Guairá, Caazapá, Itapúa, Paraguary, Alto Paraná y Ñeembucú) as part of "mop-up" efforts to vaccinate 42,913 children who had not been vaccinated. Rapid coverage surveys[2] to identify pockets of unvaccinated children were conducted in districts and areas served by health services reaching <95% of the target population. Efforts to vaccinate all children in neighborhoods with poor vaccination rates were then implemented.

Accumulation of Susceptibles

For 2003, 135,607 (91%) of the 148,399 children targeted were vaccinated (Table 3). Assuming a conservative estimate of 90% vaccine effectiveness, the number of one-year-old children who were susceptibles at the end of 2003 –as either the consequence of primary vaccine failure or failure to receive vaccination– was 26,353. This figure represents 18% of a typical birth cohort. Similar calculation is made for 2004, assuming a target population of 148,399 children aged 1 year and vaccination coverage of 88% (projection based on 65,094 vaccinated children as of July 2004). It is estimated that 30,867 one-year-old children will join the pool of susceptibles at the end of 2004. Adding the number of susceptibles for 2003 and 2004, the pool of susceptible children at the end of 2004 is estimated to be 39% of a typical birth cohort (Table 3). If the same pattern were to be observed in 2005 and 2006, i.e., an average of 19% of the birth cohort remaining susceptible each year, 77% of a typical birth cohort would be susceptible at the end of 2006 and 96% at the end of 2007. Using 95% vaccine effectiveness, an average 15% of a birth cohort would be accumulating each year. At the end of 2007, the number of susceptible children would be equivalent to 80% of a typical birth cohort.

Based on these results, Paraguay has scheduled its next "follow-up" campaign for 2007. However, as part of the rubella elimination initiative, a mass vaccination campaign targeting the population aged 5-39 years and using MR vaccine is planned for 2005. This campaign will not only greatly reduce rubella virus transmission, it will also greatly reduce the risk of measles virus transmission following potential importations.

Table 3. Accumulation of susceptibles in Paraguay, 2003-2007

POPULATION GROUPS		2003	2004*	END 2005	END 2006	END 2007
Population aged 1 year**	= A	148,399	148,399			
Vaccinated children		135,607 (91%)	130,591 (88%)			
Unvaccinated children	= B	12,792	17,808			
Susceptible children due to vaccine failure***	= C	13,561	13,059			
Total susceptibles per year (B+C)	= D	26,353	30,867			
% susceptibles per year (D/Ax100)		18%	21%	19%	19%	19%
Cumulative % of susceptibles		18%	39%	58%	77%	96%

* Projected from coverage data up to June 2004.
** Data for 2003-2004 from National Office of Statistics and Census, Ministry of Public Health and Social Welfare.
*** Assuming primary vaccine failure of 10%

[2] Pan American Health Organization. The Use of Rapid Coverage Monitoring: The Vaccination Campaign against Measles and Rubella in Ecuador. *EPI Newsletter* 2003; 25(2):1-3.

Comparison of Three Alternatives for Administering DTP, *Haemophilus influenzae* type b, and Hepatitis B Vaccines through the Expanded Program on Immunization (EPI) in Bolivia

Background

Bolivia introduced the vaccines against hepatitis B and infections associated with *Haemophilus influenzae* type b (Hib) in 2000 as part of its Expanded Program on Immunization (EPI). To administer these vaccines, the EPI selected a combination vaccine against diphtheria-tetanus-pertussis-Hib-hepatitis B (DTP-Hib-HepB, or pentavalent) in single-dose vials. The introduction of the new vaccines under the EPI prompted a change in the name of the program, which is now called the second-generation EPI or EPI-II.

The introduction of the new vaccines has been a success. Four years after the vaccines were first used, the program is functioning well and coverage rates are high. Data from the surveillance system show that the incidence of Hib infections has been reduced, and a new sentinel surveillance system is being set up for viral hepatitis.

With assistance from the World Bank, the Bolivian government pays for most of the vaccines used in the country. Introduction of the Hib and hepatitis B vaccines made it necessary to examine different options to ensure the program's financial sustainability and keep these vaccines continuously available under EPI-II. This article reports on the results of a study to evaluate three available alternatives (formulation/presentation) from the standpoint of costs and operational benefits.

Table 1. Comparison of Alternatives for Administering DTP, Hib and Hepatitis B Vaccines, Bolivia, 2004

Options	Formulation	Presentation	Price per dose (FOB) *
Current	Combination Vaccine DTP-Hib + Hep B	Single-dose Vials	US $3.80
Option A	Separate Vaccines DTP-Hib + Hep B	Single-dose Vials	US $3.50
Option B	Separate Vaccines DTP-Hib + Hep B	Multi-dose Vials	US $2.87

* Freight on board: For shipping to Bolivia add 15%.

Table 2. Main Assumptions Used in the Study, Bolivia 2004

	Penta[a] Option	Tetra[b] + Hep B Option (Single-dose)	Tetra[b] + Hep B Option (Multi-dose)
DPT 3 Coverage	93%	93%	93%
Number of Newborns	255,681	255,681	255,681
Vaccine Cost (With Transportation)	US $ 4.37	US $ 4.03	US $ 3.30
Wastage Rate (Vaccine)	5%	5%	30%
Syringe Cost (Single) (To Administer or Dilute)	US $0.09	US $0.09	US $0.09
Wastage Rage (Syringes)	2%	2%	2%
Number of Syringes per Dose	2	3	2
Safety Box Cost (Single)	US $1.50	US $1.50	US $1.50
Wastage Rate (Safety Boxes)	2%	2%	2%
Time required for administration	20 min.	25 min.	25 min.

[a]DTP-Hib-Hep B
[b]DTP-Hib

Methodology

The formulation and presentation of the alternative currently used in Bolivia -pentavalent vaccine in single-dose vials- was compared with two other available alternatives, as shown in Table 1.

The vaccines and formulations mentioned in all three options can be purchased through the EPI Revolving Fund for vaccine procurement, established by the Pan American Health Organization (PAHO).

Other alternatives -such as separately administering DTP-HepB vaccine and Hib vaccine as two injections rather than one, or using multi-dose vials for the pentavalent vaccine- were not included in this study because these vaccines are not available through the EPI Revolving Fund, and Bolivia would not be in a position to purchase them on its own.

Cost Estimates

1. Overview

This study followed the general recommendations for estimating the cost of introducing new vaccines in immunization programs.[1] The study used the health system perspective, which considers only the costs paid by the health system and not those incurred by other parties involved, such as families.[1] Economic costs beyond the financial costs included in a budget are also taken into account.[1]

2. **Included and Excluded Costs**

The study included costs of components that are different in the three options:

1. Vaccines;
2. Syringes (to dilute and administer the vaccine);
3. Biosafety (safety boxes);
4. Transportation;
5. Cold chain storage; and
6. Personnel.

The study did not include costs common to the three options: epidemiological surveillance, training, social mobilization, and administration.

3. **Cost Estimation Methods**

Capital costs and current costs for 2004 were used as a reference. For capital costs, an estimate of the average life of the different components and a discount rate *[or amortization]* of 10% were used.

4. **Sources of Data**

The EPI Revolving Fund price schedule was used to estimate the costs of vaccines and syringes. For biosafety, the study used the price of the safety boxes produced in Bolivia and used by EPI-II, as well as an average of two cents (US $.02) per syringe for waste disposal.[2] For transportation, the study used the prices paid by EPI-II to a firm hired to distribute the vaccines. For the cold chain, estimates were made of the volume, type of cold room, and number of refrigerators needed. Costs of cold chain equipment was obtained from a WHO document.[3] For personnel costs, the study used (1) estimates for national supervision of EPI-II to calculate the time needed to administer the vaccines simultaneously or separately, and (2) the average salary (with benefits) paid to nurses who administer the vaccines in health centers. As the costs were available in Bolivian pesos, an exchange rate of 7.87 Bolivian pesos per US $1 was used.

5. **Assumptions and Costs**

The three options assumed a coverage rate of 93% (Table 2) and 255,681 newborns. Vaccine costs also include the cost of transporting the vaccines to Bolivia (15%). A vaccine wastage rate of 5% was assumed for the single-dose vial option. This rate corresponds to current wastage rates in Bolivia for pentavalent vaccine.[4] A vaccine wastage rate of 30%, which corresponds to Bolivia's wastage rate for the DPT vaccine in multi-dose vials, was assumed for the multi-dose vial option.[4]

Total Costs of Each Alternative

1. **Combination vaccines in single-dose vials (current alternative):** Under the current alternative, annual costs are $3,281,410 for the vaccines, $133,935 for syringes, and $43,972 for biosafety (Table 3). The total annual cost is $3,490,151. Current use of the pentavalent vaccine is associated with a quarterly volume of 11.75m^3 in the cold chain at the central level and 23.10 m^3 at the health center level.
2. **Separate vaccines in single-dose vials (option A):** For the alternative based on separately administering the tetravalent vaccine and the hepatitis B vaccine using single-dose vials,

Table 3. Total Annual Costs of the Three Alternatives for Administering DTP, Hib and Hepatitis B Vaccines Bolivia 2004

	Penta[a] Option	Tetra[b] + Hep B Option (Single-dose)	Tetra[b] + Hep B Option (Multi-dose)
CAPITAL COSTS			
Cold Chain	US $ -	US $ 182,233	US $ -
Total Capital Costs	**US $ -**	**US $ 182,233**	**US $ -**
RECURRING COSTS			
Vaccines	US $ 3,281,410	US $ 3,022,351	US $ 3,363,445
Syringes	US $ 133,935	US $ 200,903	US $ 140,632
Personnel	US $ 20,673	US $ 25,841	US $ 35,070
Biosafety	US $ 43,972	US $ 65,957	US $ 46,170
Transportation and Maintenance	US $ 10,161	US $ 15,242	US $ 12,974
Total Recurring Costs	**US $ 3,490,151**	**US $ 3,330,294**	**US $ 3,598,291**
TOTAL COSTS	**US $ 3,490,151**	**US $ 3,512,528**	**US $ 3,598,291**

[a]DTP-Hib-Hep B
[b]DTP-Hib

Observations Regarding the Study

Even though introducing new vaccines under the Expanded Program on Immunization benefits public health, efforts must be made to determine the optimal alternative or option in order to support the program's financial sustainability. To achieve this end, the study compared the three available alternatives for administering the DTP, Hib, and hepatitis B vaccines under EPI-II in Bolivia.

Results suggest the following:

- Although the pentavalent vaccine is more expensive at the time of purchase, when all costs are taken into account, the option that uses the pentavalent vaccine is ultimately the most economical for EPI-II.
- The option of separately administering the tetravalent (DTP-Hib) vaccine and the hepatitis B vaccine using single-dose vials might have been considered as an option due to its lower wastage rate. However, when the higher costs of syringes, biosafety, and cold chain are taken into account, the lower wastage rate does not offset the higher costs in terms of the additional number of injections and the necessary expansion of the cold chain.
- The option of separately administering the tetravalent (DTP-Hib) vaccine and the hepatitis B vaccine in multi-dose vials might also have been considered as a viable option. Under this alternative, the price of the vaccines is more economical and no expansion of the cold chain is required. However, these advantages are offset by the increase in the wastage rate, ultimately resulting in almost equivalent costs.

annual costs were $3,022,351 for the vaccines, $200,903 for the syringes, and $25,841 for biosafety (Table 3). The total annual cost was $3,512,528. The cold chain should be expanded due to the quarterly increase in packaging volume of 32.22m^3 in the cold chain at the central level and 63.36m^3 at the health center level.

3. **Separate vaccines in multi-dose vials (option B):** For the alternative based on separately administering the tetravalent vaccine and the hepatitis B vaccine using multi-dose vials, annual costs were $3,363,445 for the vaccines, $140,632 for the syringes, and $46,170 for biosafety (Table 3). The total annual cost was $3,598,291. Under this option, the cold chain does not need to be expanded, because the volume of vaccines would be more or less identical—a quarterly volume of 11.92m^3 in the cold chain at the central level and 23.44m^3 at the health center level.

Conclusion

This study has a few limitations. First, the analysis is purely economic and does not consider the non-economic benefits of the pentavalent vaccine alternative associated with a single injection of a combination vaccine. These benefits include (1) less trauma for the child; (2) lower risk of transmitting infections (although in Bolivia the safety of injections is guaranteed by the use of disposal syringes); (3) less risk of contamination by using multi-dose vials[5]; and (4) the guarantee that the five vaccines are in fact administered, since they are administered simultaneously.

Second, option B (separately administering the DTP-Hib and the hepatitis B vaccines using multi-dose vials) implies coverage rates that are equal to those of the pentavalent vaccine. However, other studies show that the use of multi-dose vials is associated with a missed opportunity rate of between 10% and 20%.[6] Therefore, if the tetravalent vaccine and the hepatitis B vaccine were administered separately in multi-dose vials, coverage as well as costs might be lower but yield less of a public health benefit.

When all of the economic costs are taken into account, the results of the study indicate that the alternative selected by the Ministry of Health of Bolivia to administer the DTP-Hib and hepatitis B vaccines in the form of a pentavalent vaccine in single-dose vials is best. The limitations of this study highlighted above actually further reinforce the decision made by the Ministry of Health. Furthermore, this alternative has other non-economic benefits, including a lower risk of transmitting diseases, fewer missed opportunities, and higher coverage. In the future, documentation of reductions in the incidence of infections associated with *Haemophilus influenzae* type b and the hepatitis B virus will allow for further analysis of cost-effectiveness. This will facilitate the financial sustainability of the EPI in Bolivia. This model can be useful for other countries that are introducing new vaccines into their EPI programs.

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How to Reconstitute and Administer Lyophilized DTP + Hib + Hepatitis B (Pentavalent) Vaccine

IMPORTANT FACTS TO CONSIDER

Lyophilized Hib + DTP + Hepatitis B vaccine comes in two separate vials:
- One vial contains liquid DTP + Hepatitis B vaccine (used as a diluent)
- The second vial contains a lyophilized (freeze-dried) Hib vaccine

- Only use the DPT-Hep B vaccine supplied with the lyophilized Hib vaccine
- Never use water or any other diluent to reconstitute the pentavalent vaccine
- Remember that the diluent IS the DTP-Hep B component of the vaccine

RECONSTITUTING

- Make sure you have both vials and 2 ml mixing (reconstitution) syringes
- Check the expiry date of the DTP + hepatitis B vaccine:
  - Discard vaccine that is too old or has been exposed to too much heat
- Use the shake test to determine if the DTP + hepatitis B vaccine has been frozen:
  - Do not use DTP + hepatitis B vaccine that has been frozen, or that you suspect has been frozen.
- Using the mixing syringe, draw up all of the DTP + hepatitis B vaccine (used as diluent). Inject it into the vial containing the lyophilized Hib vaccine.
- Remove the mixing syringe from the vaccine vial and shake the vial, or roll it between your palms, until the powder is fully dissolved and there are no visible particles in the vial

IMPORTANT: Discard any reconstituted Pentavalent vaccine after six hours, or at the end of each session, whichever comes first

ADMINISTERING

- Use a 0.5 ml syringe and needle (disposable or auto-disable), the same type of syringe and needle as are routinely used for DTP injections
- Draw 0.5 ml of reconstituted (mixed) vaccine into the injection syringe
- Administer as an intramuscular injection (IM) in the infant's outer mid-thigh*:

* NEVER give intramuscular injections in the buttock of infants as there is risk of damaging nerves in that area. Also, it will result in a reduction in immunogenicity, especially for the Hep B component of the vaccine.

NOTE: A sterile syringe and needle must be used for each injection and discarded in a safety box. The syringe and needle used for reconstitution should not be used for giving the injection

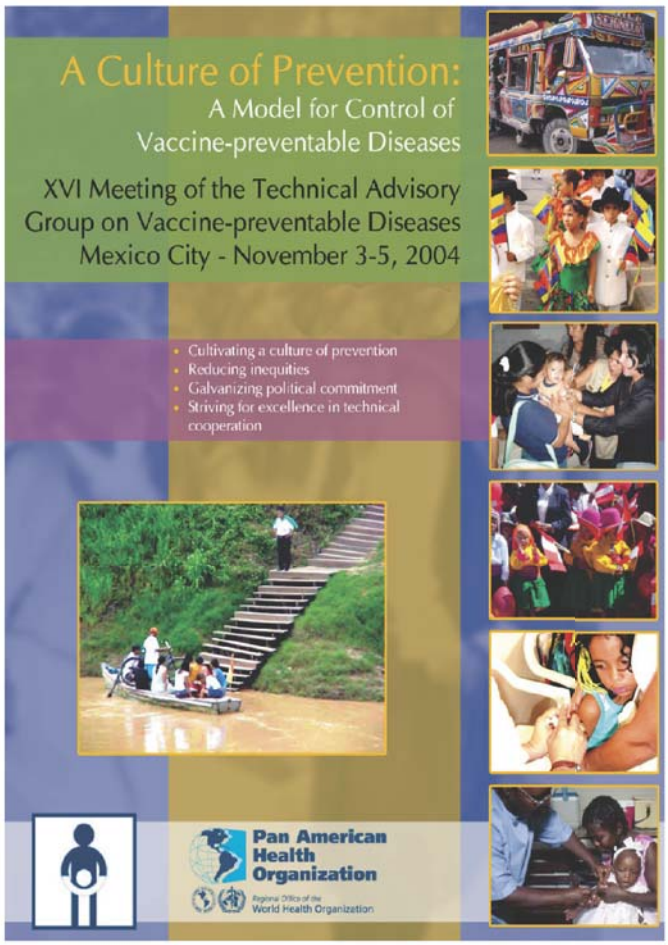
REMEMBER THE FOLLOWING PRECAUTIONS

To facilitate the adequate reconstitution of the pentavalent vaccine, always:
- Log the vaccines AND diluents in the stock inventory books
- Avoid keeping the lyophilized Hib vaccine and the DTP-Hep B vaccine (used as diluent) separated

During supervisory visits, supervisors must ensure the proper reconstitution and administration of the pentavalent vaccine by:
- Observing the reconstitution and injection process
- Ensuring the availability of the same number of lyophilized Hib and DTP-Hep B vials

Source: PATH (*Program for Appropriate Technology in Health*). Immunizing children against *Haemophilus influenzae* type b (Hib). A training module for vaccinators. Available at http://www.childrensvaccine.org/html/ip_clinical.htm#training

A Culture of Prevention:
A Model for Control of Vaccine-preventable Diseases



The next Technical Advisory Group (TAG) Meeting will take place in Mexico City on 3-5 November 2004. This meeting provides an extraordinary opportunity for assessing progress of national immunization programs because all the country representatives of the Americas will be there. More than 150 professionals will address the challenges facing today's immunization programs.

All the participants are highly committed to the control of vaccine-preventable diseases, particularly in high-risk communities where services need to be strengthened. Decision-makers will meet to explore common issues, learn about important breakthroughs in the fight against vaccine-preventable diseases, and review potential new policy approaches in reducing inequities in primary health care.

The speakers in this conference have expertise in new vaccines; elimination of polio, measles, rubella, and neonatal tetanus; surveillance of infectious diseases; laboratories; and management.

The agenda is organized with the aim of defining the vaccination challenges today. Each topic session culminates with a panel discussion by the TAG Members and the invited participants. In their final report, the TAG Members provide recommendations that will help improve immunization services in the countries.

The Pan American Health Organization (PAHO) organizes the meeting. PAHO is a technical cooperation agency that, by working with the countries of the Americas, is striving to provide excellence in immunization services to the children of the Americas.

The EPI Newsletter is published every two months, in Spanish, English and French by the Immunization Unit 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.

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