

# Immunization Newsletter

Pan American Health Organization

VOLUME XXVII, NUMBER 3 ► JUNE 2005

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## Rotavirus Update

In the Region of the Americas, rotavirus diarrhea is estimated to cause over 15,000 deaths and 75,000 hospitalizations each year. In partnership with the Canadian International Development Agency, PATH (Program for Appropriate Technology in Health), and the U.S. Centers for Disease Control and Prevention, PAHO supports the development of rotavirus surveillance throughout Latin America.

Following generic protocols proposed by WHO, this surveillance is based on a network of sentinel hospitals. Since mid-2004, surveillance has gradually been established in eleven countries --Argentina, El Salvador, Guatemala, Guyana, Honduras, Paraguay, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago, Uruguay, and Venezuela. Surveillance objectives are to characterize the proportion of diarrheal hospitalizations attributable to a rotavirus infection, serotypes of circulating rotaviruses, and the seasonality of rotavirus infections. This information will be fed into economic analyses, a critical element in the countries' decision on whether to introduce a vaccine against rotaviruses.

In the first trimester of 2005, an increase in diarrheal illnesses was observed in El Salvador and Nicaragua. In El Salvador, laboratory analyses showed that the illness increase was due to the novel circulation of the G9 P[8] serotype, as opposed to the G1 P[8] serotype seen in the previous year. In Nicaragua, an increase in deaths among children aged <2 years who had diarrhea also occurred. Preliminary results of the investigation of the Nicaraguan outbreak suggest that, while as many as 80% of diarrheal illnesses was due to a rotavirus infection, absent or inadequate medical care of children with diarrhea caused the increase in deaths.

Because of the magnitude of rotavirus disease, this issue of the Immunization Newsletter will primarily deal with countries' experience in facing the disease. Articles include an update on the rotavirus situation in Nicaragua, an overview of the implementation of a rotavirus and intussusception surveillance system in Guatemala, and a summary of the management of diarrhea with dehydration, so frequently seen with rotavirus, using the Integrated Management of Childhood Illness strategy. Current experiences in the countries are paving the way for rotavirus vaccine introduction into national immunization schedules. The PAHO Revolving Fund will definitely play a key role during that process ■

After 26 years of existence, the EPI Newsletter is changing its face and has now become the Immunization Newsletter. This new format reflects the many changes that immunization programs have experienced since the introduction of the Expanded Program on Immunization (EPI). Throughout the years, immunization programs have evolved from childhood-based programs to programs targeting the entire family.

Immunization programs in the Americas face many challenges. They need to protect EPI achievements, such as zero endemic cases of polio and measles, elimination of neonatal tetanus as a public health problem, and control of other vaccine-preventable diseases. At the same time, they must expand their programs to include new vaccines while ensuring financial sustainability and program continuity.

The Immunization Newsletter's goal is to promote technical excellence and, as stated in the first issue of the EPI Newsletter in 1979, it will continue to include information on ALL aspects of program implementation, from scientific articles on vaccine-preventable diseases and vaccines to practical matters related to the day-to-day running of an immunization program. Our Immunization Newsletter will continue to serve as a regional forum to facilitate the exchange of ideas and information concerning immunization programs in the Region. To this end, we reemphasize the importance of receiving contributions from our readers.

We hope you continue to enjoy your Newsletter!

## Nicaragua

### Nicaragua Faces Rotavirus Outbreak

Beginning in February, Epidemiological Week (EW) 5, of 2005, Nicaragua experienced an increase in reported cases of diarrhea. The increase peaked between EW 7 and 9. By EW 13, a total of 64,088 cases and 56 deaths due to diarrhea had been reported to the Ministry of Health (MINSa) through the routine surveillance system (Figure 1). The incidence and mortality rates due to diarrhea were much higher than those reported for the same period in 2004. Children aged <5 years were most affected, representing 73% of cases and 100% of deaths.

Of 253 stool samples collected from children aged <5 years brought to medical attention until EW 13, 59% tested positive for rotavirus by an immunochromatographic assay.

Outbreak control measures were implemented in order to interrupt disease transmission and to prevent additional deaths. These measures included intensifying community health education, improving environmental sanitation, and assuring timely and adequate health care for the sick.

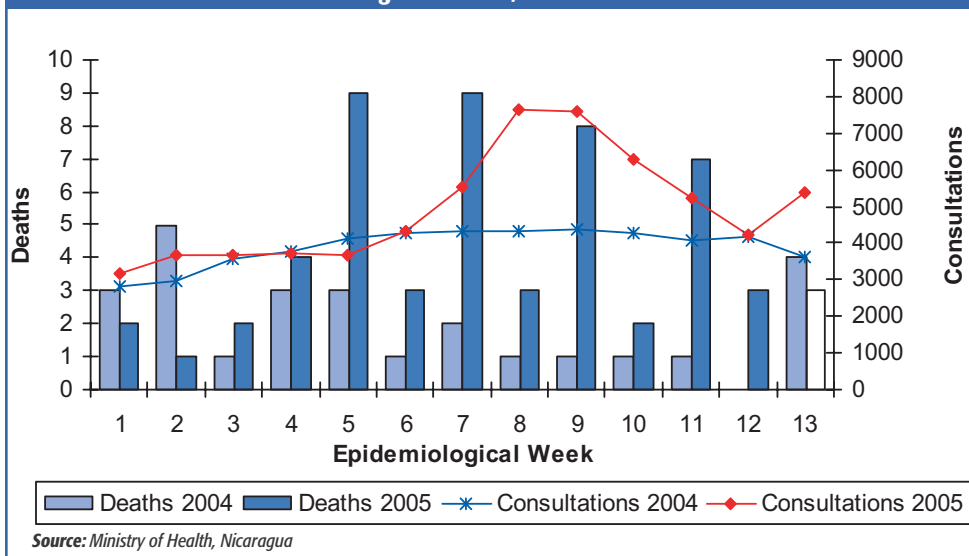
In March 2005, MINSa also formed an outbreak investigation team composed of epidemiologists from its National Epidemiology Department, from the U.S. Centers for Disease Control and

**NICARAGUA** From page 1

Prevention, and from PAHO's Country Office and Headquarters. The team was charged with identifying risk factors for severe disease through two approaches: 1) a case-control study including fatal cases and age-matched controls to determine risk factors for death, and 2) a hospital-based case series including children aged <5 years hospitalized for diarrhea to confirm etiology and determine risk factors for hospitalization.

Preliminary results from the case-control study indicated that severity of dehydration and treatment prior to hospital consultation might be associated with death due to the diarrhea. Characterization of rotavirus strains and testing for additional pathogens on samples collected as part of the hospital-based study are on-going. Currently, Nicaragua is conducting an aggressive educational campaign aimed at improving knowledge of diarrheal diseases, including recognition of warning signs of dehydration and encouraging prompt access to health care facilities in the context of community and clinical IMCI (Integrated Management of Childhood Illness) strategy ■

**Figure 1. Number of Consultations and Deaths Due to Diarrhea Among Children <5 Years Old by Epidemiological Week Nicaragua EW 1-13, 2004 and 2005**



**Editorial Comment:** As rotavirus vaccines are expected to be widely available soon, it is paramount for all countries in the Region to strengthen surveillance of diarrheal illnesses

in general and rotavirus gastroenteritis in particular, in order to better understand disease patterns and more accurately target future interventions.

**Guatemala**

## Implementing the World Health Organization's Generic Protocol for Hospital-Based Rotavirus Disease Burden Assessment: Guatemala's Experience

**Introduction**

Anticipating the availability of a rotavirus vaccine in the next several years, the World Health Organization (WHO) published the generic protocols for assessing the disease burden of rotaviral gastroenteritis among hospitalized children in 2002.<sup>1</sup> This guide was designed to help countries gather data upon which to base vaccine introduction decisions. While many countries chose to implement the WHO protocol in the form of special studies, others, such as Guatemala, decided to establish rotavirus surveillance systems through their Ministry of Health (MOH).

Guatemala's surveillance system was designed to provide the country with information on rotavirus disease burden in the hospital setting, circulating strains of the virus, and baseline data on intussusception, a condition associated with the first rotavirus vaccine (Rotashield®, a tetravalent rhesus-based rotavirus vaccine) used in the United States.<sup>2</sup> The surveillance system

was also meant to strengthen the public health infrastructure of the country, and empower the MOH to make informed decisions on rotavirus vaccine introduction, impact, and safety. This article describes the methods used in Guatemala to establish a rotavirus and intussusception surveillance system, and reports preliminary data gathered from surveillance.

**Development of the Surveillance System**

A team composed of members from the MOH, the local health department (*Area de Salud*), and the Pan American Health Organization (PAHO) was created to develop and implement a hospital-based rotavirus surveillance system. A PAHO consultant, assigned to Guatemala for a 6-month period, served as the surveillance team coordinator. Based on capacity and public accessibility, the team identified three hospitals in the capital city as possible sentinel surveillance sites: *Hospital General San Juan de Dios*, *Hospital de Pediatría del Instituto*

*Guatemalteco de Seguridad Social (IGSS, Zone 9)*, and *Hospital Roosevelt*. During a training session at Hospital Roosevelt, it became clear that many children presenting to this hospital with dehydration due to diarrhea or vomiting were transferred to the *Hospital Infantil de Infectología y Rehabilitación* for admission. Thus, this fourth hospital was later included in the surveillance system.

In July 2004, the team began holding meetings with the chiefs of pediatrics, epidemiologists, and laboratory directors at each of the first three hospitals, as well as with the National Health Laboratory (NHL). The meetings' objectives were to introduce the hospitals and NHL to the surveillance system, deliver a copy of the generic surveillance protocol, gauge participatory interest, assess the ability of hospitals to serve as surveillance sites, and garner support for the project. The *Area de Salud* was also involved. At the same time, members of the team conducted a literature search for rotavirus studies done in Guatemala and reviewed MOH data on diarrhea and rotavirus, as well as rotavirus studies

and surveillance protocols from Colombia, El Salvador, and Venezuela. With this information, the team produced a draft of the surveillance protocol for Guatemala.

The team asked each hospital to submit data to the MOH on the number of children aged <5 years admitted to the hospital for diarrhea in 2003 and 2004 and on catchment area population. Two nurses were hired to review the emergency and pediatric floor admission registries of each hospital and report on the number of children aged <5 years admitted for diarrhea in 2003. The nurses also reviewed pediatric surgery, radiology, and operating room admission books to document the number of intussusception cases in 2003. Data from Hospital Roosevelt was not available due to admission registry structure and incompleteness. Similarly, catchment area data was not available for any of the hospitals, limiting the ability to calculate incidence.

After reviewing the data available, the team decided to include every child that fit the case definition into the surveillance system, instead of doing a sampling. The team also determined that admissions to the Oral Rehydration Unit should be counted as hospital admissions. After taking into account input from several epidemiologists and pediatricians, the final case definition read as follows: *Any child aged <5 years who presents with dehydration from acute watery diarrhea and/or vomiting and is admitted to the Oral Rehydration Unit with treatment Plan B or C or to a hospital floor.*<sup>3</sup> Vomiting was included because it is the predominant symptom in the first 24 hours of rotaviral infection and, by itself, can cause dehydration and need for hospitalization, especially in infants. The case definition was also designed to be similar to that used by other countries, so data would be comparable. A separate case definition was developed for intussusception surveillance: *A child of any age, presenting with symptoms and/or signs of intussusception AND an imaging study or surgery confirming the diagnosis.*

While hospital data was being collected, the Epidemiology Department at the *Area de Salud* and the PAHO consultant began systematizing hospital logistics and data flow through meetings with nurses, epidemiologists, and laboratory technicians from each hospital. In addition, several meetings with laboratory staff from the hospitals and the NHL were held. These meetings were instrumental in efficiently implementing surveillance within existing hospital processes and logistics, and helped in gathering information to include in the operative guide. The meetings also served to educate the participants on the purpose of rotavirus and

Figure 1. Hospital-Based Rotavirus Surveillance, Guatemala

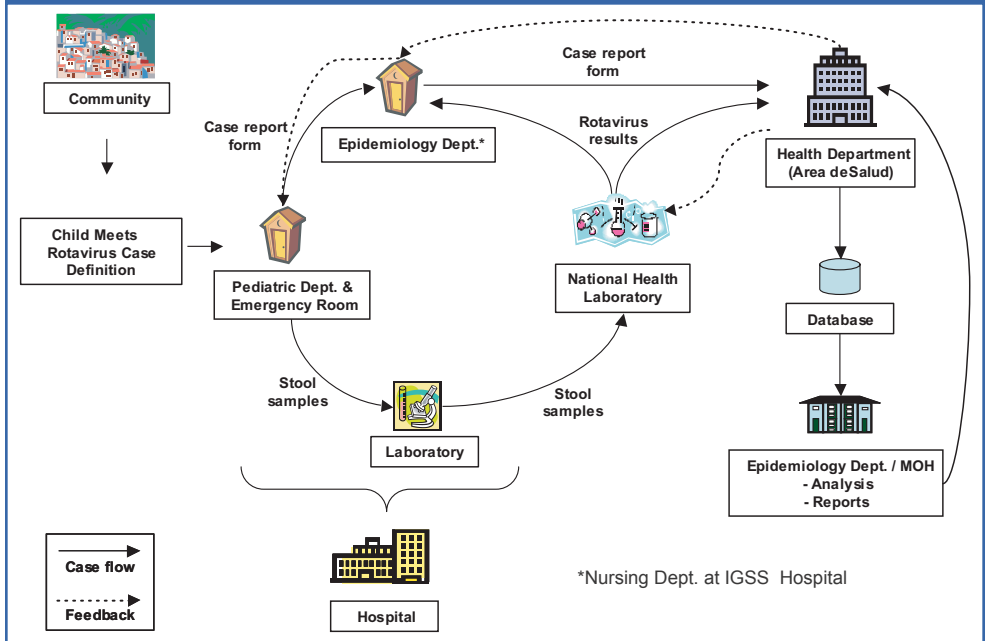
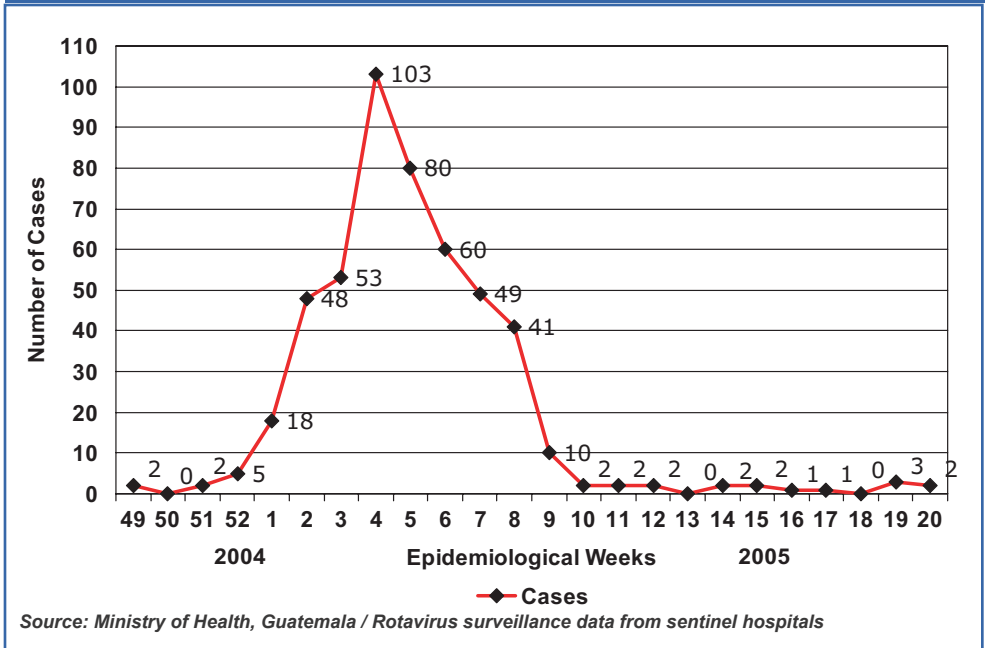


Figure 2. Confirmed Rotavirus Cases, Surveillance from Sentinel Hospitals Guatemala, 2004-2005



intussusception surveillance. Each participant was asked to write a section of the operative guide, share their thoughts on how best to implement surveillance in their institution, provide advice on who should be responsible for case report form completion and sample collection, and comment on the proposed case report forms. The team decided that the pediatric physicians and residents should be responsible for triage and answering the clinical questions on the case report form, and nursing staff would help ensure completeness of reporting, obtain the stool samples, and send them to the

hospital laboratory. This participatory approach not only helped the MOH better understand how to implement surveillance but also helped the hospital teams take ownership of the surveillance system.

Considering the experience of El Salvador, which was conducting a rotavirus disease burden study at the time, the team decided that the hospital epidemiology departments should coordinate surveillance activities and be the focal points for case report form submission and data transfer to the *Area de Salud*. The only exception to this was the IGSS Zone 9 Hospital where it was

simpler for the Pediatric Nursing Department to coordinate surveillance activities. The *Area de Salud* took responsibility for collecting case report forms from hospital epidemiology/pediatric nursing departments on a weekly basis, entering the data into an EpiInfo database and sending a copy of the database to the MOH. The *Area de Salud* also agreed to provide the hospitals with a weekly update on rotavirus test results and monthly data analysis updates. Epidemiologists at the MOH, with support from the *Area de Salud*, took the responsibility to conduct most of the data analysis.

The NHL was selected as the laboratory for stool sample processing. Although the hospital laboratories had the equipment and training to do rotavirus ELISAs, using one laboratory would better ensure standardization of methodology. In addition, the *Area de Salud* already had a mechanism for transporting samples from the hospitals to the NHL on a weekly basis, which later was arranged to be done daily. After negotiations with high level MOH officials, the NHL was ultimately granted permission to process the stool samples. Strain identification with reverse transcriptase–polymerase chain reaction (RT-PCR), and quality control of all positive and inconclusive samples and 10% of negative samples will be done by the U.S. Centers for Disease Control and Prevention while national capacity is developed.

With basic logistics and data flow mechanisms in place (see Figure 1), hospital staff training began. With the help of *Area de Salud* epidemiologists, the surveillance team leader gave over 15 training sessions for nurses, residents and laboratory technicians. The presentations explained the case definitions, reviewed the case report form, and discussed how to obtain and transport stool samples. The chief of pediatrics and head of pediatric nursing were both given a CD with training materials so they could continue training new staff. The residents and nurses were assigned surveillance responsibilities and provided with instructions where to submit case report forms.

After five months of collaborative work between the MOH, *Area de Salud*, NHL, participating hospitals, and PAHO, the rotavirus and intussusception surveillance system began functioning in three hospitals on 9 December 2004 and in the Roosevelt Hospital on 14 December 2004. The surveillance protocol, case report forms, and operative guide were published and distributed to all participating hospitals. The MOH took over responsibility for system monitoring and evaluation. PAHO reiterated its commitment to support the MOH

in monitoring activities and expansion of the surveillance system.

### Preliminary Results

Surveillance data shows the percent of hospitalized cases of diarrhea and/or vomiting in children aged <5 years that are rotavirus positive and the percentage of rotavirus positive cases per month beginning in December 2004 (Table 1). A sharp rise and subsequent decline in the total number of admissions for diarrhea and/or vomiting occurred (Figure 2). As of 23 May, no case of intussusception has been identified.

The number of rotavirus cases for December does not include the total number of hospitalizations for diarrhea and/or vomiting during the month, given that surveillance began on 9 December in 3 hospitals and in the fourth hospital on 14 December. The proportion of rotavirus positive cases seen in December, however, should not be affected. Thus far, surveillance data represents rotavirus activity during the dry season (low temperatures), which may explain

this article, Ministries of Health throughout the Americas can gather hospital-based rotavirus disease burden data and prepare their countries for the possible introduction of a future rotavirus vaccine.

Adapting a generic protocol to the local circumstances of the country and taking advantage of processes that are already in place are essential for successfully implementing a rotavirus surveillance system. In addition, two other strategies were very useful in quickly establishing a functioning rotavirus and intussusception surveillance system in Guatemala. These include having a full-time team coordinator to work closely with MOH, *Area de Salud*, and PAHO in all aspects of the surveillance system, and the use of a participatory approach in developing and implementing a rotavirus surveillance system, which ensures that hospital staff, participating laboratories, the MOH, and others involved take ownership of the project ■

**Table 1. Results from Rotavirus Hospital-based Surveillance by Month, Guatemala, 2004 - 2005**

Month	Laboratory Results			
	Total	Positive	%	95% Confidence Interval (CI)
December	31	17	54.8	36.0 - 72.7
January	315	276	87.6	83.4 - 91.0
February	215	174	80.9	74.7 - 85.7
TOTAL	561	467	83.2	79.8 - 86.2

Source: Ministry of Health (Rotavirus surveillance data from sentinel hospitals)

why the disease burden is higher (peak of 87.6% positivity, 95% CI: 83.4%-91.0%) than the 20-70% positivity in hospital setting estimated by WHO.<sup>4</sup>

The surveillance system was instrumental in promptly detecting a rise in total and percent positive rotavirus cases, allowing the MOH to quickly send out a nationwide rotavirus outbreak alert and promote rotavirus education and prevention activities at the local level.

Next steps include mounting a surveillance site in a different region of Guatemala.

### Conclusions

The experience of Guatemala illustrates that developing and implementing a surveillance system for rotavirus disease and intussusception in a short period of time is feasible. Such surveillance systems are useful in better understanding the local burden of rotavirus disease. Using the methodology described in

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For their contribution to this work and the data published in their report, the authors would like to thank all hospital staff (including V. Fuentes, L. Gomez de Huinac, Dr. R. Mena, D. Montejo R.N., Dr. T. Obispo, L. Pérez, and Dr. L. Roche), the MOH (Dr. E. Espinoza and Dr. C. Sánchez), the *Área de Salud* (Dr. C. Cajas, A. Guerra, A. López RN, and Dr. C. Ovando), and J. Fitzsimmons, Technical Officer, and Dr. J.K. Andrus, Chief, Immunization Unit, PAHO.

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- 1 World Health Organization. Generic Protocols for (i) hospital-based surveillance to estimate the burden of rotavirus gastroenteritis in children and (ii) a community-based survey on utilization of health care services for gastroenteritis in children. Department of Vaccines and Biologicals. WHO/

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- 2 Centers for Disease Control and Prevention. Suspension of Rotavirus Vaccine After Reports of Intussusception - United States, 1999. *MMWR*. Sept. 3, 2004; 53(34): 786-789.
- 3 Sagastume M, Cifuentes J, Cano O, Cabrera

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*Panamericana de la Salud, Noviembre 2004.*

- 4 de Zoysa I, Feachem RG. Interventions for the control of diarrhoeal disease among young children: rotavirus and cholera immunization. *Bull World Health Org.* 1985; 63:569-583.

## EPI Revolving Fund Operational Workshop Washington, D.C., 14-17 March 2005

Representatives from the Ministries of Health of Venezuela and El Salvador, from El Salvador's Social Security Institute (ISSS), and PAHO staff from both countries joined members of the EPI Revolving Fund (RF) team from various units at Regional Headquarters for a 4-day workshop on the operations of the EPI Revolving Fund for vaccine and syringe procurement. The workshop objectives included understanding and mapping the key supply chain processes of the RF, identifying performance gaps and opportunities for improvement, refining tools for managing these processes, and establishing a workshop model for replication with other countries.

The workshop highlighted the six key supply chain processes, or sets of activities (Figure 1). Participants considered each process in depth, from the perspective of national governments, PAHO, and suppliers. Process maps depicting the flow of activities for each process, and in some cases sub-processes, were presented and modified by participants to reflect a common understanding of the supply chain reality. In addition, participants identified opportunities for improvement and proposed initial performance indicators for each of the six processes.

### Demand Forecasting

Workshop participants recognized that demand forecasting accuracy has critical implications throughout the supply chain. In countries, underestimating demand may lead to shortfalls in inventory, while overestimating may make it difficult to use vaccine supplies before the expiry date. Likewise, accurate demand forecasting impacts the production decisions of suppliers. As lead times for vaccine production may be over 12 months, accurate forecasts from countries help suppliers plan production efficiently. This, in turn, ensures adequate supply and helps control prices.

Countries currently provide forecasts on an annual basis for routine and supplemental

immunization activities through the PAHO Form 173. These estimates are updated quarterly and changes are tracked at the Regional level through a rolling forecast tool. Participants expressed interest in having the rolling forecast tool made available to them to help manage changes in demand at the national level. They agreed on the goal of attaining 90-95% forecasting accuracy annually for all antigens in the RF.

### Budget, Finance, and Accounting

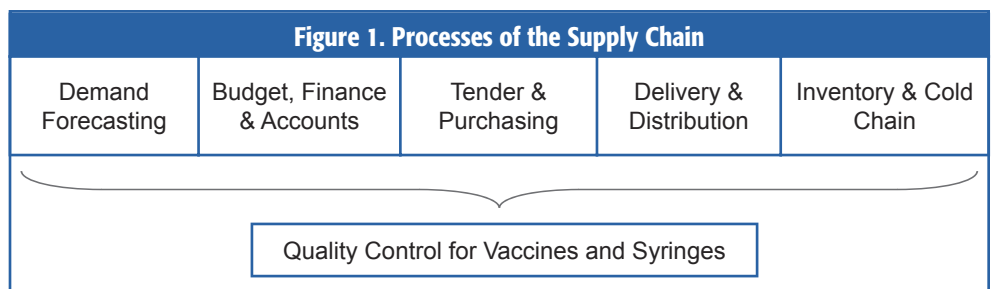
A line item for vaccine purchasing in the national budget has always been a requirement for RF participation, yet there are many other types of legislation in the Region promoting sustainability of national immunization programs. Venezuelan legislation, for example, includes a component exempting vaccines and syringes purchased by the national program from value-added tax (VAT). In El Salvador, where this exemption does not exist, VAT payments reached approximately \$1.2 million in 2004. Accordingly, El Salvador will work to incorporate a VAT exemption component in the country's new vaccine legislation.

Workshop participants also identified an opportunity for improvement in the PAHO invoice cycle. Invoices are emitted daily at PAHO, however they often arrive in countries up to 10 days after their issuance due to the distribution system. This lag delays initiation of the payment process in countries. PAHO recognized this impediment and is working toward reducing the lag. Participants proposed as a performance indicator on-time payment of invoices (net 60 days) by countries.

### Sourcing, Bidding, and Procurement

Workshop participants reviewed the bidding timeline, highlighting the need for countries and the Regional office to comply with critical deadlines throughout the process. Figure 3 (Page 8) illustrates the bidding process, showing the chronological order of activities, actors involved, decision criteria, and time allocated for each step. To meet the June deadline for vaccine and syringe requirements for submission to PAHO, participants recognized the need to begin planning in March.

Discussion revealed the need to extend forecasting from a one- to a two-year timeframe. This longer planning horizon should facilitate annual forecasting in countries by providing a



Well-designed vaccine laws contribute to both financial sustainability and programmatic continuity. Participants identified several benefits that may be derived from comprehensive vaccine laws, such as fast-track customs clearance and facilitated introduction of new and underutilized vaccines. Figure 2 shows the 25 countries in the Region that have enacted vaccine legislation.

base estimate from which to start. For suppliers, a two-year forecast from PAHO will provide the estimates required to make better-informed production decisions. As such, expanding the forecasting horizon and improving forecasting accuracy should collectively contribute to more stable supply and lower prices. Advance planning will also help facilitate the process of

introducing new technologies for countries.

## Other Revolving Fund Supply Chain Processes

Workshop sessions also covered vaccine delivery and distribution, as well as inventory and cold chain. Quality control was a recurrent theme, which pertains to all RF supply chain activities. Key recommendations from the discussions are summarized in Table 1.

## Revolving Fund Management Initiatives

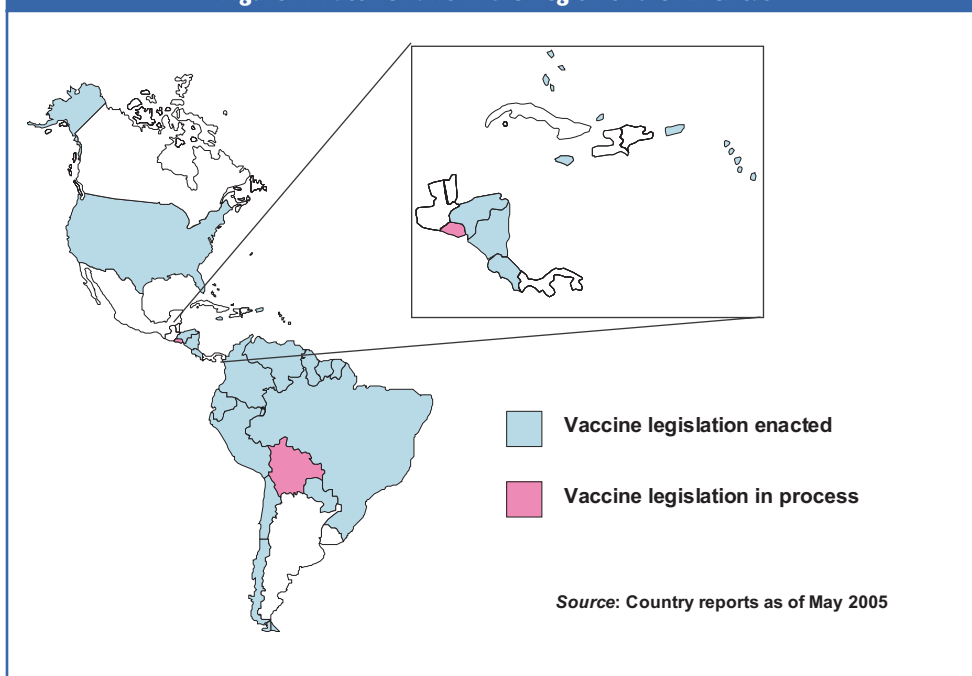
Workshop participants included the value of the RF in providing technical support, facilitating the ordering process, and working to obtain the lowest prices for quality vaccines. As countries prepare for the introduction of new technologies and new vaccines into national schedules, the RF should be ready to meet these expanded needs. In this context, workshop participants unanimously supported new supply chain initiatives, such as:

1. Development of enhanced demand forecasting tools and a comprehensive RF database:  
The rolling forecast tool and quarterly reconciliation will evolve into a new database to manage information on demand forecasting, vaccine price trends, antigen uptake, and country payment records. This database will facilitate supply chain management by countries, suppliers, and PAHO across all six supply chain processes.
2. Regional quality control plan for syringes:  
Many PAHO member countries are in the process of transitioning from disposable to auto-disable (AD) syringes. PAHO's technical units are committed to ensuring syringe quality through an updated Regional plan. Objectives of the plan are to assure availability of high quality syringes at affordable prices, develop a disposable-to-AD transition plan, facilitate Regional standardization of syringes, train a reference laboratory to conduct quality control, and develop trainings on vaccination safety. The plan aims to improve internal quality control measures and implement an assessment mechanism that ensures syringe quality compliance with international standards.
3. Supply chain assessment:  
The workshop benefited from the participation of a logistics planning expert

**Table 1. Key Supply Chain Recommendations**

Delivery and Distribution	Inventory and Cold Chain	Quality Control
<ul style="list-style-type: none"> <li>• PAHO will prepare a cost analysis comparing freight rates of sea versus air for syringes.</li> <li>• PAHO will work with suppliers to reduce order lead times.</li> <li>• PAHO will ensure that suppliers comply with timelines for transmitting shipping documents.</li> </ul>	<ul style="list-style-type: none"> <li>• Countries will consider current inventory when preparing annual demand forecasts.</li> <li>• Countries will ensure adequate cold chain installations for storage, and will adhere to storage guidelines pertaining to the quality of vaccines and syringes.</li> </ul>	<ul style="list-style-type: none"> <li>• PAHO and countries will be vigilant of supplier adherence to vaccine and syringe quality standards.</li> <li>• PAHO, together with countries, will develop a local level training model to ensure awareness of good vaccination safety practices and biohazardous waste disposal plans.</li> </ul>

**Figure 2. Vaccine Laws in the Region of the Americas**



who attended as an observer. Participants discussed the possibility of undertaking a supply chain assessment of the RF, and acknowledged the merit of an independent third party assessment. As part of the assessment, the performance indicators identified during the workshop would be further refined in the context of monitoring activities intended to meet the targets.

4. Regional cold chain plan:  
A Regional cold chain plan of action is being drafted to address gaps in the adequacy and effectiveness of current cold chain processes and equipment. Activities are being developed in the areas of training, quality control, introduction of new technologies, supervision, and coordination. The plan also outlines several

country-specific activities for which PAHO could provide technical support.

## Conclusions

The RF workshop provided an exceptional forum for exchange of experiences and process information. Country participants developed recommendations and are committed to working toward their implementation. These focused efforts will help guide the evolution of the RF by increasing its value to countries as a mechanism for providing safe and affordable vaccines to the public sector. This workshop should be replicated to continue to generate the valuable feedback and suggestions of the participants ■

# The Integrated Management of Childhood Illness (IMCI) for Diarrhea as seen with Rotavirus Disease

## ASSESS ALL SICK CHILDREN AND SICK YOUNG INFANTS.

1. For <b>ALL</b> sick children ask the mother about the child's problem	<p><b>General Danger Signs</b> →</p> <p>A child with any general danger sign needs <b>URGENT</b> attention; complete the assessment and any pre-referral treatment immediately so referral is not delayed</p>	<p><b>ASK:</b> Is the child able to drink or breastfeed?</p> <p><b>ASK</b> Does the child vomit everything?</p> <p><b>ASK:</b> Has the child had convulsions?</p> <p><b>LOOK</b> To see if the child is lethargic or unconscious</p>
2. For <b>ALL</b> sick children ask the mother about the child's problem, then <b>CHECK FOR GENERAL DANGER SIGNS</b>		
3. For <b>ALL</b> sick children ask the mother about the child's problem, check for general danger signs, and then <b>ASK about cough or difficulty breathing</b>	<p><b>ASK</b></p> <ul style="list-style-type: none"> <li>For how long?</li> <li>Is there blood in the stool?</li> </ul> <p><b>LOOK, LISTEN, FEEL</b></p> <ul style="list-style-type: none"> <li>Look at the child's general condition. Is the child:                     <ul style="list-style-type: none"> <li>→ Lethargic or unconscious?</li> <li>→ Restless or irritable?</li> </ul> </li> <li>Look for sunken eyes</li> <li>Offer the child fluid. Is the child:                     <ul style="list-style-type: none"> <li>→ Not able to drink or drinking poorly?</li> <li>→ Drinking eagerly, thirsty?</li> </ul> </li> <li>Pinch the skin of the abdomen. Does it go back:                     <ul style="list-style-type: none"> <li>→ Very slowly (longer than 2 seconds)?</li> <li>→ Slowly?</li> <li>→ Immediately?</li> </ul> </li> </ul>	
4. For <b>ALL</b> sick children ask the mother about the child's problem, check for general danger signs, ask about cough or difficulty breathing, and then <b>ASK: Does the child have diarrhea?</b>		
<b>If yes see right</b>		
5. For <b>ALL</b> sick children ask the mother about the child's problem, check for general danger signs, ask about cough or difficulty breathing, diarrhea and then ask for fever.		
6. For <b>ALL</b> sick children ask the mother about the child's problem, check for general danger signs, ask about cough or difficulty breathing, diarrhea, fever and then ask for an ear problem.		
7. For <b>ALL</b> sick children ask the mother about the child's problem, check for general danger signs, ask about cough or difficulty breathing, diarrhea, fever and ear problem. <b>CHECK</b> for malnutrition and anemia, immunization status and for other problems.		

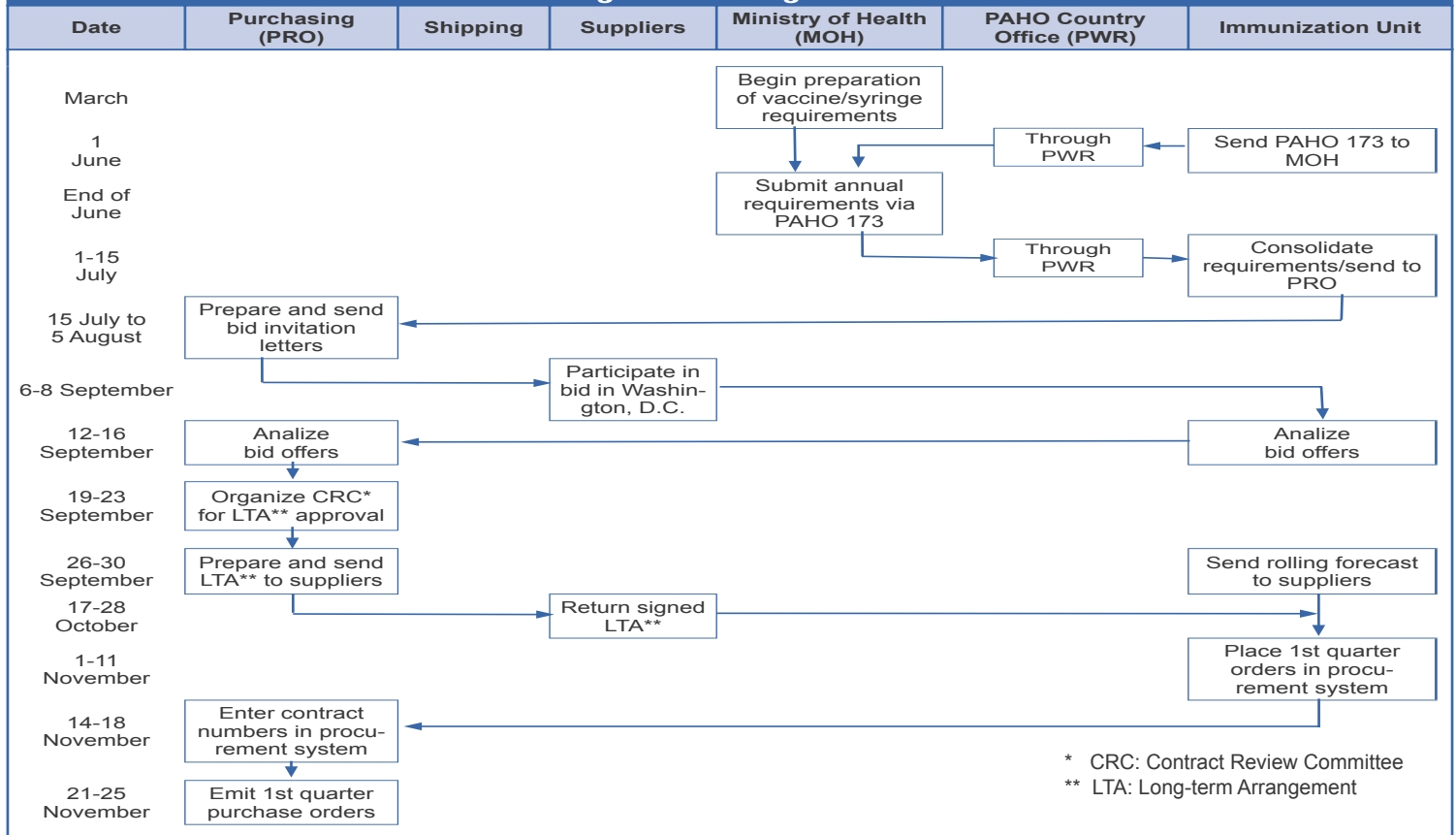
Table 1. Classification Table for Dehydration

SIGNS	CLASSIFY AS	IDENTIFY TREATMENT (Urgent pre-referral treatments are in bold print)
Two of the following signs: <ul style="list-style-type: none"> <li>Lethargic or unconscious</li> <li>Sunken eyes</li> <li>Not able to drink or drinking poorly</li> <li>Skin pinch goes back very slowly</li> </ul>	<b>SEVERE DEHYDRATION</b>	If child has no other severe classification: - Give fluid for severe dehydration (Plan C below) OR If child also has another severe classification: - Refer <b>URGENTLY</b> to hospital with mother giving frequent sips of <b>ORS*</b> on the way. Advise the mother to continue breastfeeding ▲ If child is 2 years or older and there is cholera in your area, give antibiotic for cholera ▲ Give fluid and food for some dehydration (Plan B below): - Give fluid for severe dehydration (Plan C below) ▲ If child also has a severe classification: - Refer <b>URGENTLY</b> to hospital with mother giving frequent sips of <b>ORS*</b> on the way. Advise the mother to continue breastfeeding ▲ Advise mother when to return immediately ▲ Follow-up in 5 days if not improving
Two of the following signs: <ul style="list-style-type: none"> <li>Restless, irritable</li> <li>Sunken eyes</li> <li>Drinks eagerly, thirsty</li> <li>Skin pinch goes back slowly</li> </ul>	<b>SOME DEHYDRATION</b>	Give fluid and food to treat diarrhea at home (Plan A below) Advise mother when to return immediately ▲ Follow-up in 5 days if not improving ▲ Advise mother when to return immediately ▲ Follow-up in 5 days if not improving
Not enough signs to classify as some or severe dehydration	<b>NO DEHYDRATION</b>	Give fluid and food to treat diarrhea at home (Plan A below) Advise mother when to return immediately ▲ Follow-up in 5 days if not improving

Table 2. Extra Fluid for Diarrhea and Continued Feeding

To treat a child who has diarrhea and NO DEHYDRATION	
<b>PLAN A: Treat diarrhea at home</b>	Give extra fluid: - Give more fluid as usual as soon as diarrhea starts - Breastfeed frequently and longer at each feeding - If exclusively breastfed, child should be breastfed more frequently than usual - Teach mother how to mix ORS* - Show mother how much fluid to give in addition to usual fluid intake Continue feeding Return to health center if child is not able to drink or breastfeed, becomes sicker, develops a fever. If the child has diarrhea, return if she has blood in stool or is not able to drink or breastfeed
<b>PLAN B: Treat some dehydration with ORS*</b>	To treat a child who has diarrhea and <b>SOME DEHYDRATION</b> (includes an initial treatment of 4 hours in the clinic) Determine the amount of ORS* to give during the first 4 hours Show the mother how to give ORS* solution After 4 hours, reassess the child. If <b>NO DEHYDRATION</b> , choose <b>PLAN A</b> . If the child still has <b>SOME DEHYDRATION</b> , choose <b>PLAN B</b> again
<b>PLAN C: Treat severe dehydration quickly</b>	To treat a child who has <b>SEVERE DEHYDRATION</b> Water and salts must be quickly replaced with intravenous fluids

\*ORS: Oral Rehydration Solution

**Figure 3. Bidding Process**

The *Immunization 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). The purpose of the Immunization Newsletter 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 possible solutions to those problems.

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.

ISSN 1814-6244

Volume XXVII, Number 3 • June 2005

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**Pan American  
Health  
Organization**



Regional Office of the  
World Health Organization

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