



Protecting children for a healthy tomorrow



Lessons from the
Andhra Pradesh
Partnership Project on
immunization



Commissioner Family Welfare,
Government of Andhra Pradesh



Protecting children for a healthy tomorrow

Lessons from the Andhra Pradesh
Partnership Project **on immunization**

2006



Commissioner Family Welfare,
Government of Andhra Pradesh



Acknowledgements

This report was prepared by Ms. Madhu Krishna, Consultant, on behalf of the Government of Andhra Pradesh and PATH.

Several persons provided valuable inputs and insights to the document at various stages of its development. These include Mr. C.B.S. Venkataramana, IAS, Commissioner, Family Welfare, Government of Andhra Pradesh; Dr. R. Gopalakrishna Rao, Joint Director, Child Health and Immunization, Government of Andhra Pradesh; Mr. James Cheyne, Associate Director: CVP, PATH; Dr. Satish Kaipiliyawar, Sr. Program Manager, Mr. Jeffrey O'Malley, Country Director; Mr. Vinay Kumar, Director Operations, Mr. J.V.G. Krishnamurthy, Sr. Program Manager and Mr. Bhawani Shankar Tripathy, Communications Officer, at PATH in India.

The production of this report was supported by the Bill & Melinda Gates Foundation.

Copyright © 2006, The Government of Andhra Pradesh and Program for Appropriate Technology in Health (PATH). All rights reserved. The material in this document may be freely used for educational or noncommercial purposes, provided that the material used is accompanied by an acknowledgement line.

For more information

To learn more about the project, please contact:

Satish Kaipiliyawar
Senior Program Manager, PATH, India
APMHIDC Building, 4th Floor, DM&HS Campus Sultan Bazar
Koti, Hyderabad 500095, India
Tel: +91-40-24657065/53/24600192, Fax: +91-40-24600204
Email: satish@pathindia.org

For additional copies, please contact:

Bhawani Shankar Tripathy
Communications Officer, PATH, India
A-9, Qutab Institutional Area, New Delhi 110016, India
Tel: +91-11-26530080 upto 88, Fax: +91-11-26530089
Email: bhawani@pathindia.org

Photographs: By PATH.

Contents

Acronyms	5
Foreword	6
Overview	7
Accomplishments	
Key strategies	
1. Project rationale	12
Why introduce hepatitis B vaccine?	
The injection-safety problem	
The need to strengthen routine immunization	
2. Baseline assessment	16
Understanding the program's structure, target population, and challenges	
Analyzing resource availability and gaps	
District profiling and local partner identification	
3. Project planning and preparation	22
Scheduling project roll-out	
Building local partnerships	
Financial mapping	
4. Reaching everyone: cold chain, vaccine distribution, and service delivery	26
Vaccine logistics	
Vaccine distribution and inventory management	
Making vaccine storage safer	
5. Teach and learn: training and performance enhancement	32
Training needs assessment	
Developing a curriculum, schedule, and materials	

Finding the right partners	
Ongoing capacity-building	
Community mobilization and awareness-raising	
6. Making injections safer	40
Innovations for injection safety	
Implementing new technologies for waste management	
Eliminating unnecessary injections	
Enabling continuous improvement and innovation	
7. Building for the future: political support, procurement, and health-system strengthening	47
Building political support	
Procurement	
Health-system strengthening	
Appendices	53
Records & Reports in Immunization	

Acronyms

AD	Autodisable
ANM	Auxiliary nurse-midwife
AP	Andhra Pradesh
DPT	Diphtheria, pertussis, and tetanus
ILR	Ice-lined refrigerator
ISDS	Immunization service-delivery support
JE	Japanese encephalitis
MPHW	Multi-purpose health worker
NGO	Nongovernmental organization
OPV	Oral polio vaccine
PHC	Primary health center
RCH	Reproductive and child health
RIMS	Routine Immunization Management System
TOT	Training of trainers
UNICEF	United Nations Children's Fund
VVM	Vaccine vial monitor
WHO	World Health Organization

Foreword

This document *Protecting children for a healthy tomorrow: lessons from the Andhra Pradesh Partnership Project* on immunization outlines briefly the activities undertaken in the five-year (2001-06) Partnership Project on immunization between the Government of Andhra Pradesh and PATH funded by the Bill & Melinda Gates Foundation, called “Child Vaccine Program” to strengthen routine immunization by introduction of Hepatitis B vaccine in all the 23 districts of the state. As may be seen from this report, the achievements are exciting, promising and substantial. The project involved the public and the private sector, NGOs, professional bodies and civil society. Not only were these partnerships very effective, but also ensured the success of the project objectives in an overwhelming manner.

Further, during the project implementation, the project managers faced several challenges along the way. This document identifies the ways to meet these challenges and lists out some important lessons learned in meeting these challenges. As ten more states in India get ready to implement similar projects as part of the second phase of the Global Alliance for Vaccines & Immunization (GAVI) initiative in India, there is a strong case for looking closely at the Andhra Pradesh experience. This document may not offer ready-made prescriptions for dealing with complex issues and problems that may arise in individual states and regions, but it does however provide a framework within which various stakeholders involved in immunization program in general can explore the issues, anticipate the problems, work together to address them, and increase the likelihood that similar projects yield good results.

The Family Welfare Department of the Government of Andhra Pradesh remains committed to continuing the work under this project to strengthen the quality and coverage of immunization of children in the state.



C.B.S. VENKATARAMANA, IAS
Commissioner of Family Welfare & Ex-Officio Principal Secretary
Government of Andhra Pradesh

Overview

The Andhra Pradesh (AP) Partnership Project on Immunization was a singular initiative implemented through a strong partnership between the Government of Andhra Pradesh and PATH, an international health nongovernmental organization (NGO). The project was funded through a combination of private foundation support and state government resources.

The project’s main objectives were to:

- Introduce hepatitis B vaccine as part of routine immunization.
- Improve injection safety.
- Strengthen routine immunization services.
- Establish a name-based registry for effective immunization status tracking.
- Provide technical support for the control of Japanese encephalitis (JE) in AP.

The scope of the project covered all 23 districts in AP—a population of 75 million people—over a five-year period.

As with any project of this magnitude, there were many trials and errors, and the project partners learned many lessons that are worth sharing. This document summarizes the practical lessons learned as well as the challenges encountered during project implementation. As several new states in India embark on similar projects as part of the second phase of the GAVI Alliance initiative in the country, the report is intended to serve as a valuable resource for program managers in new states undertaking similar projects in particular and for health service delivery programs in general.

Accomplishments

Highlights of the project’s many accomplishments include the following:

Increased immunization coverage and successful introduction of hepatitis B vaccine into routine immunization. As a result of the project activities, immunization coverage rates increased from 58 percent to 72 percent, while drop-out rates for measles vaccination decreased from 22 percent to 8 percent. Hepatitis B vaccine is now available—free of

charge—to all 1.6 million children born in AP each year. These vaccine-introduction goals were achieved in only 30 months—more than 2 years ahead of schedule.

Improved vaccine logistics, management, and supervision. The project team re-trained more than 23,000 nurses and health workers and 3,000 doctors and technicians in immunization, injection safety, record-keeping, and communication with parents. The new, outsourced supervision system resulted in improved planning, better cold-chain management, safer handling and disposal of sharps, and improved drop-out tracking.

Safe injections for all vaccinations. The team successfully introduced autodisable (AD) syringes for all nine million immunization injections given in AP each year, along with procedures and products for safe disposal of used injection equipment.

Increased financial sustainability through greater government commitment. Over the five-year project period, the government's contributions for hepatitis B vaccine and AD syringes increased at a rate of 20 percent each year. Contributions are expected to reach 100 percent in 2006.

Development of a replicable model. Other Indian states plan to implement projects like the AP project with funding from the GAVI Alliance. The Indian government has announced a national policy for the introduction of AD syringes for all immunization injections. AP's strategies for safe disposal will be adapted in each state.

Safe injection practices were adopted by using autodisable syringes.

photo : PATH - Dr. Satish Kaipilyawar



Plans for new vaccines and ongoing immunization strengthening. The partnership established a Commission on the Future of Immunization in AP. The commission included leading national and international experts who formed a strategic plan to introduce newer vaccines and continue to strengthen the universal immunization program in the state.

Key strategies

Over the course of the project, the partnership team identified and adopted several strategies at the state and district levels that were critical to the project's success. They also provide insights for future efforts.

Foster a strong partnership and high political commitment. The cornerstone of the project was a strong partnership between the Government of Andhra Pradesh and PATH. Over time, the partnership extended to include the Government of India and local and international partners. The partnership orientation allowed project personnel to experiment with innovative technologies and systems in a way that would have otherwise been difficult. In addition, the project's political and financial support allowed the team to be flexible and realign project activities to on-the-ground realities. These factors accelerated implementation over all districts in three years—much more quickly than the planned five-year schedule.

Adopt a project approach to implementation. The partnership recognized that the introduction of a new vaccine and injection technology was not time-bound and had to be successfully integrated into existing systems. Using a “project approach” to implementation was essential to success. This approach involved focusing on:

- Defined milestones and timelines.
- A dedicated team of professionals with clearly defined responsibilities.
- Defined indicators for project activities.
- Use of milestone achievements to obtain project visibility through annual events and launches.

While the partnership worked through policy and field-level discussion and support-building, they were able to resolve issues quickly because the members had a shared understanding of project deadlines and the need to meet senior leaders' expectations.

Work for broad impact—synergize with the broader health system and replicate successful interventions. The AP partnership project was instrumental in working through many of the intricate policy and technical issues surrounding procurement, vaccine schedules, disease-burden rationale, vaccine preparedness, health personnel training and support, communications, and awareness of hepatitis B disease.

By keeping a clear focus on routine immunization strengthening, the project team made a significant impact on many diverse areas of primary health care. Using the introduction of a new vaccine as a lever to strengthen all aspects of immunization service delivery, the project was successful in influencing systems and processes beyond immunization creating a positive ripple effect beyond AP. This achievement is validated by the Government of India's decision to implement similar immunization projects in 11 other states with support from the GAVI Alliance.¹

Throughout, it was important for the partnership team to maintain a consistent practice of directing resources to cover broad system-strengthening measures and not restrict itself to the objective of introducing a new vaccine or technology.

Strengthen the supply chain. The partnership focused on refurbishing and strengthening the cold chain in AP through added equipment and better use of the cold chain at various distribution points. It also worked to strengthen its management by supporting efforts related to vaccine storage, inventory management, distribution tracking, vaccine handling, and improved logistics.

Make injection safety a health priority. One of the project's most significant achievements is the marked success of its push for injection safety. Beginning with the introduction of AD syringes for all immunization, the project successfully experimented with and fostered a safe waste-disposal plan for injection devices—an issue that had hampered a policy decision for the introduction of these safe-injection



Ice-box for vaccines.

devices in the national program. The use of AD syringes is now mandatory for all government-run immunization programs in the country, and the waste-disposal policy is directly based on the findings and achievements of this project.

Start small on new innovations. One of the project's ongoing challenges has been the effort to establish a name-based registry. From the beginning, there was a lack of clear direction and consensus around what this would involve, and it became entangled with a larger information- and data-collection project being implemented in the state. While several models were tried and tested, the various parties have yet to agree on a clear direction in this area. We hope that continued work will bring success in the near future.

Monitor progress and create strong partnerships for sustainability. Integrating activities at every level with human capacity-building and institutional strengthening—along with working with local partners—became key to the project's impact. Using evaluation systems and annual events to measure and communicate progress was critical. These efforts helped maintain awareness of immunization priorities and activities. As the team met and communicated its objectives, it gradually built support among stakeholders and allowed them to share successes and to take on new challenges.

As these activities expanded, it was important to bring field implementers into the vision. The team achieved this through regular seminars, workshops, and visits. In addition, by working with local partners on key project activities (such as training, communications, and supportive supervision), the partnership team built a strong network of institutions and individuals that are committed to the cause.

¹ Government of India's proposal for support submitted to GAVI and the Vaccine Fund, Ministry of Health and Family Welfare, November 2005.

1. Project Rationale

Introducing a new vaccine into a state as large as AP entails many changes and, often, resistance. The partnership project's experience showed programs will be most successful when health staff at every level are unified in their views and messages on the issue.

Why introduce hepatitis B vaccine?

Once the project was launched—and, indeed, even to this day—there was a great amount of concern over the need for introducing hepatitis B vaccine into the routine immunization program, particularly if it took precedence over other health priorities. Program managers in other states will likely face similar questions from the public and even health experts on the rationale for this introduction.

As the project team encountered concerns over the years, it identified a range of effective responses:

- Estimates show that 1 in every 20 people in India is a carrier of hepatitis B virus. Hepatitis B is responsible for 49 to 68 percent of chronic liver diseases, 80 percent of all liver cancer, and about 1 percent of all adult deaths.
- Infants and young children are most at risk of contracting the hepatitis B virus, and they face a greater risk of becoming chronic carriers—which in turn leads to liver damage and illness during the most productive years of their lives.
- Currently, there are no effective treatments for chronic hepatitis B infection. The best approach is prevention through immunization within the first year of an infant's life.
- People often confuse hepatitis B vaccine and jaundice. Hepatitis B vaccine only prevents hepatitis B disease—not all forms of hepatitis or the related jaundice.
- The hepatitis B vaccine is about 95 percent effective against hepatitis B disease.
- Hepatitis B vaccines are very safe, and side effects are rare. The vaccine can be given safely to infants, children, and adults. To date, more than one billion doses have been administered in more than 150 countries.
- The World Health Organization (WHO) recommends that all countries make

hepatitis B vaccine a part of routine immunization.

These reasons illustrate the importance of hepatitis B vaccine in any country. Given the challenges associated with unprotected sex, infected needles, and blood transfusion, all measures that can prevent transmission of this deadly disease should be taken up as soon and as widely as possible.

The injection-safety problem

Injection safety also is not well understood. Questions about the need to introduce new injection technologies and concerns around their safe disposal and environmental impact often arise.

Increasing understanding can help alleviate these concerns. The arguments below—which can be adapted as needed for other settings—provide a standard set of responses on this issue:

- WHO estimates that at least 50 percent of all injections administered in India are unsafe and that more than 60 percent of these are unnecessary—posing serious health risks to recipients, health workers, and the public.
- Other studies have shown that, as recently as two years ago, 67 percent of injections in both the public and private sectors were unsafe.²
- Poor injection techniques, together with unsafe handling and disposal of syringes and needles, place patients, health workers, and the community at risk for contracting deadly infections including hepatitis B, hepatitis C, and HIV, the virus that causes AIDS.



photo : PATH - Dr. Satish Kaipilyawar

² “An assessment of injection practices in India.” IndiaClen Program Evaluation Network: Clinical Epidemiology Unit, All India Institute of Medical Sciences, New Delhi, 2003-2004.

- Among all unsafe practices, reusing an unsterilized needle or syringe is the most dangerous. AD syringes are self-locking, disposable syringes that cannot be used more than once—eliminating the threat of cross-infection from syringe reuse.
- AD syringes create no more waste than disposable syringes, which are commonly used in India. Used syringes can be collected in safety boxes and later buried.
- Glass syringes, though inexpensive in the long term, must be sterilized before use. The sterilization procedure is not practical in all settings, nor is there any guarantee that all health workers will ensure adequate sterilization at all times.
- Injection safety also includes eliminating unnecessary injections, such as those for vitamins or ordinary pain killers (e.g., paracetamol).
- WHO, the United Nations Children’s Fund (UNICEF), and the United Nations Population Fund recommend use of AD syringes for all national immunization programs.

The need to strengthen routine immunization

While the partnership did not face any resistance to its overall goal of strengthening routine immunization, a few vaccine opponents questioned the rationale for devoting state attention and funding to an immunization program.

Again, the team sought to increase understanding of the issue to counter these concerns. The arguments used successfully included:

- Immunization is one of the greatest medical success stories in human history. Worldwide, childhood immunization saves about three million lives each year. Nearly three million additional lives could be saved if all children received the vaccines they need. All children deserve immunization protection from serious childhood diseases such as measles, polio, mumps, diphtheria, tetanus, tuberculosis, and hepatitis B.
- Diseases spread through communities by infecting unimmunized people. For some highly infectious diseases, such as measles, even a small number of unimmunized or underimmunized people can lead to an outbreak. Immunization is the single-most important way parents can protect their children and themselves against serious disease. Children who have not been immunized are at the greatest risk.

- Immunizations are extremely safe, and medical research and ongoing review are ensuring that they become even safer and more effective. Immunizations are given to keep healthy people well, so they are held to the highest safety standards.
- Immunizations work by naturally using the power of the body’s own immune system to fight disease.
- Every rupee spent on vaccine saves more than 7 times the medical costs and 25 times the overall costs related to vaccine-preventable diseases, making immunization the most cost-effective health intervention available today.

Lessons from the project launch Information is an effective antidote

- Be prepared for misinformation, confusion, and negative reactions whenever introducing something new. People often are resistant to change. It takes time to win over skeptics, late acceptors, and the media.
- Respond consistently and clearly to all issues raised by health providers, the community, and the media.
- Emphasize the differences between hepatitis B and other forms of hepatitis as well as jaundice. Avoid implying that jaundice is caused only by hepatitis B.
- Convey that hepatitis B vaccine prevents disease later in life—but prevention can begin in infancy.
- Emphasize that WHO currently recommends that all infants receive hepatitis B vaccine.
- Reiterate global policy on the use of AD syringes and injection safety.
- Concentrate on providing high-quality reference materials, such as flyers with clear answers to frequently asked questions. Include these materials in trainings for doctors, nurses, vaccinators, and outreach workers.
- Be prepared to respond to rumors about the safety and efficacy of various types of hepatitis B vaccine. Information on quality assurance, supplier selection, and procurement can be useful in clarifying information about vaccine safety and efficacy.

2. Baseline assessment

Since India's national immunization program did not yet include hepatitis B vaccine as part of the routine immunization program, it was important to have data to support its introduction in AP.

Understanding the program's structure, target population, and challenges

The partnership team initiated a series of assessments in an effort to increase understanding of the current state of immunization in AP and key challenges (Appendix 1–7). The team also used these assessments to validate the planned project components, especially in the context of the introduction of hepatitis B vaccine.

The various assessments included:

- Disease burden study for hepatitis B.
- Cold-chain assessment.
- Information system assessment and recommendations.
- Coverage evaluation survey.
- Training needs assessment.
- Recommendations for JE control activities.

Tapping into the right information sources

Over the course of the assessment process, the team turned to known national and international experts. It soon became clear that involving local partners and district-level officials would lead to better results. Without their support, information was irregular and dated, and the team's access to facilities was limited.

Without the active support of cold-chain managers, for instance, the results of the cold-chain assessment would have been much less detailed and thorough. Obtaining a first-hand view of their resources as well as the cold-chain handlers' operational experiences helped the project emphasize both replacement of old equipment and focused training for handlers at every level.

This exercise also created a need for the team to engage more closely with field-level managers and create support for project activities. Increasing awareness of project goals and objectives through the districts became paramount. The team conducted early workshops that facilitated project implementation in the first districts. To gain the most support, information, and insight, the team learned that it needed to plan on these engagements with local project managers early on.

Turning information into action

The early assessments were key to planning the project and validating decisions about where to begin, which challenges to address, and how to best identify resource gaps. The cold-chain assessment was one of the most comprehensive—and a first in India in a decade. Most important, the assessments established a baseline against which the partnership team could monitor progress.

The coverage evaluation surveys were critical to the project design and planning process. Based on the detailed sample survey covering some 16,560 samples (approx 750 per district), the surveys provided an excellent tool for:

- District profiling: needs/gaps assessment and performance ranking.
- Target population profiling.
- Facing challenges in generating community demand.
- Determining reasons for drop-outs.
- Identifying urban versus rural patterns of health service access.

The team used the final evaluation results to rank districts on the various issues. The comparative charts were then discussed and distributed to districts, to encourage them to focus on areas that emerged as needing strengthening. At the same time, the charts also helped generate renewed interest and focus based on district performance and feedback from the communities they served. This was the first time that a comprehensive immunization survey was conducted across districts—providing, for the first time, information that district managers could use to measure progress.

Once the assessments were conducted, the project partners worked to build a shared understanding and acceptance of the findings. Given the sensitive nature of some of the information, this process had to be handled with caution. Taking a collaborative approach

and building an environment of problem-solving rather than finger-pointing helped build support and prevent antagonistic reactions.

Reflections on the study design

One important area that the studies omitted—based on a planned national survey—was a baseline assessment of injection safety. In its absence, the project lacked hard evidence that was specific to AP—or a benchmark for measuring progress in the early years. Having this information may have led to earlier policy support for the wider introduction of injection-safety devices.

The topics of organizational structure and funding flow also were not part of the early assessments. As the project gained momentum, misunderstandings of these structures led to delays and some initial missteps in start-up activities. The team had to find expedient measures—such as PATH procuring all services from outside agencies—until the procurement mechanics were made more efficient.

Over the course of the project, the team came to realize the importance of making sure that the appropriate measures of progress—the indicators—were properly selected and that information on these indicators was shared with relevant stakeholders.

Analyzing resource availability and gap

Next, the project team identified resource gaps and built them into the project plan. The partners took care to build consensus around the assessment results and ensure that all stakeholders shared a common priority list for project activities. As a result of having the validated data and reports, the partnership team was able to access funds from other sources, which increased the projects' financial security and allowed proper allocation of resources based on the needs of each district.

One of the main evaluation findings was the need for significant investments in the cold chain, especially at state, regional, and district levels. This finding helped the partnership access central government resources and allocations for the cold chain more easily than in states where such an assessment had not been made.

Another key finding was the extent to which bad terrain, long distances, and a lack of transportation funds made access to health services in many rural areas difficult. Resource

shortages at the local level compromised the quality of service delivery. In addition to financial shortages, material needs (such as petrol and medical supplies) and human resources, such as vacancies for auxiliary nurse-midwives (ANMs) and multi-purpose health workers (MPHWs), undermined programs' potential.

Based on this information, the team devised more expedient and efficient means of resource transfer. As with other immunization programs, providing for efficient transportation of vaccines from central and district stores to points of delivery included challenges that the project needed to address as a high priority. Ensuring transportation for field health workers (such as ANMs) to cover their planned outreach sessions more effectively was another challenge for which no ready solutions were available. The partnership team tried several approaches based on their experiences and local input, including:

- Providing additional resources for ANMs to use commercial transport.
- Enlisting MPHWs to accompany ANMs through difficult terrain.
- Using a system of central delivery from district centers to primary health centers

The urban challenge

The assessments illustrated the extent to which urban and rural areas face unique resource gaps. For example:

- Immunization service delivery was weaker in urban areas than in rural areas. Urban health infrastructure was not as clearly defined as in rural primary and subcenter health facilities.
- The involvement of multiple stakeholders—such as the Ministry of Urban Development, municipal corporations, and state health departments—made urban health centers less effective. More coordination was needed to improve the quality and attention to immunization services.
- The private sector did not deliver high-quality immunization services, since there were gaps in the cold chain. The team found that it would be more effective to strengthen the public health system for immunization service delivery.
- Urban immunization has special problems related to floating/ migrating populations. Effective coverage therefore remains an ongoing challenge.

(PHCs) and beyond to minimize health-worker commutes.

In the medium term, the key to raising coverage was based on a continuous search for answers and the willingness to experiment with new tactics.

District profiling and local partner identification

The detailed district profiling was one of the most important outcomes of the baseline assessment, as it allowed the project to focus activities on each district's particular needs and gaps. In addition, the profiling facilitated the early identification of local partner organizations and experts that later became vital to project implementation and roll-out. It also identified project managers who might resist new project responsibilities early in the process. All of these benefits contributed to the planning process.

The training needs assessment showed that an existing network of district-level training institutes was underutilized. Master trainers from these institutions helped facilitate an easier roll-out of the project's multi-year training and capacity-building exercise. At the state level, the assessment identified a private NGO that became a core partner in this activity.

Overcoming obstacles

Because it was difficult to find the right mix of technical and practical experience within the partner groups, PATH used its internal resources to produce the first round of training materials. Similarly, for vaccine and AD syringe procurement, the partnership project had to enlist an international partner because there was no state-level agency with appropriate practical experience. This partner's services were later used to build local capacity.

Lessons from the baseline assessment

The biggest room in the world is the room for improvement

- Baseline assessments for all project components are critical for effective project planning.
- Coverage-evaluation surveys are essential for focusing project activities and measuring progress. Teams should use whatever data are easily available and compile them to establish a baseline and focus project activities.
- Project teams may be most effective if they :
 - Involve field staff early in the evaluation process.
 - Involve them in developing monitoring indicators on which they can commit to reporting.
 - Share results carefully and use them to create peer pressure.
 - Use the analysis to determine the best starting point and the special needs of each district.
- Share assessment data with decision-makers and policymakers to facilitate needed policy decisions (e.g., on waste management or financial and in-kind resources).
- Use assessments to identify high-priority areas, such as cold-chain needs, transportation issues, and training needs specific to each district.
- Find local partners and champions early on in the process
- Be open to enlisting a wider range of support from national and international partners and use them to build capacity.
- Use the assessments to start the district planning process using standard plan formats.

3. Project planning and preparation

The project team selected the first districts for project implementation based on criteria such as existing coverage and performance levels, health priorities, and regional representation. A fundamental principle was that the early districts would be those with the capacity to absorb new responsibilities and where the partnership would have a strong chance of demonstrating success.

Scheduling project roll-out

The project team based the project phasing on three principles: start fast and small, learn early lessons, and then move on to more challenging districts. This approach proved to be highly effective.

With five years of project funding, the team initially planned to begin with six districts in the first year, add an additional six districts in the second year, and spread the remaining districts over the last three years. Fortunately, the team was able to implement its work much more quickly than anticipated—in large part because project teams gained experience, and early issues (e.g., cold-chain strengthening, training, procurement, project management) were sorted in the first two years.

Scheduling insights

The importance of starting in a cluster of districts cannot be understated. In this project, the first districts staggered their project launches, which led to inefficiencies in project implementation, particularly as it related to procurement, training, and planning vaccine logistics. Selecting a cluster of districts for project activities and then starting activities simultaneously is far more effective.

Detailed district action plans that described all pre-project activities and agreed-upon timelines were also critical to the project's effectiveness. When compiled, the plans provided the partnership with a bottoms-up master project schedule that was discussed with all stakeholders and departments. The districts needed technical assistance from the state to draw up these detailed plans; the partnership team also provided formats to each district.

Reaching agreement on a training schedule that matched each district's requirements—especially for doctors—was a significant challenge, since each district was reluctant to leave health centers without a doctor in place, and they often had several competing priorities. Delays emerging from this process, together with unforeseen delays in areas such as procurement of vaccines and syringes, emerged as obstacles early on. As the project team gained experience, they were able to resolve these problems and implement the project more smoothly.

Building local partnerships

Local partnerships were one of the key determinants of the project's success. Through the involvement of NGOs and lead health agencies, the team supported many of its efforts in the districts. Over time, it became clear that the partnership team also needed to work with district officials in this manner and find district-level champions. Their support was critical to facilitating on-the-ground activities.

The project team initially focused on finding partners for specific activities such as training and working with district managers to phase in preparatory and implementation activities. The team soon found that local partnerships were equally important once project implementation subsided and activities needed to be mainstreamed. These partners also played a key role in maintaining quality control and providing local technical support to health workers using new technologies.

In addition to partnerships with local NGOs, medical colleges, and local medical training institutions, the project team found invaluable support from local technical officers at agencies such as WHO and UNICEF, as well as recently retired technical officers from district immunization/health programs. These individuals helped sustain project activities from the second year of activity in a district—that is, once the focus shifted to introduction of project activities in new districts. Once the period of geographic expansion ended, these technical officers facilitated the hand-off process and helped the project graduate into a part of the district's normal work flow.

Partnership insights

These experiences illustrate that it is essential to work with all district health officials in a partnership mode. Similarly, it is important to identify—as soon as possible—individuals

who are strong advocates and to help strengthen their efforts and demonstrate success. At the same time, teams should be prepared for detractors. A mixed strategy of coaxing and enforcing can help ensure that project implementation stays on course.

As districts become more empowered, it is particularly important for new states to adopt this partnership orientation while working with district managers. Ultimately, the districts will determine how successful the project will be. Involving them early, giving them credit for all achievements, and supporting their distinct needs in the areas of financial, technical, and human resources will be critical for:

- Introducing new activities in specified roles.
- Building confidence in field staff.
- Sustaining project quality.

Local partners other than district health staff can also be valuable resources for providing training, ongoing supportive supervision, and technical support at the local level and for facilitating local innovations. Individuals from local NGOs and UNICEF offices, as well as WHO technical officers known in districts, are natural partners on which states should be able to rely.

Financial mapping

Financial mapping refers to the process of drawing up an analysis of financial resource availability and needs. Since most projects have well-defined timelines and resource allocations, it is important to have a detailed financial plan in place for every activity and to determine how resources will move through the system.

Project teams often ignore the issue of how the resources will flow. Unlike elaborate financial budgeting sessions, the discipline of working on financial flows and payment schedules is not as common. Over time, the partnership team learned that the absence of a clear resource flow plan and schedule can bring up unexpected impediments to project implementation, even when financial resources have been earmarked and are available to the project.

In addition, it is important to understand process flows—such as clearances, authorizations, budget schedules, and financial reporting requirements—to ensure that

finances are made available to project activities in a timely manner. Failure to develop a clear understanding of these processes can lead to faulty planning and project delays.

These are some of the hard lessons learned by the project team. It took time for the project team to assimilate these insights and establish a process for regular process review and changes.

Lessons from project planning and preparation

Well begun is half done

- Be sure to have a project phasing plan—and be prepared for it to change as early lessons are applied.
- Increase the chance of early success by starting with districts with higher chances of success and where lessons can be used.
- Recognize that project implementation in the first districts is the hardest and takes the longest to start. Implementation in subsequent districts is easier. As problems are solved, implementation can accelerate.
- Start activities in all cluster districts at once. This makes training, procurement, and logistics easier to manage.
- Develop detailed district action plans to build up a master project schedule with realistic time estimates for all project activities.
- Create a shared understanding and commitment with each district and at the state level.
- Work with districts in a partnership mode. Involve them early!
- Identify project champions and use them as advocates.
- Recognize and celebrate their achievements.
- Be prepared to handle difficult officers, critics, and detractors. Coax and then enforce to keep the project on course.
- Engage local partners who are active in immunization. UNICEF and WHO officers, local CARE and PATH staff, and other international health agency offices are natural allies.
- Actively build public-private partnerships with local NGOs in the state or district. They can provide help and increase local capacity if needed.
- Perform an early assessment of financial procedures and authorizations needed to anticipate potential disbursement delays.
- Ensure regular submission of financial reports for forecasting and timely allocation of resources.
- Find ways to tighten the process for disbursement. Fewer authorizations through policy amendments is an option.

4. Reaching everyone: cold chain, vaccine distribution, and service delivery

The availability of a safe and effective vaccine is important, but without adequate systems, it can take years for broad-scale introduction to occur. The team therefore placed great attention on integrating hepatitis B vaccine into routine systems as quickly and thoroughly as possible.

Vaccine logistics

Vaccine logistics is a critical part of any immunization program. Given the varying requirements for vaccine storage and transportation, this area is management-intensive.

Vaccine logistics require great attention to detail in transportation, storage at different points along the distribution chain, scheduling of vaccine sessions, and the availability of trained staff to deliver the services. Effectively managing these issues requires that an integrated system of equipment, people, policies, and procedures works seamlessly.

To strengthen vaccine logistics, the partnership project first focused on analyzing the most cost-effective interventions, based on the assessment findings. The assessment revealed key challenges, including:

- The cold chain needed refurbishing at various levels. Regular maintenance was a bigger problem than replacing parts. Spare parts were readily available
- Due to the lack of transportation and difficult terrain, it was hard for ANMs at the PHC and subcenter levels to cover all outreach sessions.
- There was a need for separate training on cold-chain handling and stock management to strengthen program management, especially at the PHC level.
- To prevent stock-outs and ensure vaccine effectiveness, simple vaccine- and supply-monitoring tools were needed to ensure adequate planning and integration at every level.

The team made assessments on cold-chain space at every level. The team found the need to add cold-chain space at the state, regional, and district centers; add new walk-in coolers at the state and regional centers; and furnish large ice-lined refrigerators (ILRs) (300-liter capacity) at district centers.

The assessments found that space at the PHC level was sufficient to handle the additional hepatitis B vaccine. Volume calculations were based on the current storage requirements for diphtheria, pertussis, and tetanus (DPT) vaccine, since hepatitis B vaccine was to be given on the same schedule.

The team did not account for newer vaccines and campaigns (other than polio) in the cold-chain space-requirement forecasts. New states implementing hepatitis B introduction should anticipate new vaccines that may be introduced in the next three to five years as well as disease-targeting campaigns (e.g., against measles, JE, or maternal/neonatal tetanus).

Vaccine distribution and inventory management

To improve vaccine distribution, the partnership team worked with districts to develop a more efficient system for delivering vaccines from district headquarters to PHCs. The team determined that delivery to PHCs via district vehicles would bring many improvements compared to the usual approach of PHC officers being responsible for picking up vaccine stocks. In particular, the approach allowed better management and supervision of the cold chain up to the PHC delivery point. In addition, it meant that:

- Vaccines reached the furthest points early.
- Since the last point of delivery was closest to the district center, there was no longer a need for overnight charges.
- If supplies ran out during the trip, the closest PHCs could be supplied the next day without a long distance being covered again.

The team developed a route map that reached the outermost PHCs first and worked back toward the PHCs closest to the district centers (See Figure 1 on page 28).

Furthermore, the team adopted several measures to ensure efficiency in inventory management:

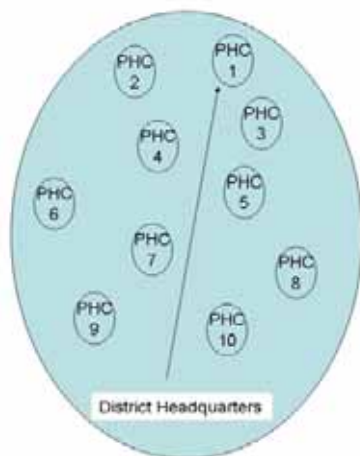


Figure 1. Route map for delivery of hepatitis B vaccine.

- Ensuring adherence to Government of India guidelines on keeping stocks for no more than three months (as opposed to six months) at a time at regional and district stores.
- Introducing new guidelines that asked PHCs to stock for no more than six weeks at a time. Coupled with efficient monthly deliveries that replenished this stock, the additional two weeks of buffer stock ensured that PHCs never ran out of stock.
- Training PHC pharmacists and/or staff nurses and making them responsible for stock management—including indenting, procuring, storing, distributing, and accounting. The new responsibilities were formalized through a re-worked job description, which was initially challenged by this group.
- To ensure that the PHCs' cold-chain problems were handled quickly, the project team made a cold-chain mechanic part of the delivery team. This person checked the equipment, carried spare parts, and made routine maintenance calls.
- To ensure reliable transportation, the team carefully calculated fuel costs based on the reworked routes and quarterly funds disbursed in advance.

Since these activities required a high level of attention, the team worked closely with district managers to introduce and support the process. For future efforts, we highly recommended that a dedicated logistics officer be part of the project team and work with districts to develop similar initiatives.

Vaccine-tracking software

Apart from the strategies described above, the partnership team also worked with a local software partner to develop a vaccine-tracking software system that allows district centers to upload information on vaccine receipt and distribution. Similarly, it allows regional and state stores to report on vaccine distribution from their stores. All of this information is available online to monitor dispatch and receipt of vaccine stocks from state to district and down to PHCs. PHC-level information is captured via forms that are sent to districts for entry into the system.

Making vaccine storage safer

The partnership team also worked to make vaccine storage safer, especially at the PHC level. The team devised new storage patterns that accounted for different vaccine storage and temperature needs in the ILRs. For example:



photo : PATH - Dr. Satish Kaipiyawar

■ Freeze-sensitive vaccines (e.g., hepatitis B, DPT, tetanus toxoid) were kept in baskets to ensure that they did not accidentally freeze if they came into contact with the ILR walls. The team also raised awareness of the dangers of accidental vaccine freezing.

■ Polythene bags were introduced to cover vaccine vials so that vaccine vial monitor (VVM) labels did not fall off due to excessive moisture.

■ ANMs were trained in “conditioning” their ice packs. To prevent any accidental freezing of vaccine vials stored next to the ice packs, ANMs were instructed to let the packs stay outside the freezer until condensation developed.

■ ANMs’ vaccine carriers for outreach sessions were fitted with custom-cut foam pads on top of the ice packs. The pads protected the vaccines inside the carriers.

■ VVM use on hepatitis B vaccines was introduced as a new policy guideline. This guideline has now become national procurement policy.

■ All PHCs were instructed to use deep freezers only for ice-pack storage; all vaccines were to be stored only in the ILRs.

■ A special training course for pharmacists and cold-chain handlers at the PHC level was introduced. This course covered storage, equipment maintenance, distribution, open-vial policy, and management of returned vaccines.

The project team introduced vaccine logistics forms for tracking distribution and receipt of vaccine stocks between districts and the PHCs. These forms are a precursor to the more elaborate Routine Immunization Management System (RIMS) software now being developed by the Government of India and introduced in 80 districts. If used effectively, this software will help new implementing states streamline inventory management and move toward a more rational “pull” system based on actual consumption of vaccine stocks.

The freezing story

The partnership found that problems with the “T series” of vaccines (DPT and tetanus toxoid), which are sensitive to freezing and lose their potency, were not being acknowledged or addressed. Using assessment data from a similar project in Indonesia, PATH brought this problem to light and presented anecdotal evidence supporting the gravity of the situation in AP. Based on this information, AP implemented policy changes and addressed the freezing of vaccines head on.

Despite these many efforts to improve vaccine logistics, distribution, and storage, challenges remain. The majority of subcenters are now well-served with vaccine supplies, but a significant number still struggle to reach their planned sessions in the face of difficult terrain and the lack of public transport. ANMs at some subcenters are left with little option but to walk long distances, which limits their ability to be reliable and efficient. For these subcenters, the partnership team worked with PHCs to develop action plans to minimize long trips and serve the subcenters with vehicles and transportation support from the PHC.

Another ongoing challenge is responsiveness to campaign-mode immunizations for targeted disease prevention and control programs. Immunization leaders must devise better ways to schedule campaigns around routine services.

Lessons about the cold chain, vaccine distribution, and service delivery

"No problem can stand the assault of sustained thinking."

—Voltaire

- Recognize the importance of the cold-chain space assessment. Teams should plan and account for new vaccines that may be introduced in coming years.
- Appoint a dedicated professional to work on logistics, support districts in formulating efficient transportation routes, and enforce adherence to inventory/stock guidelines.
- Rework PHC pharmacists’ job descriptions to manage vaccine stocks. Train them accordingly.
- Anticipate resistance to change; be prepared with strong data and rationale.
- Use information technology to streamline the monitoring of vaccine movement.
- Realize that small changes in cold-chain handling and storage—for example, the use of VVMs and rearrangement of vaccine storage in ILRs and vaccine carriers—can make a huge difference in vaccine safety and quality assurance.
- Leverage the delivery of vaccines. Send a cold-chain mechanic for regular equipment maintenance at the PHCs.
- Work with PHCs to develop action plans to cover hard-to-reach areas with adequate transportation for health workers.
- Be prepared for immunization campaigns. Work around them to sustain high-level routine immunization services.

5. Teach and learn : training and performance enhancement

Strong systems are essential—as are the knowledge and performance of the health professionals that work within them.

Training needs assessment

A training needs assessment is an important precursor to planning project training. Even a quick assessment helps identify key knowledge and skills gaps at different levels of the health system.

The partnership project's training needs assessment used a mix of methods, including:

- Review of old training materials and schedules.
- In-depth interviews with a sample set of PHC doctors, ANMs, and district medical staff.
- Review of prior state and national studies on health-worker training programs and gap analyses.
- Commissioned studies on knowledge, attitudes, and practices among health workers

Since the project's overriding principle was to use the introduction of a new vaccine to strengthen routine services, the team strived to achieve a balance between introducing the new vaccine and safe-injection technologies and refreshing skills and knowledge for basic immunization services.

Developing a curriculum and materials

The partnership team assigned the training responsibility to a small group focused on defining and developing a suitable curriculum and obtaining input from professionals with expertise in the cold chain, vaccines, epidemiology, and injection safety. The group included officials, partners from local training institutes, and international training experts from PATH. The group was intentionally small and manageable so that the process remained quick and efficient.

Based on the training needs assessment, it was clear that storage and distribution issues throughout the cold chain needed focused attention—especially since the storage of hepatitis B vaccine was completely antithetical to that of oral polio vaccine (OPV), since OPV is heat-sensitive, while hepatitis B vaccine is freeze-sensitive. The team therefore decided to organize a separate training for cold-chain handlers, distinct from that of medical officers and field health workers.

The assessment also indicated that a large number of staff at the district level had never been to a refresher training. In addition, field health workers and medical officers often lacked access to reference handbooks or manuals. The team therefore identified a new set of training materials as imperative.

The resulting materials have been a key contribution of the partnership project. Building on the introduction of hepatitis B vaccine and use of AD syringes, the materials cover key issues in simple language. The team developed separate manuals for health workers and medical officers, as well as a set of training handbooks for master trainers that includes frequently asked questions, presentations, and tips for organizing and running training sessions. These materials were later adapted for the first GAVI-funded Government of India pilot project, which was implemented in 15 cities and 32 districts. Now all states that introduce hepatitis B vaccine and new injection technologies with GAVI support will have access to the training materials developed under the project.

Finding the right partners

To work most effectively with the districts and the more than 30,000 health workers who would need to be trained, the partnership team used a tiered training format with a core group of master trainers. This helped create a sustainable base of peer trainers who could carry on training at the local level—especially in the context of medical officers.

For training of health workers, the team set out to locate suitable organizations that would have both the physical and human infrastructure required for running training programs for health workers. In addition to in-class sessions, practical sessions for skills-building were needed. Trainers who could travel to the health centers for on-the-job training were also needed. To this end, the partnership team used existing district-level training centers and other locally available venues for the training.

These trainers were brought into the project as part of the training of trainers (TOT) program. As responsibilities were handed over, quality-monitoring teams observed and supervised their initial training sessions. Over time, the partnership team found that high-quality monitoring was a critical part of the training program, even as the local institutions gained experience.

Training and learning

The team designed the training workshops to be interactive, combining both classroom sessions with practical lessons—especially as they related to upgrading skills and introducing new injection technologies, injection techniques, and monitoring of both vaccine quality and the cold chain.



photo : PATH - Dr. Satish Kaipilyawar

Evaluation was an integral part of all training sessions. The evaluation was easy to implement: simple pre- and post-test evaluations and direct observation were used to improve and focus the training sessions. Once the TOT sessions were completed, the core training teams continued to observe and monitor second rounds of training at the district and PHC levels.

Training insights

Because training materials improve with time, the team found it useful to work with drafts for several rounds of training before finalizing the content. The current materials have been used with more than 33,000 health workers and medical officers in AP. In the future, the materials may need to be revised to incorporate emerging local priorities or policy changes.

During the training process, the partnership team found that sufficient funds had not been budgeted for new rounds of training for individuals who were unable to attend the scheduled trainings or joined after a district's training had been completed. To ensure the high quality of service delivery, impromptu or one-on-one training had to be conducted by the visiting observers or supervising teams.

Ongoing capacity-building

The partnership team reinforced ongoing capacity-building through a robust system of supportive supervision. Although the health system had established supervisory visits, they only recorded staff attendance and adherence to uniform guidelines; there was little qualitative oversight. The supervisory visits were not bound under any clear guidelines or checklists.

In contrast, the partnership team embraced a supportive approach. As part of this, they devised clear checklists (Appendix 6) that, over time, became more focused, seeking clear, binary answers rather than long, qualitative responses. This approach allowed for rapid tabulation that in turn enabled quick results and grading. At the end of the day, the supervisory team could provide immediate results to district managers as well as PHC medical officers on how their facilities and services rated against defined indicators and ranges (e.g., very good, average, poor). The team left copies of the results with district managers as well as with individual PHCs, checking against the results in the next round of visits.

The visits were also used to impart new information on innovations being introduced in the project. Each visit focused on a new, particular area—a special theme, so to speak in addition to observation and checks on the

A new model: immunization service-delivery support

The partnership project devised a new model for supportive supervision: the immunization service-delivery support, or ISDS. Given the limited human resources available to immunization programs, the partnership enrolled the services of local medical colleges to conduct regular visits to support immunization service delivery. Using field-tested checklists, these teams visited PHCs and outreach sessions to rate services on six key aspects of service delivery:

- Planned session achievement.
- Program management.
- Logistics and cold-chain handling.
- Injection safety.
- Bio-waste disposal.
- AEFI.

The visiting teams graded these components using a 43-point checklist and weighed each point; the maximum possible score was 75. They then graded each center on a four-stage ordinal scale and shared the results with district managers and the partnership team for analysis and corrective action. The visiting teams also provided on-the-spot problem-solving and training as indicated by observation.

A round of ISDS is implemented every six months. The period between visits is used to improve identified weak areas during scheduled, monthly district-review meetings.

The ISDS has the dual effect of supplementing limited health staff resources and leveraging locally available immunization expertise. Medical college staff gain knowledge from field experience that they can translate into more meaningful teaching. In addition, the partnership offered them an added incentive to use results from the visits for research and field studies.

quality of regular services.

The visit checklists were also used to rank districts and PHCs with due weighing. These results were shared during monthly meetings with district managers and, in turn, with PHC medical officers.

The various levels of feedback and results-sharing created a healthy, competitive environment. By being fact-finding missions rather than fault-finding ones, the visits became a powerful means of ensuring quality control and providing ongoing capacity-building to health staff in the PHCs and districts. Collaboration with local medical colleges further supported this approach (see box on page 35). A key lesson from these efforts was that a good balance between traditional, hands-on workshop training and supportive supervision should be maintained. During project introduction, a more formal training session allows peers to work together and gain confidence with new products and technologies; however, ongoing capacity-building efforts result in long-term quality assurance and regular immunization services.

Handling resistance

When faced with difficult situations or resistance district level functionaries, the team worked with higher district-level officials to improve the situation. For example, the team shared program's results with these officials and demonstrated that the situation was not improving, and by this way the team could gain their support. Using comparative data from other districts, the officials could be motivated to contribute to the improvement of indicators for their districts.

Community mobilization and awareness-raising

The partnership focused on establishing the quality and supply of immunization services before working on raising demand and mobilizing the community. This principle was based on the recognition that, if the service is unavailable or of low quality, it is easy to lose the community's confidence—and harder to build it back.

Early steps

In some early initiatives, however, the team identified the need to direct communities to where immunization services were available. To meet this need, the team painted

immunization schedules along highways, near town squares, and close to PHCs and subcenters.

A longer-term strategy was to include patient education in the training curriculum. The interpersonal connections with health staff were the most important and fundamental community communication channel that the partnership had for reaching out to the community.

Entering the mainstream

Once the partnership was confident that high-quality services were available, it embarked on a mass media campaign to raise demand for immunization services and ensure full immunization coverage. Called *Chiru Chukkalu*, *Chiru Teekalu* (Tiny Drops, Tiny Shots), the campaign was designed to increase communities' demand for immunization through an interesting mix of media, road shows, and school programs that integrated a multi-level, multi-channel campaign. The campaign's main objectives were to:

- Increase demand for immunization among parents through information, education, and communication.
- Get target audiences—including men—actively involved in immunization.
- Introduce and familiarize the tagline *Chiru Chukkalu*, *Chiru Teekalu* to parents throughout AP.
- Use the campaign to provoke audiences to assess their children's immunization status and drive them to complete their children's full immunization.

"Entertainment-education" on radio

The partnership team ran a bilingual program on the radio for 20 weeks, setting the ground for a larger campaign. Aired in both Urdu and Telugu, the interactive campaign opened with a general introduction on the seven vaccine-preventable diseases and then followed with information on single diseases. The approach allowed for in-depth information to be subtly built into the storylines.

The program was packaged as an "education packed with entertainment" activity, with phone-in opportunities with officials of the Government of Andhra Pradesh and technical experts. To encourage more listeners and obtain feedback about the program, the team offered prize schemes.

Lessons on training and performance enhancement**Be dedicated to constant and never-ending improvement**

- Training needs assessments are important and should be quick. They help to focus training on identified knowledge/skills gaps at different levels of health staff.
- Use available documents as part of the assessment. Sample interviews can involve trainees.
- Use assessments to identify training partners with local experience.
- Plan for special training for groups such as cold-chain handlers and mechanics.
- Use the introduction of a new vaccine and safe-injection technologies to comprehensively cover immunization for all levels of health workers.
- Plan training schedules carefully through an iterative consultative process.
- Back all classroom/workshop trainings with supportive supervision and observation visits.
- Find local partners early.
- Select trainers who are willing to learn new ideas and evolve with the training program.
- Ensure that quality monitoring is integral to training implementation, even as partners gain experience.
- Design training sessions that are interactive (e.g., through real-life case presentations and role plays). Conduct a segment of the training as on-the-job sessions, preferably in real-life situations.
- Build evaluation and feedback into the process through simple pre- and post-tests. Compile the results quickly and use the data to re-direct the curriculum and training format as needed.
- Since training materials improve over time, plan to use drafts for several sessions and produce final materials once the effort is well under way.
- Budget for additional training for those who do not make the scheduled sessions.

*Continues***Lessons on training and performance enhancement—continued**

- Be prepared to provide ad hoc training as needed to supplement classroom training and ensure the continued quality of service delivery.
- Reinforce training often and regularly through supportive visits by a team from state and partner organizations.
- Use checklists, quick compilation, and results-sharing to motivate performance at district centers and PHCs. Leave copies with the centers' managers.
- Monitor progress against the results from previous visits. Applaud achievements and support lagging areas.
- For low-performance districts, share results and use comparative district data to enlist district collectors' support.
- Emphasize different themes to keep supportive supervision visits fresh and new.
- Ensure that high-quality services are available before reaching out to the community.
- Include patient-education skills as part of the health worker training.
- Focus early initiatives on using simple communication media (like wall paintings) to inform parents about immunization schedules and locations. Later, build on these efforts through broader marketing approaches that focus on simple messages about the true value of immunization.

6. Making injections safer

Increasing injection safety was a key project objective. Although the team did not carry out a separate baseline assessment specific to AP, there were enough national and international data to support a broad initiative in this area—starting with immunization services and extending to all health services over time.

Innovations for injection safety

A small sample study conducted by the project team based on observation of prevailing injection practices in Hyderabad city confirmed the need for a well-rounded injection-safety initiative. The three key areas that were addressed included:

- Unsafe injection techniques and inadequate sterilization.
- Unsafe waste disposal of used injection equipment.
- Irrational use of injections.

Available data show that use of glass syringes and the corresponding sterilization process (steam sterilizers using kerosene stoves) grossly compromise injection safety. The introduction of AD syringes for all immunization injections was a first step toward addressing this problem.

The introduction of this new injection technology provided an opportunity to retrain health workers on all aspects of injection safety, including:

- Skill-building around safe-injection techniques.
- Correct injection site.
- Safe disposal of used equipment.

The project team provided this guidance through classroom training and reinforced it through supportive supervision visits, during which injection safety was made a high priority.

Despite the partnership's efforts to raise injection safety as a major health initiative in AP, the team achieved mixed success in taking this message beyond immunization services. This underlines the importance of supportive supervision, which is required to change longstanding practices.

Implementing new technologies for waste management

The acute problem of unsafe disposal of used injection materials is closely related to poor injection techniques and unsafe equipment.

As a first step toward safe disposal of used injection equipment, the partnership team bundled the supply of safety boxes for safe disposal of syringes with the supply of syringes. When the internationally accepted standard safety boxes were used in the field, they were found to be too large for routine immunization sessions. The team therefore experimented with developing smaller safety boxes that were in keeping with field needs and easy for ANMs to carry and use. Over time, the team learned that the ANMs did not find the smaller boxes practical, and the boxes soon went into disuse. This experience highlights the importance of testing any procedures or technologies among field workers before introducing them widely. It is important to validate “accepted” products, based on specific field acceptance and ease of use.

When the project started, there was still no acceptable, unified strategy for final, safe disposal of the safety boxes and used syringes. The partnership team tried several strategies, first emphasizing making the waste material safe at the point of use. Next, the team sought to find locally acceptable means of disposing of the safety boxes in light of environmental restrictions on burning of medical waste (including injection plastic material). The team then field-

tested and later adopted a process involving the following steps:

- Providing manual needle cutters at every PHC and subcenter to make injection equipment safe at the point of use.
- Digging a concrete-lined needle pit at every PHC for safe disposal of used needles.



- Developing a safe procedure for needle-cutting and avoiding needle-stick injury through training.
- Collecting and disinfecting used plastic syringe bodies for recycling.
- Following up these procedures with regular supervision.

The strategies proven in AP were taken to the national government. Today, they are part of the new national policy on injection safety, supporting health workers at different levels of health facilities—PHCs, subcenters, and outreach sessions.

Needle cutters versus needle burners

While needle burners had been introduced into many PHCs, the devices did not solve the disposal problem. Since many PHCs have unstable power, the electric burners would often remain unused, and staff would need to resort to hand-cutting the needles or disposing of them in an unsafe manner. In addition, most of the tested burners were found to leave a dangerous needle stub even after the process; this again proved to be unsafe for waste collectors. In addition, they released harmful infectious material during the burning process, which put vaccinators at risk.



The partnership also addressed another problem: the supply of affordable needle cutters of acceptable quality. Because the identified foreign-designed needle cutters were too expensive for widespread use, the partnership team worked with another international manufacturer and brokered a deal with an indigenous manufacturer for technology transfer. The agreement was designed to ensure regular and affordable supplies. To enable the Government of India and UNICEF to continue their support of this approach, it will be important to work with more suppliers to ensure cost competitiveness and regular supply to new implementing states.

Tailored options for rural and urban health centers

Based on the partnership's experience and large-scale field-testing of many of the new technologies and practices, new implementing states may have fewer problems with which to contend. Field realities, however, may still require adjustments to prescribed products or practice.

For instance, concrete-lined disposal pits functioned well in rural areas, but the partnership had limited space with which to work in urban health centers. As a result, they had to develop an alternative: large plastic tanks like those used to store water, which were adapted with covers that allowed for safe disposal of used needles.

Recycling plastic syringe bodies

Early in the process of implementing the new strategies, the team hoped that the sale of used plastic from the syringe bodies would cover the cost of collection and destruction. Unfortunately, the costs were not covered in their entirety, although some percentage of the costs was defrayed through the sales. New states should budget for these additional costs for injection safety.

Constant training and supervision

The project team soon recognized that constant training and support to health workers are required to make needle-cutting and disposal in safety boxes a regular practice. To raise awareness among all levels of workers, the partnership worked on this issue not only with ANMs and medical officers but with all levels of PHC staff.

Eliminating unnecessary injections

The assessment identified the overuse of injections in the public health system as an important problem. Findings from the small sample study on safe injection practices in Hyderabad revealed that two out of three clients visiting health facilities received an injection. Of these injections, only a quarter were used rationally for therapeutic or preventive purposes. Nearly 75 percent of the injections administered to outpatients were unnecessary (e.g., vitamin injections, injections for mild painkillers).

The findings showed that eliminating unnecessary injections would be a critical component for injection safety. The team therefore followed a two-pronged strategy:

- Reviewing and updating AP's essential drugs list and substituting oral formulations for 350 injectables, including those for vitamin B and paracetamol. At the end of the review, injectables were reduced to a more rational list of 30 drugs.
- Raising awareness among physicians who prescribed these injectables. The team worked through medical bodies such as local chapters of the Indian Medical Association and the

Indian Academy of Pediatrics.

Enabling continuous improvement and innovation

Once the partnership started work on injection safety, it became clear that there was great need to expand the work to health system areas beyond immunization. To this end, the team worked to set up model injection centers in the state.

The rationale was that formal medical education in India does not emphasize the issue of safe injections, and injection-giving techniques are often self-taught by the nursing community. Training on safe-injection techniques, safe disposal of sharps, and rational use of injections has not been part of medical education for doctors, nurses, or paramedical staff.

The project team set up a model injection center in Hyderabad to:

- Demonstrate safe injections from the perspective of the provider, recipient, and community at large.
- Raise skills among medical, nursing, and paramedical staff around injection techniques and safe waste disposal.
- Raise awareness in the medical community about the need to rationalize and reduce the number of curative injections.
- Inform the community on the need to ensure safe injections for themselves.

The model injection center has been successful in:

- Reducing the number of curative injections in the hospital.
- Improving safe injection and disposal practices among nursing and medical staff.
- Enabling students from the hospital and elsewhere to learn safe-injection techniques and disposal methods by observation.
- Attracting learners from professional, academic, and policy institutions and making the center available to a large cross-section of public health officials.

Lessons from efforts to increase injection safety

Perseverance can bring lasting change

- Injection safety should be a high priority for improved immunization services.
- Refreshing skills in injection techniques and injection-site selection is as important as skill-building for new injection equipment (such as AD syringes).
- Teams should be vigilant about breaking longstanding unsafe injection-safety practices and techniques through regular supervision and observation.
- All health services should be involved in injection-safety initiatives. Instead of restricting efforts to the introduction of AD syringes, efforts should focus on overall improvement in injection techniques, injection site selection, rational use of injections, and safe disposal of used injection equipment.
- Teams should be open to using alternatives that work in different field situations.
- Point-of-use safe disposal is essential. Needle cutters are important, and needle-cutting should be mandatory for used injection equipment.
- States should work with the Government of India, UNICEF, and other health agencies to identify local suppliers of key injection disposal equipment. Ensuring regular supply is important. Without it, health workers will fall back on bad practices.
- Teams should budget for environmentally friendly disposal through collection and recycling of syringe plastic bodies.
- Supportive supervision can support new disposal practices among health workers. Observe, correct, and enforce!
- It is critical to review the essential drugs list and highlight unnecessary injectables that can be substituted as oral formulations.
- Collaboration is essential. Work with medical officers to enforce rational use of injections in public health facilities. Involve private physicians and medical bodies to raise awareness of the need to eliminate unnecessary injections. Use NGOs and other local partners to raise community awareness of unnecessary injections.

Continues

Lessons from efforts to increase injection safety**Perseverance can bring lasting change—*continued***

- States should consider different strategies for continuous improvement and awareness-raising around injection safety in the health sector overall.
- Model injection centers can be set up in partnership with public- and private-sector hospitals. The centers are excellent learning and demonstration venues for all levels of health staff and the community—including segments beyond the immunization sphere.
- Teams should encourage learning visits from medical staff—for example, by setting up small-scale model immunization centers in districts.
- States should incorporate injection safety messages into all community- and health-related communications. They can use taglines on circulars and brochures and designate Injection Safety Days for medical and community awareness.

7. Building for the future: political support, procurement, and health-system strengthening

The project enjoyed a unique degree of political visibility and support, particularly given the involvement of the chief minister and Mr. Bill Gates, both of whom put their personal stamp on the project. While new implementing states may not have this degree of prominence, it is nevertheless within their ability to plan events and launches that gain the public's attention and the health system's commitment to long-lasting change.

Building political support

Demonstrating and sharing early successes with political leaders helped raise political support for the initiative and immunization in general. The partnership team found this to be an effective strategy for managing a change in government, where it otherwise might have lost political support. By ensuring that the new leaders learned of the project's success and by keeping them involved in new achievements, the team was able to sustain its political support during a transition in political leadership.

Furthermore, AP leaders appeared proud of their leadership status in starting a new initiative before other states—especially the introduction of hepatitis B vaccine as part of routine immunization and AD syringes for all immunization. Leaders of the first round of implementing states will also have opportunities to convey a strong political message.

At the district level, annual events that focused on immunization and injection safety — such as Children's Day—kept political leaders engaged in the activities. Creating a broad range of supporters at the state and district levels helped keep interest and political support alive.

Newer implementing states would be well-served to consider these strategies to gain political and community support for project activities. Involving local NGOs and technical partners such as UNICEF, WHO, CARE, and PATH is useful in keeping immunization a high priority. Inviting these groups to host conferences or meetings around project-related activities also helps.

Procurement

Since immunization programs are centrally funded by the Government of India, most procurement efforts have been and will continue to be the main responsibility of the central government.

However, the partnership team faced a series of procurement challenges around vaccines, injection devices, and cold-chain equipment, especially with technical issues around procurement of hepatitis B vaccine and AD syringes—both were firsts for the state. The team sought UNICEF's assistance with this process, and key project officials devoted additional time to form a clear understanding of the detailed specification documents as well as the supplier market before starting the procurement process.

This is an important lesson for all program managers: it is important for program managers to build their procurement capacity through technical experts and collaboration with procurement agencies.

Health-system strengthening

Increasing the capacity of the broader health system is essential to improving services overall.

Use of information technology

One of the early objectives for strengthening health service delivery was that of creating a strong information technology-based system for monitoring the delivery of immunization services. This name-based registry was an ambitious program to centrally track the immunization status of every child.

Unfortunately, because the program was so ambitious, it was not implemented successfully. The effort became entangled with the state's plan to provide a computer and internet connection to every PHC and software that more comprehensively covered monitoring of all reproductive and child health (RCH) programs, including immunization.

Under a previous regime, this component was given a high priority and the hardware provision was effectively carried out. In several districts, the software was also installed, and training was imparted to PHC staff for entering data sets around the various components of the RCH and immunization programs. With a change in government,

however, this initiative came to an end, and the name-based registry was never fully implemented in any district.

In retrospect, the registry was too ambitious a program to begin with. However, to the extent it supported state coverage of PHCs with a computer system and some internet connectivity, the effort made some inroads and took them a step forward. An early lesson from this limited introduction is that systems must be strengthened and health staff must be trained to systematically record and monitor data collection if information technology-based systems are to be successfully introduced.

More focused initiatives like the partnership's vaccine logistics monitoring software were more successful. New implementing states will hopefully also introduce RIMS, since it comprehensively covers the immunization program. When implemented, it should go a long way in helping strengthen immunization programs in other states.

Create a strong immunization team

Many of the partnership's achievements were the result of the strong team it assembled for project activities. We strongly recommend that new implementing states follow a similar project-team approach to their own activities as they roll out new vaccines and injection technologies.

Using a mix of professional skills and expertise provides a strong technical core that can effectively support the districts as they implement their programs. A suggested mix includes:

- **Program manager.** Responsible for project oversight; liaison with state leaders, senior government officials, partners, and the Government of India; budget control and flows to district offices; definitions and monitoring of project milestones; adherence to implementation schedules; definitions of program guidelines; policy issues; and procurement.
- **Logistics manager.** Responsible for all vaccine logistics and support to districts around logistics issues, forecasting requirements, inventory management, training on vaccine logistics, and development of quarterly or annual district/PHC action plans.
- **Quality improvement manager.** Responsible for working on all issues related to training and supportive supervision, liaising with state and district training partners and

offices, reviewing and developing training material, planning and running TOT sessions, performing quality control of second- and third-tier training sessions, forming supportive supervision teams, liaising with local medical colleges, and collecting and reviewing feedback and incorporating it into training curricula and supportive supervision checklists.

- **Injection safety manager.** Responsible for all injection-safety measures in the state. Focal point for all initiatives for introduction of new injection technologies, waste-disposal systems/technologies, and training material on injection safety for all health systems.
- **Cold-chain manager.** Responsible for all cold-chain issues, including space and equipment assessment and maintenance and storage and distribution at state, regional, and district stores.
- **Communications manager.** Early in the project, manages the press and external communications. Later in the project, focuses on demand creation, marketing, and communicating lessons learned to the next states to adopt a new vaccine.

Building strong financial systems

The partnership also worked on strengthening financial management systems, especially for quicker financial disbursements. As a first priority, the partnership built a system for regular financial reporting and analysis of project outflows. This helped program managers see where disbursements and expenditures were lagging and where they needed to be streamlined.

A manual for financial management was developed to assist in efficient and effective management of project funds.

PATH assisted the office of the Commissioner in large procurement of items related to vaccines, immunization, injection safety, and cold chain. This assistance paved the way for quicker and efficient procurement following due diligence processes.

Lessons on building for the future **Gain support—and think big!**

- Engage political leaders by sharing quick wins and successes that they can use as part of their political campaigns.
- Encourage them to use “leadership in health initiatives” as a strong political message.
- Involve district-level political leaders through organized events around immunization activities.
- Leverage the presence of partners such as UNICEF, local offices of international NGOs, leading local NGOs, and celebrities to organize events that keep immunization and project activities visible.
- Invite agencies—such as the Indian Medical Association, Indian Academy of Pediatrics, UNICEF, WHO, or the Medical Council—to host meetings and conferences on immunization-related issues.
- Use national and international procurement experts to build the state’s capacity for procuring immunization supplies.
- Become informed buyers during the procurement process. Learn about product specifications, sellers and manufacturers, price movements, and causes.
- Learn about reputed suppliers and be as clear and transparent as possible for the procurement process. Maintain and adhere to clear and updated procurement guidelines.
- Explore local manufacturing capacity for consumables (such as needle cutters or safety boxes) to ensure regular supply and competitive prices.
- Streamline supply forecasts from districts and higher levels, so suppliers are given enough lead time to manufacture high-quality supplies. Be sensitive to production lead times and make available supply requirements as early as possible.
- Systematically plan and design data-collection processes to smoothly introduce information technology-based systems later. Redesign forms with binary answers where possible and streamline the collection of repetitive information through coding of common fields.
- Build capacity to effectively analyze and compile data reports for quick monitoring and feedback. Use available tools such as spreadsheets and charts.
- When working on information-technology initiatives, start with small, focused efforts for example, vaccine logistics or session monitoring and then integrate them into larger programs.

Records and Reports in Immunization

- Vaccine Logistic Form
- Vaccine Indent Form
- Stock Register
- Record Temperature in log book
- Temperature recording chart for ILR/Deep freezer
- Checklist - Health Center
- Checklist - Immunization Session

Vaccine Issue and Monitoring Format per each Session at PHC																			
Date	Name of the Sub Center	Vaccines										Syringes		Safety Boxes	Reasons for not conducting a session	AEFI occurrence, if any	Person carrying vaccine	Day of taking vaccines from PHC	
		BCG	OPV	DPT	Hep B	Measles	DT	TT	ADS	BCG	Reconstitution	Large	Small						
		Issued																	
	1	Consumed																	
		Returned																	
	2	Issued																	
		Consumed																	
		Returned																	
	3	Issued																	
		Consumed																	
		Returned																	
	4	Issued																	
		Consumed																	
		Returned																	
	5	Issued																	
		Consumed																	
		Returned																	

Signature of Medical Officer

Signature of CHO/HEO

Signature of Pharmacist

COMMISSIONERATE OF FAMILY WELFARE: AP:HYD
IMMUNIZATION PROGRAMME
INDENT FORM FOR VACCINES

PHC/Institution Name: Date:
For the Month:

S.No	Name of the Vaccine	One Month's Requirement (As per estimate i.e. population x Birthrate x No of doses per child + wastage factor)	Opening Balance at the beginning of the month	Receipts during the month	Total Stock (4 + 5)	Expenditure during the month	Closing Balance as on reporting date (6 - 8)	PRESENT REQUIREMENT IN DOSES (3 - 8)
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
1	DPT							
2	OPV							
3	BCG							
4	MEASLES							
5	T.T.							
6	D.T.							
7	Hep-B							

Signature:.....
Pharmacist/Staff Nurse

Signature:.....
CHO/MPHEO

Signature:.....
Medical Officer
PHC:.....

To
The District Immunization Officer,
..... District.

Column 1 to 8 are filled by Pharmacist/Staff Nurse.

CHO/MPHEO scrutinizes
and fills up Column 9

Medical Officer of PHC
Scrutinizes and signs

Note: Finalising the Monthly Indent is the Collaborative responsibility of Pharmacist, CHO/MPHEO and the MO.

STOCK REGISTER FOR VACCINES AND OTHER SUPPLIES IN IMMUNIZATION

Name of Antigen/Supplies:

[illegible]

*** MO should sign for all receipts from DM&HO, Discardings and attest on the last Saturday of the month.

* Stocks received from DM&HO should be entered Batch Wise.

TEMPERATURE RECORDING CHART
(KEEP NEAR THE EQUIPMENT FOR INSPECTION BY SUPERVISOR)

Month:.....

	DATE	Temp.in ILR (+ ° C)		Temp in DF (- ° C)		Power Failure in Hrs.		Initial	Weekly Remarks & MO's Sig	
		Morning	Evening	Morning	Evening	From	To			
DO's * Keep the units in a well ventilated room. * Keep the unit clean. * Record temp twice-daily. * Use voltage stabiliser. * Defrost the unit periodically. * Check the expiry date of vaccines. * Check the VVM stage of the vaccines. * Check if 'T' series vaccines are frozen. DONT'S *Do not open the door unless necessary. *Do not keep the food, drinking water, eatables in the units. *Do not keep the 'date expired' vaccines. *Do not keep anything on the top of the unit. * Do not expose the vaccine to direct sunlight. *Do not keep anything other than Vaccines (like drugs, reagents, chemicals etc.) in the units.	1									
	2									
	3									
	4									
	5									
	6									
	7									
	8									
	9									
	10									
	11									
	12									
	13									
	14									
	15									
	16									
	17									
	18									
	19									
	20									
	21									
	22									
	23									
	24									
	25									
	26									
	27									
	28									
	29									
	30									
	31									

	I	II	Sno	Supervisory Officer's Visit		Remarks
				Name	Designation	
Date of Defrost:			1			
Signature of Pharmacist==>						
Date of RM's Visit			2			
Signature of RM==>						

TEMPERATURE RECORDING CHART FOR ILR/DEEP FREEZER

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31

ILR

Deep Freezer

Record ILR Temperature here

Record Deep Freezer Temperature here

Note : The two bands show Ideal temperature for ILR and Deep Freezer. Any recording below or above that should be reported to the MO.
Record the power failure in Hrs. in a day



ಕರ್ನಾಟಕ ಸರ್ಕಾರ, ಬಾಲ್ಯವೈದ್ಯ

Checklist - Health Center



PATH
A PATHWAYS FOR GATE TO HEALTH

District

Division

Name of Health Center

Type of Health Center

PHC ID number

PHC Phone number

Date of visit

Population covered by center

No. of SC

Name of visiting officer

Gold chain maintenance

Program management

No.

Yes

No

1. Use of Vaccine Logistic Forms (VLF)

a) Complete ☐ b) Correct ☐ c) Consistent ☐

2. Vaccine consumption in VLF matches with FSR / counterfoil

3. Tracking system for full immunization

a) Computer ☐ b) Ticker ☐ c) None ☐

4. Availability of correct immunisation action plan

5. Display of immunization action plan

Immunization sessions in the last month

Planned

Total Conducted

Conducted as per plan

6. Fixed centers

7. Outreach

8. Total

Immunization supplies

(a) Physical stock on date of visit

(b) Stock as per stock register updated upto

(c) Issuance / Receipt after last entry in stock register

Freeze sensitive

9. DPT vaccine

10. DT vaccine

11. TT vaccine

12. Hep-B vaccine

13. JE vaccine

Heat sensitive

14. Oral polio vaccine

15. Measles vaccine

16. BCG vaccine

Others (quantities)

17. BCG diluents

18. Measles vaccine

19. AD syringes (0.5 ml)

20. AD syringes (0.1 ml)


21. Reconstitution syringes (5 ml)

22. Reconstitution syringes (2 ml)


23. Immunization cards with Hep-B boxes

24. Actual stocks of vaccine logistics matches with stock register

Yes ☐ No ☐



Checklist - Immunization session



District: **PHC ID No.:** **Date of visit:**

Name of Primary Health Center / equivalent unit:

Type of Location: ☐ Subcenter ☐ Anganwadi center ☐ Other outreach ☐ UHC ☐

Name of location:

Vaccine logistics	Yes	No
1. Collection of vaccines on same day	<input type="checkbox"/>	<input type="checkbox"/>
2. Use of vaccine carrier with 4 ice packs	<input type="checkbox"/>	<input type="checkbox"/>
3. Presence of ice in ice packs	<input type="checkbox"/>	<input type="checkbox"/>
4. Use of polythene bag for all vaccines	<input type="checkbox"/>	<input type="checkbox"/>
5. Presence of freeze-sensitive vaccines in liquid form and shake test-ok	<input type="checkbox"/>	<input type="checkbox"/>
6. VVM stage 1 or 2 on OPV	<input type="checkbox"/>	<input type="checkbox"/>
7. All vaccines available at session	<input type="checkbox"/>	<input type="checkbox"/>

Immunization practices	Yes	No
8. Use of Hep B along with DPT	<input type="checkbox"/>	<input type="checkbox"/>
9. Use of correct diluents for BCG and measles	<input type="checkbox"/>	<input type="checkbox"/>
10. Use of 0.5 ml AD syringes for all injections	<input type="checkbox"/>	<input type="checkbox"/>
11. Use of AD syringes for BCG	<input type="checkbox"/>	<input type="checkbox"/>
12. Correct selection of injection site	<input type="checkbox"/>	<input type="checkbox"/>
13. Correct injection technique	<input type="checkbox"/>	<input type="checkbox"/>
14. Correct age of administration of measles vaccine (10-12 months)	<input type="checkbox"/>	<input type="checkbox"/>
15. Absence of recapping of used syringes	<input type="checkbox"/>	<input type="checkbox"/>
16. Correct placement of syringes in PPC (needle pointing down)	<input type="checkbox"/>	<input type="checkbox"/>
17. Reconstituted BCG/Measles Vials discarded	<input type="checkbox"/>	<input type="checkbox"/>
18. Correct use of mechanical needle removers, if provided	<input type="checkbox"/>	<input type="checkbox"/>
19. Proper filling of immunization cards	<input type="checkbox"/>	<input type="checkbox"/>
20. Proper filling of counterfoils	<input type="checkbox"/>	<input type="checkbox"/>
21. Active tracking for dropouts	<input type="checkbox"/>	<input type="checkbox"/>
22. Correct use of immunization registers	<input type="checkbox"/>	<input type="checkbox"/>
23. Informing mothers correctly about next visit	<input type="checkbox"/>	<input type="checkbox"/>
24. Informing mothers on possible reactions	<input type="checkbox"/>	<input type="checkbox"/>
25. ANM inquiring about abscesses following previous immunization	<input type="checkbox"/>	<input type="checkbox"/>
26. Number of needle stick injuries during Last 3 months	<input type="text"/>	<input type="text"/>

Community mobilization	Yes	No
27. Active involvement of Anganwadi worker in immunization	<input type="checkbox"/>	<input type="checkbox"/>
28. Presence of wall painting at session site	<input type="checkbox"/>	<input type="checkbox"/>

This document summarizes the practical lessons learned and challenges encountered during implementation of the five-year Partnership Project between the Government of Andhra Pradesh and PATH (Program for Appropriate Technology in Health), an international NGO, on introducing hepatitis B vaccine and strengthening routine immunization in the state. As 10 new states in India embark on similar projects as part of the second phase of the GAVI Alliance initiative in the country, this document is intended to serve as a valuable resource for program managers in these new states undertaking similar projects in particular, and for health service delivery programs in general.

DEPARTMENT OF HEALTH, MEDICAL
AND FAMILY WELFARE
Commissionerate of Family Welfare
Directorate of Health Campus
Sultan Bazaar, Koti
Hyderabad 500095
Andhra Pradesh, India
Tel: +91-40-24650365
Fax: +91-40-24652267

PATH
A-9, Qutab Institutional Area
New Delhi 110067, India
Tel: +91-11-26530080 up to 88
Fax: +91-11-26530089
Web: www.path.org

PATH: A catalyst for global health