



USAID
FROM THE AMERICAN PEOPLE



a global leader in reproductive health

Integrated Family Health Program



John Snow, Inc.

THE COLD CHAIN AND IMMUNIZATION SERVICES

**Experiences of the
Southern Nations,
Nationalities and
Peoples' Regional
State**



CONTENTS

Page 1

Cold Chain Management

Page 2

The Cold Chain in the Southern Region

Page 4

The Cold Chain at the Zonal Health Desks

Page 6

The Cold Chain and the Primary Health Care Unit

Page 8

Immunization Services at Health Posts

Page 12

Building Health Provider Skills

Page 14

Fostering Partnership for Immunization Services



COLD CHAIN MAINTENANCE

A successful immunization service depends on an ample supply of vaccines, skilled health care providers and a well-functioning cold chain system. The cold chain refers to the storage and transportation of vaccines within the optimally required temperature starting from the time the vaccines leave the manufacturing plant until they reach the end-users.

In Ethiopia, vaccines are transported and stored at various points before they reach clients. The chain begins at the Federal Ministry of Health, followed by the Regional Health Bureaus, Zonal Health Desks, Woreda Health Offices, Health Centers, and Health Posts. Each point in the health system is expected to set its required storage facility at the optimum temperature level. If a cold chain is broken at any one of the points, the vaccines lose their potency. A dysfunctional cold chain inhibits all the efforts to prevent maternal, neonatal, and child morbidity and mortality.

The Ethiopian health system provides nine types of vaccines that prevent eight diseases frequent among children

and mothers. Each vaccine requires a prescribed temperature level and the utmost care during transportation and storage to maintain its efficacy. The cold chain needs to be functional and intact at all levels in the health system for efficient and effective immunization services.

Thus, facilities and health offices that handle the vaccines are equipped with refrigerators specifically designed for storing vaccines, along with accessories such as ice boxes and ice packs. In addition to maintaining a functional cold chain, it is essential to equip professionals with the necessary skills for monitoring and managing vaccine refrigerators. This brief booklet depicts efforts to improve immunization services through improved cold chain maintenance in the Southern Nations, Nationalities, and Peoples' Regional State (SNNPR). The accompanying short film shows SNNPR's capacity building activities, including health worker training and repair of non-functional refrigerators.



THE COLD CHAIN IN THE SOUTHERN REGION

The Southern Nations, Nationalities and Peoples' Regional Health Bureau (SNNPR RHB) considers improving immunization services a key agenda for promoting maternal and child health and prevention of diseases. The ultimate goal is to achieve the Millennium Development Goals (MDGs) in the reduction of maternal and child mortality. The region focuses on cold chain maintenance as one of the criteria for effective immunization services. The RHB manages two big cold rooms to store vaccines received from the Federal Ministry of Health (FMOH) and to distribute to its zones and special woredas. The cold room located at the RHB compound supplies vaccines to 11 zones, and the cold room in Bonga, Kefa Zone, supplies vaccines to three adjacent zones. Additionally, each health office in the region has established cold rooms to store and distribute vaccines to facilities.

The cold rooms were previously managed by maternal and child health coordinators. Recently, the region has recruited cold chain officers to exclusively manage the

cold rooms. The cold chain officers at the RHB, zonal health desks, and woreda health offices attend a 10-day cold chain management training. Six training days are dedicated to repairing non-functional refrigerators. The officers monitor the temperature of cold rooms and refrigerators, keep record of vaccines, report stock outages and request refills, and—most importantly—repair refrigerators. The RHB realizes that it is not always practical or cost-effective to replace refrigerators every time they stop working, and most of the repairs are easily manageable. The senior technical officer at the RHB takes care of major repairs.

The RHB Child Survival Technical Working (TWG) group plays a pivotal role in identifying gaps and devising solutions for child health-related issues. The TWG closely monitors the immunization services and works to remove obstacles at each level through capacity building, supportive supervision, on-the-job mentoring, and technical assistance.



Dr. Mulugeta Wondwosen

Dr. Mulugeta Wondwosen is the Disease Prevention and Health Promotion Process Officer at the SNNPR Regional Health Bureau. Dr. Mulugeta says that it is crucial to ensure the cold chain is intact and functional at all times. The proper temperature for storing vaccines is between 2 to 8 degrees Celsius. If one of the actors in the cold chain fails to have a functional vaccine storage, the chain breaks and hampers access to immunization services. Vaccines can be damaged and lose their potency because of over- or under-cooling. Vaccines that have lost their potency do not protect infants and mothers from diseases. The capacity building training for health providers is expected to prevent problems related to the cold chain management. In SNNPR, there is a renewed focus on improving the quality and accessibility of immunization services, which depends heavily on the continuity and functionality of the cold chain.



The SNNPR Regional Cold Room, Hawassa

Hailu Hadero was recruited as SNNPR RHB's cold chain officer in July 2011 (2003, Ethiopian Calendar). Hailu manages the temperature of the cold room, keeps records of vaccines, and distributes them to the zones upon request. Hailu takes the utmost care when receiving vaccines from the Federal Ministry of Health. He receives potent vaccines with long expiry dates. He packs the vaccines in special cold boxes and moves them to the RHB cold room, the center for storing vaccines and distributing them to 11 zones and special woredas in the region. The RHB cold room has a sufficient number of vaccine-specific refrigerators that store more than three million vials of various vaccines at a given time. The RHB has installed a generator exclusively for the cold room so that it will continue to function in the case of an electric power interruption.



Hailu Hadero

COLD CHAIN AT THE ZONAL HEALTH DESKS

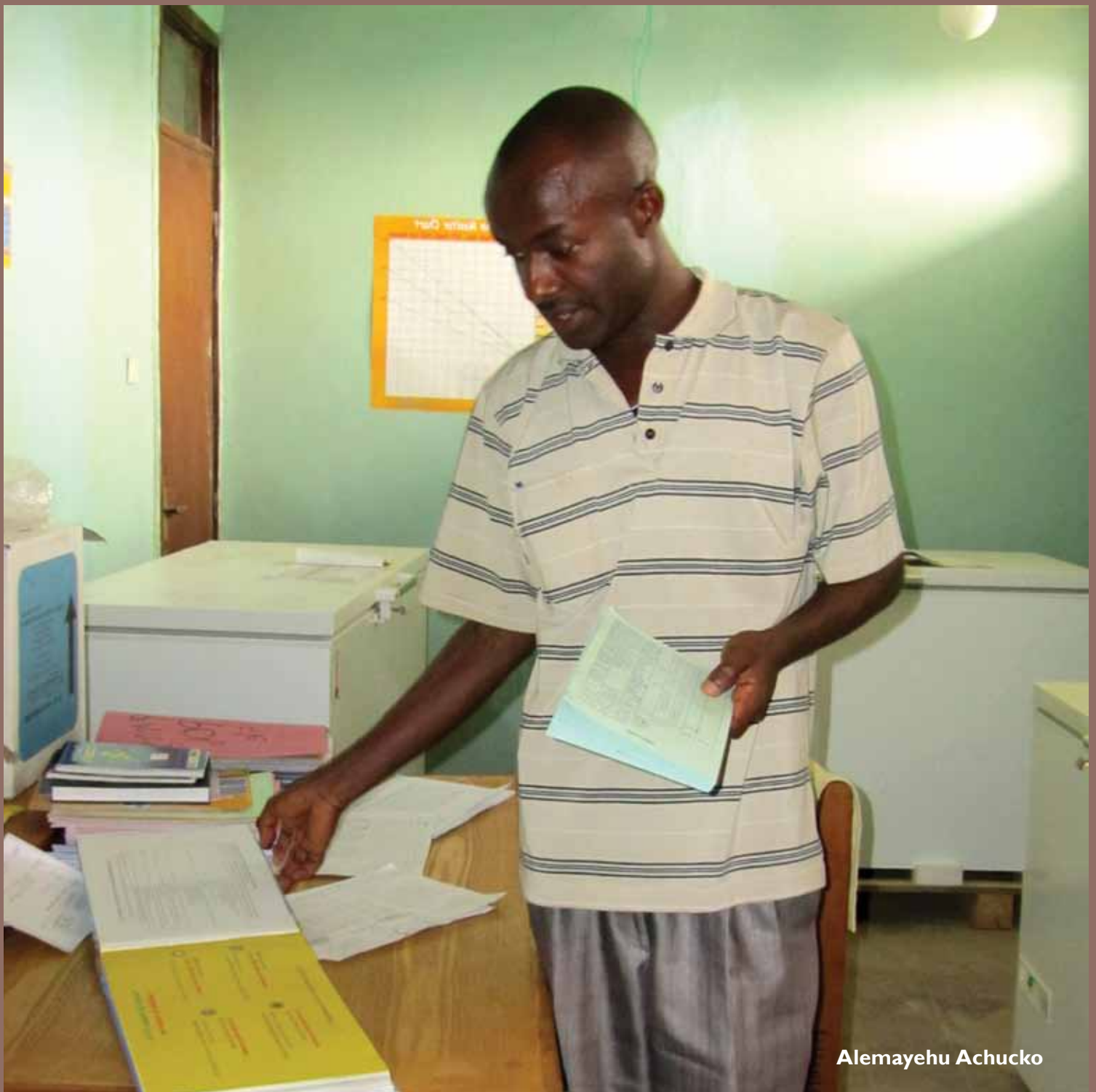
Zonal Health Desks (ZHDs) in SNNPR are the main custodians and distributors of vaccines to all their catchment woredas. They have a strong recording and reporting mechanism to plan for vaccines, and they send requests to the RHB regularly. Vaccines are requested from the region based on annual plans and after identifying the ZHDs remaining stocks. The zones take the utmost care to maintain the optimum temperature when transporting and storing vaccines. The zonal cold chain officers ensure that zones do not receive vaccines nearing their expiry date. The officers record vaccine stocks and manage the temperature of the cold rooms in the zonal offices. They are responsible for distributing the vaccines to the woredas in a timely manner to prevent expiration of vaccines at all levels.

The zonal offices conduct regular supportive supervision to assist woredas and health centers that need special attention in immunization services. The zones assess the functionality of the cold chain and support facilities accordingly. They also allocate part of their yearly budget for kerosene to ensure the refrigerators that work on kerosene function all year round. The ZHDs recognize that it is important to have a cold chain system that is intact, functional, and consistent to provide efficient immunization services for the prevention of maternal and child morbidity and mortality.



Elias Mamo

Elias Mamo is the Head of the Kembata Tembaro Zonal Health Department. Cold chain management is one of Kembata Tembaro ZHD's strongest suits. The ZHD has various types of refrigerators that are used for storing vaccines for three months before they are distributed to the woredas based on the ZHD's quarterly plans. Each woreda under ZHD catchment has refrigerators that accommodate a month's supply of vaccines for distribution to the respective health centers. The Expanded Program on Immunization (EPI) focal persons and coordinators, including health extension workers, are trained in EPI+Cold Chain Maintenance. These professionals conduct minor refrigerator repairs and seek support from the RHB for major repairs. The ZHD conducts regular inventory to identify the non-functional refrigerators and facilitate repair services. To ensure the continuity of services, the zone budgets for kerosene to fuel the vaccine refrigerators.



Alemayehu Achucko

Alemayehu Achuko is the Cold Chain Officer and EPI Coordinator at Kembata Tembaro ZHD. Rooms are scarce in the ZHD office, but the zone still manages a functional cold room. Two adjacent rooms were joined together to establish a well-ventilated cold room that accommodates six vaccine refrigerators. As soon as Alemayehu returned from the EPI+Cold Chain Maintenance training, he removed the power strips shared by the refrigerators and hooked each refrigerator to

a main electric line for optimum power use. Alemayehu uses a bin card for each vaccine type to record their quantity and expiry dates. He records the temperature of each refrigerator twice a day on the monitoring chart. Alemayehu makes sure that Kembata Tembaro zone never receives vaccines with nearing expiry dates. He also carries out minor refrigerator repairs. Alemayehu and his colleagues proudly report that immunization is a highly successful operation in the zone.

THE COLD CHAIN AND THE PRIMARY HEALTH CARE UNIT

The Primary Health Care Unit (PHCU) in SNNPR, which consists of the primary hospitals in woredas, health centers, and health posts, provides the platform for regular and uninterrupted immunization services. In addition to providing routine immunization services, health centers shoulder the responsibility of supplying health posts with vaccines and providing technical assistance to health extension workers (HEWs). The EPI focal persons in health centers are responsible for storing vaccines in the health center cold rooms within the prescribed temperature range.

Most health centers in SNNPR have vaccine refrigerators that operate on both electricity and kerosene. The health centers also have cold boxes for temporary storage when refrigerators stop functioning. The cold boxes maintain the

temperature of the vaccines for 72 hours, providing sufficient time for refrigerator repair. Once the refrigerators are repaired and set to the right temperature, the vaccines are stored back inside the refrigerators.

As part of the technical support to the health posts, the health center staff ensure that health post refrigerators are operational and set to the required temperature for storing vaccine at all times. In health posts where there are no refrigerators, the health center team assists the HEWs in transporting vaccines to be used for routine immunization and outreach services.



Guba Health Center is located in Halaba Special Woreda in the SNNPR. The vaccine refrigerators, cold boxes, and carriers needed for immunization services are all available at the Health Center, and service is uninterrupted. The EPI Coordinators in the Health Center attended the EPI+Cold Chain Maintenance training organized by the RHB. They have the capacity to conduct minor repairs, and they seek assistance from the Halaba Special Woreda Health Office for major repairs. The EPI coordinators at Guba Health have surpassed the World Health Organization's standard in Penta dropout rate, proudly reporting that only 0.8% of patients do not receive their required vaccinations.

Under-five Clinic at Goba Health Center, Halaba Special Woreda



Immunization services at Guba Health Center

The Guba Health Center in Halaba Special Woreda administers immunizations daily as part of the Health Extension Program's packages. This primary Health Center Unit (PHCU) manages vaccine-storing refrigerators for its daily immunization services and for distribution to the 11 kebeles under the PHCU.

Mesai Daniel and his team are responsible for ensuring that the refrigerators used for storing vaccines at Guba Health Center, as well as those in various health posts, function at all times. Mesai also makes sure that all the 11 health posts receive vaccines regularly for routine immunization and outreach services.



Mesai Daniel

IMMUNIZATION SERVICES AT HEALTH POSTS

Health posts are the final destination for vaccines after they pass through the long chain that begins at the FMOH. Routine immunization and outreach vaccination services reach the community through a coordinated effort of all responsible in the Primary Health Care Unit. Health posts receive vaccines from health centers and, on occasion, from woreda health offices, depending on their proximity. Some health posts have refrigerators that run on kerosene, while others have to collect vaccines regularly from the facilities.

Health extension workers are part of the capacity building training on EPI+Cold Chain Maintenance. At minimum, they are aware of the optimum temperature required for storing vaccines, how to refill refrigerators with kerosene, how to properly store vaccines in cold boxes, and to seek help when a refrigerator is out of order. The HEWs record the temperature on monitoring charts twice a day. With the help of health development armies, HEWS coordinate intensive community mobilization to create the demand for immunization services.

The health posts do their best to eliminate obstacles to immunization, such as staying open late to receive clients. During outreach immunization days, HEWs get support from health centers. They carry vaccines with carriers and travel to places near and convenient to the community to provide the service.



Geremush Siltanu

Geremush Siltanu is the health extension worker in Jore Health Post in Kedida Gamella Woreda. She is responsible for implementing the Health Extension Program's 16 packages to the 1,339 households in Jore Kebele. Jore Health Post has a refrigerator that operates on kerosene. Geremush, who has been trained in EPI+Cold Chain Maintenance, monitors the temperature of the refrigerator twice a day and records it on the temperature monitoring chart. She refills the refrigerator with one liter of kerosene every day. Geremush transfers the vaccines when the refrigerator needs cleaning or if it stops functioning. She tries to repair minor setbacks, but she notifies the woreda if the repair is beyond her ability.

At Jore Health Post, immunization service is available every day. Geremush ensures that every eligible individual in each household gets immunization services. Volunteers help identify families with newborns and report back to the Health Post. To ensure that families are informed, Geremush sends messages through volunteers about immunization dates.

Four years ago when Geremush began work at Jore Health Post, immunization coverage was very low. Currently, she proudly reports that every eligible child in Jore Kebele has been vaccinated.



Immunization services at Jore Health Post

BUILDING HEALTH PROVIDER SKILLS

In Ethiopia, nine types of vaccines are provided to children: Penta5 (five vaccines in one), BCG, Measles, Polio, and PCV (to mothers and children.) Storing these vaccines in the right temperature is paramount to maintaining their efficacy. A cold chain functions best when managed by skilled personnel. In addition to providing the necessary equipment for a functional cold chain, the SNNPR RHB coordinates with the Integrated Family Health Program (IFHP) to improve health professionals' capacity to provide quality immunization services and effectively monitor the cold chain.

The recently recruited 165 Cold Chain Officers are full-time employees specifically assigned to monitor the functionality of the cold chain at regional, zonal, and woreda levels. The officers were trained in cold chain management for 10 days, during which six days were dedicated to a practical session that focused on repairing non-functional refrigerators.

The four-day EPI+Cold Chain Maintenance training targets zonal and woreda health managers, EPI Coordinators in health facilities, health extension supervisors, and health extension workers. The training equips these professionals with the skills and knowledge to manage quality and uninterrupted immunization services, thereby creating access

for all eligible infants and mothers. Prior to the training, facilities with poor EPI services and non-functional refrigerators are identified, and the broken refrigerators are collected at a convenient location.

During the first three days, the training—assisted with EPI modules—focuses on theoretical issues such as quality immunization services, types of vaccines in Ethiopia, introduction of any new vaccines, proper storage and transportation of vaccines, and similar technical areas. The RHB Senior Technical Officer for Medical Equipment and the Cold Chain Officers from different health offices also come together to repair the identified non-functional refrigerators. On the fourth day, the participants are trained on how to conduct minor repairs and the importance of seeking immediate help for major repairs.

By the end of the training, participants are supplied with spare parts to take to their respective facilities for use in minor repairs. The trainees are responsible for proper management of the refrigerators, including timely refilling kerosene, monitoring temperature daily, storing vaccines in proper compartments, identifying vaccines with short expiry dates, conducting minor repairs, and seeking immediate assistance for major repairs after storing the vaccines in cold boxes.



Mahlet Wondimu

Mahlet Wondimu is the EPI coordinator at Halaba Health Center. She is one of the trainees in the EPI+Cold Chain Maintenance training organized in Halaba Special Woreda. Mahlet had only one year of experience in the public health sector and says that she benefited a lot from this refresher training. She says the training has equipped her with the essential skills for quality immunization services. She is confident that she will put to use all the lessons she learned in this training and excel in providing immunization services when she goes back to work.



The senior technicians of medical equipment repair the identified refrigerators in a health facility.

FOSTERING PARTNERSHIP FOR IMMUNIZATION SERVICES

The USAID-funded Integrated Family Health Program (IFHP) follows the strategies of building community awareness and creating demand for health information and services; building the capacity of health care providers; and strengthening the health system and ensuring availability of supplies and equipment. The program recognizes that quality immunization services require skilled professionals, in addition to a supply of vaccines and a well-functioning cold chain, in order to reduce maternal and child morbidity and mortality and to meet the Millennium Development Goals.

Support for immunization services began when the USAID-funded Essential Services for Health in Ethiopia (ESHE) collaborated with the FMOH, Regional Health Bureaus, and other health partners to adopt the World Health Organization EPI training material into a five-module document. Continuous monitoring and follow-up visits to health facilities revealed that having professionals in place does not necessarily ensure the continuity of immunization services—unless there is an ample supply and proper storage of vaccines. The EPI training material was then augmented

to include the cold chain maintenance component. The adopted material incorporates EPI+Cold Chain for health professionals. The training is shortened to three days, but maintains all the essential elements that a quality immunization requires.

IFHP continues to support the EPI and the Cold Chain Maintenance program through various approaches. In SNNPR, IFHP has collaborated with the SNNPR RHB, to train all the EPI coordinators in its 54 focus woredas. All trainings have been followed through with mentoring and on-the-job support. IFHP is a member of the SNNPR RHB Child Survival Technical Working Group, in which members discuss child health issues and devise joint solutions. Through its regional and cluster office staff, IFHP actively participates in the RHB, ZHD, and Woreda Health Offices' Integrated Supportive Supervision (ISS) activities and review meetings.

Since the program began in early 2009, IFHP has been collaborating with the SNNPR RHB to organize and facilitate a four-day EPI+Cold Chain Management training for 1,515



Alemu Kebede

Alemu Kebede is a Senior Technical Officer for Medical Equipment at the SNNPR RHB. Alemu conducts major refrigerator repairs by traveling to health facilities and zonal health offices when he receives requests. He is also a facilitator for the EPI+Cold Chain Maintenance training for health professionals, particularly in the refrigerator maintenance component. He trains health providers on how to identify problems in a non-functional refrigerator and how to repair it using the spare parts provided by the region. Alemu says that most of the repair problems are preventable through regular cleaning and temperature monitoring. Refrigerators operating on kerosene need equal attention. The flame should always be the color described by the manufacturer and kerosene needs to be refilled regularly. According to Alemu, some vaccines are sensitive to cold, while others are sensitive to heat. It is important to ensure that refrigerators operate at the optimum temperature and that problems are fixed as soon as they are identified.

health center EPI coordinators, woreda and zonal health managers, health extension workers, and HEW supervisors. When the RHB recruited its 165 full-time Cold Chain Officers, IFHP helped organize a 10-day special EPI+Cold Chain Maintenance training for the new recruits.

ISS and review meetings are crucial for identifying gaps and working on remedies to repair non-functional refrigerators. IFHP helps identify non-functional refrigerators, transports these refrigerators—along with spare parts—to maintenance locations, and covers the expenses of the technicians.

Due to the joint effort of SNNPR RHB and IFHP, 612 non-functional refrigerators were identified and repaired, saving the region the 15 million Ethiopian birr (US \$845,276) it would have cost to buy new refrigerators. The cost to repair the refrigerators was extremely mini-

IFHP staff provide on-the-job support to health extension workers by IFHP



mal and significantly benefited the community by sustaining immunization services. This collaboration aimed at to ensure the accessibility of immunization services to all eligible families without interruption. The effort to stabilize the cold chain system, coupled with the health worker skill building, has made immunization services available to more than 500,000 children under one year of age and more than 1.5 million women of child-bearing age in the 54 IFHP woredas in SNNPR.

Mohammed Akmel is the EPI Focal person and Disease Prevention and Health Promotion Officer in Hadiya ZHD. He is one of the trainers in the four-day EPI+Cold Chain Maintenance training organized at Halaba Special Woreda. Participants are EPI Coordinators selected from health facilities that have gaps in cold chain management and immunization services. The trainers consist of technical persons from ZHD, Integrated Family Health Program staff, and medical equipment technicians from the SNNPR RHB and hospitals in the region. Mohammed says that he has facilitated a number of trainings and has witnessed improvements in the quality of immunization services in facilities with trained staff. According to Mohammed, it is essential that the technical training about vaccination is combined with the refrigerator maintenance for maximum efficacy.



Mohammed Akmel

THE INTEGRATED FAMILY HEALTH PROGRAM

The Integrated Family Health Program (IFHP) is a five-year (2009-2013) USAID-funded program that is implemented by John Snow Inc. (JSI) and Pathfinder International-Ethiopia in partnership with the Consortium of Reproductive Health Associations (CORHA). IFHP supports USAID-Ethiopia's strategic objective of "Investing in People" with the overall goal of creating and consolidating a functional and effective network of a diversified and well-integrated package of family health services to communities within the framework of the Primary Health Care Unit and more specifically the Health Extension Program. The network is based on a continuum of care linking communities, health posts, and health centers for improved healthy life.

The IFHP collaborates to make maternal, newborn, and child health services, as well as family planning, available to families. The program focuses on creating health-seeking behaviors (demand creation) in communities and ensuring the availability of information, services, and commodities to meet these demands by strengthening the health system.

IFHP is implemented in the four large regions of Ethiopia: Amhara, Oromia, SNNPR, and Tigray, and, to a limited extent, Benishangul Gumuz and Somali regions. Of the 796 woredas in Ethiopia, 301 woredas are covered by the program, benefiting more than 35 million people.

With over 30 years' experience, JSI brings to IFHP practical approaches to address maternal, newborn and child health challenges by building partnerships among governments, nongovernmental organizations, and communities. In Ethiopia, JSI works within the framework of the primary health care unit to increase demand for and availability of an integrated package of high impact health services for Ethiopian women, children and families.





ACKNOWLEDGEMENTS

IFHP expresses its deepest appreciation for all the cooperation forwarded to it by the Kembata Tembaro ZHD, Halaba Special Woreda, Guba Health Center and Jore Health Post. The production of this booklet would not have been possible without their assistance throughout the documentation process. The IFHP also extends its gratitude to the SNNPR Regional Health Bureau for allowing the documentation of this booklet along with a movie and for providing the requested information.



John Snow, Inc.
44 Farnsworth Street
Boston, MA 02210
617-482-9485
www.jsi.com
jsiinfo@jsi.com

IFHP/Addis Ababa
Nefasilk Lafto Sub-City
Kebele 05
Haji Kelifa Sabit Building
P.O. Box 1392 Code 1110
Addis Ababa, Ethiopia
Phone: 251.113.20.35.01
Fax: 251.113.320.3572

The Integrated Family Health Program is implemented by Pathfinder International and John Snow, Inc. in partnership with the Consortium of Reproductive Health Association. IFHP is one of many assistance projects made possible through the United States Agency for International Development (USAID).

This publication is made possible by the support of the American people through the United States Agency for International Development (USAID). The contents are the sole responsibility of John Snow, Inc. under Cooperative Agreement No. 663-A-00-08-00414-00, and do not necessarily reflect the views of USAID or the United States Government.