ANNUAL REPORT
2014–2015

CDC India Staff with CDC Director Tom Frieden

"It is health that is real wealth and not pieces of gold and silver."

—Mahatma Gandhi

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LETTER FROM THE DIRECTOR

The U.S. Centers for Disease Control and Prevention (CDC) opened its office in Delhi in 2001. Working closely with local partners and health agencies, CDC India has spent the last 15 years addressing a widening range of infectious and noncommunicable diseases through the Global Disease Detection Regional Center (GDD), the Division of Global HIV and Tuberculosis (DGHT), the Influenza Division, and the Global Immunization Division.

Our office and focus have expanded over the years, but 2014–2015 marked a significant period of growth and accomplishment. Our country teams collectively managed more than 23 projects, including 12 new launches. We partnered with more than 32 Indian government agencies, local health organizations, hospitals, and universities, and facilitated new collaborations in 23 states across India.

GDD was busy nurturing the fledgling India Epidemic Intelligence Service (EIS), which graduated its first cohort in September of 2014 and the second in 2015. These graduates and other officers were often on the front lines of outbreak response across India, serving as invaluable resources to the government of India and GDD's various project teams. GDD has also been collaborating on the design and implementation of the Global Health Security Agenda (GHSA) in India, and 2016 will see this work expand significantly.

Great strides were made by our influenza team, which worked with local partners to help identify the spring seasonality of the influenza virus in India. The Influenza Program also collaborated with the All India Institute of Medical Sciences (AIIMS) to launch a vaccine trial comparing live attenuated influenza vaccine to inactivated influenza vaccine—one of the very few such trials being conducted in the tropics.

DGHT continued a productive partnership with India's National AIDS Control Organization (NACO), providing technical assistance to strengthen both local and national HIV monitoring, care, and treatment mechanisms. Over the past year the team supported planning for the largest Integrated Bio-Behavioral Survey of key populations and migrants in India's history, as well as supported the first-ever assessment of ART clinics across the country. The team's 2015 PEPFAR pivot will focus on epidemic control in high burden districts across five states and will introduce a broad tuberculosis initiative under the GHSA.

Perhaps one of the most significant accomplishments happened in March of 2014: India was officially certified polio-free, marking a historic moment for one of CDC India's very first collaborations.

But with these milestones come reminders of all the work that lies ahead: curbing the growing tuberculosis (TB) epidemic, improving traffic safety measures, and building a local framework for global health security. The challenges will be many but I am confident in our tireless staff and ever thankful for our enduring partnership with India. Together we will continue to grow, work hard, and help give the people of this beautiful country healthier, safer, longer, and more productive lives.

Sincerely,

Dr. Kayla Laserson

FAST FACTS

ESTABLISHED
2001

STAFF
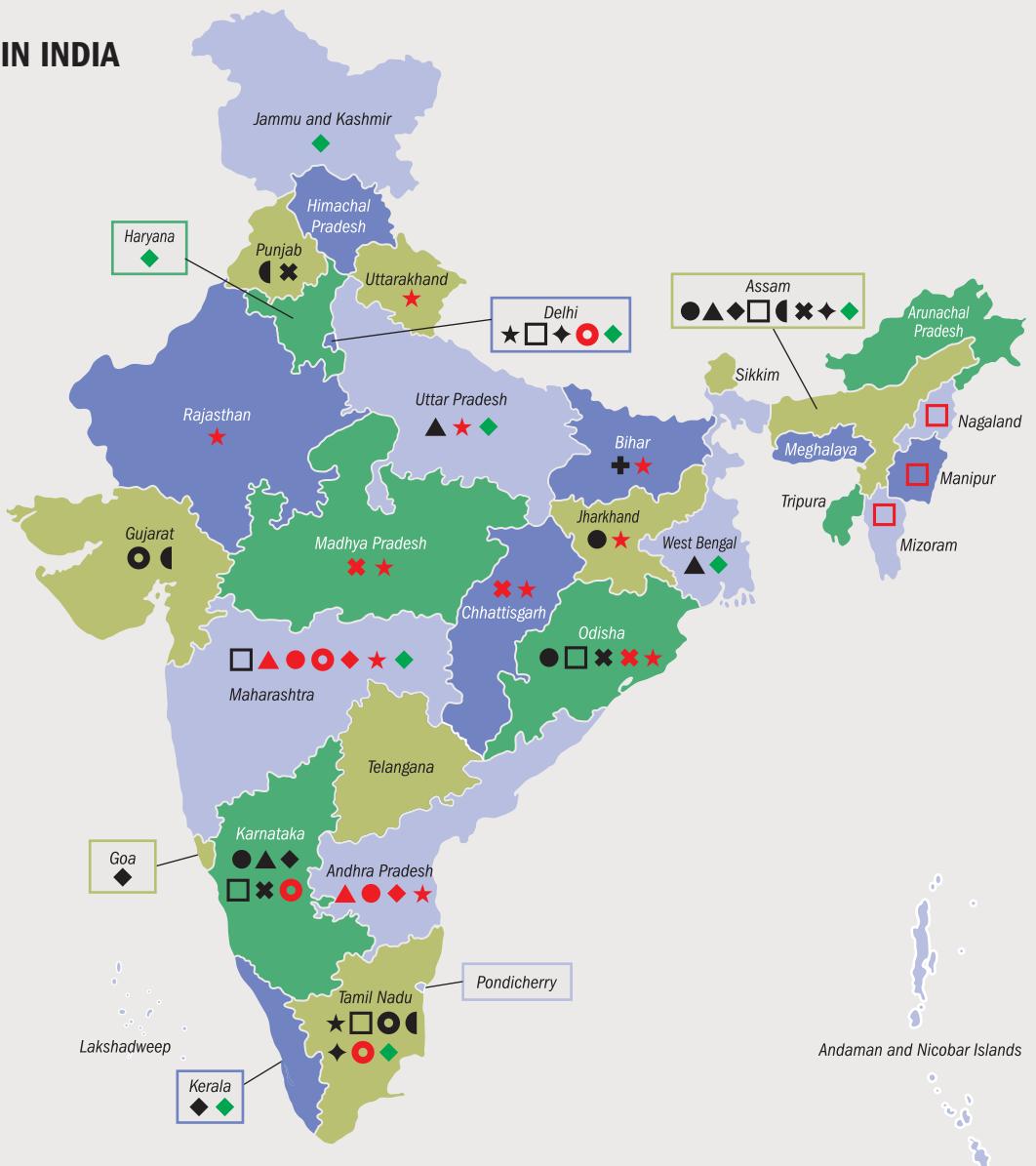12 U.S. Assignees
26 Locally Employed Staff

PROGRAMS
Division of Global HIV and Tuberculosis

Division of Global Health Protection, Global Disease Detection Regional Center

Influenza Division, including secondee to WHO SEARO

Global Immunization Division, seconded to WHO SEARO

BUDGET
FY2014: $16,671,296
FY2015: $40,401,705

OFFICES
Delhi
Hyderabad

CDC PROJECTS IN INDIA

Jammu and Kashmir

Himachal Pradesh

Haryana

Punjab

Uttarakhand

Delhi

Assam

Arunachal Pradesh

Sikkim

Nagaland

Manipur

Meghalaya

Tripura

Mizoram

Rajasthan

Uttar Pradesh

Bihar

Gujarat

Madhya Pradesh

Jharkhand

West Bengal

Chhattisgarh

Odisha

Maharashtra

Telangana

Karnataka

Goa

Andhra Pradesh

Pondicherry

Tamil Nadu

Lakshadweep

Kerala

Andaman and Nicobar Islands

KEY

Global Disease Detection (GDD)

▲ Acute Encephalitis Syndrome (AES)

◆ Acute Febrile Illness (AFI)

● Anthrax

★ Antimicrobial Resistance (AMR)

□ India Epidemic Intelligence Service (EIS)

◉ Global Acute Diarrheal Diseases (GADD)

◖ Lab Strengthening NATIONWIDE (focus)

✚ Muzzafarpur

✖ One Health

✦ Strategic Health Operations Center (SHOC)

Division of Global HIV and Tuberculosis (DGHT)

▲ Blood Safety NATIONWIDE (focus)

● Lab Strengthening NATIONWIDE (focus)

✖ Local Capacity Initiative (LCI)

◉ TB NATIONWIDE (focus)

◆ Prevention of Mother to Child Transmission of HIV (PMTCT) NATIONWIDE

★ HIV/TB

□ India People Who Inject Drugs (PWID) Collaborative Project

✚ Care, Support, and Treatment NATIONWIDE

◆ **Influenza Division**

GLOBAL HEALTH SECURITY AGENDA (GHSA)

Working toward a world safe and secure from infectious disease threats.

In 2014, the U.S. government announced its **intent to invest more than $1 billion in resources to expand the GHSA—an initiative designed** to make sure the world is ready to prevent, detect, and respond to future infectious disease outbreaks.

The GHSA builds on the International Health Regulations (IHR), which provide guidance for countries to assess and manage serious health threats that have the potential to spread beyond borders. The GHSA expands on the IHR guidance by providing specific and measurable targets in 11 areas. CDC's Division of Global Health Protection is focusing their efforts on four of those targets, including strengthening laboratory systems, increasing real-time surveillance of potential public health threats, ensuring health workers are well-trained, and establishing Emergency Operations Centers (EOCs) with rapid response teams capable of activating a coordinated emergency response.

India is the largest of the initial 17 target countries, and also sits on the 10-country GHSA Steering Group, which puts India and our CDC team in a unique position to be true leaders in the initial stages of GHSA implementation. Drawing on extensive experience with infectious disease surveillance, emergency response, and lab strengthening, CDC India began working with India's Ministry of Health (MOH) to support GHSA goals in 2014. In September of 2015, CDC India received over $15 million in new funding for the Indian government and local partner organizations to establish or expand on existing GHSA projects and to begin implementing GHSA activities.

CDC India Director Kayla Laserson, US Ambassador Richard Verma and officials from India's first Ministry of Health light a lamp at the opening of the GHSA Stakeholder meeting

GHSA partners at the first interagency GHSA stakeholder meeting in 2015

CDC India is working to strengthen India's global health security by focusing on the three pillars of the GHSA

1
Prevent Avoidable Epidemics

- Supporting sentinel surveillance sites in at least five epidemiologic zones across India
- Enhancing the quality and capacity of public health laboratories through projects like the Labs for Life partnership
- Supporting surveillance of healthcare associated infections and antimicrobial resistance
- Working with the government of India to increase routine immunization coverage
- Training hospital and laboratory staff on antimicrobial resistance laboratory techniques, infection control practices, and antimicrobial resistance and healthcare-associated infection surveillance

2
Detect Threats Early

- Strengthening national epidemiologic capacity through the India EIS program, three month epidemiology trainings, and rapid response team training, including for veterinarians
- Conducting high impact public health surveillance of disease syndromes such as Acute Febrile Illness and Acute Encephalitis Syndrome
- Working with national and regional partners on One Health to track, detect and prevent pathogens from spreading from animals to humans
- Expanding laboratory-based diarrheal disease surveillance and enhancing foodborne outbreak response
- Enhancing influenza virus, respiratory disease, and viral hemorrhagic fever surveillance
- Enhancing current surveillance to detect vaccine-preventable bacterial disease in young children
- Developing rapid diagnostic capabilities and DNA sequencing for drug resistant TB

3
Respond Rapidly and Effectively

- Providing training for disaster response and mass casualty events
- Supporting the Indian Strategic Health Operations Center (SHOC) with emergency response training and facilitating development of SHOCs at state level
- Training laboratory staff in safe handling and rapid transportation of clinical specimens and of potentially infectious waste during public health emergencies

DIVISION OF GLOBAL HIV AND TUBERCULOSIS

Over 2.1 million Indians are infected with HIV—constituting the third largest HIV epidemic in the world.

DGHT Director Pauline Harvey signs the TB Call To Action

DGHT team members Archana Beri, Sunita Upadhyaya, and Sanjeev Verma

CDC India has been working on HIV/AIDS prevention and control since 2001, and currently provides technical assistance and support to the Indian Ministry of Health and Family Welfare's National AIDS Control Organization (NACO) and the Central TB Division. With staff in Delhi and Hyderabad, along with indigenous and international implementing partners, DGHT supports activities and initiatives across the country designed to help prevent new infections, increase access to services and service quality for persons living with HIV and/or TB, and accelerate these efforts in areas with high HIV burden and large unmet need.

Supporting TB Control in India

India has an estimated 2.6 million TB cases and 240,000 TB deaths annually, and accounts for a substantial portion of all multi-drug resistant (MDR) TB cases globally. CDC India has provided technical assistance for TB control efforts here since 1997 through a secondment agreement with WHO. In 2015 CDC India received direct funding for a medical officer dedicated to a broad initiative aimed at supporting the Central TB Division within the Ministry of Health and Family Welfare, GHSA goals, enhancing HIV-TB coordination, and reducing the importation of TB into the United States. In particular, under the GHSA, DGHT staff will collaborate with the National Institute of Research in Tuberculosis (NIRT) in Chennai, and will support the prevention, diagnosis and treatment of MDR TB in Mumbai, where the team aims to support the government of India in establishing a model center for addressing MDR TB.

India Care and Treatment and HIV-TB Project

In 2014 only 61% of TB patients were screened for HIV and knew their HIV status. Mortality among HIV-infected TB patients continues to be unacceptably high, primarily due to a late or missed diagnosis of either disease. In 2015 DGHT began providing technical support to NACO and strengthening key institutions to help address gaps in the coverage and quality of HIV-TB and HIV treatment services. By working to strengthen airborne infection control, increase ART treatment coverage and cross referrals, support efforts to improve treatment adherence and other strategies, DGHT hopes to help NACO increase the number of TB patients who know their HIV status to 90%, as well as link and retain 90% of HIV-TB co-infected patients in care.

Quality Management Systems in Blood Banks

Charged with reducing the rate of transfusion transmitted HIV infections to below 0.5 percent and ensuring that safe blood is available to all health facilities, NACO and its Blood Transfusion Service turned to the DGHT staff for technical assistance and strategic guidance. Since 2013 DGHT has been an integral part of the assessment of blood banks and training centres, delivery of in-service training modules, and providing ongoing technical support for the project as a whole. These ongoing efforts have helped reduce HIV transmission and other transfusion-transmitted infections, as well as supported well-coordinated national and state-level blood transfusion programs.

Laboratory Systems Strengthening

Previous phases of the National AIDS Control Program (NACP) focused on scaling up HIV testing and related services. But in 2015 DGHT began working with NACO on Phase IV goals, which include ensuring higher quality diagnosis while also sustaining efforts to scale up coverage. Efforts have been focused on a cost-effective and mandatory External Quality Assessment Scheme and capacity building initiatives, with the ultimate goal being International Standards Organization (ISO) accreditation.

Local Capacity Initiative (LCI)

NACO has scaled up the HIV/AIDS response throughout the country. While declining HIV trends are reported in southern states, some low prevalence states in the northern region are showing rising trends. NACO was concerned with the rising number of new HIV infections in some northern states and looked to augment the capacity of these states to scale up the response. Through the LCI project, NACO requested CDC to strengthen the institutional capacity of civil society organizations in the states of Chattisgarh, Madhya Pradesh, and Odisha. NACO, CDC, and our implementing partner, the India HIV/AIDS Alliance, conducted a detailed analysis of the epidemiology and the current program response in these states, and an implementation plan with innovative approaches has been developed to achieve accelerated epidemic control in these areas.

By working to enhance the skills of outreach workers and health care providers, improving access to government social benefit schemes, and piloting other innovative, cost effective strategies, NACO and DGHT have started to see improvement in the ability of Civil Society Organizations to advocate for improved access to HIV prevention, care and treatment services and ultimately reach underserved areas and populations.

India's National Blood Donation Day, 2014

Prevention of Mother to Child Transmission of HIV (PMTCT)

With the global target of eliminating new HIV infections among children in mind, DGHT partnered with NACO to provide technical assistance and implementation support to Prevention of Mother to Child Transmission of HIV — referred to as Prevention of Parent to Child Transmission of HIV, or PPTCT, in India.

Faced with limited counseling and testing for pregnant women and poor linkage of HIV-infected women and children to the appropriate postnatal care, the team has been working to improve detection and increase access to care. A new initiative to expand and strengthen PMTCT coverage in Chattisgarh, Haryana, and Punjab involves mobilizing private healthcare institutions in these efforts, with an aim to integrate PPTCT care with general health services in high burden districts.

Since its launch, the project has helped implement triple-drug, life-long antiretroviral therapy (ART) for HIV-infected pregnant and breast feeding women (Option B+) across all states in India. National guidelines for PPTCT have been revised and implemented, and the team has also successfully assessed the implementation of Option B and Option B+ rollout in four states.

India People Who Inject Drugs (PWID) Collaborative Project

Despite success with outreach services, HIV prevalence continues to be high among PWID in the northeast region of India, due in large part to the multiple barriers this population faces when trying to access the comprehensive package of services available.

To help address this growing epidemic, NACO and DGHT launched the India PWID Collaborative Project in April of 2015 to support NACO's ongoing efforts to reach PWID with efficient and effective care, especially in high burden districts of Manipur, Mizoram, and Nagaland. By working to scale up and improve the quality of services for the PWID population in these areas, DGHT hopes to eventually see a 30%-40% reduction in new HIV cases, a significant increase in the use of opioid substitution therapy, and a majority of eligible HIV-positive PWID receiving ART.

Strategic Assessment for Strategic Action (SASA)

In an effort to help inform the Indian government's decisions on strategic investments, NACO implemented the SASA project in 2014 under expert guidance from DGHT. The SASA project provides cutting edge technical assistance to the Indian government to collect data-based evidence for improving strategic information, HIV prevention, and care and treatment interventions.

Since launching, the project team has guided an assessment of linked antiretroviral therapy centers and finalized critical district epidemiological profiles of Andhra Pradesh, Karnataka, and the northeastern states. With continued progress, the team hopes to foster the creation of a monitoring system that can help identify best practice HIV models for India.

Technical Assistance to the National AIDS Control Program (NACP)

India's NACP is currently in its fourth phase, focused on reversing the HIV epidemic and sustaining that response level for five years. The Technical Assistance to NACP Project provides needs-based technical assistance to NACO in support of NACP-IV. Partnering with Voluntary Health Services, DGHT works to maximize resources, address gaps in the HIV/AIDS prevention, care, and treatment program, and assist with scaling up high-impact practices in the areas of prevention, care and treatment.

To date this project has helped increase PPTCT coverage in 80% of the target states; enhanced the capacity of 189 District AIDS Prevention and Control Units; and increased the number of private maternity hospitals providing stigma-free PPTCT services. In the coming year the team anticipates broadening technical assistance efforts to help support the governments of Bangladesh and Sri Lanka in their HIV response.

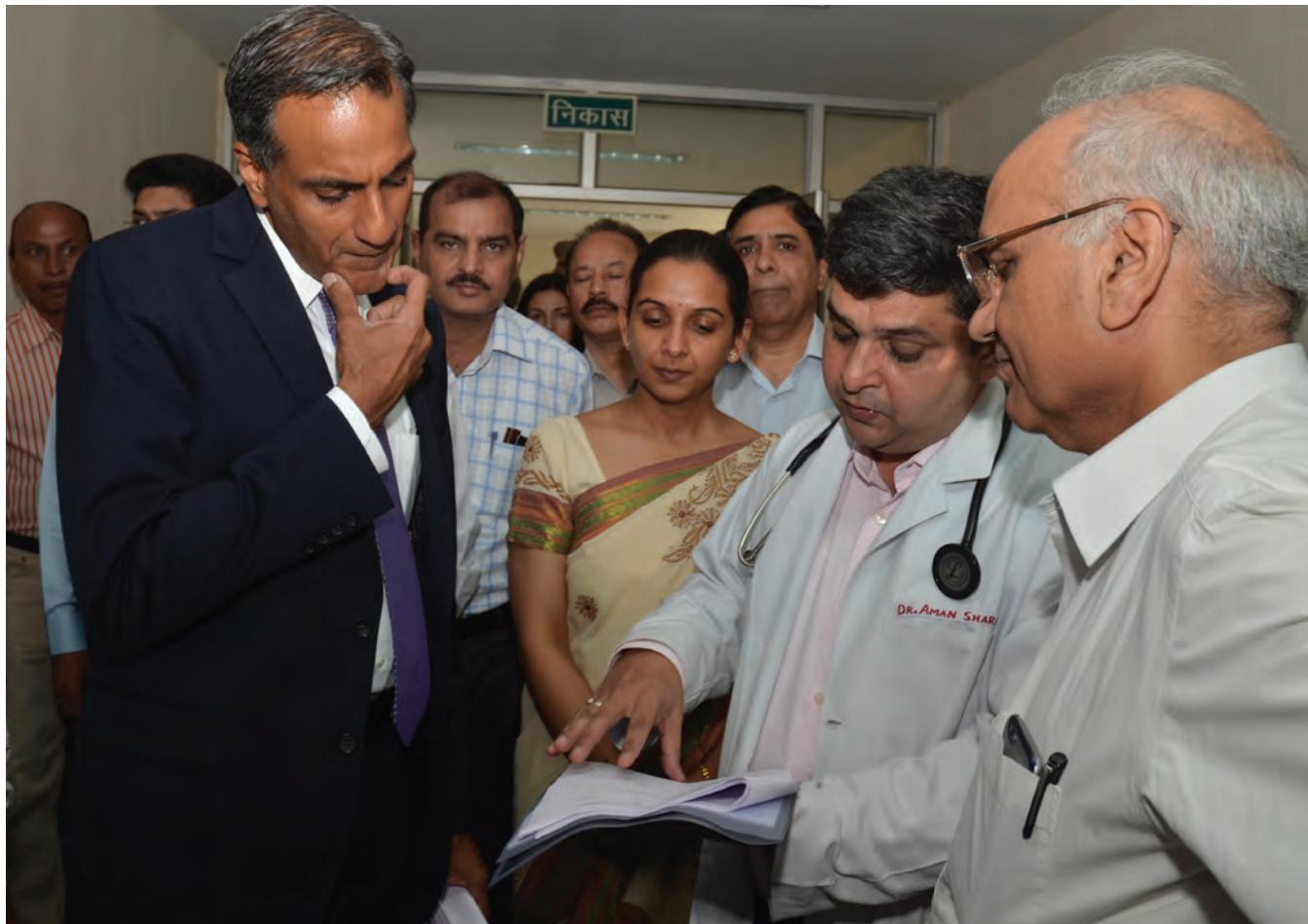## Collaboration with Joint United Nations Program on HIV/AIDS (UNAIDS)

UNAIDS, with technical assistance from DGHT, works to build the core competencies of national staff, ensuring they have the technical know-how and the latest skills in data generation, analysis, and use. At the conclusion of the project, these skilled workers will transition to Indian government positions with NACP-IV to support future strategic decision making.

With the PEPFAR India strategy as an overarching guide, DGHT focused 2014-2015 efforts on training local staff in size estimation and projection methods, disseminating HIV estimates for 35 states, and strengthening technical capacity at the National Institute of Medical Statistics.

Collaboration with the World Health Organization (WHO)

WHO supports information management and evidence-based policy making in India in close collaboration with NACO and DGHT. This project provides technical assistance to NACP in strategic information-related policy and decision making, as well as planning, implementation, and performance assessment.

Since the project launched in 2012 the DGHT staff has worked with WHO and NACO to facilitate the successful implementation of the SI-related priorities of NACP-IV. The team has helped develop operations and training materials for HIV sentinel surveillance in antenatal clinics, contributed to the planning of the Integrated Biological and Behavioral Survey, and helped update the master database of blood banks.

US Ambassador Richard Verma and DGHT's Archana Beri meet ART clinic staff at the Postgraduate Institute of Medical Education and Research in Chandigarh

GLOBAL DISEASE DETECTION REGIONAL CENTER, INDIA (GDD)

With the GHSA as a central focus, the GDD team works to build capacity within local, regional, and global public health entities to rapidly detect, accurately identify, and promptly contain emerging infectious disease threats.

GDD's Padmini Srikantiah examines treatment kits in Muzaffarpur

In the past two years GDD has more than doubled the number of active GDD projects across India, working in a total of 14 states.

Acute Encephalitis Syndrome/Japanese Encephalitis (AES/JEV)

JEV is one the leading causes of AES in India, but many regions lack the essential lab capacity to test for it—meaning many cases of JEV are not confirmed or accurately diagnosed, while other potential causes of AES go undetected. In September 2013, GDD and the National Institute of Mental Health and Neurosciences (NIMHANS) helped launch a tiered laboratory surveillance network designed to improve AES diagnostic capacity and enhance quality laboratory practices. GDD helped provide training on standardized diagnostic procedures and algorithms, as well as support for the implementation of systematic surveillance for AES. Surveillance data will be used to design evidence-driven interventions to reduce AES illnesses and deaths.

In 2014, the project helped establish consistent JEV diagnostic testing capacity in eight districts linked with four quality-assured referral apex laboratories for additional testing. Eight additional districts were added in 2015. The NIMHANS/GDD team has already seen a marked improvement in AES pathogen testing and reporting, and the project as a whole has provided valuable epidemiologic, clinical, and laboratory data for determining the causes of AES across different epidemiologic zones in India.

Acute Febrile Illness (AFI)

Despite advances in laboratory diagnostics, there are still gaps in understanding the burden, etiologic spectrum, and risk factors associated with AFI in India. GDD and Manipal University have collaborated to determine the specific causes of AFI and offer insights on possible data-driven interventions to reduce illness and mortality.

This project, initiated in 2014, is currently being implemented in Karnataka, Kerala and Goa as an ongoing surveillance activity at select hospitals, where it has identified previously undiagnosed fever pathogens and provided insights on influenza, leptospirosis, scrub typhus, dengue, malaria, and Kyasanur Forest Disease. Study sites in Goa and Assam started in 2015, and other new sites will be rolled out in ten other states over the next year. The increase in lab capacity has had a significant impact on patients—with the ability to get lab-confirmed diagnoses in 24 hours, doctors are able to treat patients more quickly with the appropriate medicines, shortening hospital stays, and improving clinical outcomes.

Healthcare Associated Infections (HAIs) and Antimicrobial Resistance (AMR)

Despite the increasing threat of AMR in India, many hospitals lack the capacity to accurately detect AMR in key pathogens, and the country lacks a uniform system to implement infection control practices and surveillance for HAIs. As India has committed to the AMR targets of the GHSA, there is an urgent need to enhance the capacity of national and regional laboratories to accurately detect AMR pathogens, assess and strengthen infection control practices, and expand standardized surveillance of HAIs.

In 2015, the GDD team began to leverage existing capacities in two AMR surveillance networks within the Ministry of Health and Family Welfare to quantify, strengthen and expand the ability of healthcare systems in India to generate and report accurate AMR data. Working with the Indian Council of Medical Research (ICMR) and the National Centre for Disease Control (NCDC), the team is helping to assess antimicrobial use and resistance patterns, the acquisition of healthcare associated infections, and infection control practices. The resulting data will ultimately help support better patient care, guide the development of antimicrobial stewardship policies, reflect the magnitude of AMR threats affecting India, and guide further refinement of state and national plans to combat antimicrobial resistance.

India Epidemic Intelligence Service (EIS)

Recognizing a need to strengthen comprehensive hands-on epidemiology training available, GDD collaborated with NCDC to launch the India EIS Program in October 2012. Modeled after CDC's own EIS, the India EIS is a two-year training program focused on applied epidemiology that provides medical doctors a premiere learning experience through practical field experience.

The EIS program graduated its first cohort of seven EIS officers in September 2014. Six more graduated in September 2015, and another 11 are scheduled to graduate in September 2016. These officers have been involved in multiple investigations and projects of public health importance in India, including an ongoing investigation of acute encephalopathy syndrome in Bihar; the establishment of a burn registry system; a surveillance review of birth defects in southern India; and outbreak investigations of anthrax, Kyasanur Forest Disease, acute diarrheal diseases, hepatitis E, measles, and many other priority diseases.

FACES FROM THE FIELD
Anoop and Rajesh

After months of taking case histories to try to understand a neurological illness threatening local village children in Bihar, and an intense investigation of an acute diarrheal disease outbreak in Cuddalore, Dr. Rajesh Yadav and Dr. Anoop Velayudhan found themselves on stage—in Atlanta.

Dr. Yadav and Dr. Velayudhan, officers in the second cohort of the India EIS Programme, competed against epidemiologists from more than 20 field epidemiology training programs around the world to earn a chance to present their work at the CDC's annual EIS Conference. For Dr. Yadav, the international exposure was nothing short of inspirational, offering a rare opportunity to learn about other international officers' work and to network with leaders in epidemiology. Dr. Velayudhan also took the networking seriously, managing to connect with one of his public health heroes, Dr. Bill Foege, for a brief discussion and an autograph in Dr. Foege's latest book on global smallpox eradication. It's these types of exchanges that are critical to the India EIS experience and the broader goals of global health security—sharing knowledge between experts and across borders to keep the world safe from emerging disease threats.

Lab Systems Strengthening—Integrated Disease Surveillance Program (IDSP)

The IDSP is a surveillance and laboratory network that forms the backbone of India's disease detection and surveillance at the district level. In 2013 a systematic assessment of the IDSP network revealed multiple gaps in the quality of lab services including biosafety, equipment maintenance, and use of standardized methodology. To address these issues, GDD, in collaboration with IDSP, launched an initiative to introduce quality management systems (QMS) principles to public health laboratories throughout the network.

In November 2014, microbiologists from 20 states were trained on the essentials of laboratory QMS principles. In August 2014 the collaboration launched a year-long pilot QMS initiative in Punjab and Assam, which used a mentor-based model to train quality officers from medical college laboratories, focusing on the use of systematic diagnostic algorithms, enhanced biosafety practices, and improved documentation of laboratory testing and results. The team has also worked to develop an IDSP laboratory strategic plan, which will guide the implementation of a strengthened IDSP laboratory network over the next three to five years.

Muzaffarpur Outbreak Response and Investigation

Seasonal outbreaks of an unexplained, often deadly neurologic illness have been reported in the Muzaffarpur district of Bihar state since 1995. After ruling out infectious disease, pesticides, and heavy metal poisoning, collaborative NCDC-GDD investigations in 2013-2014 helped classify this illness as a noninfectious/noninflammatory hypoglycemic encephalopathy associated with the consumption of the natural toxin hypoglycin/MCPG found in litchi fruit—a crop which is cultivated extensively in the area.

Investigations continued throughout the 2015 litchi season, along with enhanced clinical training for neurocritical care and early glucose measurement and treatment. The NCDC-GDD India team also shared key recommendations with national and state health officials, including minimizing litchi consumption among young children in Muzaffarpur, ensuring children receive an evening meal throughout the outbreak season, and ensuring rapid glucose assessment and correction in children suspected to have the illness. Future impact hinges on implementing these effective interventions, and continued evaluation to pinpoint more specific recommendations about litchi consumption.

Global Acute Diarrheal Diseases (GADD)

Acute diarrheal diseases (ADD) and food poisoning account for 40% of reported disease outbreaks in India, but finding the source of the outbreak can be challenging. In 2013 GDD collaborated with the IDSP to launch a GADD pilot project in four districts across Tamil Nadu and Gujarat focused on enhancing surveillance and response to ADD and foodborne disease outbreaks. The team has been working to strengthen all aspects of outbreak investigations, including building capacity for the analytic components of lab work, a more systematic epidemiologic approach, and initiating routine ADD surveillance.

In the past year every pilot district has shown marked improvement in organized ADD outbreak response. The project team has seen the adaptation of standardized formats for epidemiologic investigations and regular specimen collection; real time collaboration between laboratories, EIS officers, and public health officials; and the initiation of routine laboratory-based surveillance of patients presenting to district hospitals with ADD complaints – thanks in part to onsite microbiologic trainings for microbiologists and technicians. After evaluating the pilot districts, the team plans to significantly expand the number of participating districts in Tamil Nadu and Gujarat and to expand activities to at least three additional states, while also equipping labs to test for additional common pathogens.

Grandmother and grandchild from the litchi-growing areas of Muzaffarpur

One Health

Recent outbreaks of zoonotic diseases such as anthrax, leptospirosis, avian, and swine flu have illuminated an urgent need to collaborate with animal health experts to establish an interdisciplinary strategy for infectious diseases that have an impact on both humans and animals.

With those needs and the goals of the GHSA in mind, GDD has partnered with multiple institutions, including NCDC, NIMHANS, the National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI) and Manipal University to launch a One Health initiative aimed at tracking and controlling emerging zoonotic diseases. In particular, GDD and NIVEDI have teamed up to train veterinarians in epidemiology and outbreak response, and GDD has been working with various partners to gather a precise understanding of the prevalence and transmission dynamics of anthrax in India. Along with detecting and investigating all reported human and animal anthrax outbreaks through the IDSP and the National Animal Disease Expert Referral System, the project team recently conducted an outbreak investigation with the state government in Jharkhand that will serve as the model for future outbreaks.

Next steps for the One Health project include establishing a poison registry, continuing to enhance training capacity and standards, evaluating AMR in animals, and helping NCDC and NIVEDI establish veterinary public health capacity for disease control.

Strategic Health Operations Center (SHOC)

Establishing an interconnected global network of emergency operations centers is one of the main strategic priorities of the GHSA. Since 2012, GDD has been helping NCDC build their SHOC, which includes trained rapid response teams, increased laboratory capacity, and supporting incident command and other infrastructure to ensure efficient outbreak detection and response.

In 2014, GDD continued to help the SHOC team build expertise and strengthen program infrastructure, including facilitating FEMA Incident Response Training for 18 SHOC staff members and sending two staff to a six month Public Health Management Fellowship at the CDC headquarters in Atlanta. Since the launch of the SHOC, the SHOC team, with technical assistance from GDD, has developed 47 standard operating procedures and an Infectious Disease Outbreak plan. The first SHOC response was successfully activated on Feb 27, 2015 for the influenza H1N1 outbreak in India with additional activations for the Muzaffarpur outbreak and flooding around India in the summer of 2015. In the coming year GDD will assist NCDC and the Indian government in the creation of state-based SHOCs across India.

Investigating a foodborne-illness outbreak in Cuddalore

CDC Director Tom Frieden and Ambassador Richard Verma visit the SHOC at NCDC

INFLUENZA DIVISION

Since 2004, CDC India's Influenza Division has partnered with the Indian Ministry of Health and Family Welfare to support preparedness and response measures against seasonal, avian, and pandemic influenza in India.
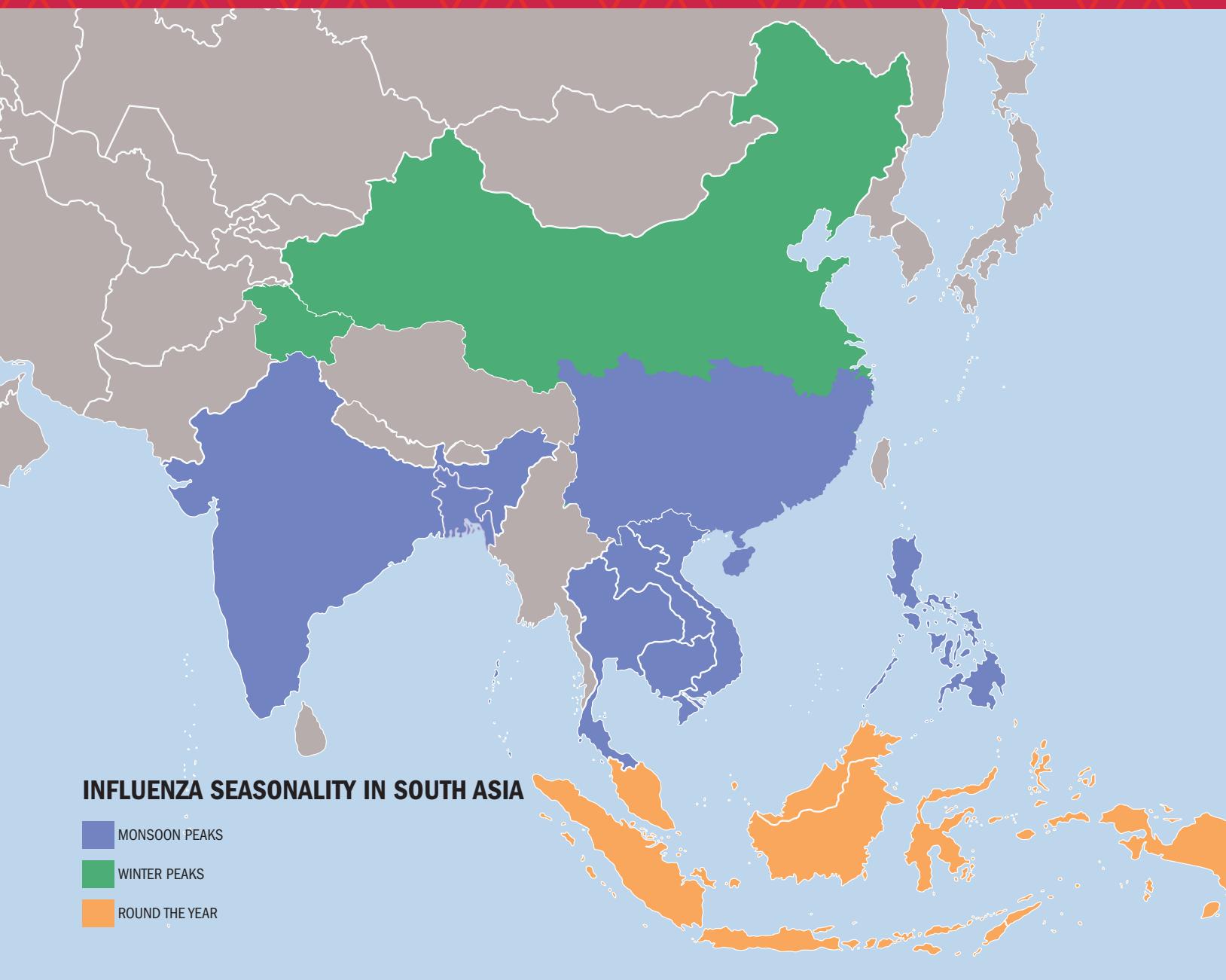

Conducting a nasal swab flu test in the field

The program aims to generate evidence to inform policy makers on influenza control and prevention strategies, while always working toward three main objectives:

- ◆ Pandemic preparedness, response, and containment, including rapid response outbreak investigations, physician awareness, and respiratory infection control training

- ◆ Building surveillance and lab capacity for the timely identification and characterization of viruses with pandemic potential, as well as efficient detection of seasonal influenza viruses, respiratory viruses, and novel emerging variants

- ◆ Public health research, to assess the impact of influenza in terms of hospitalizations, deaths, and cost; to evaluate the direct and indirect effects of influenza vaccination among children; and to better understand the epidemiology of respiratory pathogens causing acute respiratory infections in India

In addition to a stronger surveillance network and improved regional response, recent efforts have had significant policy effects in India. In 2012, the influenza team focused efforts on pinpointing the most effective influenza vaccine types and vaccination schedule for particular regions of India. Extensive surveillance in the tropical regions of South Asia and India revealed peak influenza circulation during monsoon season, leading CDC India and partners to recommend the import of the southern hemisphere vaccine for use in April- June, even though India is in the northern hemisphere. The Central Drug Standards and Control Organization agreed with these measures and adjusted the strain of vaccine and timing of vaccination accordingly.

Ongoing work on launching the local production of the influenza vaccine also came to fruition in the last year. The Serum Institute of India, Pune, supported by U.S. Health and Human Services/WHO, led the local production of trivalent live attenuated influenza vaccine, allowing for more timely and efficient local vaccination efforts and lower costs.

INFLUENZA SEASONALITY IN SOUTH ASIA

■ MONSOON PEAKS

■ WINTER PEAKS

■ ROUND THE YEAR

FACES FROM THE FIELD

Dr. Mayuri Gohain, Senior Research Officer, Kalawati Saran Children's Hospital

Every day Dr. Gohain and a study nurse screen patients in a busy 400-bed public sector pediatric hospital in New Delhi. They're looking for children hospitalized with pneumonia to take part in the TAC-KID Study — a project launched in partnership with the CDC India Influenza Division in 2013. Dr. Gohain is in charge of study enrollment at Kalawati Saran Children's Hospital, a challenging job that entails working to gain the trust of caregivers who may be hesitant to give consent. Enrolling age-matched, non-respiratory controls from the outpatients is even more challenging, as it involves motivating caregivers standing in a queue for immunization or unrelated issues to participate in the study for the greater good of society. When enrollment numbers started to fall last year, Dr. Gohain sounded the alarm, allowing investigators to work out an alternate enrollment strategy to meet the study target. She manages the day to day logistics but always has the big picture in mind, helping to keep this important study running smoothly.

OTHER CDC INDIA PROJECTS

EIS Officer conducting an immunization coverage survey in Alwar District, Rajasthan, India, October 2012

Traditional cooking methods

Immunization

Since 1993, CDC has assigned experts to both the WHO regional office (overseeing immunization-related activities in 10 other countries) and the country office for India to support the surveillance and control of vaccine-preventable diseases. CDC's technical support and leadership has been instrumental in developing and implementing polio eradication strategies, strengthening the national immunization program, supporting accelerated control of measles and rubella, and supporting maternal and neonatal tetanus elimination strategies.

India was once considered one of the most complex challenges to achieving global polio eradication. But 2014 marked a historic moment for India and all of CDC's immunization efforts here: on March 27, CDC Director Dr. Tom Frieden, together with WHO and UNICEF leadership, gathered with Indian and other global leaders to certify the SE Asia Region, which includes India, as polio-free, following three years without any new cases detected.

Clean Cook Stoves

In India, chronic obstructive pulmonary disease (COPD) is responsible for approximately 10% of female deaths every year. Most of India's women do not smoke, are not overweight, are physically active, and do not abuse alcohol. They do, however, share a widespread, but under-recognized risk factor: household air pollution from cooking with solid fuels. With 166 million of India's households relying on open fires or traditional *chulhas* as their primary method of cooking, household air pollution is arguably the greatest modifiable risk factor for noncommunicable diseases, including chronic respiratory diseases like COPD, among women in India.

For the past year CDC India has been working with The Global Alliance for Clean Cook Stoves to support the launch of a comprehensive, field-based project to evaluate how COPD and other chronic respiratory diseases can be prevented through the promotion of clean cooking.

Self-Employed Women's Association of India (SEWA)—LPG Cooking Project

A similar initiative focused on household air pollution, the SEWA – LPG Cooking Project aims to increase the use of liquefied petroleum gas (LPG) in rural communities that are not served by existing distributors of the Indian state oil companies and private sector LPG companies.

While the Global LPG Partnership, SEWA, and Bharat Petroleum Corporation Limited work to extend the LPG supply safely and viably into rural areas, CDC India is helping to evaluate the impact of LPG adoption in terms of economics, gender, livelihood, and health among new LPG users.

Expanding Cooperation in the Health Sector

The opportunities for public health collaboration in India stretch beyond the realm of infectious disease, and CDC India has been eager to foster partnerships in the area of environmental health. On June 25 2015, several Memoranda of Understanding were signed between U.S. and Indian officials, including the Environmental Health MOU to renew and expand bilateral cooperation on injury prevention, traffic safety, and indoor air pollution. Three years in the making, this MOU has already helped spur important new work between CDC India and our local partners.

Secretary of Health BP Sharma, Director of AIIMS Dr. Misra, Ambassador Verma, HHS Attaché Amy Dubois, and GDD Deputy Director Sharon Daves at the MOU signing.

FACES FROM THE FIELD

Dr. Kapil Goel

Dr. Kapil Goel is on a mission to help improve the air quality in India. But you won't find him lobbying for stricter controls on factory emissions. Dr. Goel's work starts in the kitchen.

For many of India's women, household air pollution from cooking with solid fuels is one of the biggest risk factors for respiratory diseases like COPD. Dr. Goel recognized an opportunity to change that, so after graduating with the first cohort of the Indian EIS Programme in 2014, he joined the CDC India team as a Medical Epidemiologist/Senior Medical Consultant. He now helps coordinate with the Global Alliance for Clean Cook Stoves to study the effects of household air pollution, speaks at conferences about promoting cleaner cooking methods, and helps SEWA conduct field studies on how to get cleaner LPG fuel to rural districts. Dr. Goel is using his EIS training to track and combat one of India's biggest noncommunicable disease threats—one *chulha* at a time.

FIGHTING EBOLA

CDC India sends six staff members to hardest hit areas.

A UN helicopter ready to transport CDC specimens in Sierra Leone

Country Director Kayla Laserson in Sierra Leone

When CDC put out the urgent call for responders in Ebola-stricken Africa, employees from around the globe packed their bags for the front lines. CDC India sent six of its staff members to some of the hardest hit areas to support epidemiology teams, offer technical assistance, and help manage the logistics of the international, interagency health crisis response.

Dr. Kayla Laserson, Country Director for CDC India, spent one month in Sierra Leone as the Epi Team Lead for the Western District. Working closely with CDC, WHO, Médecins Sans Frontières, British military, and local Sierra Leonean staff, she helped follow-up on people with possible symptoms, ascertain if they met the Ebola case definition, and ensure they went to an Ebola Holding Center for testing. When not tracking case leads or contacts, Dr. Laserson helped compile the daily and weekly epidemiological data for the Western District, and had the opportunity to join a multi-agency team in investigating a suspect case in Kailahun district, where there had not been a case for over 100 days.

Dr. Dan Rosen spent time in three of Sierra Leone's districts – Kono, Bombali, and Port Loko. In Kono Dr. Rosen worked on improving the monitoring system for cases, linking data between headquarters, the lab, and the Ebola Treatment Unit, and also tracked potential cases and the epidemic links between potential cases. In Bombali Dr. Rosen focused his efforts on the completely-quarantined Rosanda village, helping to improve the distribution system for food and water, latrine construction, and the data system for tracking cases. In Port Loko he did quality improvement work on the data system overall, including the CDC Viral Hemorrhagic Fever System.

Sharon Daves left for Sierra Leone in December 2014, spending over two months as the Deputy for the Ebola Response. While there she led the Management and Operations team, which was responsible for the safety, logistics, and administration of the 80-100 temporary duty employees in the country at that time. Ms. Daves coordinated with CDC headquarters and the U.S. Embassy to help launch the CDC office in Freetown, oversaw the implementation of CDC Foundation requests, and coordinated official visits from the CDC Foundation, CGH leadership, and a Senate Appropriations Committee Staff Delegation. Partnering with Peace Corps leadership, Ms. Daves also enlisted the Peace Corps Language/Cultural Volunteer Program to help response teams interact positively and peacefully with local citizens.

One of CDC India's locally employed public health specialists, **Dr. Rajeev Sharma**, joined the Ebola response in Liberia. Drawing from his experience assisting with the emergency response center at India's National Center for Disease Control, Dr. Sharma spent six weeks in Liberia to help the local government establish EOCs at the national and county level. Dr. Sharma helped develop training modules for EOC staff and established an organized alert, reporting, and notification process for disease outbreaks.

DGHT Deputy Director **Ron Peterson** was also in Liberia for a month in early 2015, working on several partnership and MOU issues for CDC, the CDC Foundation, and Liberia's MOH. Mr. Peterson negotiated some key issues concerning the building of the EOC in Monrovia, and helped develop a separate MOU to have CDC personnel co-located there. Ron also helped facilitate the donation of 87 vehicles that were desperately needed for outbreak response.

Dr. Pauline Harvey, Director of DGHT, was deployed to Nigeria from October-December 2014 as Acting Director of the CDC Nigeria office. She was actively engaged in Ebola containment activities including training of health care workers on point-of-entry screening at national and international airports of Abuja, Kano, and Lagos, representing CDC at the Extraordinary Session of the Authority of ECOWAS Heads of State and Government Summit on Ebola held November 2014 in Accra, Ghana, visiting with the Medical Director and staff within the Lagos hospital where the index case was treated, and representing CDC at the WHO Ebola Containment Ceremony.

GDD's Sharon Daves visiting
a quarantined home in Bo, Sierra Leone

DGHT Director Pauline Harvey and members of the
CDC Ebola team after point-of-entry training
at Kano International Airport, Nigeria

Image from DGHT's Dan Rosen in Sierra Leone

GDD's Rajeev Sharma in Liberia

2014-2015 FUNDING

	FY 2014	FY 2015
CGH	**$15,541,414**	**$38,943,346**
Global Disease Detection	$3,355,725*	$3,836,000*
Global Health Security Agenda		$16,500,000
Global HIV/AIDS	$2,000,000	$2,000,000
Global Immunizations	$2,055,600	$ 6,545,300
PEPFAR	$7,966,072	$9,880,046
Rapid Outbreak Response—Pan Flu	$164,017	$182,000
NCHHSTP	**$210,192**	**$588,669**
TB	$210,192	$588,669
NCIRD	**$919,690**	**$869,690**
Influenza Division	$919,690	$869,690
India Total	**$16,671,296**	**$40,401,705**

*Includes both DoS/BEP and DoD/DTRA funding

Over 70% of funding goes to program implementation.

KEY PARTNERS

All India Institute of Medical Services (AIIMS)

Christian Medical Association of India (CMAI)

FHI360

Indian Council of Medical Research (ICMR)

India HIV/AIDS Alliance

John Snow Incorporated

Kalawati Saran Children's Hospital, New Delhi

Manipal University

Ministry of Health and Family Welfare—Central Tuberculosis Division

Ministry of Health and Family Welfare—International Health Division

Ministry of Health and Family Welfare—National AIDS Control Organization

National Centre for Disease Control (NCDC)

National Disaster Management Authority (NDMA)

National Institute of Epidemiology (NIE)

National Institute of Health and Family Welfare (NIHFW)

National Institute of Mental Health and Neurosciences (NIMHANS)

National Institute for Medical Statistics (NIMS)

National Institute for Research in Tuberculosis (NIRT)

National Institute of Tuberculosis and Respiratory Diseases (NITRD)

National Institute of Veterinary Epidemiology and Disease Informatics (NIVEDI)

National Institute of Virology, Pune (NIV)

National Tuberculosis Institute (NTI)

Public Health Institute (PHI)

SHARE India

Sheri Kashmir Institute of Medical Sciences, Srinagar

UNAIDS

University of Washington—ITECH

Voluntary Health Services

World Health Organization

Children hold up their vaccination cards in Uttar Pradesh, India

MEET OUR STAFF

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INFLUENZA

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Public Health Specialist

2014–2015 PUBLICATIONS

2014

Broor S, Dawood FS, Pandey BG, **Saha S,** Gupta V, Krishnan A, Rai S, Singh P, Erdman D, **Lal RB.** Rates of respiratory virus-associated hospitalization in children aged <5 years in rural northern India. J Infect. 2014 Mar;68(3):281-9. doi: 10.1016/j.jinf.2013.11.005.

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