SUSTAINABLE DEVELOPMENT GOALS

LYMPHATIC FILARIASIS

SANITATION

CAS

MASS DRUG ADMINISTRATION
A hallmark of India’s investment in its development is the thoughtful application of scientific and technological advances to meet the needs of the poorest populations. In New Delhi, last November, Bill Gates explained why he is “an optimist about India.” The country, he told the National Institute for Transforming India, is “taking technology, including digital technology, and using it” to “write a new chapter in the history books about how a people and country can rise to big challenges.” This letter is about some of the ways in which India is doing this and how the Bill & Melinda Gates Foundation is collaborating with local institutions to support these efforts, in our own small way.

Over the years, the Gates Foundation has learned a lot about how to be an effective partner. We understand India’s scale and diversity and know that we don’t have the resources to support multiple programs here on our own. We also recognize India’s complexity and know that the most reliable and sustainable solutions are best provided by local champions who’ve spent their careers working in India. For this reason, we rarely initiate programs from scratch, instead partnering with leaders and communities and striving to add value as they take on big health and development challenges.

Sometimes the Gates Foundation contributes expertise. We know the issues and key players and can help connect the right people and resources. At other times we contribute data. We quickly set up pilot projects to test and refine a strategy, and provide decision-makers with examples and evidence. We also help facilitate important relationships across traditional boundaries so that governments, non-governmental organizations and private sector companies can collaborate to deliver innovations faster to those in need. The investments we make fill gaps and help good ideas become life-saving solutions.

What follows are four stories of how we’re doing this – in close collaboration with partners across the country – as India strives to attain the Sustainable Development Goals.
Through the Swachh Bharat Mission, the Government of India has made a strong commitment to end open defecation. This is a vital initiative because bacteria, parasites and viruses in fecal waste matter are responsible for the deaths of over 200,000 children each year as well as the chronic poor health of many more children and adults. While ending open defecation is an extremely important and challenging first step, it is just one component in comprehensively addressing the sanitation problem. Treating fecal waste and disposing of it safely are critical steps toward ensuring safe sanitation for entire communities.

Today, close to 70% of the human waste generated across India seeps into the environment untreated. While cities such as Indore and Nashik are addressing sanitation holistically, most urban and rural areas in India have been unable to do this successfully. Fully centralized sewerage systems are prohibitively expensive propositions, due in large part to the high cost of water and energy. Indeed, they are no longer the only recommended solutions for modern cities.

Decentralized, non-sewered sanitation solutions have a bigger role to play in most urban areas, given that more than 70% of households use onsite sanitation containment systems such as septic tanks and pit latrines. These solutions can be sized to local needs, with smaller infrastructure footprints and affordable capital- and operating-expenditures.

To demonstrate the viability of such solutions, in 2014 the Gates Foundation helped a sanitation company build and fine-tune the first community fecal sludge treatment plant (FSTP) in Devanahalli, near Bangalore city. In less than a year, the amount of waste being treated in Devanahalli increased from 0 to 40 percent. The plant separates liquid from solid waste, treats both to remove pathogens and produces compost and water that are safe for agricultural use.

The plant uses relatively basic technology but is configured ingeniously so it can be sized to meet the needs of the community it serves, gives off no odour whatsoever and uses no electricity—it is powered by gravity, for the most part. Thanks to its intentional design, the plant is relatively inexpensive to build and run, which makes the cost-benefit analysis clear to state governments and municipalities considering making similar investments of their own.

FSTPs are currently being built in Odisha. Officials in Tamil Nadu, Rajasthan, Andhra Pradesh, Maharashtra, UP and Bihar are planning the build-out of similar plants. By 2020, we expect there to be more than 25 such plants supporting sanitation across India, in towns and cities with populations as small as 20,000 and those that are over a million strong.
The powerful, nearly ubiquitous mobile phone is helping the government make great strides in improving health systems. At the request of the Ministry for Women and Child Development, the Gates Foundation worked with a partner to develop and roll out the ministry’s new Common Application Software (CAS). CAS is changing the way Anganwadi workers help mothers keep their children healthy and well-nourished. Currently, health workers have to enter information into 11 different registers—a painstaking, time-intensive, clumsy process.

Using CAS, each Anganwadi worker can immediately enter clients’ health information into her mobile device, at which point it is uploaded to a central database and is immediately useful. Nearly 50,000 AWWs are now using CAS in five states—and the scale-up continues. Information about the health of nearly 4 million women and children has already started to come in, providing an invaluable view of their growth and nutritional status. By 2020, all 1.4 million Anganwadi workers across India will be using the system.

It isn’t only Anganwadi workers who can now track real-time information about the health needs of their communities. Decision-makers are also able to monitor districts and regions and see at-a-glance when urgent intervention or additional resources are needed.
A mobile phone-based system is also transforming the way India monitors and replenishes vaccine supplies in the country’s health centers. The accuracy of old-fashioned paper records was unreliable, and because information took weeks to reach central offices, no one knew how long stock-outs might last or when faulty equipment would be working again. Now, thanks to the mobile-based electronic vaccination intelligence network (eVIN), many of the weaknesses inherent in the paper-based system are gone.

eVIN was created by the government in collaboration with a software company and several NGOs, including the Gates Foundation. Sensors in refrigerators and freezers automatically inform a central database when temperatures change, signaling that the equipment needs to be repaired or replaced. Managers at vaccination locations enter data as soon as vaccines are delivered, providing a global view of the supply situation. In the past, district-level administrators were unable to move supplies within their systems: if a health center had a stock-out, it had to be re-supplied from a central location. Now, workers can identify overstocked centers nearby and quickly shift the excess supplies as eVIN tracks their transit and temperature. The technology works well even in low-resource network settings.

Stock-outs have fallen by half in states where eVIN is in place, and it may soon be deployed for other medicines. The system has been so successful that other countries, including the Philippines, Indonesia, Bangladesh, Nepal and Thailand, are looking at it.
TO ACHIEVE
Universal immunization

India aims to immunize **27 million** new children every year

THE CHALLENGES

- **Consistent supply of vaccines required** – stored at recommended temperatures at every stage
- **Significant inequities in vaccination coverage** – depending on demography, social characteristics and other factors
- **Infrastructure challenges** – in storage and supply of vaccines at the optimal temperature

IMPLEMENTATION & IMPACT

**ADDRESSING THE PROBLEMS:**

- Helps manage flow of stock – so that cold chain points do not run out of vaccines
- Helps Policymakers track progress being made to ensure immunization coverage
- Empowers vaccine handlers at the last mile – making it easy to obtain needed vaccines
- Connects the health workers and programme managers with the help of the vaccine and cold chain manager placed in every district

**IMPACT**

In only one year

- **50%** reduction in frequency of stock outs
- Stock replenishment time down to an average of **two days** from five days earlier

**IMPLEMENTED**

A mobile and web based application to ensure efficient distribution and timely availability of vaccines to all mother and children

- Enables real-time information on: Cold chain temperature – to ensure vaccines are stored at the recommended temperatures
- Vaccine stocks – the vaccines administered and vaccines in store to ensure there are always sufficient vaccines as required

**EVIN**

Electronic Vaccine Intelligence Network

Implemented by the Ministry of Health and Family Welfare and supported by the United Nations Development Programme along with GAVI

- Currently rolled-out at: Nearly 10,500 cold chain points | 371 districts | 12 states
- Nearly 10,000 vaccine temperature loggers installed for temperature monitoring
- 80 million temperature samples logged in every month
- 500 GB raw data and 2TB of analytical data from 9500+ primary stores and 500+ higher stores secured

**EVIN**

Electronic Vaccine Intelligence Network
Lymphatic Filariasis (LF) or Elephantiasis (Hathi Paon) is an ancient and neglected disease in India. Over 650 million Indians are currently at risk of contracting this disease, according to the World Health Organization (WHO). It causes painful, disabling swelling. People who present symptoms suffer from terrible social stigma. India has set a goal to eliminate LF by 2020. One of the main strategies for eliminating LF is preventative mass-drug-administration (MDA). The current MDA regimen utilizes two drugs, Albendazole and Diethylcarbamazine Citrate (DEC), to eliminate the parasite from the blood streams of infected individuals. Yet the goal of elimination remains elusive, mainly because the MDAs often don’t reach enough affected individuals.

Over the years, the Gates Foundation has been working with key development partners to strengthen India’s LF program. In 2015, we supported the Death to Onchocerciasis and Lymphatic Filariasis (DOLF) project, which discovered that in Côte d’Ivoire and Papua New Guinea the addition of a third drug, Ivermectin, made the combination treatment regimen much more effective. Evidence showed that a single dose of the triple-drug therapy – Ivermectin, DEC and Albendazole (IDA) – almost entirely eliminated the parasite from a patient’s blood.

Based on this data, in 2016 we partnered with the Indian Council of Medical Research (ICMR) and other organisations, including the WHO, to establish the three-drug regimen’s efficacy and safety. Following extensive study in India’s population, the new regime’s safety has been established and the Government of India plans to introduce IDA as a key therapeutic strategy in future MDAs. National and global elimination of this dreaded disease is in sight, thanks to innovation and testing.
LYMPHATIC FILARIASIS (ELEPHANTIASIS): A Neglected Tropical Disease

- Caused by filarial parasites
- Transmitted to humans through mosquitoes
- Common manifestations: Hydrocele (swelling of scrotum) & Lymphedema (swelling of limbs or other body parts) - which are painful and disfiguring, and can cause permanent disability
- Patients suffer mental, social and financial losses – leading to stigma and poverty

ELIMINATION GOALS
Elimination of LF as a public health problem is defined as bringing down the Microfilaria infection rate to less than 1% in all LF endemic districts after at least 5 rounds of effective MDA and meeting the Transmission Assessment Survey (TAS) criteria.

- Global elimination of LF as a public health problem targeted by 2020

GOVERNMENT OF INDIA’S EFFORTS TOWARD LF ELIMINATION

DISEASE BURDEN

- Over 650 million Indians are currently at risk of contracting LF
- Reported in 256 Districts across 21 States/Union Territories

STRATEGY FOR LF ELIMINATION
The elimination is targeted using twin strategies

- Transmission control: to prevent the occurrence of new infection by administration of annual single dose of anti-filarial drugs through Mass Drug Administration (MDA). MDA targets every individual in an at-risk community, except children less than two years, pregnant women and seriously ill people.

- Morbidity Management and Disability Prevention (MMDP): to alleviate the suffering of affected populations (controlling morbidity).
  This includes:
  - Home based management - limb hygiene for lymphedema
  - Hospital based management - surgical correction for hydrocele

MOVING AHEAD: NEW APPROACH

- Global Studies have shown that: Switching from a two drugs regime (DA) to a three drugs regime (Ivermectin, Diethyl Carbamazine and Albendazole - IDA) in MDA is superior for reducing microfilaria.

- As part of a global 4-country study on IDA: India conducted a community-based study to compare the safety, efficacy and acceptability of IDA with DA for LF elimination.

- Next step is piloting the triple drug regimen in the coming months to help communities achieve elimination faster. This is currently under discussion.

LF MDA COVERAGE AND TAS PERFORMANCE IN INDIA

Despite several rounds of MDA (two drug combination), at the beginning of 2017, the following was observed:

- Total number of LF endemic districts: 256
- TAS I Cleared: 94
- TAS I Proposed: 25
- MDA Proposed: 137 districts

The data still suggests ongoing transmission of infection and need for more steps.

Disability alleviation through home based management of lymphoedema cases (washing, exercise, foot care, suitable foot wear, wound care etc.) and surgical intervention for hydrocele cases.
As Bill Gates has said,

"What India is trying to do has never been done before."

The country is focusing on adapting cutting-edge technologies so they contribute to progress on the most challenging issues facing the poor. The combination of taking smart risks to devise new solutions and showing the will to invest in improving lives is unprecedented.

India is making great strides in science and technology that can and will transform communities at home and globally. At the Bill & Melinda Gates Foundation, we admire the scale and scope of the country’s ambitions and feel privileged to have the opportunity to help catalyze this vision into concrete results for all.

Nachiket Mor, PhD
Director, India Office,
Bill & Melinda Gates Foundation
“I believe that every life is valuable. That we can make things better. That innovation is the key to a bright future. That we’re just getting started.”

Bill Gates