Operation ASHA
Fighting Tuberculosis Worldwide

A Game-changer that can scale TB care internationally & prevent MDR

© Operation ASHA 2013

1

TB: The only disease declared a Global Emergency (WHO 1993)

Tuberculosis (TB) is a Global pandemic
- *fully curable infectious* disease
- 8 million *new* TB patients worldwide.
- 1.4 million people die of TB every year.
- TB has caused 10 million orphans
- Drug resistant TB – a new epidemic(MDR,XDR,TDR)

Horrifying Predictions:
- By 2015: 1.3 million drug resistant cases, **needing $16 billion to treat**
- "We are on the brink of another epidemic and it has no treatment. If Totally Drug Resistant spreads, we will go back to the dark ages". – *TIME* Magazine, March 4, 2013

Operation ASHA
Fighting Tuberculosis Worldwide

History

- Evidence of tubercular decay found in the skulls and spines of Egyptian mummies
- TB has been plaguing humans for at least 4,000 years.
- Hippocrates noted that "phthisis" (consumption) was the most widespread and fatal disease of his time.
- In the two centuries from 1700 to 1900, **one billion human beings died** of tuberculosis
- (200,000 died in Hiroshima and Nagasaki)
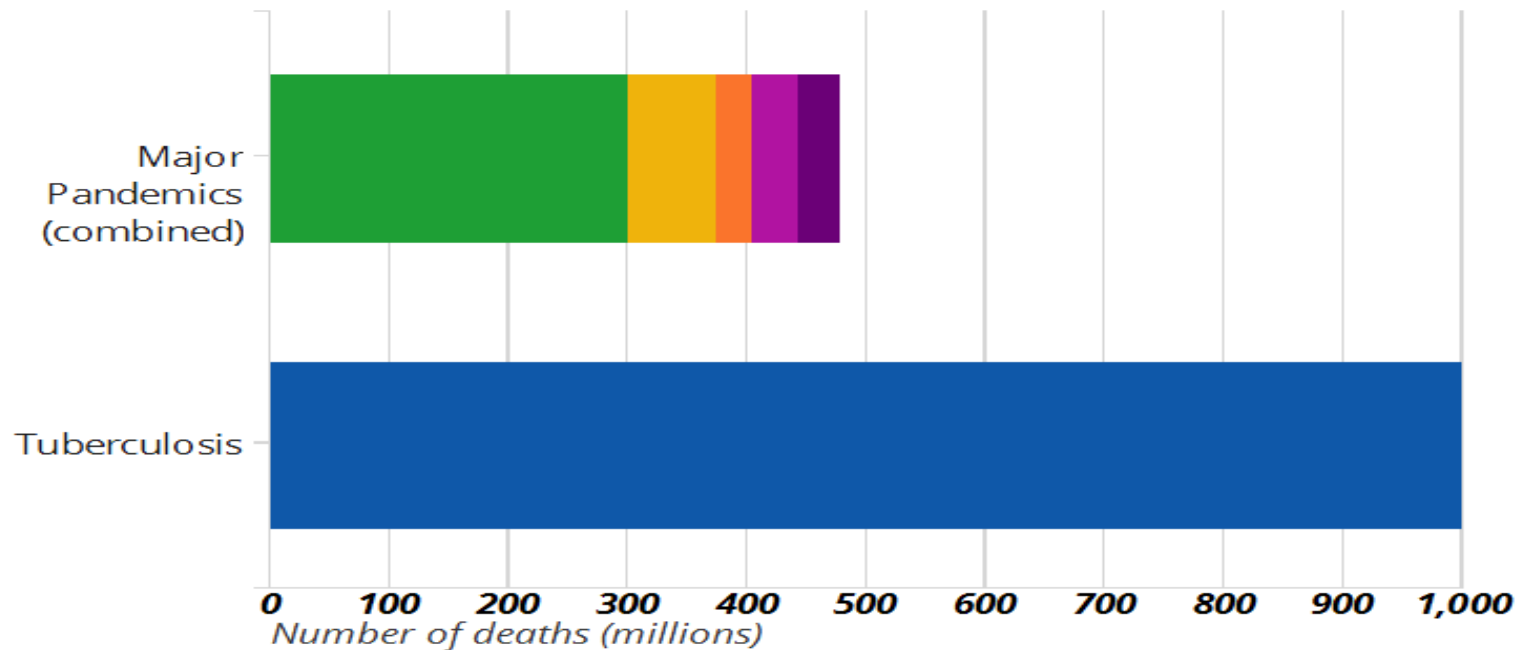
Robert Koch's terrifying statistics

"If the importance of a disease for mankind is measured by the number of fatalities it causes, then ***tuberculosis must be considered much more important*** than those most feared infectious diseases, plague, cholera and the like."

Tuberculosis (TB) is the ***number one single infectious disease killer***, taking nearly 3 million lives per year (National Foundation of Infectious Disease)

TB: The Disease That Eclipses All Other Pandemics

TB: The Disease That Eclipses All Other Pandemics
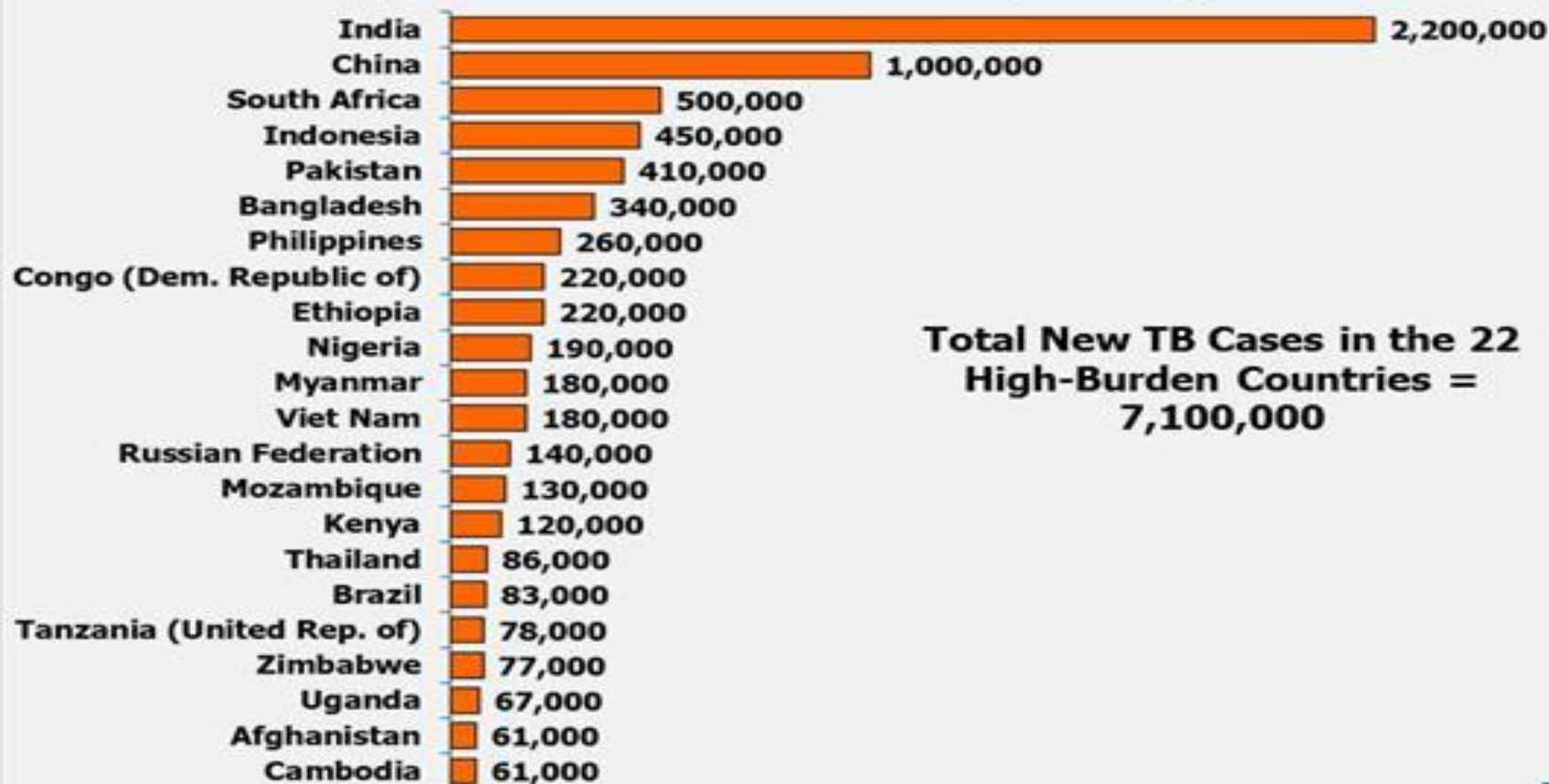

In past 200 years:

- 1,000 million men, women and children have died of TB.
- Only half as many (490 million) died because of all other major pandemics (AIDS, Small Pox, Black Death, Spanish Flu & Cholera) put together.

Source- World Health Organization

India's TB burden is more than double that of second-ranked China

New Tuberculosis (TB) Cases, 22 High-Burden Countries (HBCs), 2011

Country	New TB Cases
India	2,200,000
China	1,000,000
South Africa	500,000
Indonesia	450,000
Pakistan	410,000
Bangladesh	340,000
Philippines	260,000
Congo (Dem. Republic of)	220,000
Ethiopia	220,000
Nigeria	190,000
Myanmar	180,000
Viet Nam	180,000
Russian Federation	140,000
Mozambique	130,000
Kenya	120,000
Thailand	86,000
Brazil	83,000
Tanzania (United Rep. of)	78,000
Zimbabwe	77,000
Uganda	67,000
Afghanistan	61,000
Cambodia	61,000

Total New TB Cases in the 22 High-Burden Countries = 7,100,000

SOURCE: Kaiser Family Foundation, www.GlobalHealthFacts.org, based on WHO, *Global Tuberculosis Report*, 2012.

KAISER FAMILY

Operation ASHA
Fighting Tuberculosis Worldwide

6

Tuberculosis in India: The biggest public health crisis

Drug Resistant TB in India

More than **100,000 estimated** cases of drug resistant TB in India, less than 3,000 identified .

12 cases of extremely drug resistant TB (XXDR or TDR) recently found in India.

India has 3.5 million TB patients, 25% of the world's total burden.

100,000 infected women are thrown out by families to die of disease and starvation

2 persons die of disease every 3 minutes in India

Lost wages: $300 million/year; Total loss to Indian economy: $ 23 billion/year. *

300,000 children drop out of school because they, or a parent, have TB.

* TB India 2007, Government Of India, Mar2007

Operation **ASHA**
Fighting Tuberculosis Worldwide

Geometric Progression of Patients of all types of TB – Normal/DST, MDR, XDR & TDR

1 Pt

12 Pts

144 Pts

1728 Pts

EPIDEMIC

Challenges in TB Treatment: 60 visits to a center over 6 months for normal/DST TB; 790 visits over 2 years for MDR-TB; life-long treatment for XDR and TDR

1. Inaccessible Centers: Existing public infrastructure lacks the last mile connectivity

      - Wages or TB medication? where is the bus fare coming from?

2. **Social Stigma:** patients go into denial or hide symptoms

      - Loss of jobs

NO EFFECTIVE VACCINE!

      - Loss of families/ isolation

      - TB Patients thrown out of homes

3. **Limited/ Ineffective Education or Counseling**

4. **The Quacks**: incomplete, irregular, inadequate treatment

5. **Negligible Follow-up** of defaulting patients

6. **High Cost of Implementation** for most other NGOs: PSI spent $567 per patient in Karnataka, India in 2010-11

7. **Program Level** – lack of electronic data, inaccuracy, human errors, data-fudging to meet targets

    RESULT= High default rate- leading to drug resistance

Operation ASHA
Fighting Tuberculosis Worldwide

Sensational News Item in Times of India

"...The data was being fudged."

– Ghulam Nabi Azad, Union Health Minister (Times of India, Oct 31, 2011)

THE TIMES OF INDIA | India

States fudging infant, maternal data: Azad

Kounteya Sinha, TNN Oct 31, 2011, 04.40AM IST

Tags: Mother and Child Tracking | MCTS | maternal data

New Delhi: States fudging figures of how many pregnant women and newborn children have received health services they are entitled to - like immunization - are in trouble.
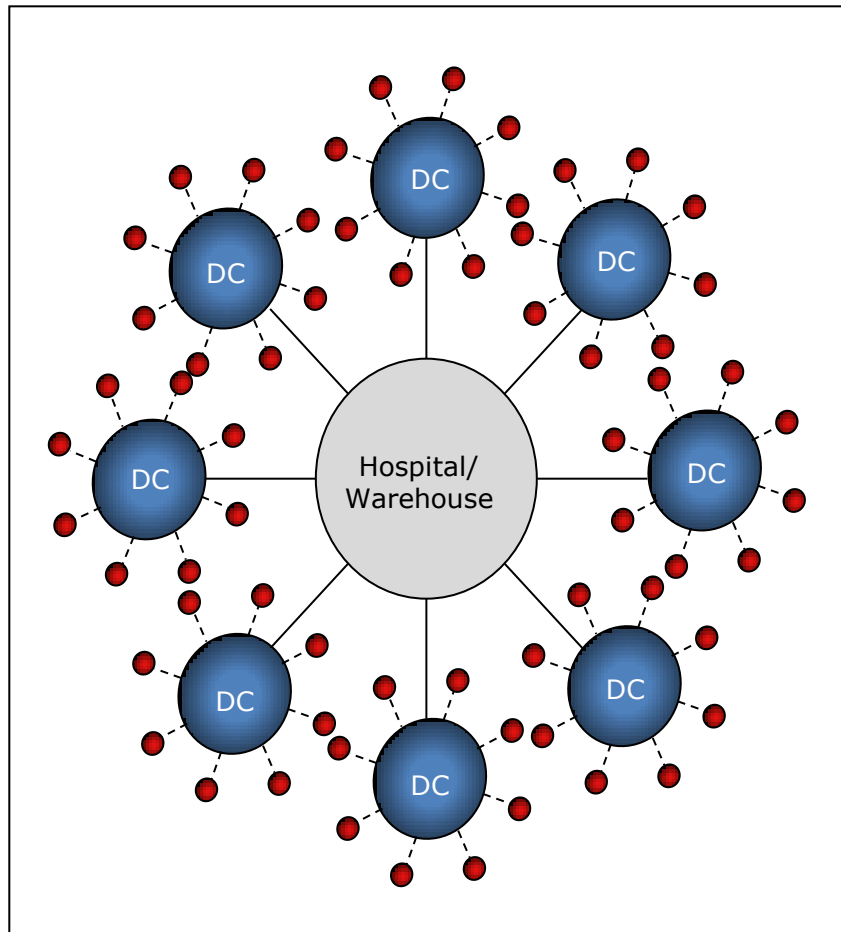
Independent evaluation by a WHO consultant found default rate of 36% and cure rate of 32%.

Operation ASHA
Fighting Tuberculosis Worldwide

TB Control program: The DOTS model- Lacks Access and Availability

The DOTS* model: network of three types of facilities

TB Hospitals: Adequate
- Government facilities providing comprehensive diagnostics and treatment recommendation
- Warehouse for medicine supplies, provided free by government & donors

Diagnostic Centers: Adequate
- Sputum tests for initial diagnosis

Treatment Centers: Inadequate in slums & villages
- Local "last mile" centers, distributing medication and ensuring compliance
- Few TCs, with limited hours
- Scarcity of TCs results in high default rates, relapse & drug-resistance

Operation ASHA
Fighting Tuberculosis Worldwide

*   "Directly Observed Therapy - Short Course"

The problem of informal providers

"In a recent study, **only 3 out of 106 practitioners could issue an appropriate prescription** for drug resistant TB"

Who are informal providers?

  - Quacks

  - Indigenous/ Traditional Systems of Medicine

  - RMPs

What do they do?

  - Incomplete, irregular, inadequate treatment

  - No follow-up

  - No counseling, destigmatization, nothing to prevent MDR-TB

Operation ASHA
Fighting Tuberculosis Worldwide

Operation ASHA's Solution: Fill the Gaps in the Government Program: local and deep model with community empowerment

Our Solution:

- Integration of informal providers within OpASHA's program by making them Community partners
- Establish DOTS centers in their clinics
- Upgrading their knowledge and skills
- Camouflage Dots centers by providing free OTC medicines
- Ensure that they do not 'lose' patients and livelihood Increased respect from the community

Strategically located TB Centers :

- Partner with local micro-entrepreneurs, priests, home-makers based in convenient, high-traffic areas
- Centers open at convenient hours, up to 18 hours a day
- No patient needs to miss work/wages or pay for bus fare to access treatment

Operation ASHA's Solution: Fill the Gaps in the Government Program: Specialized training and eCompliance technology for low cost and high impact

Local Community Members Hired as Providers & Facilitators:
- Work to detect new patients, provide treatment, track patients who miss doses
- Familiarity with local customs, geography, and informal address systems
- Performance-based salaries for field workers & supervisors
- Much more cost efficient than MD doctors

Specialized Training
- For active case finding
- Conduct health awareness programs
- Provide counseling to ensure adherence and prevent MDR
- To destigmatize TB

eCompliance Biometric Technology
- Accurate data
- Elimination of fudging and human error
- Full transparency
- Increase in productivity and reduction in operating cost
- Eliminates default and prevents MDR

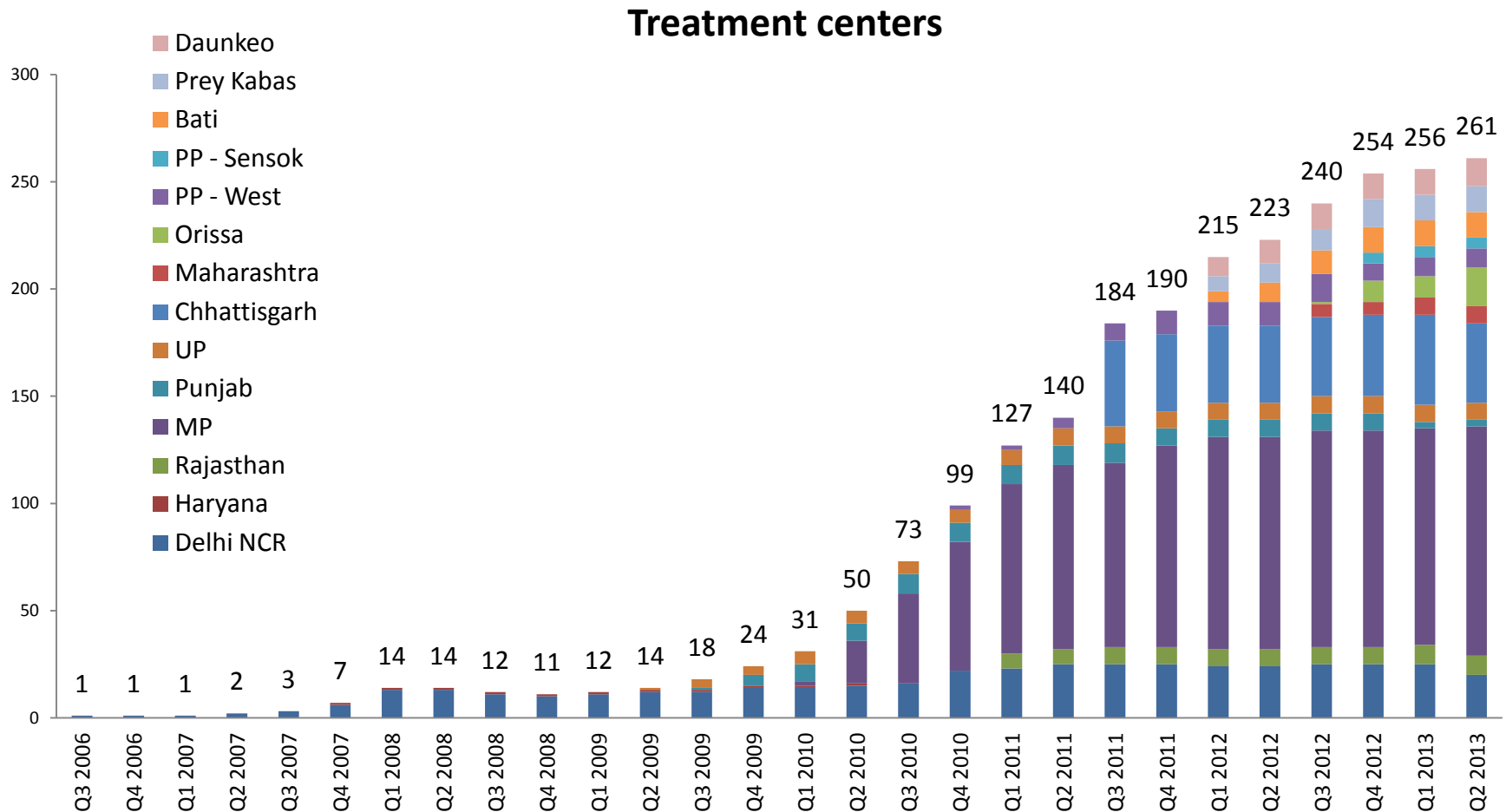**Operation ASHA**
Fighting Tuberculosis Worldwide

What makes OpASHA a game-changer?

The Outreach

- **INDIA – Replication across states**
- Started with one center in 2006, one field worker
- Now serving 6 million
- 260 centers
- Working in 8 States, 17 cities, and 14 villages, >3000 disadvantaged areas
- Working in tribal area in MP of 500,000 population
- Working in Dharavi Mumbai of 160,000 population
- 58 full-time and 248 part-time staff in India

- **CAMBODIA – Expansion/ Replication of the entire model by Operation ASHA since 2010**
- Serving 6% of the population and 8% of the patients
- Working in 5 Operational Districts, in 2 provinces
- Detection rate increased by 70%
- 65 full-time local staff, except country director.

Operation ASHA
Fighting Tuberculosis Worldwide

OpASHA: centers run by own staff in India & Cambodia

Treatment centers

Legend:
- Daunkeo
- Prey Kabas
- Bati
- PP - Sensok
- PP - West
- Orissa
- Maharashtra
- Chhattisgarh
- UP
- Punjab
- MP
- Rajasthan
- Haryana
- Delhi NCR

Values by quarter: 1 (Q3 2006), 1 (Q4 2006), 1 (Q1 2007), 2 (Q2 2007), 3 (Q3 2007), 7 (Q4 2007), 14 (Q1 2008), 14 (Q2 2008), 12 (Q3 2008), 11 (Q4 2008), 12 (Q1 2009), 14 (Q2 2009), 18 (Q3 2009), 24 (Q4 2009), 31 (Q1 2010), 50 (Q2 2010), 73 (Q3 2010), 99 (Q4 2010), 127 (Q1 2011), 140 (Q2 2011), 184 (Q3 2011), 190 (Q4 2011), 215 (Q1 2012), 223 (Q2 2012), 240 (Q3 2012), 254 (Q4 2012), 256 (Q1 2013), 261 (Q2 2013)

OpASHA : a game-changer

Replication in other countries

Third party replication by Columbia University/ The Millennium Villages Project

1. **UGANDA in June 2012**
    * Outstanding results: **Death + Default rate down to ZERO from > 16% in the preceding year**
2. **Dominican Republic: May 2013**

In the pipeline......

SWAZILAND

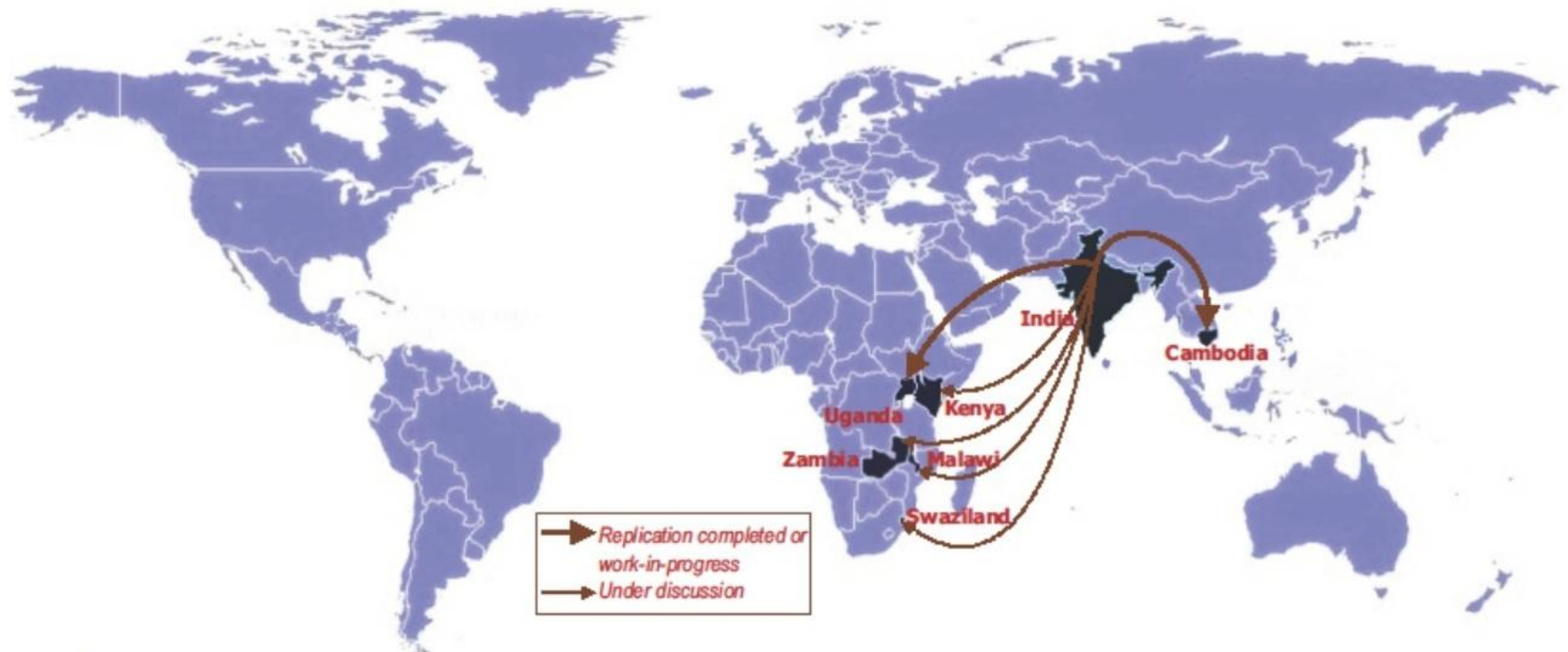• To roll out e-Compliance in the entire country

KENYA & MALAWI

• Discussion stage

Operation ASHA
Fighting Tuberculosis Worldwide

Replication of Operation ASHA's model across the world.

OpASHA: a game-changer

- Easy replicability (8 hours training remotely for Uganda)
- Cost effective, high impact model
- Believes in measuring impact & outcome: "what gets measured, gets done"- Goals matter!
- Local people and communities extensively involved
- Training manual in place, modifiable according to local customs and food habits

Cost Benefit Analysis proves game-changing potential

Our cost to detect & treat one TB patient = $80

"Operation ASHA's cost for treating each patient in India is approximately **19 times lower** than the nearest other provider" -Joan Yao, of LGT Venture Philanthropy, Switzerland

Our cost of detection alone = $27 per patient

32x lower than programs funded by TB-REACH (average cost per detection = $852)

Will lead to **$2.5 billion Saving** in cost of detecting 3 million undetected patient

Our **SROI: 3217%**

$100 invested by a donor provides benefits worth $3217 to disadvantaged communities

Cost of preventing 1 MDR case by using Operation ASHA's methodology = $200:

14-50x lower than cost of treating 1 MDR patient, which is $2,800-10,000.

Operation ASHA
Fighting Tuberculosis Worldwide

OpASHA: a game changer
eCompliance: a revolutionary intervention

"DOTS alone is not sufficient **to curb the TB epidemic in countries with high rates of MDR-TB."**

- Stop TB Working Group

"Electronic datasets are needed to facilitate accuracy and analysis of data."

- World Health Organization (2011)

eCompliance: Innovative, low cost technology

- *Aim- to* track and ensure each dose taken
- Runs on commercially available, 'off-the-shelf' components
- Minimal initial and operating costs

Netbook Computer

SMS Modem

+

OR

Android Tablet

Fingerprint Reader

Operation ASHA
Fighting Tuberculosis Worldwide

eCompliance on Android

eCompliance: Indisputable evidence for each dose taken

<u>PRIMARY OBJECTIVE</u> - To ensure accuracy and adherence

PROBLEMS

1. **Unsupervised doses being given**
   - Missed doses and default
   - Patients not tracked
   - Inaccurate record keeping
   - Data fudged
   - Inadequate follow-up
   - Time lag for follow-up
   - Absenteeism among field staff

2. **Limited knowledge of providers**

SOLUTIONS

1. Taking fingerprint every time **confirms** a TB patient's presence
   - This creates indisputable evidence
   - One cannot 'fudge' a fingerprint!

2. The entire DOTS regimen including reminders for follow up tests are **built in eCompliance**

Operation ASHA
Fighting Tuberculosis Worldwide

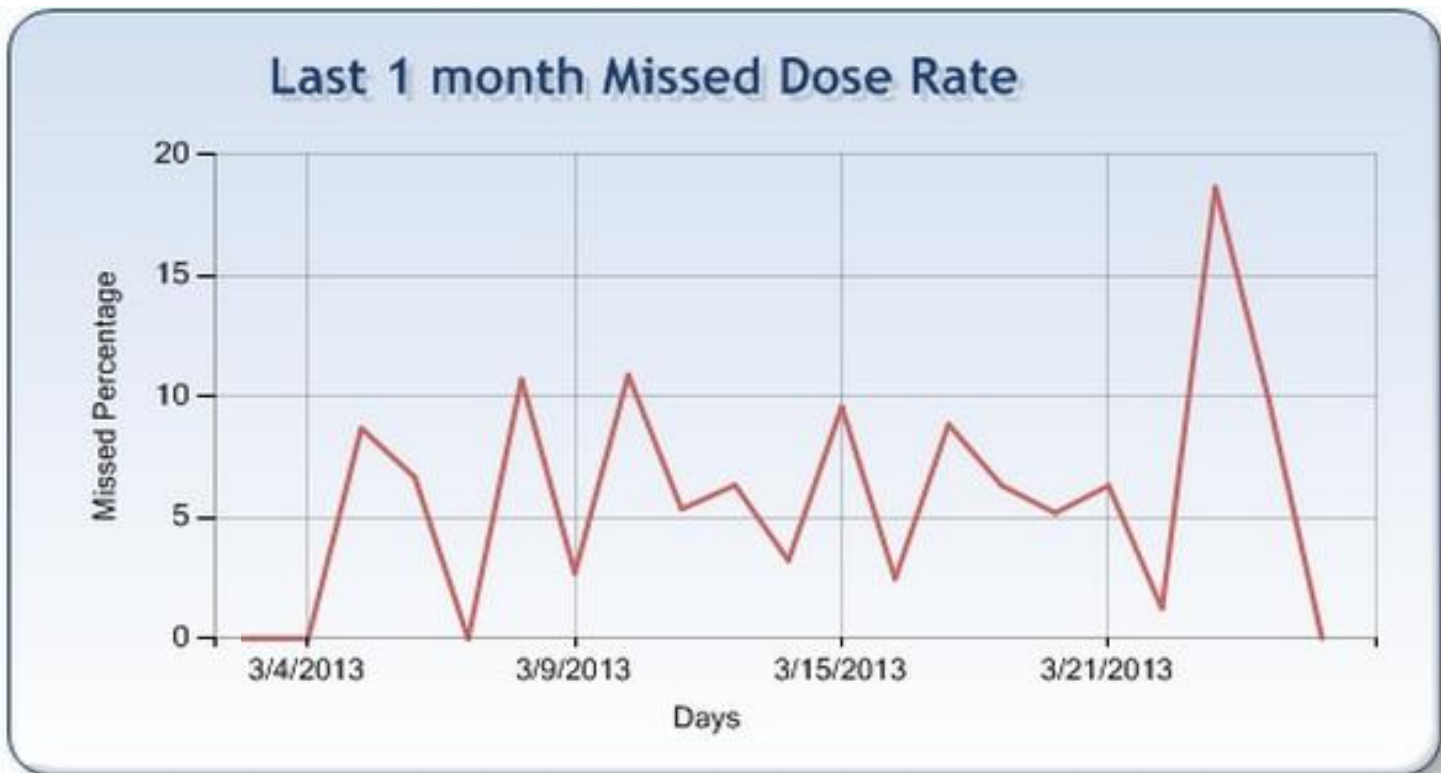# eCompliance: Easy to use for semi-literate persons

- Color coding shows that a patient has been successfully logged in

- Minimal text

- Easily translatable into other languages

Counselors can quickly identify which patients have

- Visited the center

- Not come into the center

- Missed their dose

eCompliance: Web-based reporting system at the back-end

Last 1 month Missed Dose Rate

eCompliance: Workflow

Front End

eCompliance Tablet

Dose missed!

Encrypted Data

Patients, Health Worker & Program Manager

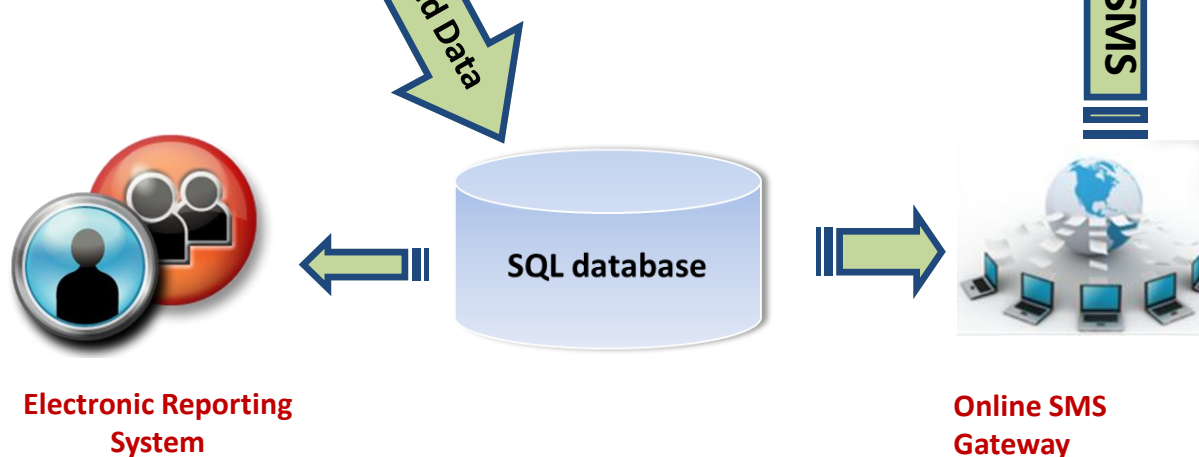**Back End**

SQL database

Electronic Reporting System

Online SMS Gateway

SMS

The Front End
- Uses only off-the-shelf components
  - ➢ A fingerprint reader
  - ➢ An Android Tablet

The Back End
- SMS Gateway for Sending Alerts
- Electronic Medical Record System
- Central Database

Op ASHA **Operation ASHA**
Fighting Tuberculosis Worldwide

eCompliance: Implementation

Results
- Default <**3%**
- Over **6,000** patients enrolled so far
- Over **225,000** visits logged
- Over **3300** visits logged every month

Lessons Learned
- Patients are not hesitant to give their fingerprints
- Patients perceive technology as a sign of high quality of treatment

25 — Terminals used in South Delhi since 2010

34 — Terminals installed in Bhiwandi, Jaipur and Mumbai centers in since 2012

84 — Terminals installed in 5 cities in MP (Bhopal, Jabalpur, Gwalior, Gwalior Rural, Indore, Sagar) and 3 cities in Chhattisgarh (Raipur, Bilaspur, Durg, Bhilai) and Orissa (Bhubaneshwar)

148 — **Total no. of terminals installed by the end of Aug 2013**

19 — Of which so many Android terminals were installed in South Delhi in Jul 2013

5 — Of which 3 terminals were installed in **Uganda in 2012 and 2 in Dominican Republic in 2013**

Operation ASHA
Fighting Tuberculosis Worldwide

eCompliance: Key Benefits

PATIENT AND COMMUNITY LEVEL

- Positive impact on the psyche, seen as dedication towards quality treatment

AT LEVEL OF PROVIDERS AND COMMUNITY PARTNERS

- Ensures integrity of DOTS: eliminates frequent unsupervised doses
- Eliminates human error
- Improves skill set
- Enhances prestige in community
- Accurate reporting and up-to-date intelligence

Operation ASHA
Fighting Tuberculosis Worldwide

eCompliance: Key Benefits (contd.)
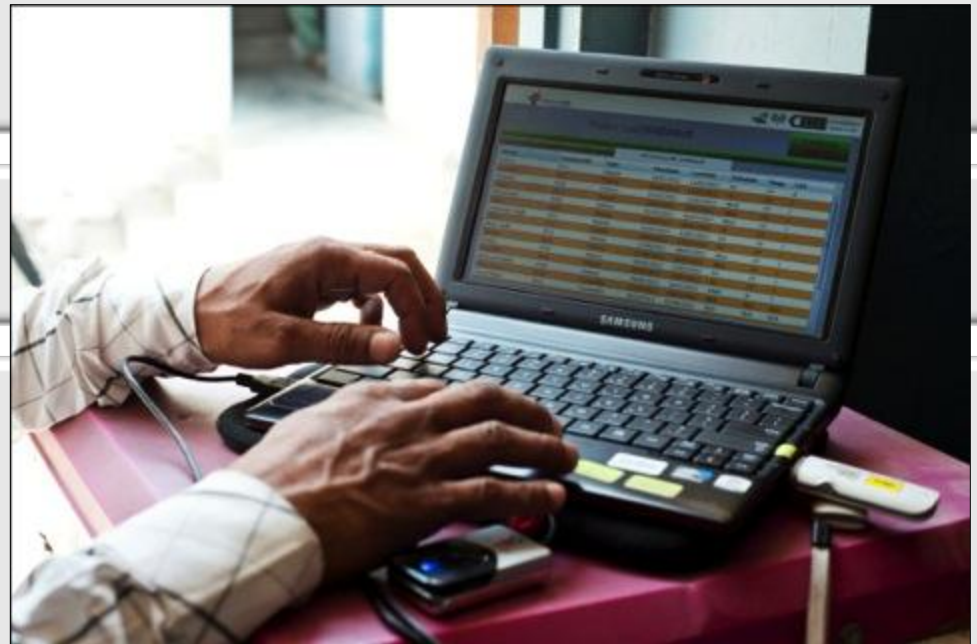
MANAGEMENT LEVEL

- Comprehensive Electronic Medical Record System.
- Web based reporting system, Multi-level accountability and transparency
- Transparent treatment supervision
- Ensures accuracy of incentive payment

THE PUBLIC HEALTH PERSPECTIVE

- Turns the tap off on Drug-Resistance

CAN BE UPGRADED FOR

- HIV treatment
- To prove presence of patients for payment to hospitals by insurance companies
- Diabetes and hypertension
- Attendance in schools and vocational training centers
- Mid-day Meal schemes

Operation ASHA
Fighting Tuberculosis Worldwide

eCompliance: A highly cost-effective intervention

Component	Cost
Android Tablet	$ 140 (Rs. 8,500)
Fingerprint Reader	$ 65 (Rs. 4,000)
Internet Plan (per year)	$ 40 (Rs. 2,400)

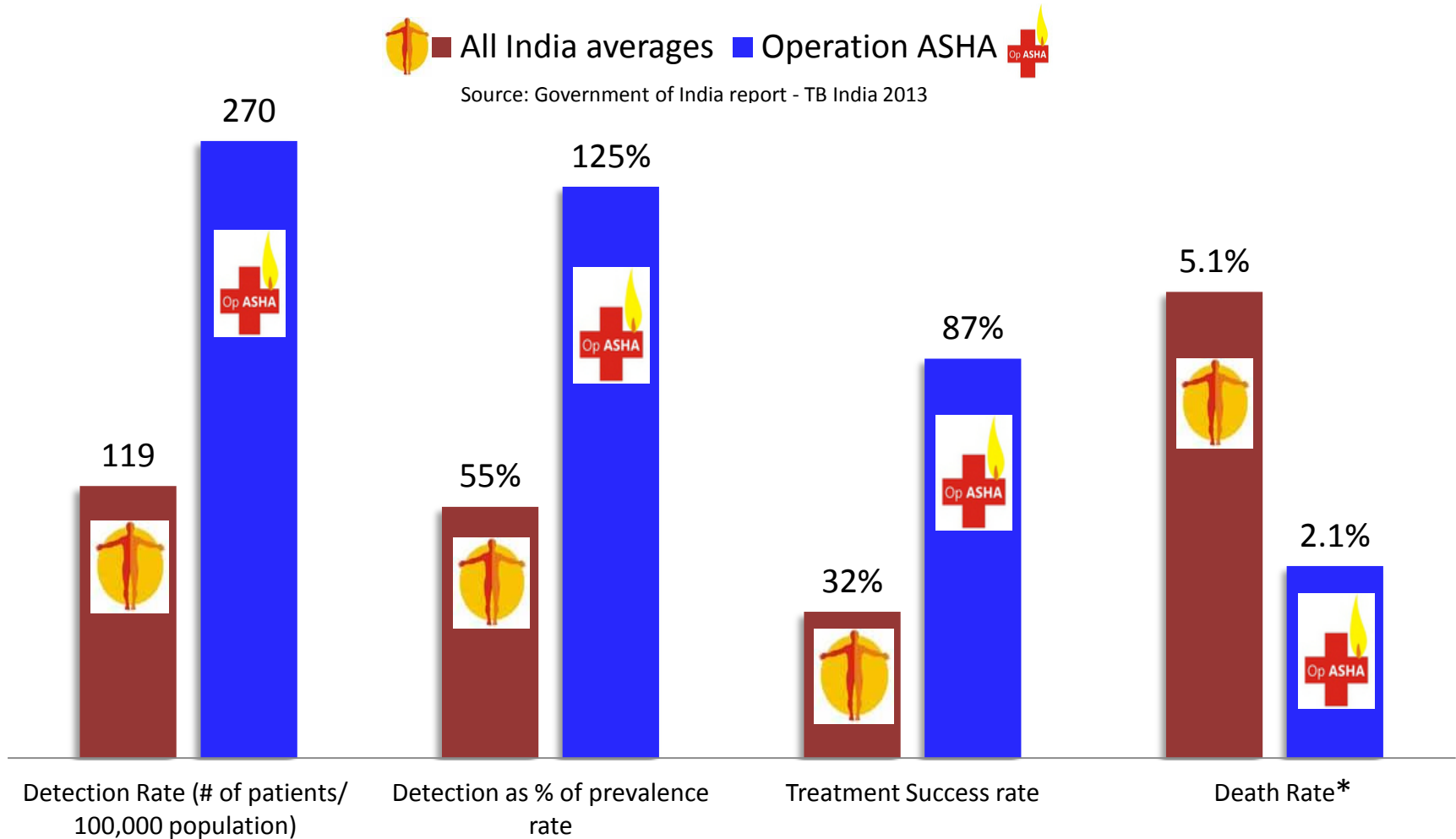Total cost of each eCompliance terminal = **$245 (Rs. 14,900)**

Cost per patient = **$2.66 (Rs. 162), which is more than offset by increased productivity** (each unit will treat 92 patients over 2 years: average at OpASHA)

Operation **ASHA**
Fighting Tuberculosis Worldwide

eCompliance: Another benefit -- Increase in productivity leading to 30% cost reduction

- Saves time that was otherwise spent in going through paper records
- Target counseling to patients who frequently miss doses saving on time required for counseling
- Reduces provider costs by 30%
- This more than pays for hardware costs, and
- Reduces recurring costs substantially

Operation ASHA
Fighting Tuberculosis Worldwide

Results delivered by OpASHA vs All India averages

Legend: ■ All India averages ■ Operation ASHA

Source: Government of India report - TB India 2013

	Detection Rate (# of patients/ 100,000 population)	Detection as % of prevalence rate	Treatment Success rate	Death Rate*
All India averages	119	55%	32%	5.1%
Operation ASHA	270	125%	87%	2.1%

* for Operation ASHA, figures are for South Delhi.

Impact – to date

30,602
Patients cured

1,83,612
Infections averted

$4,000
Cost of creating a job

89%
Treatment success rate

<3%
Default rate

190
Full-time jobs created for Semi-literate youth

175
Micro-entrepreneurs/ community partners who earn additional income in disadvantaged communities that serve as locations for Operation ASHA treatment centers

SROI 3,217%

Operation **ASHA**
Fighting Tuberculosis Worldwide

Versatile pipeline: Services provided by Operation ASHA

1. Economic benefits

2. **Jobs to semi-literate youths** who work as providers:

   80% of Operation ASHA's expenses generate livelihood

3. **Over-the-counter drugs** for ailments like acidity, dizziness and headache

4. Oral Rehydration Salt (**ORS**) to prevent diarrhea, dehydration and deaths

5. **Contraceptives**

6. Distribution of **food and nutrition supplements** given by TB Association, Indian Government, religious groups, etc. for poor children/youths/elderly living in slums

7. Micro-health insurance, micro-accident insurance, safe water, solar lamps

Operation ASHA
Fighting Tuberculosis Worldwide

OpASHA : Awards, Partners and Media Coverage

and many more…