# Epidemic Control in India: re-focusing public health services for better outcomes

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# COVID has increased interest in public health

- Current COVID pandemic wreaking havoc:
  - On people's lives
  - On the economy
- Further epidemics of communicable diseases are expected:
  - Climate change
  - Newly-emerging diseases

… on top of India's high levels of ENDEMIC communicable diseases

  - Huge toll on households and the economy

# Outline of talk

1. What is public health?

2. … and why does it matter?

3. What do public health systems need?
   - Structures with autonomy: National, State & Local
   - Staffing: technical & grassroots workers
   - Focus on weak links in the chain

4. Lessons from Tamil Nadu on effective organization of public health services

5. Lessons from Sri Lanka's effective grassroots workers

6. Conclusions: key lacunae in India's public health system

# Section 1:

# What is Public Health?

# Public health is about *preventing* disease ….rather than treating the illnesses of individuals

*Source:* Canada's Chief Public Health Officer (2011)

…..*through sanitation of the environment, control of infections, education in personal hygiene, and the organization of medical services for early diagnosis and preventive treatment of disease….'*

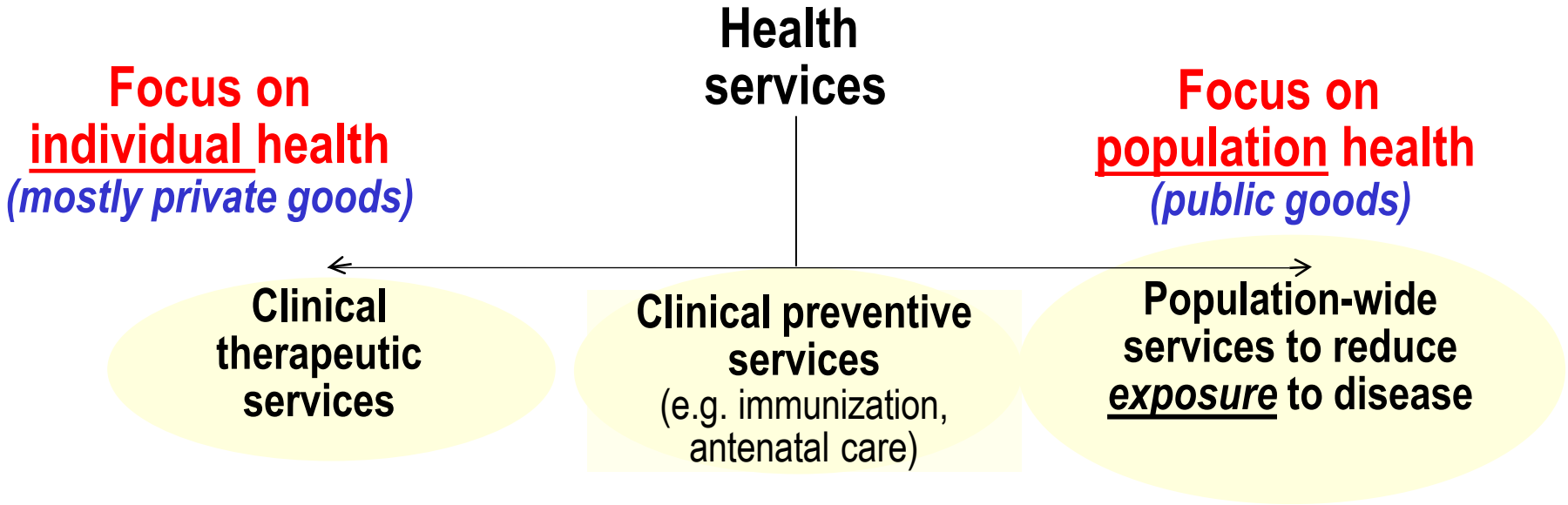
(paraphrased from Winslow 1920:30, pioneer in US public health services)

**Heavy focus on communicable diseases, as one case can infect others**

Public health not to be confused with publicly-funded medical services

Sometimes even confused with private insurance for medical care!

# *Three broad types of health services*



# What do public health systems do?

***Key services:***

- Monitor actual / potential threats
  - Threats from diverse sources, e.g. animals, insects
- Mobilize public response to avert / respond to threats:
  - Inform people
  - Use public health laws
- Provide services to avert / respond to threats, e.g.
  - Address sources of threat: e.g. sanitation, vector control
  - Reduce spread: e.g. contact tracing, vaccination, treatment

# Grassroots workers in Europe:
# Duties of Public (Environmental) Health Officers in Europe, 1978

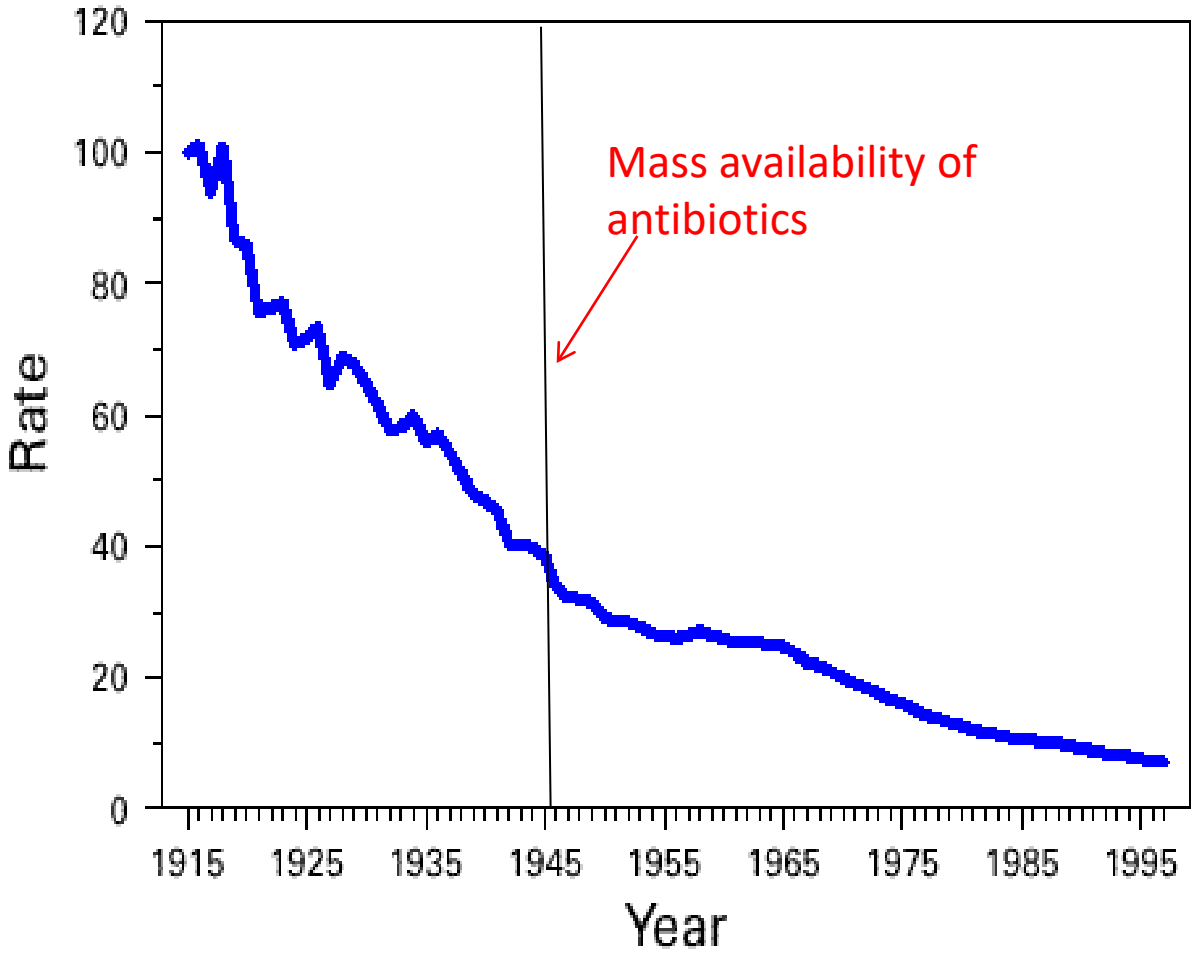
- Water safety
- Food safety (food vendors, food processing / storage, slaughterhouses, markets)
- Waste management
- Vector control
- Housing
- Investigate & manage disease threats
- Occupational health
- Air quality
- Control measures at borders and ports

Source: WHO (1978)

# Section 2
# … and why does public health matter?

# Public health measures helped reduce developed world mortality

FIGURE 1. Infant mortality rate,* by year — United States, 1915–1997



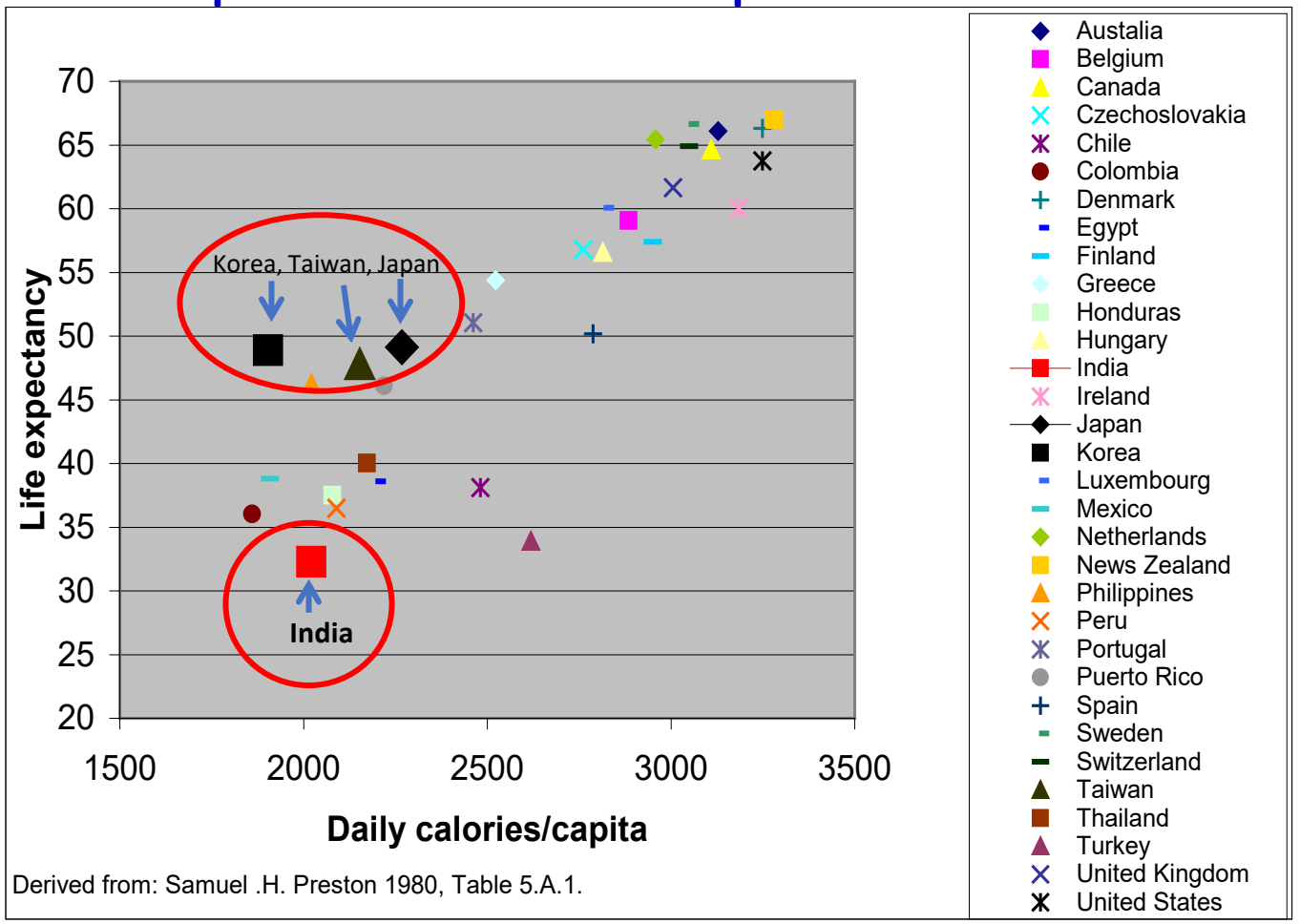

*Per 1000 live births.

Source: CDC MMWR Weekly 1999, 48(38);849-858 http://www.cdc.gov/mmwr/preview/mmwrhtml/mm4838a2.htm

# Life expectancy rises with income / nutrition

## *…but Japan's public health system helped achieve 50% higher life expectancy than India, despite similar calorie intake in 1940*

### Japan and its colonies compared with India




Source: Das Gupta et al (2010) "How Might India's Public Health Systems Be Strengthened?: lessons from Tamil Nadu", *Economic and Political Weekly* 45(10): 46-60

# Communicable diseases remain widespread in India

Huge toll on households & nation:

- Reduced labor productivity, earnings
- Costs of treatment

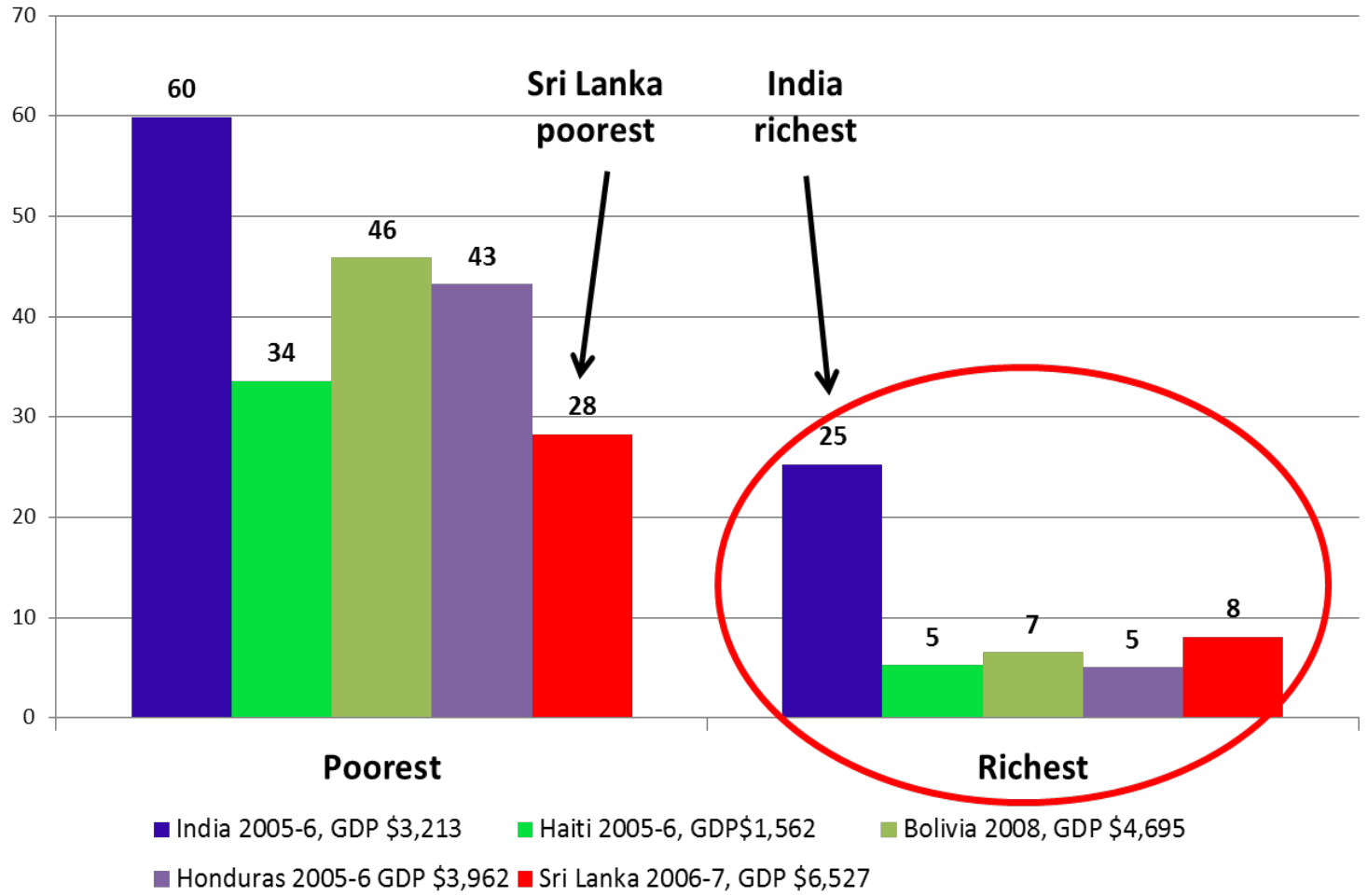
- COVID is dramatic in its impact on the economy (World Bank forecasts):
  - 5.8% growth forecast Jan 2020
  - 9.6% ***contraction*** forecast Jan 2021

    (Note: before the huge COVID surge April-May 2021)

- But routine cost of inadequate sanitation: (World Bank estimates for 2006)
  - Over 1% GDP loss due to productivity loss & costs of treatment
  - *Doesn't include lifetime productivity loss due to child stunting from repeated infections*
    - Child stunting associated with lower productivity, lower earnings

# In India, repeated infections cause high levels of child stunting, even among *wealthiest* households

## % of children stunted, by household wealth quintile: India, Sri Lanka and poorest countries in Latin America circa 2006




***Source:*** Das Gupta et al (2020), derived from DHS surveys for child stunting data by household wealth quintile, World Bank for estimated GDP per capita 2005

# Section 3
# What do Public Health Systems need?

(a) Institutional Structures, with substantial autonomy

(b) Staffing: technical and grassroots workers

(c) Focus on weak links in the chain

# *What do public health systems need?*

## (a) Institutional Structures with substantial autonomy

- National level: NCDC set up to be the national institution
  - Link with international institutions (WHO, CDC, others)
  - Link with state public health authorities down to grassroots
  - *Low autonomy*
- State level: Public Health Directorate

  *plan & coordinate public health services down to local level (municipality, district, panchayat)*
  - Most states don't have this, merged with medical services since 1950s
  - Tamil Nadu DPH not merged, good model for other states

## *What do public health systems need?*

## (b) Staffing: technical and grassroots workers

- Technical expertise required to support public health doctors:
  - Entomologists, zoonotic disease specialists, etc
    (wide range of threats to human health)
  - Epidemiologists, statisticians, etc

- Grassroots workers:
  - monitor & respond to health conditions at ground level

# *What do public health systems need?*
# (c) Focus on weak links in the chain

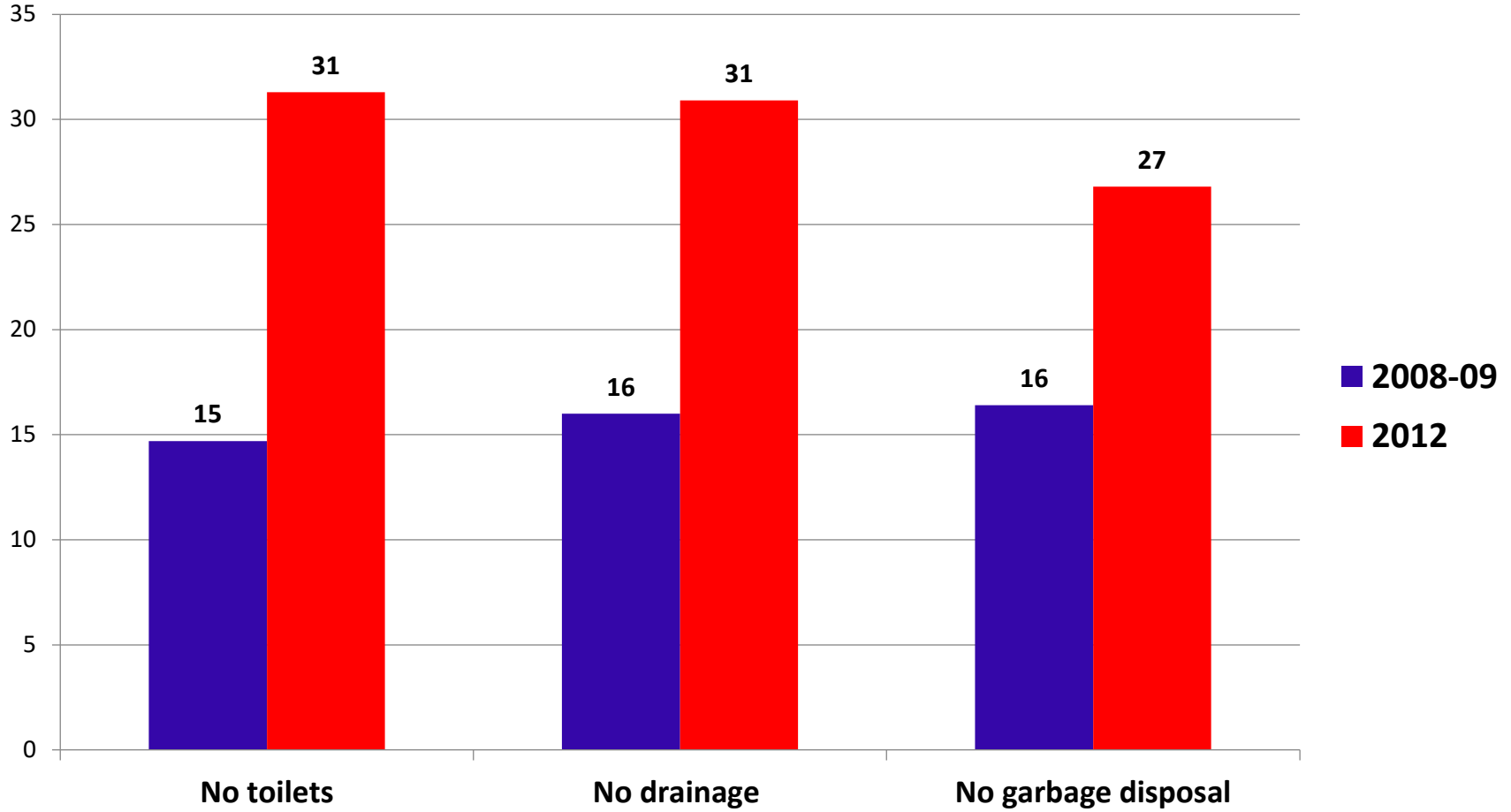
First principle of public health service provision: –

***outcomes are driven by the weakest links in the chain***

- Spillover of contagion:
  - Between countries
  - Between neighbourhoods
- In India, weakest links are in unequal distribution of civic services:
  - E.g. water, drainage, sewerage, garbage collection, etc.
  - Sanitary conditions for slum dwellers actually *worsened* between 2008 and 2012

# *Sanitary conditions in urban slums worsened 2008-2012*

## % of slums by sanitary conditions, India 2008-9 and 2012




***Source***: Das Gupta et al (2020), based on Government of India, National Sample Survey Organisation (2013)

# Weak links in the chain affect everyone

- Neglect of slums affects everyone:
  - Diseases remain endemic, not eradicated
  - Remain source of infection for everyone

***Major impetus for slum upgrading in West, from late nineteenth century***

- Children of rich + poor at risk of stunting in India
  - associated with lower cognitive ability, productivity, & earnings

# Section 4
# Lessons from Tamil Nadu on effective organization of public health services

# Lessons from Tamil Nadu

*Strong public health administration: simple, professionally run*

## *Public Health Directorate separate from Medical Services*

- Own dedicated staff:
  - Tight management structure:
    - Hire, train, & manage own staff
    - Clear allocation of responsibilities from state level to grassroots level
- Own dedicated budget:
  - Can hire full range of support staff (e.g. entomologists, labourers)
  - Finance activities to avert ***potential*** threats
    - e.g. Maintain plague monitoring centres, unlike other states
- Public Health Act: umbrella mandate for public health action
- Director Public Health has authority over whole state, top technical advisor to Health Secretary

# Close collaboration with whole state administration

Work closely with state & district administration

- Other departments understand the issues
- And know what each department needs to do in an emergency

- E.g. Annual review to prepare for disaster management:
  - District Collectors and other departments participate,
    - so everyone familiarized with actions needed to protect public health

- Smooth collaboration in disaster response, e.g. tsunami

  (WHO 2006:81, on Tamil Nadu's effective response to the tsunami)

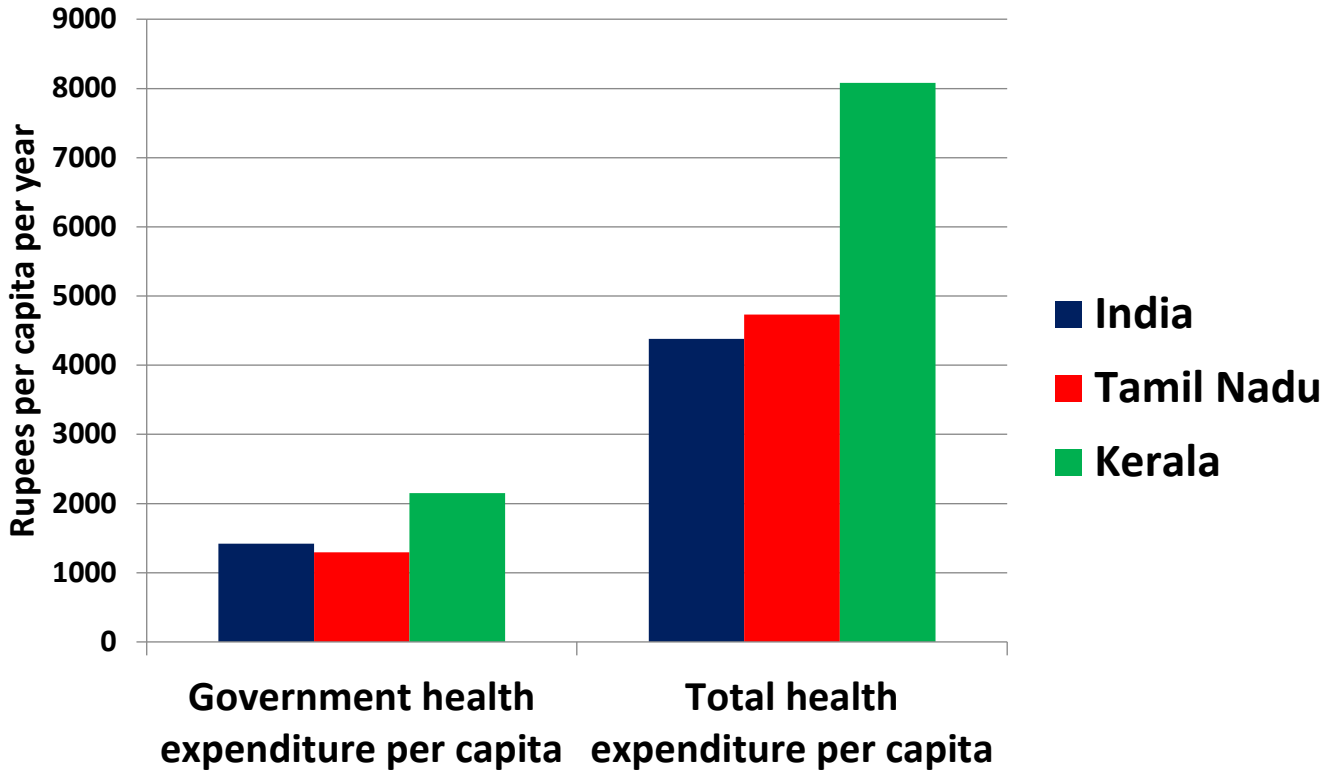
# Tamil Nadu model easily replicable in other Indian states

- *Same ingredients as other states:*
  - ***Facilities:*** State Hospitals, District hospitals, Primary Health Centers and subcenters
  - ***Staff:*** doctors, nurses, technicians, male & female outreach workers
- *Tamil Nadu organizes these ingredients differently:*
  - separates medical officers into tracks:
    - 1% to public health track, with short training in administration to manage public health and PHCs
    - 99% to medical track
  - this enhances efficiency of both sets of services

  Note: Public health administrators have to be medical doctors (understand health threats)
  — can't be sociologists or MBAs, etc
- **Done within budget similar to Indian average**

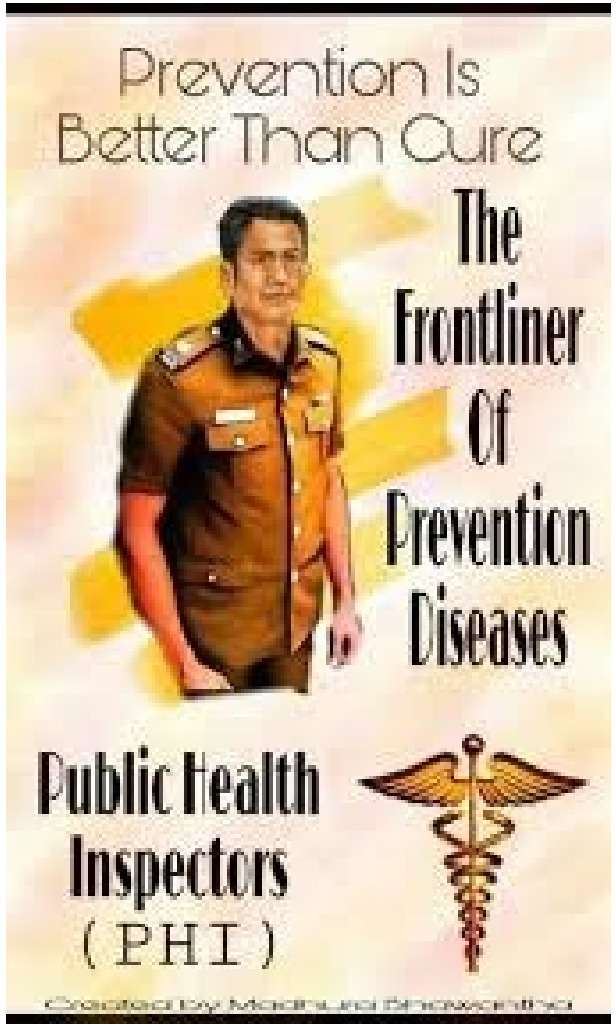
# Tamil Nadu's per capita health expenditures similar to Indian average

**Per Capita Expenditure on Health in 2016-17 in India, Tamil Nadu, and Kerala**
**(Source: Govt of India *National Health Accounts 2016-17*)**



# Section 5
# Sri Lanka: Lessons on grassroots workers
## Public Health Inspectors (equivalent of India's Male Health Workers)

# Sri Lanka's Public Health Inspectors *worth emulating*




# Duties of Public Health Inspectors in Sri Lanka

- Investigate & manage disease threats (e.g. contact tracing, follow-up with treatment defaulters)
  Key role in COVID management
- Water safety (testing, disinfection)
- Food safety (food vendors, food processing / storage, slaughterhouses, markets)
- Waste management (supervise local bodies' collection and disposal of refuse)
- Housing inspections (supervise latrine construction, sanitation, vector control)
- Vector control
- Occupational health (factory inspections)
- School health inspections (incl worm treatment)
- Health education (plan & implement)
- Disasters and epidemics: organize & supervise sanitation & other measures to prevent outbreaks
- Sanitation of medical institutions: supervise and submit reports to head of the institution

Sources: *Manual for Public Health Inspectors*, Sri Lanka https://phi.lk/Manual_for_the_Sri_Lanka_PHI.pdf

Sri Lanka Preparedness & Response Plan COVID-19 April 2020 http://www.health.gov.lk/moh_final/english/public/elfinder/files/news/2020/FinalSPRP.pdf

Das Gupta et al (2013) https://openknowledge.worldbank.org/bitstream/handle/10986/21475/WPS6558.pdf?sequence=1&isAllowed=y

# Sri Lanka's Public Health Inspectors

- Trained to work confidently organize own workplan according to changing needs (following clear overall guidelines & supervisor inputs)
- Comprehensive Training for 18 months in wide range of topics
- Detailed Manual for their work
  - https://phi.lk/Manual_for_the_Sri_Lanka_PHI.pdf
- Treated with respect e.g. Help train Doctors in Community Medicine
  - http://www.med.jfn.ac.lk/wp-content/uploads/2017/11/Community-Medicine-Attachment-Student-Guide_2017.pdf
- Community appreciation (e.g. newspaper reports on their work)

# Section 6
# Conclusions

# Conclusions: Key shortfalls in India's public health systems

1. Gaps:
    a. Inadequate structures:
        - National, State and local
    b. Inadequate staffing:
        - Non-medical technical staff (entomologists, etc)
        - Trained grassroots workers
    c. Low autonomy
    d. Services not focused on weak links in the chain

2. Consequences:
    a. Many diseases remain endemic
    b. New diseases like COVID can run rampant

# The Bottom Line

- Communicable diseases take a huge toll on people, & hinder economic growth
  - Eliminating them is key plank of development infrastructure
  - No country has developed without investing in strong public health services

- Can greatly strengthen public health services, *within current government health budgets*, using the lessons from Tamil Nadu and Sri Lanka:
  - Deploy existing resources more effectively,
  - Improve management of public health services

*Focusing on clinical services while neglecting services that reduce exposure to disease is like mopping up the floor continuously while leaving the tap running*