

NRW Forschungskolleg

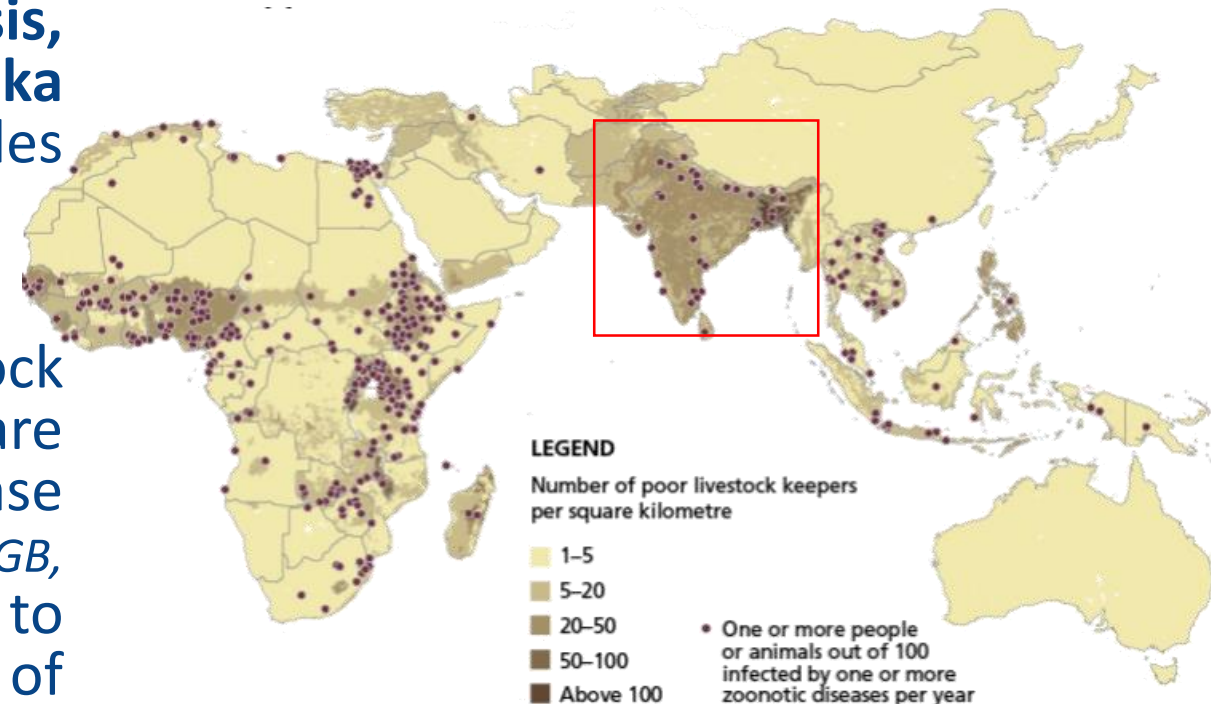
One Health and urban Transformation – Identifying Risks, Developing Sustainable Solutions

Sandul Yasobant, Krupali Patel, Anna Bruckner



Increasing burden of zoonoses in India

- In India, large and/or focal zoonotic outbreaks of **Rabies, Leptospirosis, Brucellosis, Anthrax, Influenza, Nipah, Zika** have been documented in the last decades (*Sekar, 2011*)
- According to an International Livestock Research Institute study, 13 zoonoses are cause of 2.4 billion cases of human disease and 2.2 million deaths per year (*Verma GB, 2014*). India is one of the major country to contributing to the global burden of zoonoses



Map by ILRI, from original published in an ILRI report to DFID: *Mapping of Poverty and Likely Zoonoses Hotspots*, 2012.

Fragmented approach in zoonoses prevention



ONE HEALTH
& URBAN TRANSFORMATION



सत्यमेव जयते

National Centre for Disease Control (formerly National Institute of Communicable Diseases)

Directorate General of Health Services, Ministry of Health & Family Welfare
Government of India



1. State Level Zoonoses Committee (SLZC) in 14 states including district level committees
2. National multi-stakeholder technical workshops
3. Veterinary Consultant in the integrated disease surveillance program
4. Formulation of Rapid Response Team (RRT)



सत्यमेव जयते

मत्स्यपालन, पशुपालन और डेयरी मंत्रालय
MINISTRY OF FISHERIES,
ANIMAL HUSBANDRY AND DAIRYING

1. Zoonoses among domestic and livestock animals are addressed by the MoFAHD which is newly formed from the department of the same name under the Ministry of Agriculture and Farmers Welfare in 2019.



सत्यमेव जयते

**Ministry of Environment,
Forest and Climate Change**

Government of India

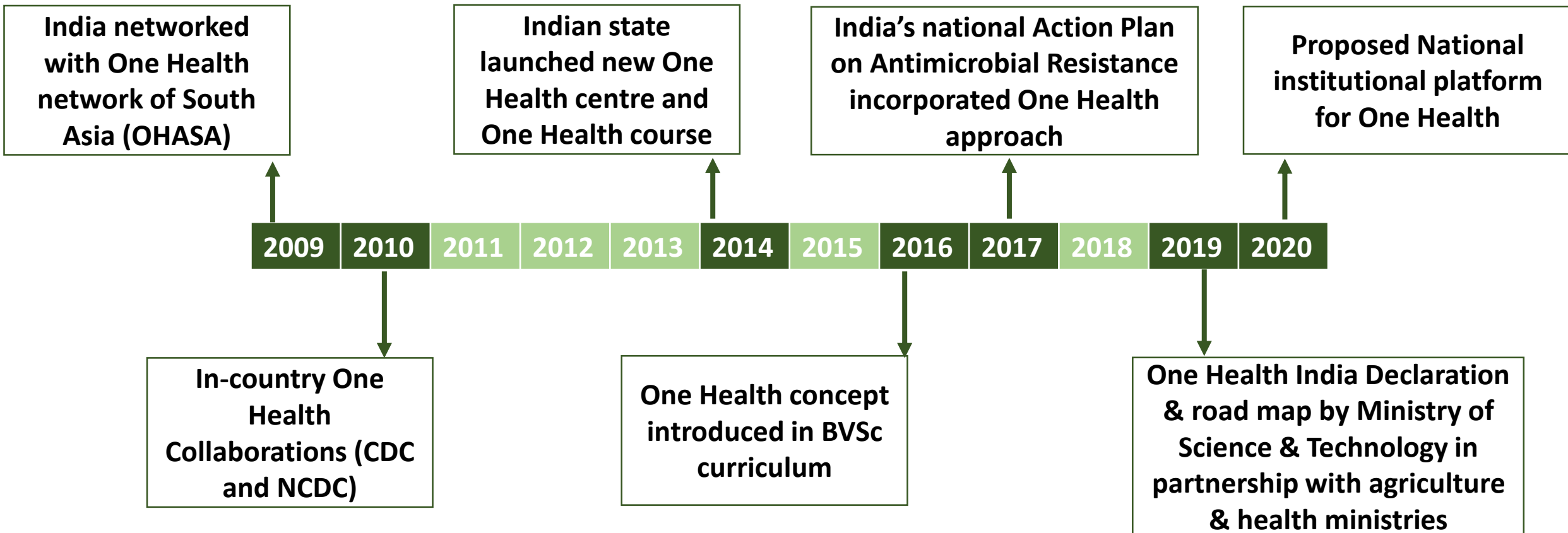


1. The Wildlife Institute of India under the MoEFCC focuses on zoonoses in wildlife

India's effort for One Health: From the concept to approach of institutionalization



ONE HEALTH
& URBAN TRANSFORMATION

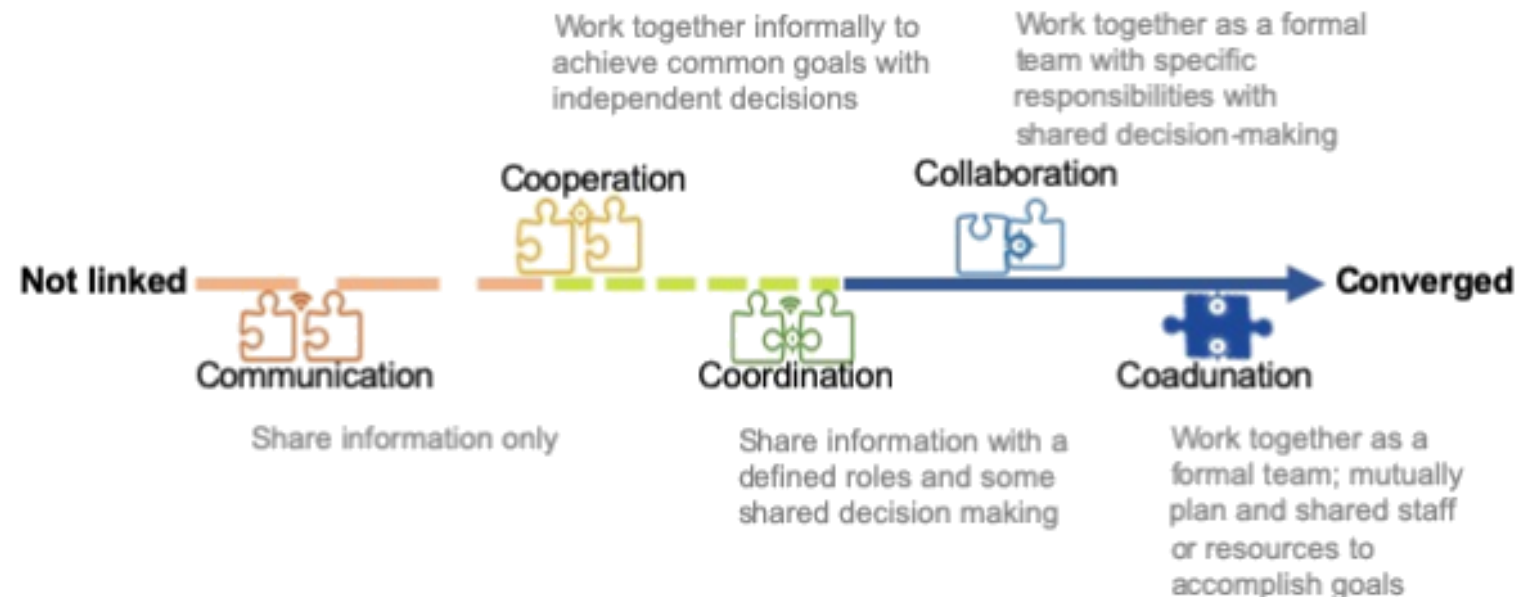


OH requires *inter-*, multi- and/or transdisciplinary collaboration and actions



ONE HEALTH
& URBAN TRANSFORMATION

- On the one hand,
 - OH implementation relies on the collaboration across diverse sectors (*Osoro E et al., 2010*)
- On the other hand,
 - Lack of understanding on the required level of integration (*Conrad PA et al., 2013*)
- The stages of integration occur over time as a continuum, or process, or convergence (*Thomson AM et al., 2006*)

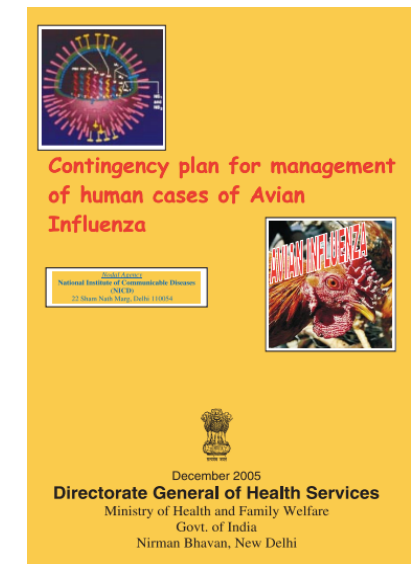
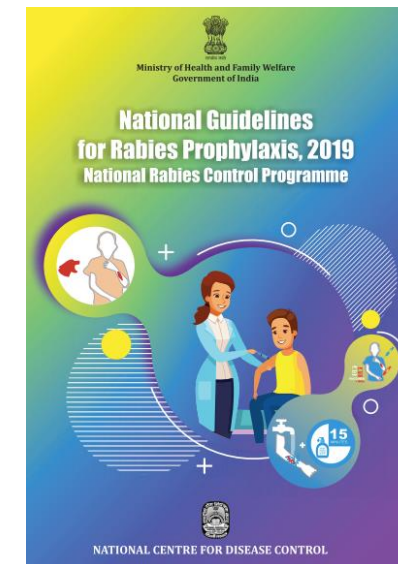




ONE HEALTH
& URBAN TRANSFORMATION

Solution-based collaborations: Is it sustainable!

- Disease specific collaborative actions
- Health emergency (as the need):
Solution-based collaboration
- State specific-OH initiatives (Tamil Nadu & Sikkim)



Rabies control initiative in Tamil Nadu, India: a test case for the 'One Health' approach

Syed Shahid Abbas, Vidya Venkataramanan, Garima Parthak, Manish Kakkar*, on behalf of the Roadmap to Combat Zoonoses in India (RCZI) Initiative

Public Health Foundation of India, 4, Institutional Area, Vasant Kunj, New Delhi 110029, India

ARTICLE INFO

Article history:
Received 05 November 2010
Revised in revised form 13 May 2011
Accepted 24 August 2011
Available online 13 November 2011

Keywords:
Rabies
Zoonosis
India
One Health
Health policy
Communicable disease

ABSTRACT

Although India accounts for nearly 50% of the global rabies mortality, there is no organized national rabies control programme. Rabies control is generally confined to small urban pockets, with minimal intersectoral co-ordination. Tamil Nadu is the first state in India to implement a state-wide, intersectoral rabies control initiative. The One Health Initiative Framework guided the current assessment of the rabies prevention and control initiative in Tamil Nadu. Principle stakeholders were engaged through a series of exercises in order to determine policy initiatives to describe the programme and understand their various roles. Surveillance data on dog bites were triangulated with vaccine consumption and dog population data to identify trends at the district level in the state. Findings and recommendations were shared at different levels. Rabies control activities in Tamil Nadu were conducted by separate departments linked by similar objectives. In addition to public health surveillance, animal control and implementation of dog licensing rules, other targeted interventions included waste management, animal birth control and anti-rabies vaccination, awareness campaigns, and widespread availability of anti-rabies vaccine at all public health facilities. In conclusion, the assessment suggests that it is possible to implement a successful One Health programme as an extension of strong political will, evidence-based policy decisions, clearly defined roles and responsibilities of agencies, co-ordination mechanisms at all levels, and a culture of open information exchange. © 2011 Royal Society of Tropical Medicine and Hygiene. Published by Elsevier Ltd. All rights reserved.

0950-2688/\$ - see front matter © 2011 Royal Society of Tropical Medicine and Hygiene. Published by Elsevier Ltd. All rights reserved.



Eliminating Dog-Mediated Rabies in Sikkim, India: A 10-Year Pathway to Success for the SARAH Program

Helen Dymally*, Andrea Bittner and Thiray Ghatak

*The Bioinformatics Division, IISc, Bangalore, 560 075, Bangalore, India; and National Institute of Health, Department of Animal Health and Production, National Institute of Veterinary Research, Dibrugarh, Assam, India

A third of the world's rabies burden is in India. The Sikkim Anti-Rabies and Animal Health (SARAH) program is the first state-wide rabies program in India and demonstrates a successful One Health model of dog-mediated rabies elimination. The SARAH program was created in 2006 as a collaboration between the Government of Sikkim and international non-government organizations – Vets Beyond Borders and Foundation Brighter World. Activities are directed to canine rabies vaccination, humane dog population control, community education, and treatment of sick and injured animals. In 2005, there were 0.74 human rabies deaths per 100,000 (4 deaths) within Sikkim, and from 2006 to 2010, there were no human rabies deaths. In 2010, two human rabies deaths were reported near the West Bengal border region. From 2005 to 2010, the incidence of animal rabies is unknown; from 2010 to 2016, eight cases of animal rabies were reported. Major challenges for the program are continued commitment to rabies control in the face of 0 to low human rabies incidence and the risk of rabies incursions. Effective intersectoral communication between Health, Veterinary, Forestry, and Police officers is essential to enable rapid response to animal bite incidents and prevent rabies incursions. An integrated One Health approach needs to be maintained, enhanced active rabies surveillance. Other states must establish similar programs. India is now to achieve a goal of eliminating dog-mediated human rabies.

Keywords: SARAH program, Sikkim India, rabies elimination, One Health, mass dog vaccination, dog population management, animal welfare, surveillance

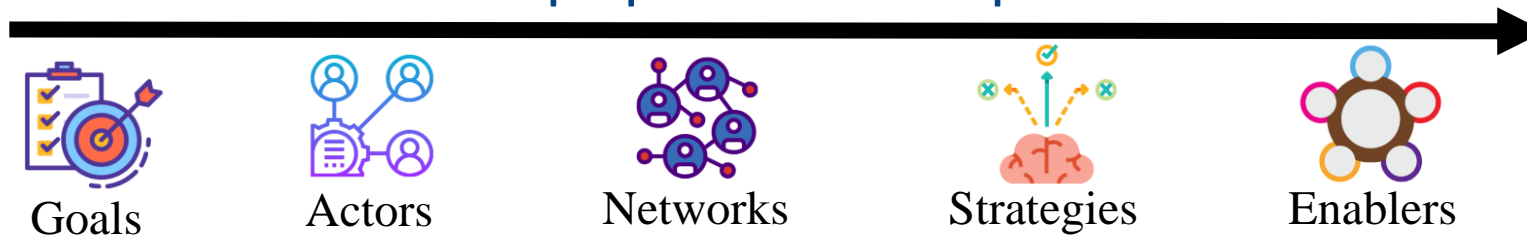
Prioritization as the first step of operationalization



ONE HEALTH
& URBAN TRANSFORMATION

- Understanding the current level of collaboration on the administrative/policy, provider and community levels serves as an important first step in developing One Health implementation strategies.

ISC five-steps process of exploration



Rabies remained the key prioritized zoonotic disease in India: A potential OH action



ONE HEALTH
& URBAN TRANSFORMATION

 PLOS ONE

Prioritizing zoonoses in Ahmedabad, India

Table 4. Summary of prioritized zoonotic diseases in India with respect to time, region and aim of prioritization.

Level	National (India)	National (India)	Local (Ahmedabad)
Author	Sekar et al., March 2009	Kurian et al., September 2013	Current Study, September 2018
Goal	To prioritize research options needed to control zoonoses.	To identify and rank the most important zoonotic diseases in India.	To determine which zoonoses should receive high concern for collaboration between the stakeholders in a smart city of India, Ahmedabad.
Method	Child Health and Nutrition Research Initiative's priority setting method.	Composite index method based on the trends of disease, adverse effects on human health, economy, trade and industry.	Centers for Disease Control and Prevention's One Health Zoonotic Disease Prioritization tool.
Prioritized diseases in descending order	Rabies, Leptospirosis, Brucellosis, Anthrax, Tuberculosis, Pandemic Flu, Helminths, Arbovirus, Food borne	Rabies, Avian Influenza (H5N1), Anthrax, Brucellosis, Leptospirosis, Tuberculosis, Japanese encephalitis, Porcine cysticercosis	Rabies, Brucellosis, Avian Influenza (H5N1), Influenza A (H1N1), Crimean-Congo Hemorrhagic Fever, Tuberculosis, Salmonellosis, Japanese encephalitis, Leptospirosis

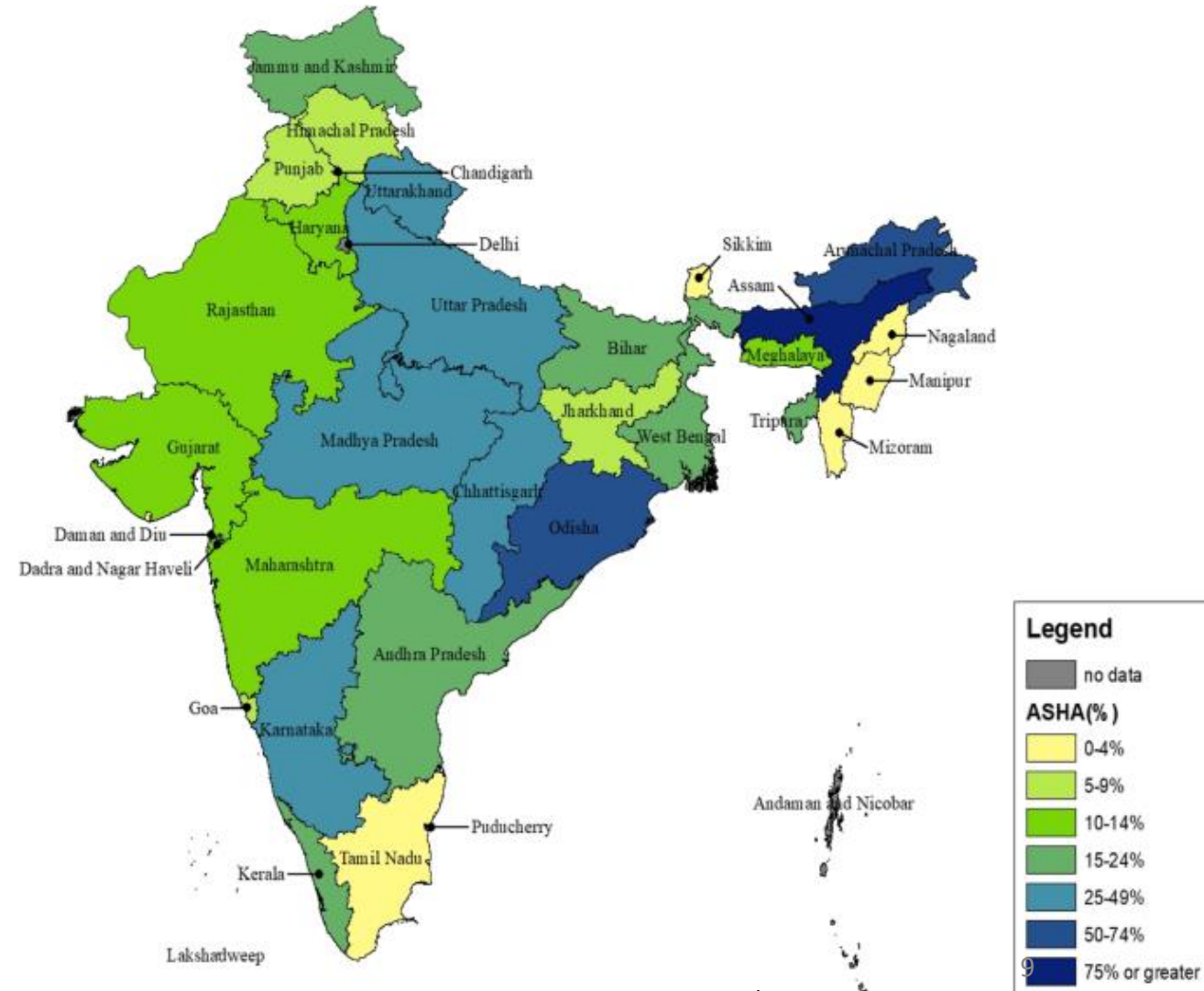
<https://doi.org/10.1371/journal.pone.0220152.t004>

Creating One Health momentum from the bottom-up: India's strength vs challenge



ONE HEALTH
& URBAN TRANSFORMATION

- Shortage of human resources in the animal husbandry sector
- Presence of Accredited Social Health Activist (ASHA) at the community level
- Preference to the top-down directives
- Low interest to collaborate during non-outbreak situations



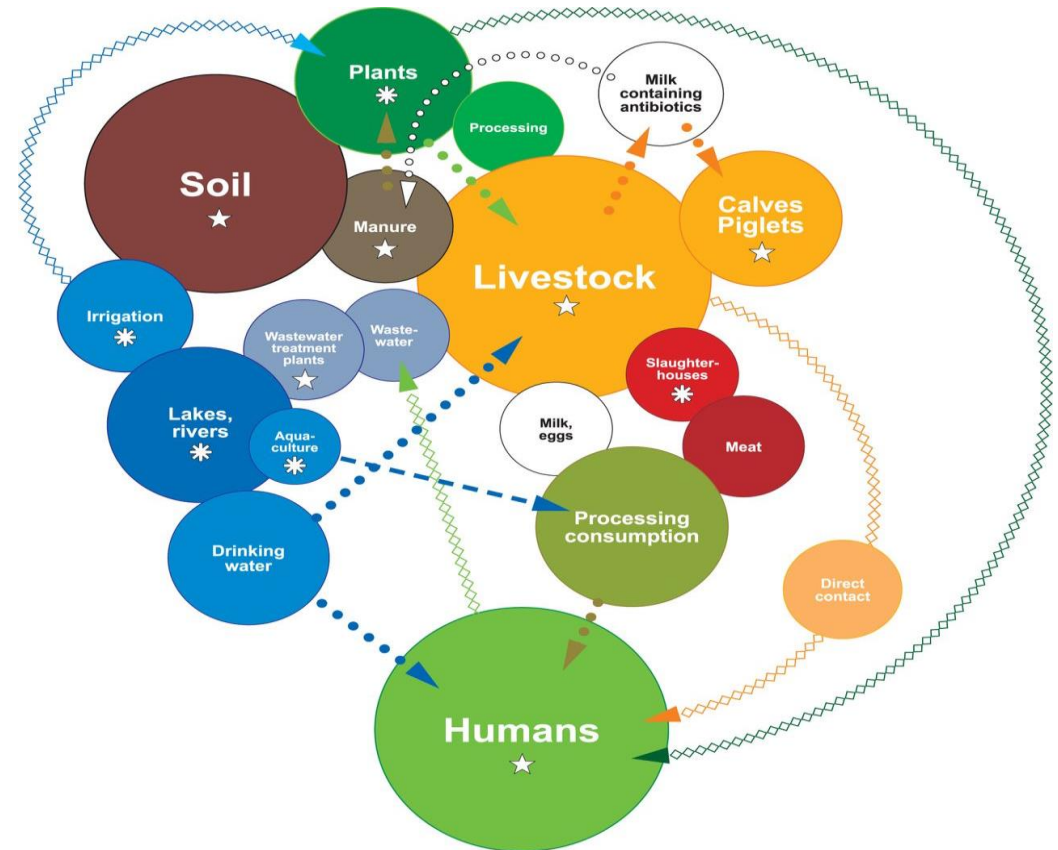
Source: Agarwal S et al., 2019, doi: 10.1186/s12960-019-0402-4

Additive challenge: Why India needs to curb antibiotic use



ONE HEALTH
& URBAN TRANSFORMATION

- India recorded a staggering 12.9 billion units of antibiotic consumption, which was the highest among all the countries (*Boeckel TPV et al., 2014*)
- India's bacterial disease burden is highest in the world (*Laxminarayan R et al., 2016*)
- High risk population: 20% suffers from chronic diseases, 40% children are malnourished and at risk of infections



Antimicrobial Resistance (AMR): Superbug in India



AMR challenge: Misuse, Underuse, Overuse!

Self-medication

Easy access to
medicines: Over
the counter

Varying approach
of treating
doctors

Simultaneous use
of antibiotics

Non-availability
and non-
utilization of the
laboratory service

Regulatory issue:
Scheduled H1
drug

Unethical
commercial
practices



ONE HEALTH
& URBAN TRANSFORMATION

India's mythology: Silent splainer of AMR

- Cow as sacred symbol of life: Worshiping vs slaughtering of cows
- Animals as part of the family
- Poor hygiene practices and lack of awareness

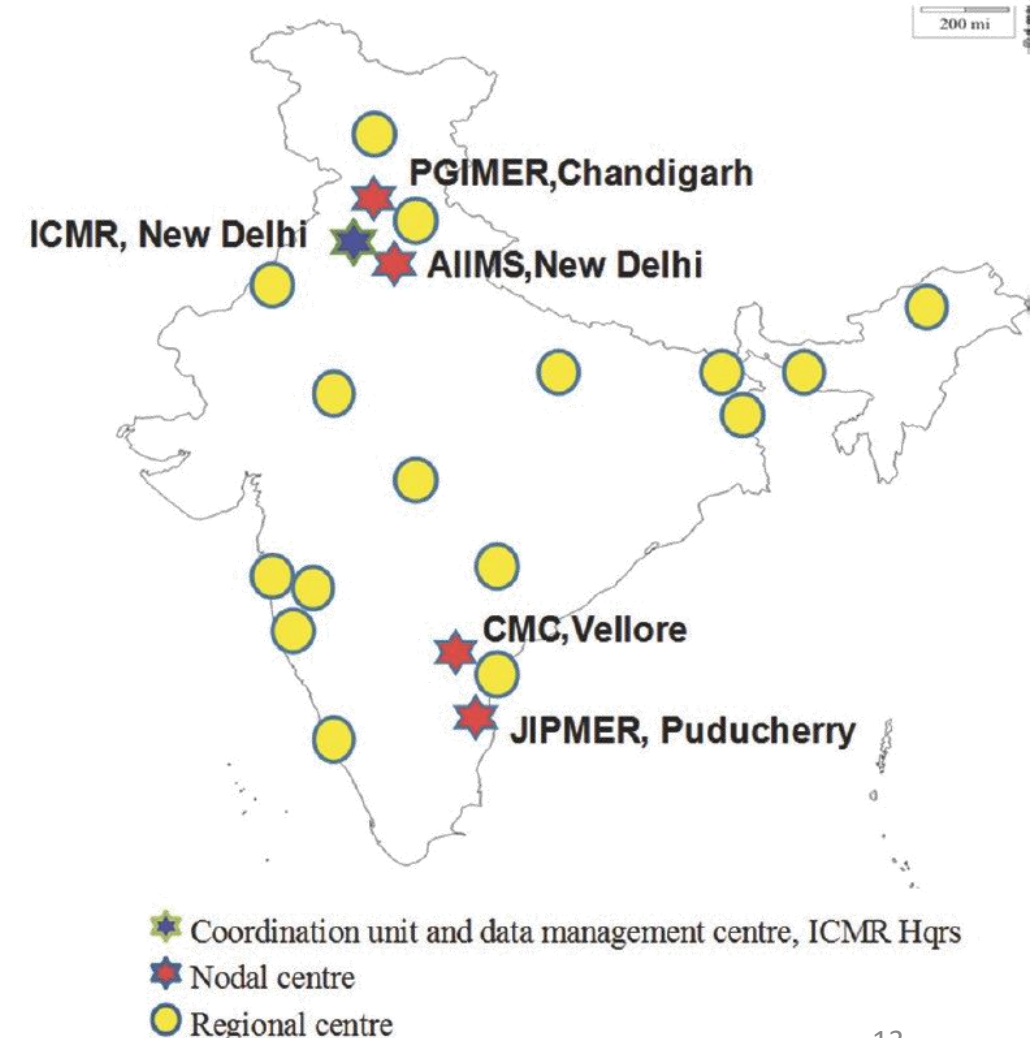


Source: Field photographs captured by Patel K and Yasoabnt S



AMR surveillance: A hope or mirage!

- National Programme on Containment of Anti-Microbial Resistance (AMR)
- 2013: Indian Council of Medical Research (ICMR) launched Antimicrobial Resistance Surveillance & Research Network (AMRSN)
- Preliminary milestone for the hospital based surveillance, while no evidence for community based surveillance





ONE HEALTH
& URBAN TRANSFORMATION

The vision of OH policy making in India



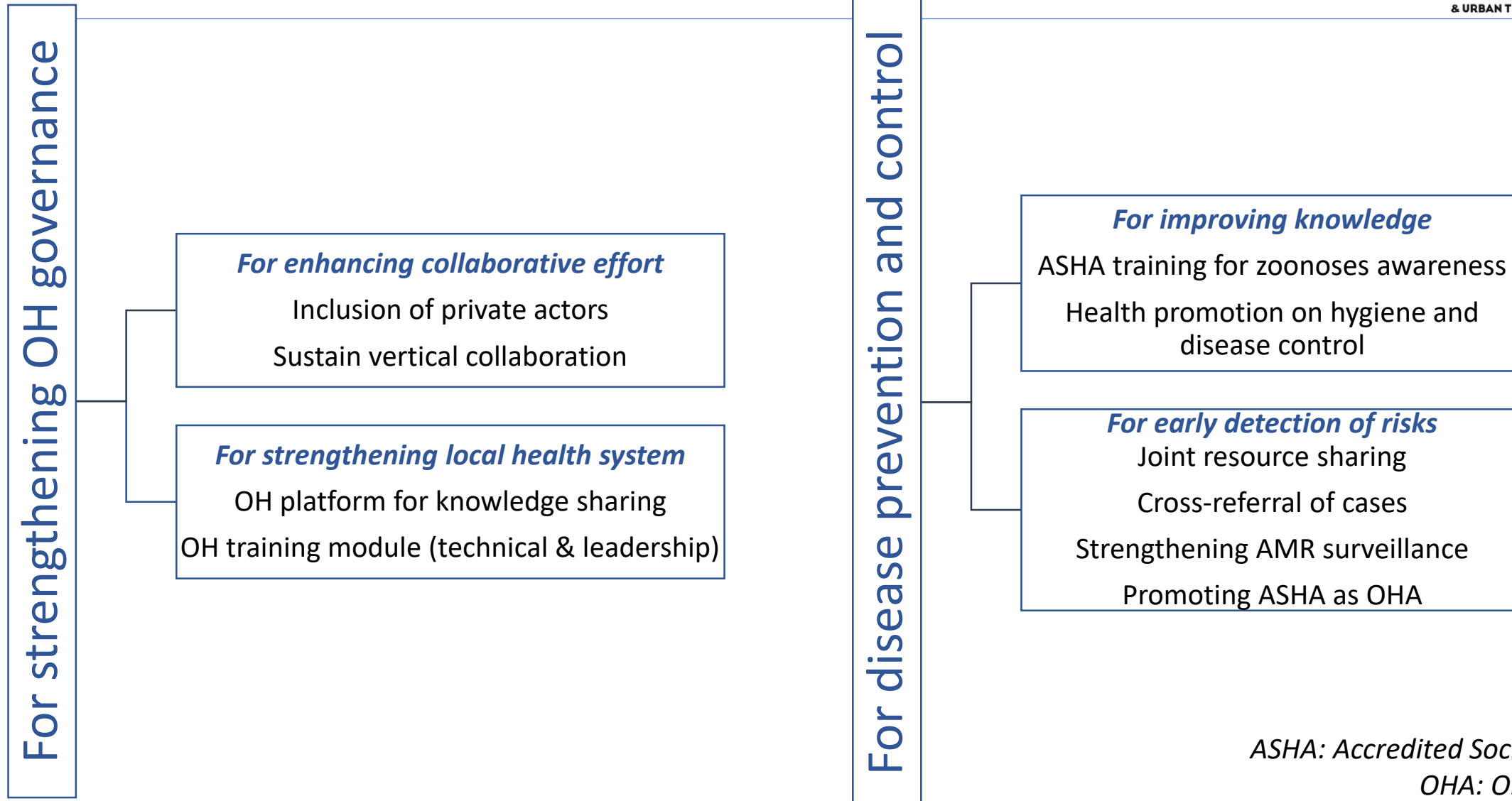
**Recommendation for
strengthening governance**



**Recommendations for disease
prevention and control**



Key recommendations: The way forward



Thank you very much



ONE HEALTH
& URBAN TRANSFORMATION

*While India has advanced in the human and animal health collaborative activities, it will be great to zoom into understanding the wider applications of One Health from **Germany**.*