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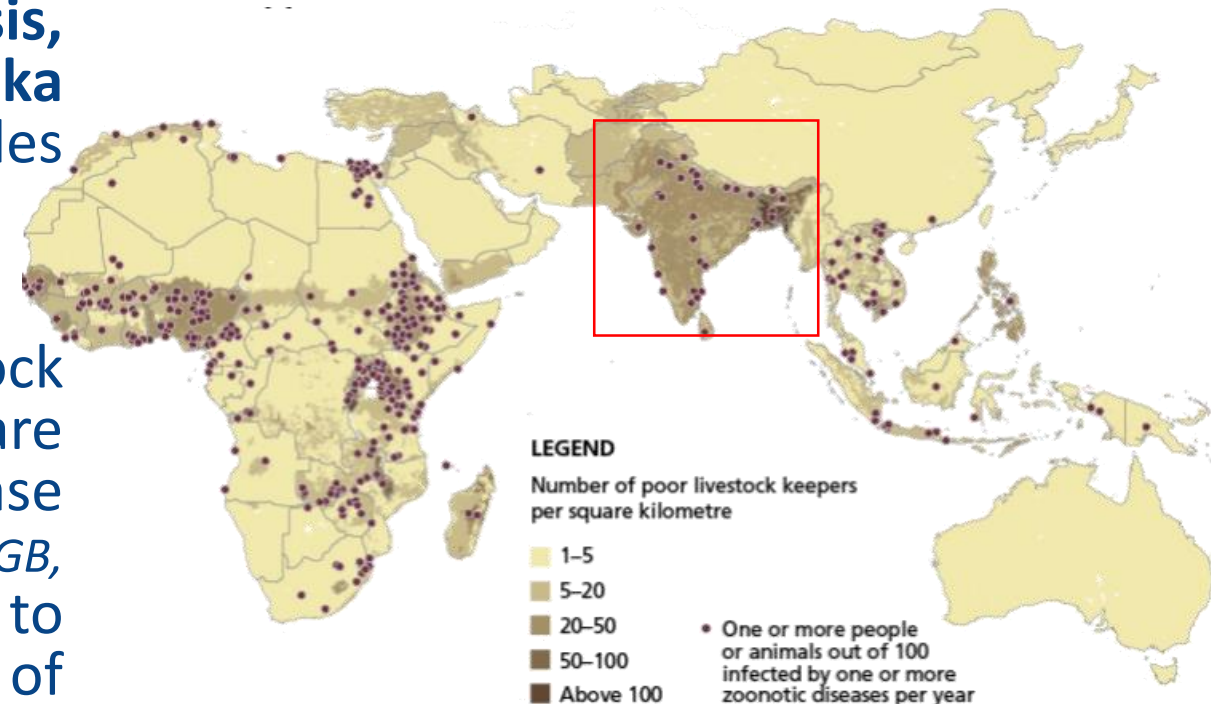# One Health and urban Transformation –
Identifying Risks, Developing Sustainable Solutions

Sandul Yasobant, Krupali Patel, Anna Bruckner

Ministerium für
Kultur und Wissenschaft
des Landes Nordrhein-Westfalen

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

LEGEND

Number of poor livestock keepers per square kilometre

- 1–5
- 5–20
- 20–50
- 50–100
- Above 100

• One or more people or animals out of 100 infected by one or more zoonotic diseases per year

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

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)

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.

Ministry of Environment, Forest and Climate Change
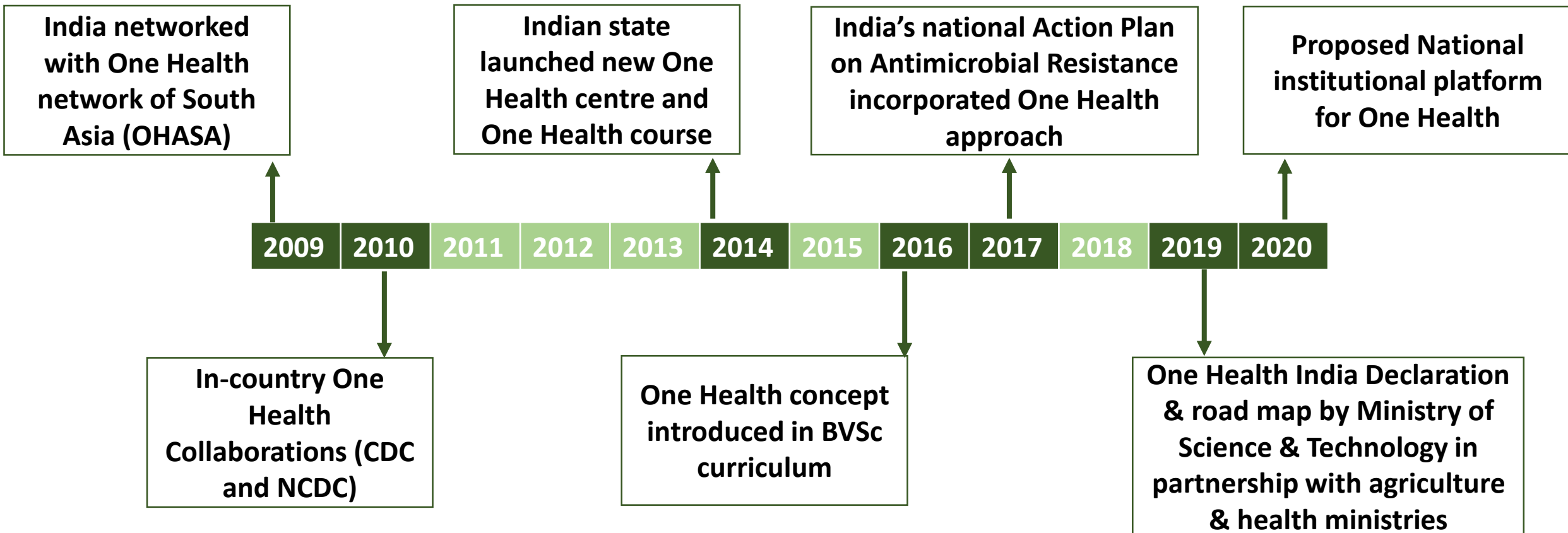Government of India

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

3

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

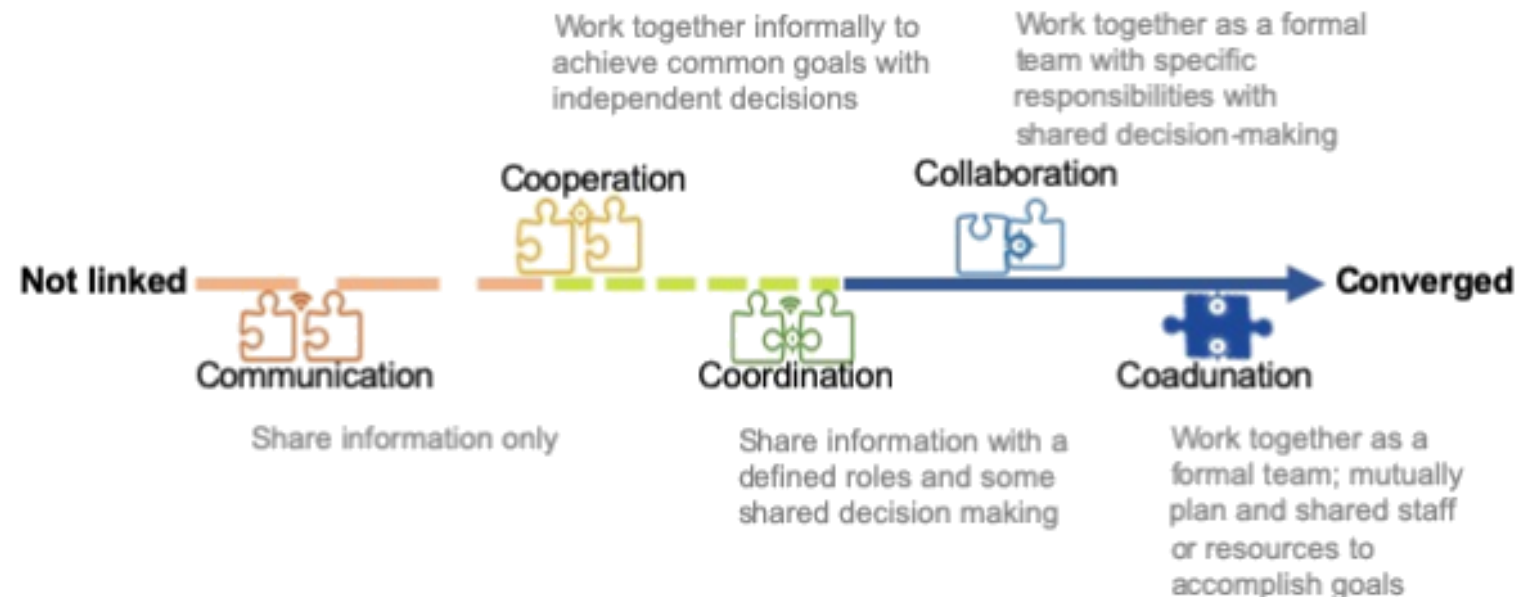India networked with One Health network of South Asia (OHASA)

Indian state launched new One Health centre and One Health course

India's national Action Plan on Antimicrobial Resistance incorporated One Health approach

Proposed National institutional platform for One Health

| 2009 | 2010 | 2011 | 2012 | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |

In-country One Health Collaborations (CDC and NCDC)

One Health concept introduced in BVSc curriculum

One Health India Declaration & road map by Ministry of Science & Technology in partnership with agriculture & health ministries

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

- 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)*

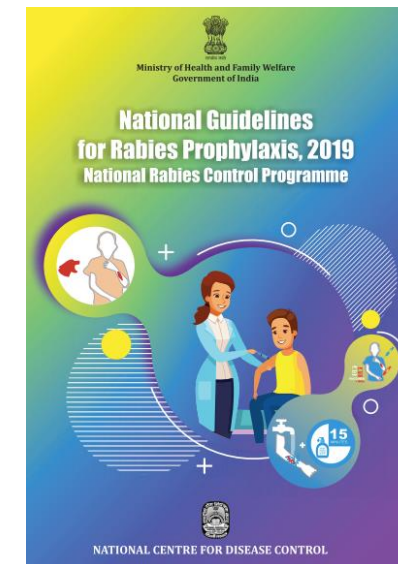- The stages of integration occur over time as a continum, or process, or convergence *(Thomson AM et al., 2006)*

Work together informally to achieve common goals with independent decisions

Work together as a formal team with specific responsibilities with shared decision-making

Cooperation

Collaboration

Not linked

Converged

Communication

Coordination

Coadunation

Share information only

Share information with a defined roles and some shared decision making

Work together as a formal team; mutually plan and shared staff or resources to accomplish goals

Source: Yasobant S et al., 2020

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)

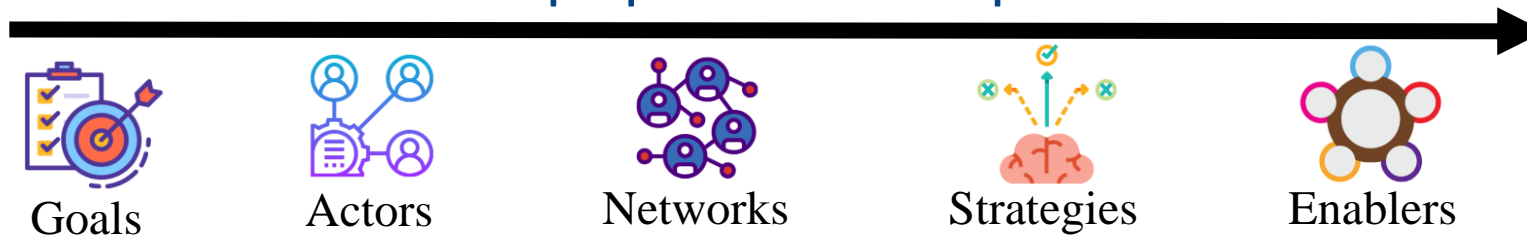# Prioritization as the first step of operationalization

- 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

Goals   Actors   Networks   Strategies   Enablers

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

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

- 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

Legend

no data

ASHA(%)

0-4%

5-9%

10-14%

15-24%

25-49%

50-74%

75% or greater
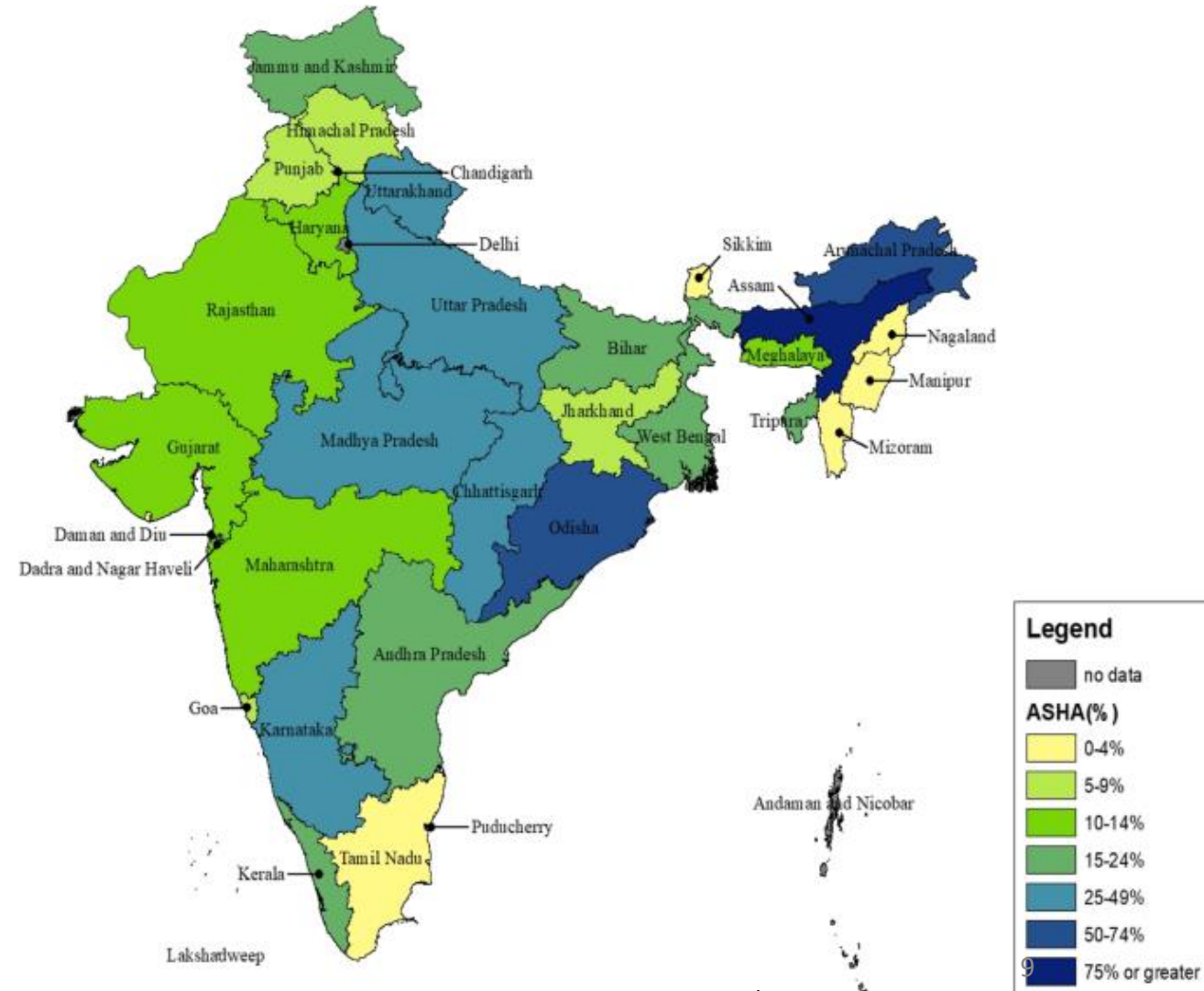
Source: Agarwal S et al., 2019, doi: 10.1186/s12960-019-0402-4

Additive challenge: Why India needs to curb antibiotic use

- 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
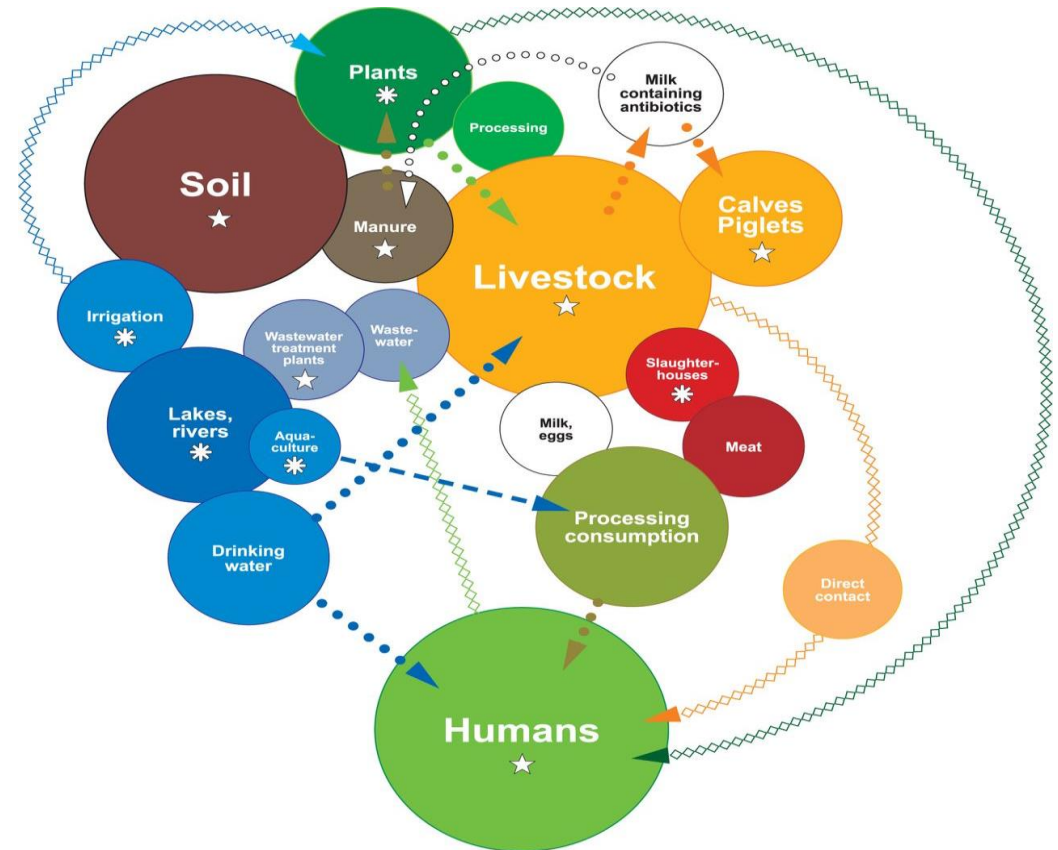
Antimicrobial Resistance (AMR): Superbug in India

Source: Sophie T et al., 2016, doi: 10.1128/mBio.02227-15

AMR challenge: Misuse, Underuse, Overuse!

Self-medication

Varying approach of treating doctors

Regulatory issue: Scheduled H1 drug

Easy access to medicines: Over the counter

Simultaneous use of antibiotics

Unethical commercial practices

Non-availability and non-utilization of the laboratory service

11

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

★ Coordination unit and data management centre, ICMR Hqrs
★ Nodal centre
○ Regional centre

13
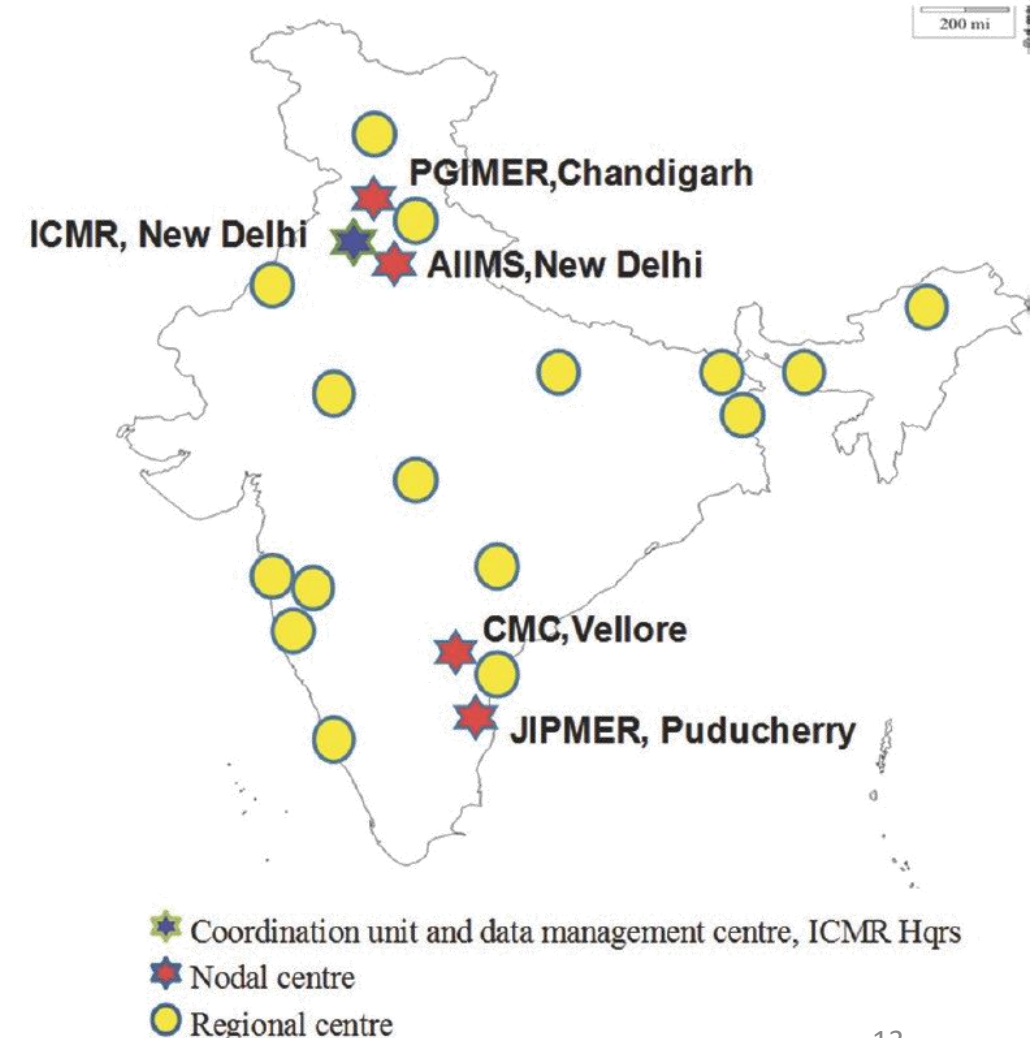
The vision of OH policy making in India

Recommendation for strengthening governance

Recommendations for disease prevention and control

Key recommendations: The way forward
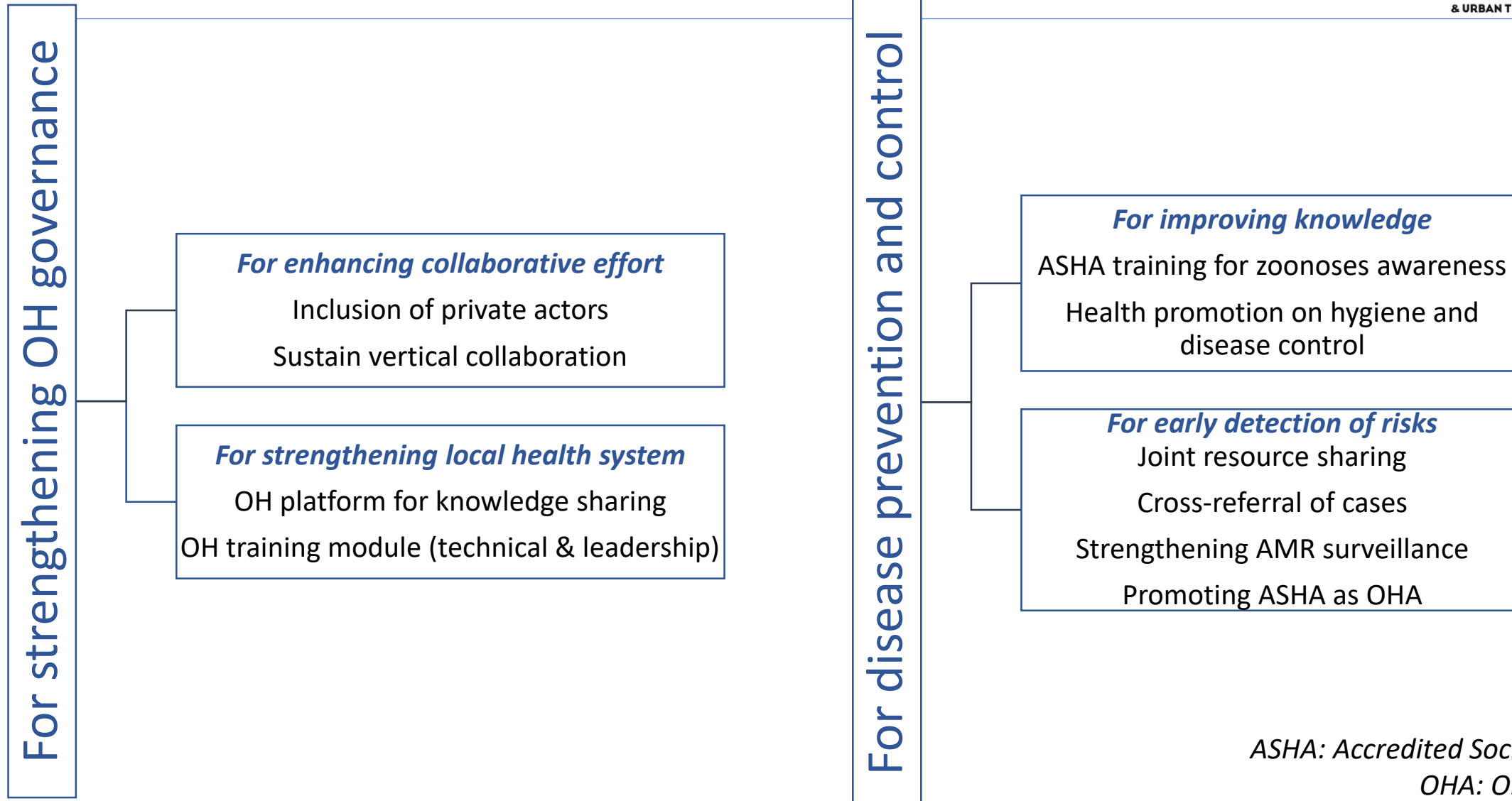
For strengthening OH governance

For enhancing collaborative effort
Inclusion of private actors

Sustain vertical collaboration

For strengthening local health system
OH platform for knowledge sharing

OH training module (technical & leadership)

For disease prevention and control

For improving knowledge
ASHA training for zoonoses awareness

Health promotion on hygiene and disease control

For early detection of risks
Joint resource sharing

Cross-referral of cases

Strengthening AMR surveillance

Promoting ASHA as OHA

ASHA: Accredited Social Health Activist
OHA: One Health Activist

Thank you very much

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**.