AN INTRODUCTION TO THE ROADMAP TO COMBAT ZOONOSES IN INDIA INITIATIVE

Zoonotic infections or zoonoses are infections naturally transmissible between vertebrate animals and humans. They constitute nearly 60% of all known human infections and over 75% of all emerging infectious diseases. The Indian subcontinent has been identified as one of the four global hot-spots at increased risk for emergence of new infectious diseases. In addition to being more vulnerable to emerging zoonoses, India has also contributed a major share of the global burden of other endemic zoonoses.

Need for a Zoonoses Initiative in India

Despite the huge burden of endemic zoonoses and increased risks of emergence of novel zoonotic diseases, there is little awareness about zoonoses, even among health professionals in India. While there is no single intervention that can address all zoonoses, it is now increasingly recognised that establishment of intersectoral collaborative mechanisms is the most efficient strategy to address existing and emerging zoonoses.

However, the coordination mechanisms in place are more administrative in nature and not always effective in promoting diffusion of knowledge from across sectors. In the aftermath of H5N1 and SARS outbreaks of 2008, there has been a felt need for a flexible space outside formal structures that promote technical dialogue between human, veterinary and wild life health sectors and inform policy discussions in the formal sector.

What is RCZI?

The Roadmap to Combat Zoonoses Initiative (RCZI) in India was launched in March 2009 following a brainstorming meeting in New Delhi in June 2008. It modelled itself around the ‘One World One Health’ concept which is a worldwide strategy for expanding interdisciplinary collaborations and communications in all aspects of health care for humans, animals and the environment.

The RCZI has been set up under the aegis of the Public Health Foundation of India (PHFI) and is the only standalone initiative on zoonoses in the country that mobilises a range of intersectoral partners working in the human, veterinary and wildlife health sectors.

By fostering academic collaboration around these functional areas, RCZI aims to build confidence, demonstrate value, stimulate need and influence policy makers and programme implementers to allow joint action for the prevention and control of zoonoses and other emerging infectious diseases as also bringing zoonoses into the realm of a wider public discourse.

Message from Chairperson

“There is little awareness about zoonoses, even among health professionals in India.”

Dr K Srinath Reddy, President PHFI and Chairperson RCZI, 2008
RCZI’s Growth Trajectory

The RCZI Initiative was initiated as a 5-year roadmap in 2009. It concentrated on baseline needs assessment exercises in the first year. Activities commissioned during this phase included research priority setting, curriculum review and communication and strategy development. The objective was to arrive at an understanding of the current situation and to provide an overall vision to its subsequent work.

In the next phase from 2009-11, RCZI’s work gained traction. Greater evidence was generated through programme assessment, medical workforce capacity assessment and resource mapping. The RCZI website and newsletter were launched and dialogue across sectors was stepped up. Currently, RCZI is consolidating some of its early work, focussing on knowledge translation and network building.

“Zoonoses necessitate collaboration between sectors and disciplines for their effective prevention and control.”

between human-animal-wildlife sectors through adoption of the following strategic approaches:

**Promote research collaborations**

Multidisciplinary collaborations are most easily brought about in a research setting. Ensuing networks and research outputs then feed into national discourse, acting as change agents advocating for increased collaborations.

**Build workforce capacity across sectors**

By undertaking capacity building and offering technical support, RCZI is ensuring joint capacity building for strengthening a consolidated and collaborative response to zoonoses.

**Advocate for increased awareness of zoonoses**

Recognising the limitations of generating knowledge for its own sake, RCZI works on policy relevant research. It communicates latest state-of-the-art research advances to policy planners, programme managers and lay audience. The initiative has increased its networks among veterinary and public health communities at the national and international levels, using them to implement knowledge translation strategies.

**Collaborative Research for Zoonoses Prevention and Control**

Undertaking multidisciplinary collaborative research was RCZI’s chief mandate for the first two years. The new knowledge generated as a result of combined insights from different sectors helped inform the policy making process. Also, these collaborations encouraged development of shared networks,
Most research conducted by RCZI can be categorised under ‘Systems and Policy Research’ and ‘Epidemiological Research’. Brief descriptions of select research activities are given below.

**Systems and Policy Research**

- Rabies
- Leptospirosis
- Brucellosis
- Anthrax
- Tuberculosis
- Pandemic Flu
- Helminths
- Arboviruses
- Food borne
- Emerging viruses
- Other
- Plague

**Epidemiologic research**

- Japanese Encephalitis micro-ecosystems
- Use of antibiotics in veterinary sector
- H1N1 modelling

Experts from across sectors and working in different positions were interviewed using a standard framework to identify priority zoonoses and their research options. More importance was attached to endemic and neglected zoonoses (rabies, leptospirosis and brucellosis) than emerging infections for the Indian population.

‘Actionable research’ related to ‘health policy and systems’. These were identified as most important while those related to ‘epidemiological research’ were identified as filling the largest knowledge gaps.

### Priority Vs Conducted Research: The Disconnect

A comparison of identified research options with research conducted on rabies in the last decade in India highlighted contrasts between the two. The study proved the need for an RCZI-like approach to original research in zoonoses.

### A Test Case for One Health Intervention?

In addition to RCZI, rabies was identified as a major priority zoonosis in India by the National Centre for Disease Control and other national agencies. Another research study related to rabies took place in the Southern state of Tamil Nadu which was the first large state to offer a population-wide rabies control programme.

---


RCZI conducted an assessment in 2010 to review rabies prevention and control initiatives in Tamil Nadu\(^3\), focusing on mechanisms that helped achieve intersectoral coordination. It found that a comprehensive set of human as well as animal-side interventions were being implemented through a joint intersectoral coordination mechanism involving state departments responsible for public health, municipal administration, town administrations, village panchayats and veterinary public health. A district-level monitoring committee with similar composition oversaw implementation of rabies control efforts.

An interesting outcome of the study was that while the state government viewed the coordination mechanism as an administrative instrument, the assessment appreciated other benefits of having such a ‘one health’ coordination mechanism in place. A national-level expert consultation cum dissemination meeting was organised subsequently where all existing evidence related to rabies control in low and middle income countries was reviewed and recommendations to develop a state-level rabies control programme were proposed.

“Zoonoses…. Not Sure What That Is”

One of the precursor activities that informed the development of a capacity development strategy of RCZI was an assessment of knowledge and practices of recent medical graduates relating to management of common zoonoses.

A cross-sectional survey was done on medical students and recent graduates to calculate knowledge scores based on pre-defined guidelines.\(^4\)

It was found that on average, a clinician knows only 40-60\% of what is needed to manage zoonoses. Only 2-4\% of respondents were able to define zoonoses accurately and less than a third were able to correctly name three common parasitic zoonoses in India. The findings of the study are being used to now bring about a revision in the medical curriculum.

### Assessment of Capacity through an Institutional Mapping Exercise

One glance at the status of nation-wide preparedness and response systems to deal with zoonoses indicates that these efforts are clearly inadequate, resulting in the need for greater institutional capacity. At the same time, existing quality researchers and pedigreed institutions working on zoonoses in India, haven’t been effectively distributed according to pathogen focus, sectors and states. RCZI addressed the issue of limited understanding of institutional capacity relating to zoonoses in India through a unique assessment. Research articles from India related to a list of 20 priority zoonotic diseases which were identified to capture research output over the last decade for all institutions working on these diseases.

It emerged that more than 440 national institutions hosted some sort of laboratory working on zoonoses. Findings from this study challenged previously held notions about lack of technical capacity for zoonoses.

---


prevention and control in India. They made a case for promoting sophisticated models of institutional networking rather than merely setting up additional stand-alone Centres of Excellence

**Epidemiological Research**

**EcoHealth Approach to Study Japanese Encephalitis Micro-Ecosystems in Uttar Pradesh**

JE causes frequent seasonal outbreaks in rural India with high morbidity and mortality in children, specifically in eastern Uttar Pradesh, where transmission patterns and local risk drivers remain under-explored. Despite repeated outbreaks of JE, limited information exists on these risk drivers.

To address these gaps, members of RCZI came up with an Ecohealth Research Core Group that uses an Ecohealth approach\(^1\) to studying the association of ecological, physical, biological and social factors on transmission of JE virus among different host populations.

Final results will be available in 2013 and would create a strong evidence base to inform interdisciplinary interventions for JE prevention and control in India.

**Study on Use of Antibiotics in the Veterinary Sector**

India has seen five decades of antibiotics use in livestock and poultry to control and treat diseases and yet there is no uniform regulation to govern dairy or poultry farming. Lack of evidence to inform policies poses a serious challenge to the enforcement of rational use of antibiotics. Indiscriminate use of antibiotics in food animals—including extra-label usage, failure to observe withholding times, and overuse in agricultural production—may lead to emergence of drug-resistant bacteria that can pose a serious threat to human health and consumer safety.

RCZI in collaboration with Karnataka Veterinary, Animal and Fisheries Sciences University (KVAFSU), Bangalore and Guru Angad Dev Veterinary and Animal Sciences University (GADVASU), Ludhiana is conducting a pilot study to determine antibiotic use in chicken and dairy cattle, including the types of antibiotics, purpose of their use and degree to which they are present in food products. This first-of-its-kind systematic assessment will provide an initial evidence base to initiate debate on rational use of antibiotics in livestock and broilers as well as encourage further investigations that explore the link between antibiotic use in case of all types of food animals and its impact on human health.

**H1N1 Modelling**

An expert committee was constituted by the Ministry of Health and Family Welfare (MoHFW) to examine H1N1 epidemiology in September 2009. This included assessment of the extent of outbreak as well as the time taken for it to be controlled. Under the organisational leadership of PHFI, epidemiological datasets from different arms of the government were mobilised and modelling expertise from the Institute of Mathematical Sciences was utilised by RCZI to assess the extent of H1N1 outbreak in the country.

“**Inadequate recognition of zoonoses as a problem and not acknowledging importance of intersectoral collaboration is a major flaw in medical and veterinary education.”**

---

Capacity Building and Technical Assistance

Inadequate recognition of zoonoses as a problem and lack of understanding of the role of intersectoral collaboration for its effective prevention and control has been a major flaw in medical and veterinary graduate education. This scenario guided RCZI’s capacity building and technical assistance programmes, which were planned keeping in mind, short-term and long-term needs of its target groups.

RCZI actively participated in One Health capacity building discussions at national and international levels. It also contributed to the development of One Health trainings through baseline assessments and development of training material and frameworks.

Capacity Building in the Short-Term

Training in Integrated Prevention and Control of Zoonoses

To build multisectoral response capacity, RCZI developed a short Training of Trainers (ToT) on ‘Integrated’ zoonoses prevention and control for district level medical, veterinary and wildlife health officers in early detection and response to episodes of zoonotic infections. The training methodology was unique, in that it stepped back from a disease-based approach, imparting skills for better coordination and planning against endemic and epidemic zoonoses situations. Trainees worked in multisectoral teams and using a case-study approach investigated and controlled a zoonotic disease outbreak before jointly developing a district level action plan for prevention and control of endemic zoonoses.

Capacity Building in the Long-Term

Revisions in Medical Curriculum

As a long-term strategy to strengthen zoonoses prevention and control, RCZI with partner organisations developed a ‘framework for targeted advocacy’ for revision of medical curriculum to make zoonoses related education more effective. The study generated primary evidence on gaps in knowledge and practice levels of medical students and graduates, gap analysis of current medical curriculum followed by intense consultation with leading national experts and academicians. Based on findings, it made a strong case for suitable revisions. The process will now be extended to graduate veterinary curriculum followed by dissemination to central and state-level medical councils.

Building Response and Research Capacity

Limited capacity exists even among researchers for multidisciplinary research studies in India. This aspect was addressed by training of junior researchers through short research assignments in multisectoral research. So far, more than ten graduate level researchers have been trained in projects involving priority setting, institutional mapping, legislative review, community based qualitative research, research administration, risk assessment, etc. These trainees have come from both national as well as international universities, including University of North Carolina at Chapel Hill, Princeton University, University of Edinburgh, University of Delhi, McMaster University and SRM University, Tamil Nadu, among others.

---

6 The National Standing Committee on Zoonoses and the RCZI Joint Working Group
7 CDC Stone Mountain sub-group on capacity building
9 Training of Trainers in One Health competencies and Framework of Advocacy for long term capacity building
Advocacy and Communication Initiatives

Advocacy and communications is a critical component of RCZI’s overall advocacy and communications strategy. From developing a One Health Network to launching its website as an online repository on zoonoses and putting together/disseminating a dedicated four-page newsletter (Zoonoses Watch), it has also developed policy briefs, contributed to peer reviewed publications and produced different products and tools for specific audiences on a regular basis.

RCZI has been represented at various national and international workshops, consultations, expert groups, strategy and brainstorming meetings. Invited to make presentations, read out papers, make poster presentations, share expert views and input on larger strategies, goals and policies, it has benefitted immensely from the experience of other countries. It has also been successful in drawing attention to some of the challenges and issues of concern that affect the Indian side. Through some of its research, RCZI has been able to generate interest in certain subjects (Rabies, Japanese Encephalitis) while showcasing its own work.

A range of policy relevant quality technical outputs in the form of high impact peer reviewed publications, policy briefs and assessment/evaluation reports have established the technical capacity and credibility of the Initiative and its efforts. This is also reflected in the rich portfolio of competitive research and technical grants mobilized by RCZI during 2009-12.

A conscious effort is being made to gradually step up awareness of zoonoses amongst the general population through media. This is particularly useful to disseminate basic information related to understanding risks and vulnerabilities, taking adequate precautions and seeking timely expert help. A microsite on H1N1, for example, was developed as a response to the outbreak in an effort to join the government in providing correct information and stalling a panic situation.

RCZI’s Achievements

In a span of four years, the RCZI has entered into a number of national and international partnerships and alliances which facilitate interdisciplinary cross-communication among the core sectors that define its existence, namely human and animal health and wildlife. These range from research collaborations and technical partnerships to advocacy networks. To achieve its goals, it works closely with a wide range of these organisations as reflected in the RCZI Joint Working Group.

Way Forward

As RCZI completes five years and reviews its activities and their impact on the communities and groups it reached out to, it will draw up its plan for the next five years. Going forward, it will develop a more focused and strategic approach to further the cause of zoonoses prevention and control, while strongly advocating for One Health values.
Since it is a multisectoral initiative, it will add greater value to its engagement with policy makers and other stakeholders to foster research networks across disciplines and sectors, consolidate existing networks and establish newer collaborations. Already some ground has been covered and sensitisation achieved with most concerned networks and groups. This will be further scaled-up through capacity building with a view to expand scope and reach at sub-national levels.

Given the recent policy focus on achieving effective sub national intersectoral collaboration, RCZI also proposes to diversify into implementation research. This would be in addition to the existing epidemiological and systems-based research that it is already doing.

Facilitating dialogues on intersectoral collaboration and developing a roadmap for zoonoses prevention and control will be an ongoing process. RCZI hopes to contribute to institutionalising the concept of One Health that is relevant and applicable to the Indian sub-continent, taking into account its unique challenges and risk factors. The road ahead is long and arduous since a lot has to be done. But a start has been made and RCZI along with its partners and networks is going to confidently inch forward as it builds technical expertise and institutional strength across the country.

Acknowledgements

The Roadmap to Combat Zoonoses Initiative in India has had the strong support of the World Health Organization, IDRC Canada and partners, without whom it would not have been able to action its objectives in such record time.

Each of these organisations has added value, providing strategic input and support in shaping RCZI’s nascent activities in the area of zoonoses control and prevention. They have contributed in bringing it to a stage where it can independently bid for projects and make the transition from being a start-up to a credible organisation that can undertake meaningful research and carve out a distinct identity for itself.

The RCZI is grateful for the support it has received from all these partners and from the government of India for the opportunity to work in this extremely challenging field of human-animal-wildlife health.