

Zoonoses comprise about 60% of emerging infectious diseases that are reported globally. More than 30 new human pathogens have been detected over the last three decades, 75% of which have originated in animals. Emergence and spread of these infections are often unpredictable as they originate from animals, usually caused by novel viruses and are detected only when outbreaks occur.

Zoonoses may be classified into three classes. Endemic zoonoses are present in many geographical locations and affect many people and animals. Epidemic zoonoses are sporadic in temporal and spatial distribution. Emerging and re-emerging zoonoses appear in a population or have existed previously but are rapidly increasing in incidence or geographical range. Pandemic influenza, Avian Influenza, Yellow fever, Rift Valley fever, SARS, West Nile virus and the Middle East respiratory syndrome coronavirus (MERS-CoV) have been reported in the past.

Zoonotic spillover is the transmission of a pathogen from a vertebrate animal to a human. A complex event involving environmental, pathogen and host factors interplay when a pathogen crosses the boundary from its natural animal reservoir and start circulating among humans. Rapid detection of zoonotic spillovers will be possible if we have good understanding of the viruses circulating in animals of high zoonotic potential. This understanding can be channeled into a powerful and effective surveillance system. Following a zoonotic spillover, human-to-human transmission is essential to sustain an epidemic or pandemic. Considering the vast number of animal pathogens indiscriminate surveys may not be effective in predicting pandemics. Monitoring strategies should target viruses showing a particularly high potential for human-to-human transmission and viruses already circulating in other human populations.

“One Health” approach is the strategic framework for control of zoonotic infections. The concept comprises of a coordination mechanism, joint planning, joint implementation, community participation, capacity building and monitoring framework between the animal health and human health sector. This approach also identifies five key areas where “One Health” is likely to make a difference.

- (i) Sharing health related issues and resources between the medical and veterinary sectors
- (ii) Effective controlling of zoonotic diseases in animal reservoirs
- (iii) Early detection of and response to emerging diseases
- (iv) Prediction and prevention of epidemics and pandemics
- (v) Insights in to health research and development.

Global efforts should continue to fill the gaps in knowledge associated with the origin and transmission of many zoonotic infections many of which are novel in origin.

Jaydeep Choudhury
Chairperson
IAP Infectious Diseases Chapter