

Public One Health Agenda



1. Determinants of inter-species (including zoonotic) transmissibility of animal infectious agents
 - i. Environmental and ecological drivers (natural and human induced)
 - ii. Host determinants (e.g. receptor distribution, immunology and evolution...)
 - iii. Pathogen determinants (e.g. RBD adaptation, escape from immunity...)
 - iv. Vector determinants: entomology, pathogen-(intermediate) host /vector- interaction/vector spread
2. Determinants of intra-species transmissibility of infectious agents that have crossed the species barrier
 - i. Environmental and ecological drivers (natural and human induced)
 - ii. Host determinants (pathogenesis and replication/shedding sites) and evolution
 - iii. Pathogen determinants
 - iv. Vector determinants: entomology, pathogen-(intermediate) host /vector- interaction/vector spread
3. Syndromic surveillance in humans & animals
 - i. Reservoir studies: bats, rodents, migratory birds,
 - ii. Arthropods (mosquitoes, ticks...)
4. Pathogen discovery / identification platforms for humans & animals
 - i. NGS /genomics /proteomics /metabolomics
 - ii. *In vitro* platforms
 - iii. Animal models (BSL -2/3/4)
5. Development of diagnostic assays for emerging infectious agents
6. Epidemiology of newly emerging infections in original host and newly invaded species (classical, molecular and GIS aided...)
7. Pathogenesis of newly emerging infections in original host and newly invaded species (virulence and transmissibility...)

8. Mathematical modelling and scenario evaluation for risk assessment and economic / disease burden impact
9. Intervention strategies in original host and in newly invaded species:
 - i. Isolation, quarantine, stamping out methods based on diagnostic/epidemiological data
 - ii. Vaccine development and testing platforms
 - iii. Biological response modifier platforms (genomics, proteomics, NGS...)
 - iv. Animal models
 - v. Mathematical modelling



10. Addressing antimicrobial resistance
 - i. Surveillance and antimicrobial drug discovery
 - ii. Development of new medicines and tools, including testing platforms
 - iii. Enhancing access to essential medicines of assured quality
 - iv. Regulation and promotion of rational use of medicines
 - v. Enhancing infection prevention and control



11. Translational science
 - i. Dissemination of high-quality data to guide policy discussions
 - ii. Promotion of evidence-based policy
 - iii. Establishing good working relationships with national and international policy makers and public health officials



SPECIFIC EXAMPLES ONE HEALTH SCIENCE and AMR:

- Wildlife trade as a mechanism for exotic disease spillovers
- Food safety and security – bush meat trade, food-borne illnesses
- Ecotourism and linkages to anthroozoonoses
- Transmission of diseases to and from domestic animals and pets
- The role of bats as reservoirs of novel diseases
- HIV and other lentiviruses (HIV-2, SIVs; vaccine development, antiviral resistance)
- Coronaviruses (MERS: camels, bats, receptors; pathogenesis; intervention at the source: vaccination of camels and humans; asymptomatic carriers in transmission cycles)
- Hendra-/Nipah virus (Pathogenesis, transmissibility; intervention; geographic spread)
- Ebola virus (early detection; diagnostics; treatment, vaccination; human-animal interface)
- Rabies virus (PEP and treatment protocols; control measures; novel lyssaviruses)
- Chikungunya virus (Environmental drivers; vaccination; wildlife reservoirs; novel vectors)
- RVFV (Environmental drivers; vaccine platforms)
- TBEV (Environmental drivers; tick transmission studies)
- CCHFV (Environmental drivers; tick transmission studies)
- HEV (Zoonotic transmission; pathogenesis)
- Bovine Tuberculosis
- EHEC (Environmental drivers)
- Cysticercosis and Echinococcosis as examples of parasitic zoonoses from domestic animals
- Clostridium difficile to and from domestic animals
- Stimulating in situ research capacity in the endemic settings of Africa and Asia, through SMART partnership consortia
- Antibiotic resistance (MRSA, importance of antibiotic usage in veterinary medicine and agriculture in the development of resistance)