Overview

- One Health theoretical foundation I
  - Example of rabies control

- One Health theoretical foundations II
  - Transdisciplinarity

- Application of One Health to mitigate the effects of Climate Change
  - Integrated environmental, animal and human disease surveillance – response systems
Theoretical foundation I

„One Health“ requirements

Necessary (but not sufficient) requirements:
Recognition of inextricable linkage of human, livestock, companion animal and wildlife health and the environment.

Sufficient requirements:
Added value of health and wellbeing of humans and animals and/or financial savings, social resilience and environmental sustainability* from closer cooperation of human and animal health and other sectors.

*Simon Rüegg, 11.9.2018
Is it profitable to control rabies by dog mass vaccination in African city?
Comparative cost analysis

Cumulative Cost(\text{animal+humans}) \ll \text{Cumulative cost(humans)} > 10 \text{ years}
Theoretical foundation II

What is Transdisciplinarity?

- Considering academic and non-academic
- Knowledge in the research process
- Value contributions of all stakeholders in the
- Generation of knowledge

Emerging career profile
Non-academic actors become research partners

www.trandisciplinarity.ch
MINIREVIEW – Environmental Microbiology

Climate change and One Health

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Exposure in domestic animals

Clinical signs in domestic animals

Presence of pathogens in wildlife vectors, riverbank sediments, wastewater, drinking water, ....

Exposure in humans

Clinical signs in humans

Humans seek medical care

Cumulative societal cost of an outbreak

Environment-Ecosystem

Social System

Social-Ecological System (SES)

Infectious Diseases of Poverty

Towards integrated surveillance-response systems for the prevention of future pandemics

Emerging diseases and Re-emerging diseases because of climate change
→ Rift Valley Fever,
West Nile Virus,
MERS,
Q-Fever,
Covid-19 …
Integrated human-animal-environmental surveillance-response systems

“research for […] vaccines should urgently be complemented by modifications to smallholder livestock systems and live-animal markets to prevent or reduce interactions between [wildlife] and [livestock], which might be reservoirs for future human […] pandemics”. “However, these implementations should be handled carefully to avoid impeding poverty …”

Urgently needed improvements of biosecurity and animal welfare in livestock production, transport and marketing.
1b) Operationalization of One Health Governance (OHG)

PVS   OHG       IHR

incidence / cost

Presence of pathogens in vectors, riverbank sediments, wastewater drinking water, ..... Exposition in animals Clinical signs in animals Exposure in humans Clinical signs in humans Cumulative cost of an outbreak Humans seek medical care

Exposure in animals

Exposure in humans
Exposure in animals

Incidence / cost

Clinical signs in animals

Presence of pathogens in vectors, riverbank sediments, wastewater drinking water, ..... Exposure in animals

Clinical signs in animals

Exposure in humans

Clinical signs in humans

Humans seek medical care

Cumulative cost of an outbreak

PVS OHG IHR
Jijiga University One Health Initiative (JOHI) Initiative

Swiss TPH
Swiss Tropical and Public Health Institute
Schweizerisches Tropen- und Public Health-Institut
Institut Tropical et de Santé Publique Suisse
Associated Institute of the University of Basel

AHRI
Armauer Hansen Research Institute

Alert
Swiss Agency for Development and Cooperation SDC
Integrated Surveillance-Response System in the Somali Regional State of Ethiopia (SDC funding)
Conclusion

Integrated approaches like One Health have an important role to play in the mitigation of health effects of climate change and pandemic prevention.
Thank you for your attention

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