Swiss TPH

“One Health” and Climate Change

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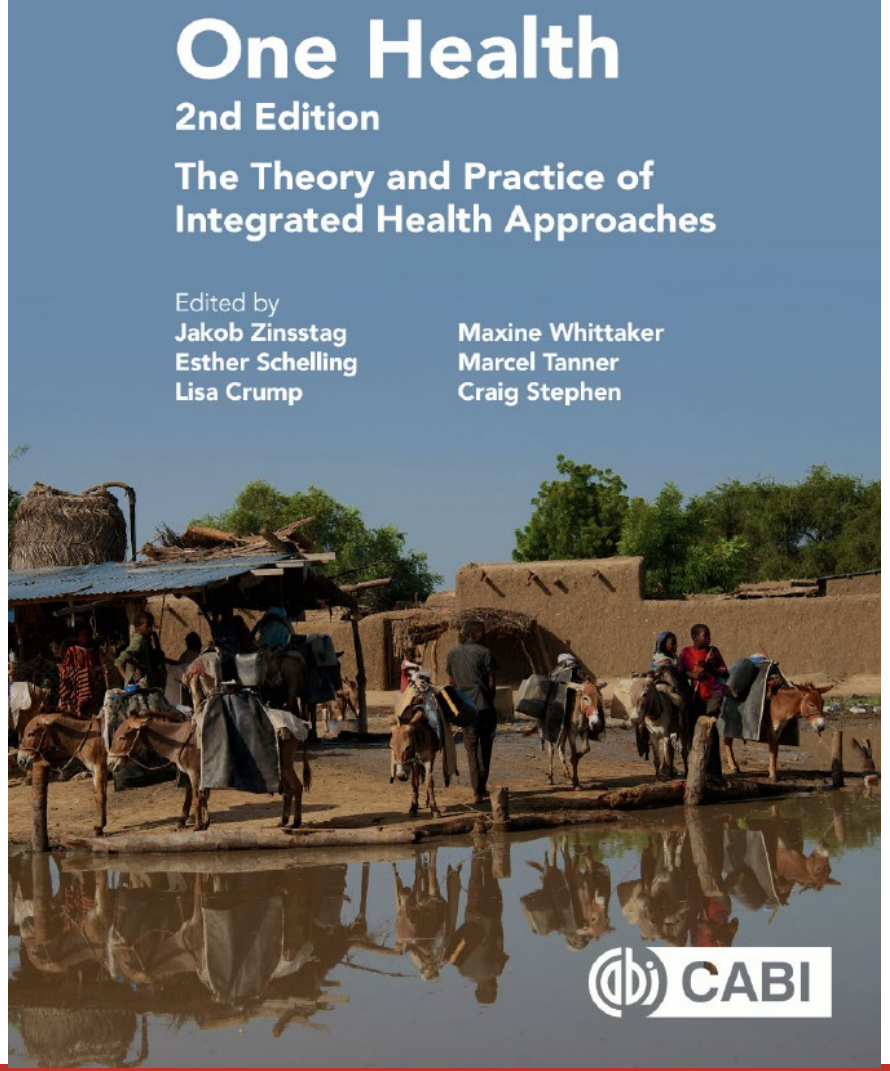
Overview

- 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

One Health Text Book



Theoretical foundation I

„One Health“ requirements

Necessary (but not sufficient) requirements:

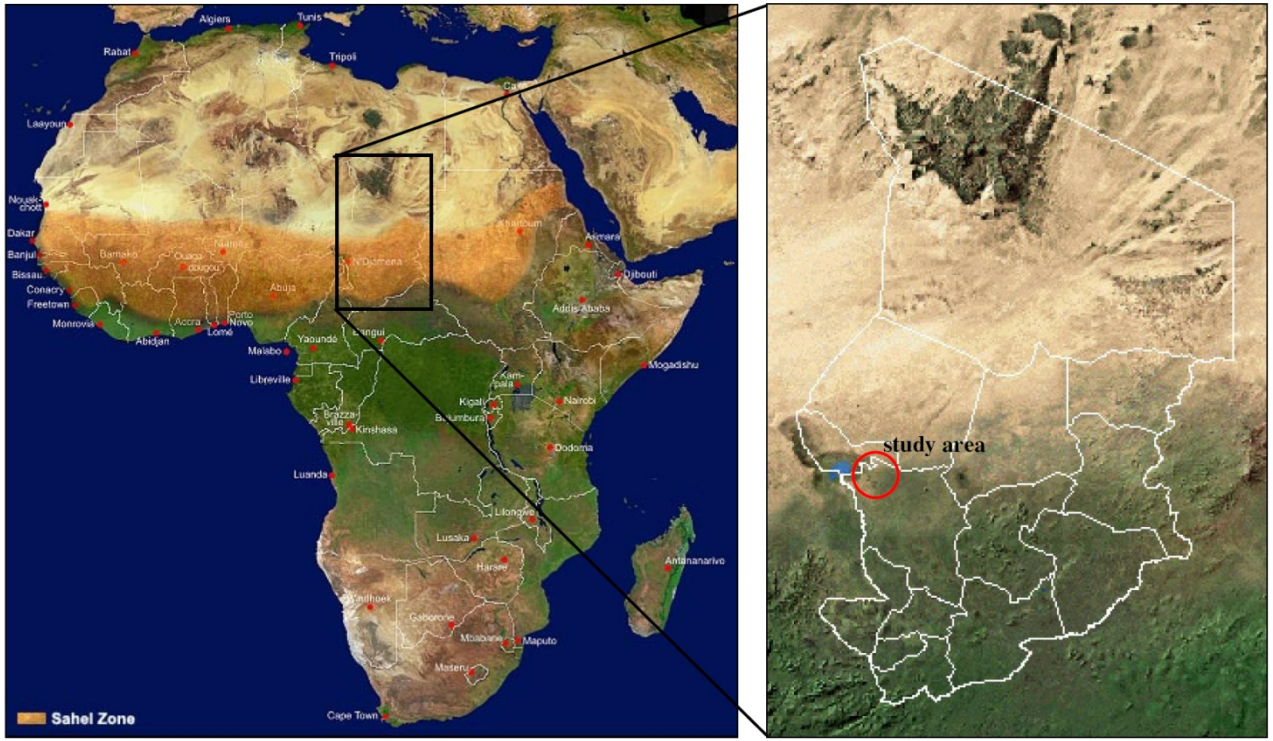
Recognition of inextricable linkage of human, livestock, companion animal and wildlife health and the environment.

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.

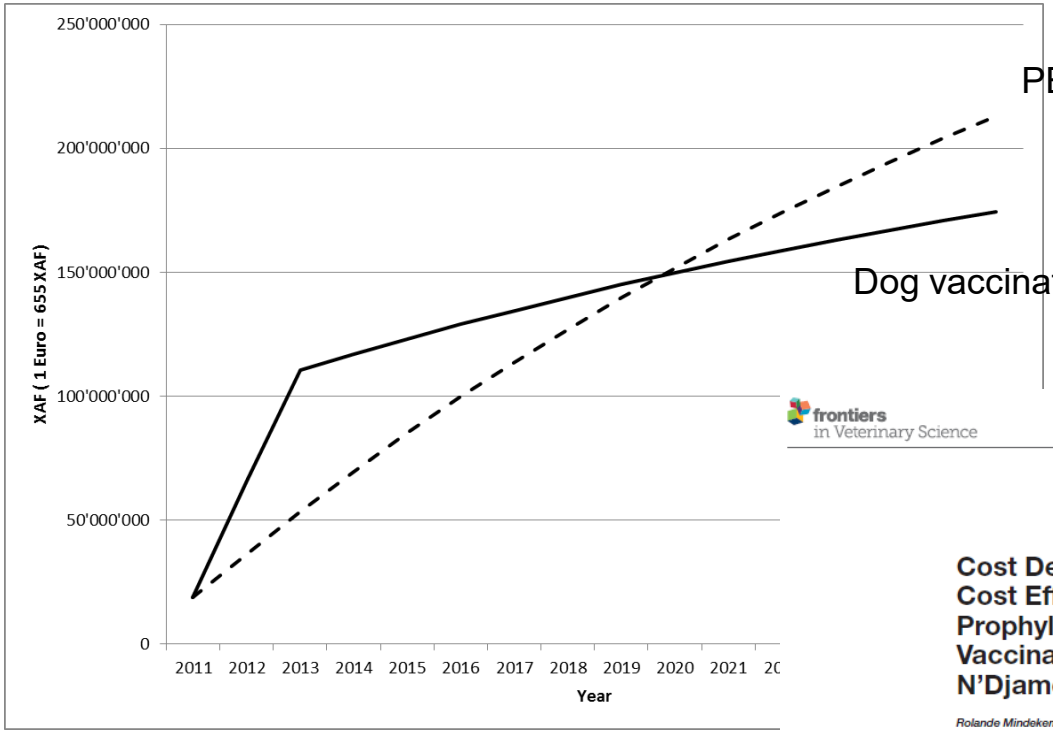
*Simon Rüegg, 11.9.2018

Is it profitable to control rabies by dog mass vaccination in African city?



Comparative cost analysis

Cumulative Cost(animal+humans) <<Cumulative cost(humans) > 10 years



Cost Description and Comparative Cost Efficiency of Post-Exposure Prophylaxis and Canine Mass Vaccination against Rabies in N'Djamena, Chad

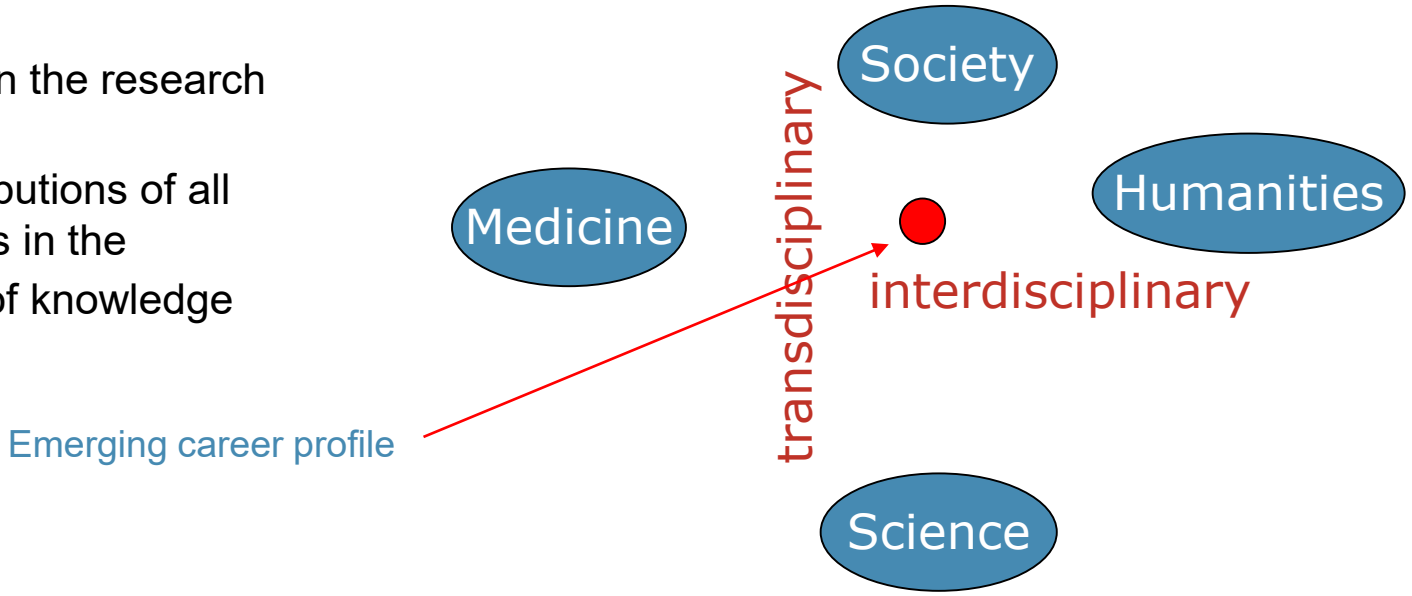
Cost Description and Comparative Cost Efficiency of Post-Exposure Prophylaxis and Canine Mass Vaccination against Rabies in N'Djamena, Chad

Rolande Mindekem[1], Monique Sarah Lechenne[2,3]*, Kemdongarti Service Naissengar[4], Assandi Oussiguéré[4], Bidjeh Kebkiba[4], Daugla Doumagoum Moto[1], Idriss Oumar Alfaroukh[4], Laurent Tinoanga Ouedraogo[5], Sahidou Salifou[4] and Jakob Zinsstag[2,3]

Theoretical foundation II

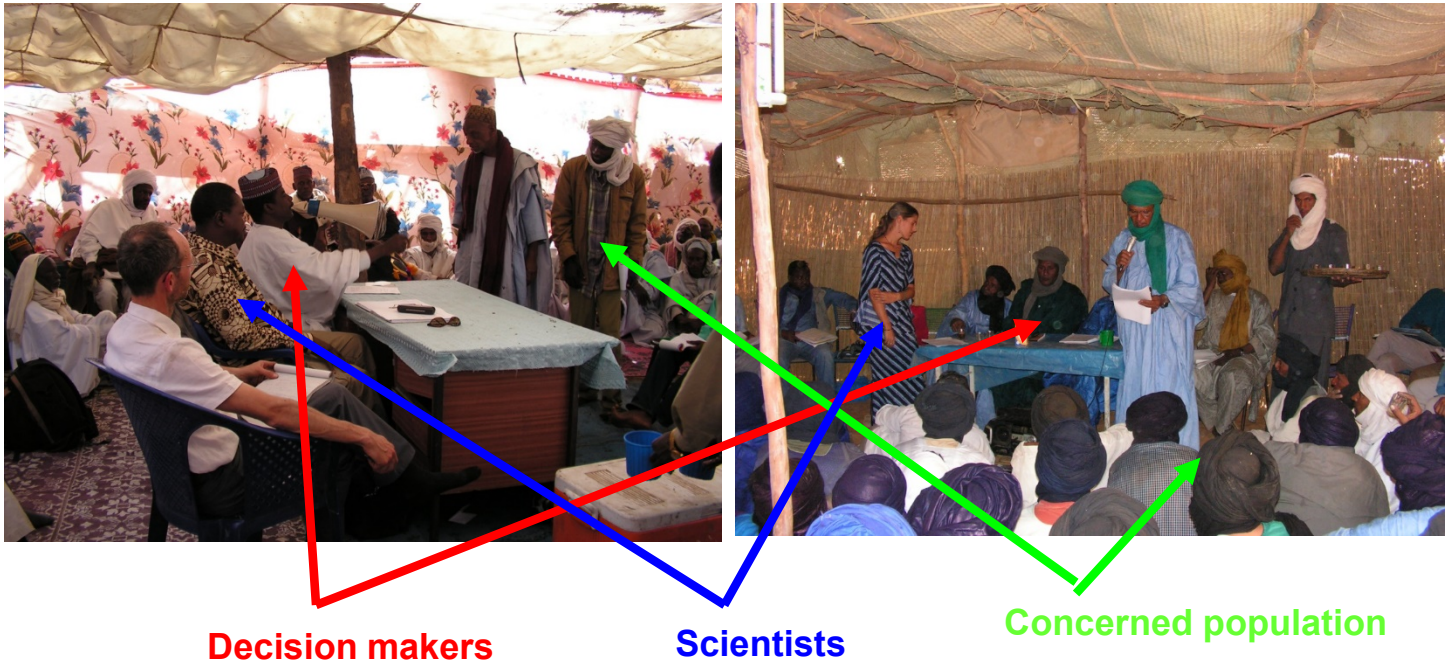
What is Transdisciplinarity?

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



Non-academic actors become research partners

www.trandisciplinarity.ch



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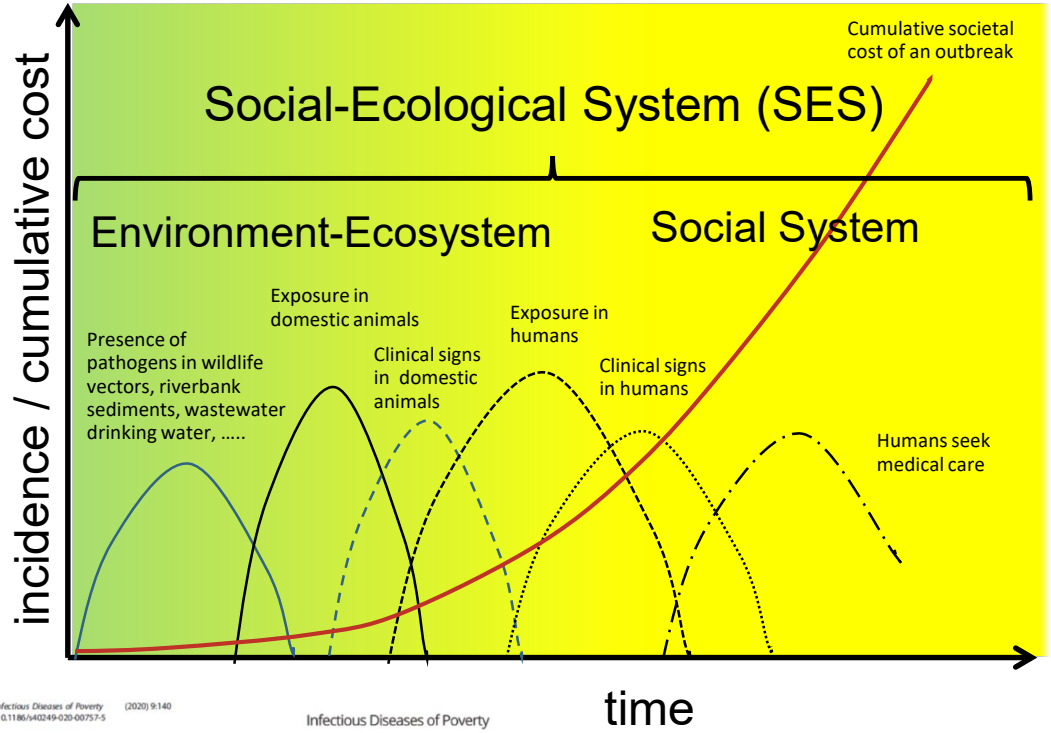
Minireview

MINIREVIEW – Environmental Microbiology

Climate change and One Health

Jakob Zinsstag[1,2,*,†], Lisa Crump[1,2], Esther Schelling[1,2], Jan Hattendorf[1,2], Yahya Osman Maidane[1,2,3], Kadra Osman Ali[1,2,3], Abdifatah Muhummed[1,2,3], Abdurezak Adem Umer[1,2,3], Ferzua Aliyi[1,2,3], Faisal Nooh[1,2,3], Mohammed Ibrahim Abdikadir[1,2,3], Seid Mohammed Ali[1,2,3], Stella Hartinger[1,2,4], Daniel Mäusezahl[1,2], Monica Berger Gonzalez de White[1,2,5], Celia Cordon-Rosales[5], Danilo Alvarez Castillo[5], John McCracken[5], Fayiz Abakar[6], Colin Cercamondi[7], Sandro Emmenegger[8], Edith Maier[8], Simon Karanja[9], Isabelle Bolon[10], Rafael Ruiz de Castañeda[10], Bassirou Bonfoh[11], Rea Tschopp[1,2,12], Nicole Probst-Hensch[1,2] and Guéladio Cissé[1,2]



Zinsstag et al. Infectious Diseases of Poverty (2020) 9:140
https://doi.org/10.1186/s40249-020-00757-5
Infectious Diseases of Poverty

OPINION Open Access

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

Jakob Zinsstag[1,2*], Jürg Utzinger[1,2], Nicole Probst-Hensch[1,2], Lv Shan[3,4] and Xiao-Nong Zhou[3,4]

World-Bank People, pathogens and our planet: Volume 2: The economics of one health. 2012. p. 1–50. Report No. 69145-GLB:50.

RESEARCH ARTICLE

Economics of One Health: Costs and benefits of integrated West Nile virus surveillance in Emilia-Romagna

Giulia Paternoster[1¤*], Sara Babo Martins[2,3], Andrea Mattivi[4], Roberto Cagarelli[4], Paola Angelini[4], Romeo Bellini[5], Annalisa Santi[1], Giorgio Galletti[1], Simonetta Pupella[6], Giuseppe Marano[6], Francesco Copello[7], Jonathan Rushton[8], Katharina D. C. Stärk[2,3], Marco Tamba[1]

Emerging diseases and

Re-emerging diseases because

of climate change

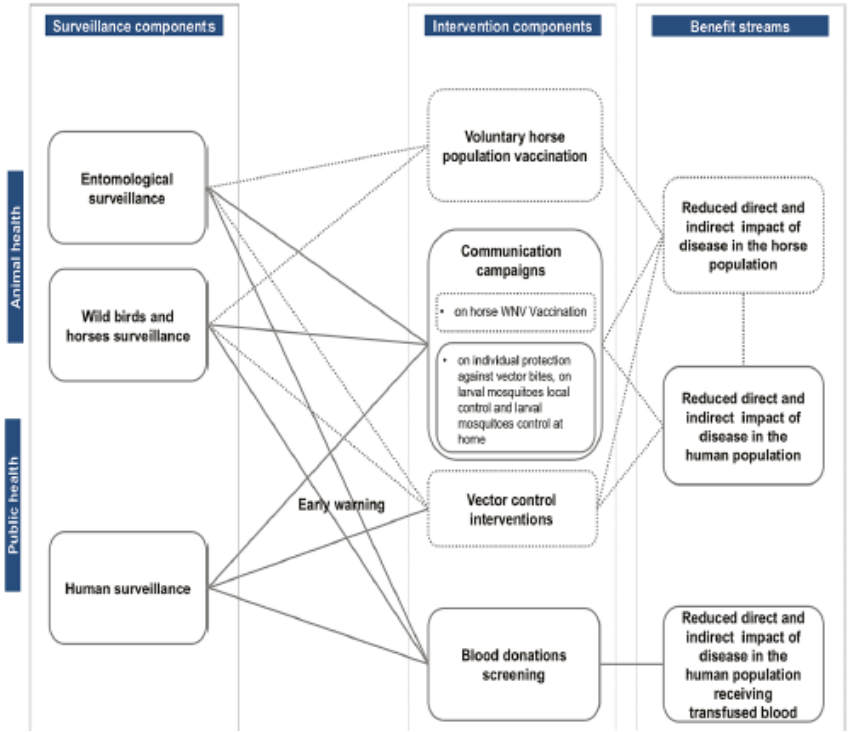
→ Rift Valley Fever,

West Nile Virus,

MERS,

Q-Fever,

Covid-19 …



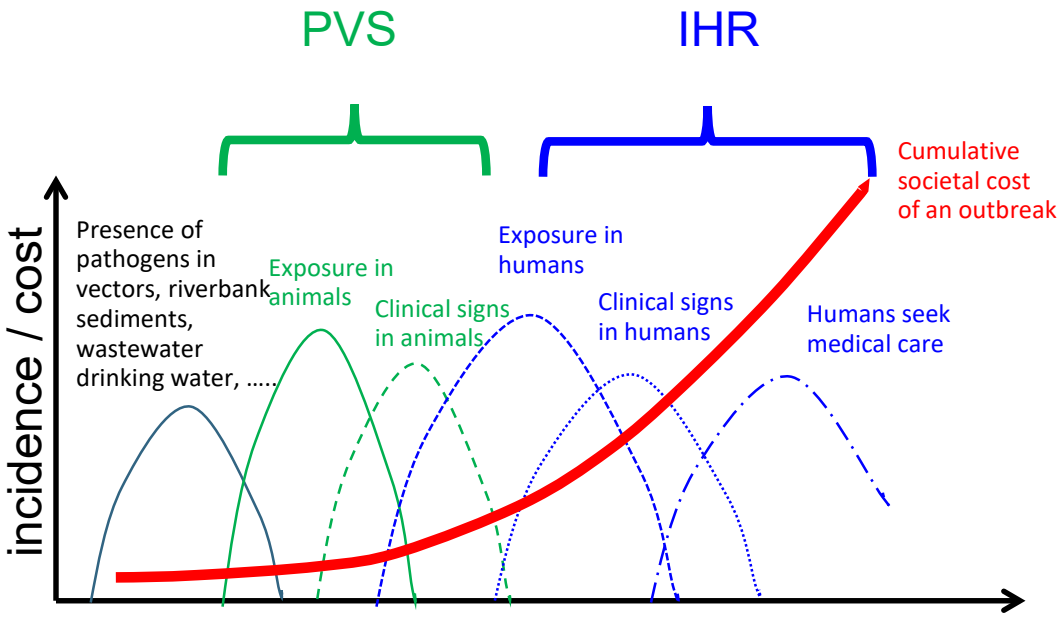
Integrated human-animal-environmental surveillance-response systems

“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 …”

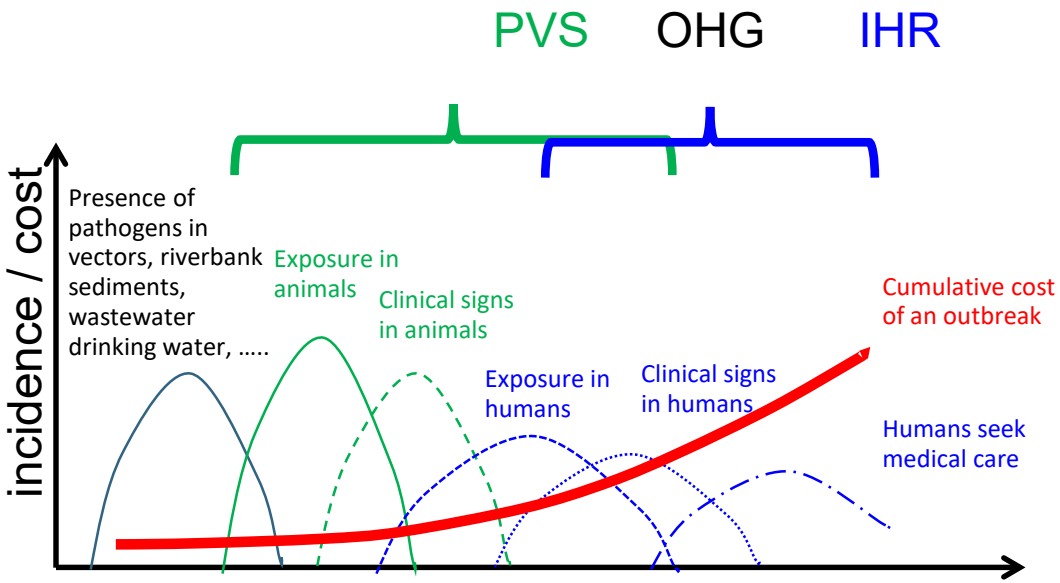
Zinsstag J, Schelling E, Wyss K, Bechir M. Potential of cooperation between human and animal health to strengthen health systems. Lancet. 2005 2005;Sect. 2142-5.

Urgently needed improvements of biosecurity and animal welfare in livestock production, transport and marketing.

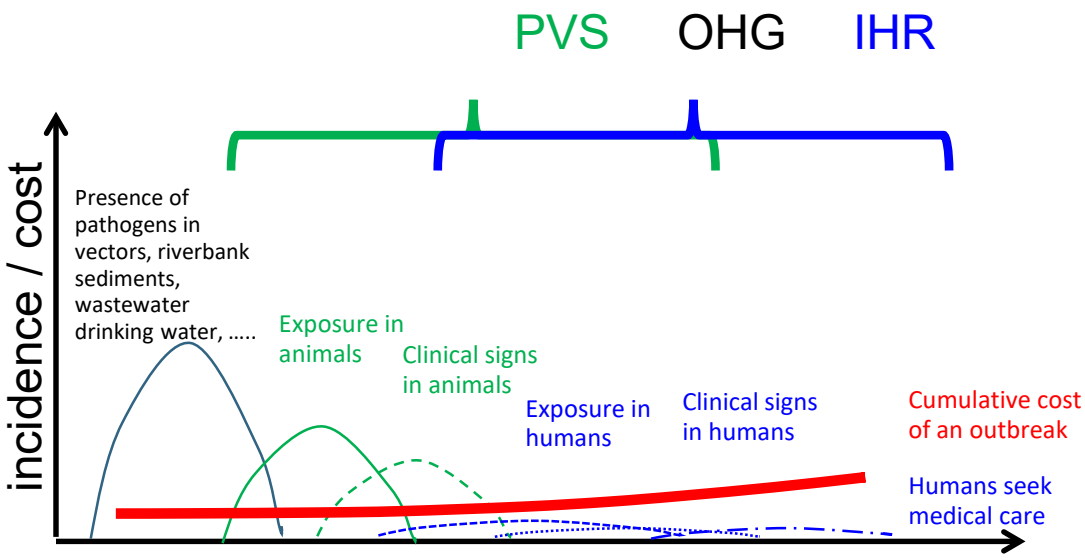
1a) World Organization for Animal Health World Health Organization



1b) Operationalization of One Health Governance (OHG)



1c)


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

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

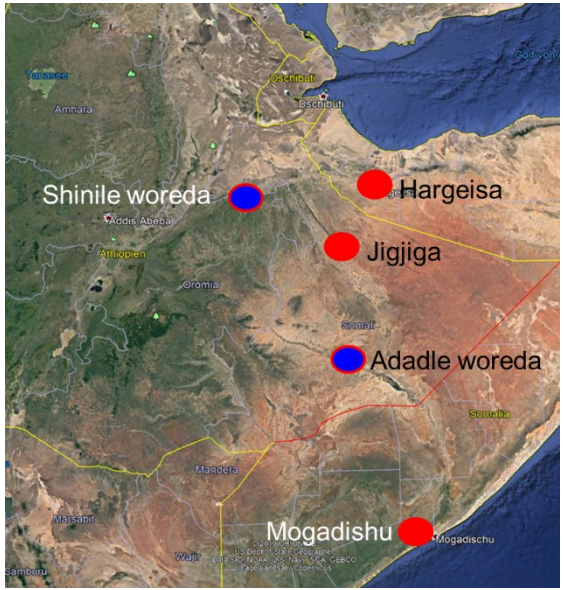
Schweizerische Eidgenossenschaft
Confédération suisse
Confederazione Svizzera
Confederaziun svizra

Swiss Agency for Development and Cooperation SDC

JIGJIGA UNIVERSITY

AHRI ALERT
Armauer Hansen Research Institute

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

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Thank you for your attention

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