Towards a “one health” research and application tool box:

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Who we are.....
Multidisciplinary research unit within the Department of Epidemiology and Public health at the **Swiss Tropical Institute (www.sti.ch)** with partnerships in seven countries in Africa and Central Asia.

**Focus:**
Health systems for nomadic pastoralists
Control of zoonoses in developing countries
Bovine tuberculosis, Rabies, Brucellosis, Anthrax, Avian Influenza
Overview

• „One medicine - one health“: What is the added value?
  • Brucellosis control in Mongolia
  • Rabies Control in N`Djaména, Chad
  • Health services for nomadic people in the Sahel
  • What is Transdisciplinarity?
• Complexity of socio-ecological interactions with health
  • Towards a systems approach to health
• Open Toolbox for „one health“
• Towards a „one health“ community of practice
The „one medicine“ by Calvin Schwabe’s has its origins in his work with Dinka pastoralists in Sudan in the 1960s.

„There is no difference of paradigm between human and veterinary medicine. Both sciences share a common body of knowledge in anatomy, physiology, pathology, on the origines of diseases in all species.“

Synoptic view of benefits and costs of animal brucellosis mass vaccination in Mongolia
Comparative profitability of rabies control in N'Djaména

Dog and human vaccination

Human vaccination alone
Mixed teams assessing human and animal health
Zoonotic seroprevalences of nomadic pastoralists and their livestock in Chad from a cross-sectional study

- Identification of possible sources of exposure of pastoralists
- Brucellosis seroprevalence cattle 7% and positive association with history of abortions
- Human brucellosis seroprevalence 2%: professional risk and raw milk consumption
- Being a camel breeder was a significant risk factor for Q-fever seropositivity in humans

Schelling et al., 2003
Intervention oriented: Joint human and animal vaccinations improve access to health care for pastoralists

- Costing study: public health sector could save up to 15% of infrastructure, cold chain and staff costs
- Private veterinarians’ interest in capitalising on transportation infrastructure
Participatory stakeholder seminars to define priorities of the populations and the authorities jointly provide shortcuts to policy
From „one health“ towards a systems theory of health

- Health in a socio-ecological system (SES)
- Well established as EcoHealth

Direct quantitative and qualitative linkages to health status and health care provision
Canadian Integrated Program for Antimicrobial Resistance Surveillance (CIPARS)


EPIDEMIOLOGY OF ANTIMICROBIAL RESISTANCE

HUMAN
COMMUNITY URBAN/RURAL
EXTENDED CARE FACILITIES

AQUACULTURE
Sea / Lakes
Drinking Water
Rivers and Streams
Drinking Water
Industrial & Household Antibacterial Chemicals

SOIL
Sewage
Vegetation, Seed Crops, Fruit

WILDLIFE

VEAL CALVES
SWINE
CATTLE
POULTRY
OTHER FARMED LIVESTOCK
SHEEP
ANIMALS

COMPANION ANIMALS

Animal Feeds
Direct Contact

Dead stock

Rendering

after Linton AH (1977), modified by Irwin RJ
Tools (I): Optimization of surveillance systems for emerging diseases: towards joint surveillance

Example of bovine tuberculosis
Tools (II): Equity-effectiveness of health interventions in humans and animals

Vlassof and Tanner (1992), Tugwell et al. 2006 (Ottawa), Obrist et al. (2008)

Identifying most sensitive parameters in the effectiveness to achieve strongest and fastest leverage
From “us versus them” to “shared risk” between humans and animals.

Humans as a determinant of “risk to ecosystem health”.

High cancer rates of Beluga in the Saguenay fiord (Martineau 2002)

Beluga cancer incidence as a proxy outcome for ecosystem quality

But, humans and human activity are an integral part of ecosystems, hence an integrated systemic approach is warranted.
Towards a community of practice of „one health“

- Map stakeholders and their networks
  - Public and animal health agencies
  - Private practioners
  - Industry, Academia
  - Livestock farmer associations
- Participatory stakeholder workshops to identify perceived priorites
  - Triangle of authorities – communities – academia („transdisciplinary“)
  - Develop a research and action agenda
  - Iterative stakeholder meetings
- Canada has excellent institutional and programmatic condensation points around CIPARS and C-Enternet, Ecosystem approach to health (IDRC) and many Universities.