University of Basel

One Health: Connecting Humans, Animals and the Environment
Video Transcript

Quantitative methods in One Health: a summary

[Jakob Zinsstag]: In the last steps, you have learned that One Health includes the added value in terms of human and animal health, financial savings, and better environmental services. To demonstrate the evidence that it is worth pursuing an integrated human and animal health approach, quantitative methods are very important. For this purpose, we first of all need to understand the biology behind certain problems. We call this 'get the biology right'. Then we need to characterise and measure the animal-human interfaces. We may do this by linear statistical methods. For example, we can study the Brucellosis seroprevalence of humans and animals at the same time. Or, especially when we want to study interventions, we can use mathematical transmission models which are linked to economic analyses.

Cross-sector economic analyses involve different metrics. Human health is expressed as averted Disability-Adjusted Life Years, also called DALY. DALY is currently the most commonly used human health metric. On the other hand, animal production is expressed in terms of financial value. We do not attempt to introduce a joint metric for humans on animals that are ill. For humans, there is a moral consensus that human life has a unique value no matter who it is or where that person lives. This has been translated into a number of health-adjusted life year measurements. For animals, such a consensus is missing.

Developing a disability metric for animals would be highly controversial as animals are valued differently both in different cultures and even among individuals within a single culture. For example, a human with a disability such as incurable lameness would receive a moderate disability weight. For many production animals, lameness would lead to culling. Thus, for animals, monetary values are the most appropriate factors. Furthermore, the lifespan for livestock is also a function of the production system in which they are kept, in which humans determine when they should be culled or sold for slaughter. But in fact, African cows often have longer lives than European dairy cows. To address cultural differences in animal-human economic analyses, we recommend a clear specification of their own cultural background.

And if needed, you can address even macroeconomic consequences of transboundary transmission of diseases like avian influenza. The One Health concept extends beyond zoonosis, because an illness in one sector can spill over to another in indirect ways. The impact of HIV/AIDS on the livestock industry of Sub-Saharan Africa got already some attention. The livestock industry forms the backbone of income in many communities, and the impacts of the disease have profound effects for the industry, including loss of agricultural labour force. Although One Health is growing as a concept, the current focus on research is primarily on improving the efficiency of the concept through the animal-to-human side of the relationship.
But we can show demonstrable economic evidence of the advantages to bi-directional economic analysis across human and animal health-related sectors.