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CREATE CHANGE

# One Health and subsistence farming in developing countries

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# Roadmap

1. The One Health concept – intention, critiques, trends
2. One Health Research – scope, deficiencies, examples
3. One Health and livestock farming in low-income countries
4. One Health Communication – case studies from Myanmar



# The One Health concept – intention, critiques, trends

# We live in an One Health world

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**Chair in One Health**

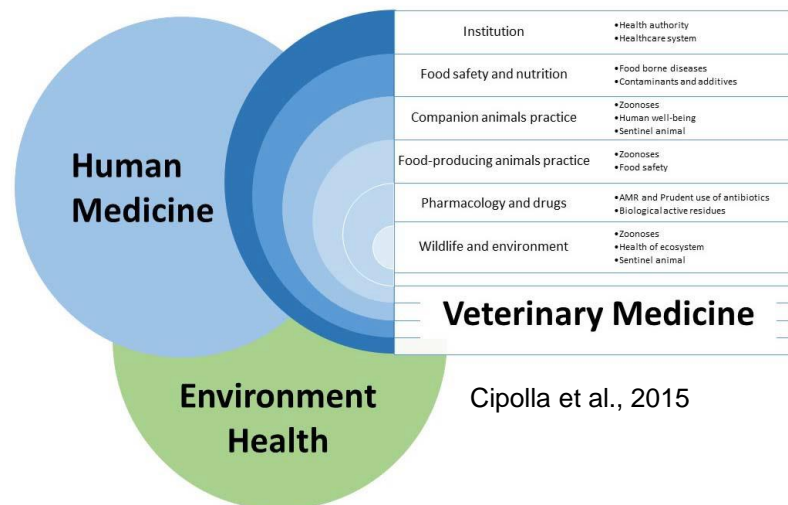
**Director in One Health**

**Professor of One Health**

# A very brief history of One Health

- The origins of One Health go back to the 1800s, when Rudolf Virchow, a German physician who coined the term "**zoonosis**", highlighted the linkages between human and veterinary medicine.
- The term "**One Medicine**" was coined by Calvin Schwabe a Professor of Veterinary Medicine at the University of California, Davis in the 1980's. One Medicine is the idea that diseases and treatments in humans and animals are fundamentally the same and that human and animal health practitioners and scientists pursue the same general goals.
- The change in terminology from One Medicine to "**One Health**" occurred during the first decade of the 21st century.
- There is no single, internationally agreed-upon definition of One Health, although several have been suggested.

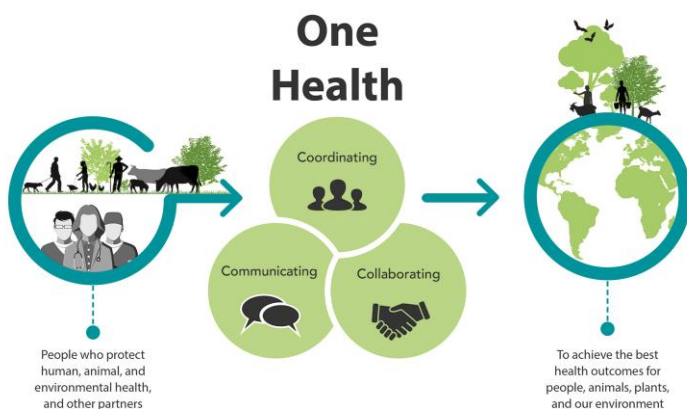
# The One Health Concept



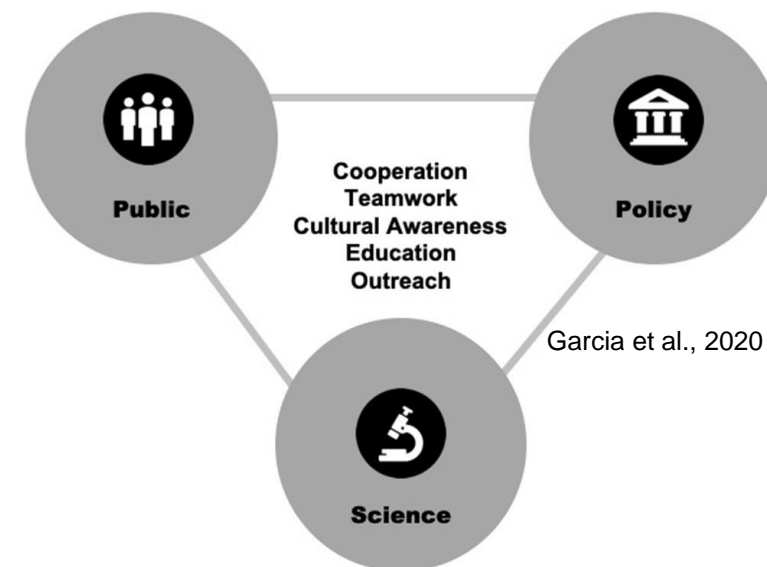
Cipolla et al., 2015

*One Health is an approach to ensure the well-being of people, animals and the environment through collaborative problem solving.*

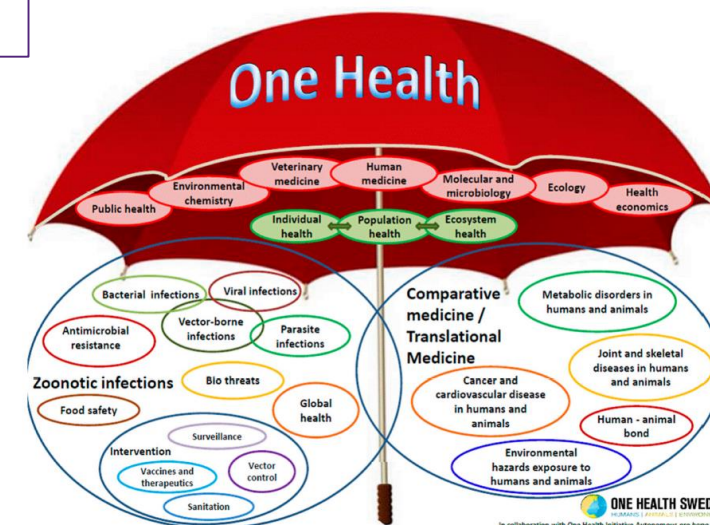
One Health Institute of the University of California at Davis



CDC website (accessed Nov 2021)



Garcia et al., 2020



Mackenzie & Jeggo, 2019

# One Health or Eco Health?

- One Health is primarily concerned with human-animal disease transmission.
- Eco Health is less focused on the human-animal health interface, instead seeking a broader understanding and includes the humanities and the natural, social and health science disciplines. (Zinsstag, 2012)
- One Health is dominated by veterinarians and animal health scientists.
- *“[Human health professionals] are less motivated than veterinarians and ecologists in cooperating with other disciplines, due to their tendency to attract greater funding and a latent sense of superiority.”* (Valeix et al., 2016)

# Critique of the One Health approach I

*Without deeper consideration of the everyday connections and disconnections between social, political and ecological worlds, the risk is that One Health will perpetuate the current compartmentalization between science, health, development and politics.*

*The expansive vision of 'One World, One Health' may, in turn, become 'side-tracked' and 'siloed' within new sets of expert-driven agendas, lofty rhetoric detached from local realities and priorities, and narrowed, technocratic interventions far removed from the social determinants of health.*

(Bardosh, K 2016, 'Imagined Futures: new directions for One Health', in One health science, politics and zoonotic disease in Africa, Routledge, Taylor & Francis Group, London, New York, pp. 231-42.)



# One Health in cross-cultural contexts

- A deeper understanding is required of culture and social practice, i.e. how people might respond to interventions and animal illness. (MacGregor and Waldman, 2017)

Small-scale poultry farmers in Myanmar don't eat eggs from home-produced chicken due to their Buddhist beliefs (i.e. improving village chicken production need to be focussed on the sale of eggs, rather than egg consumption)

(Henning et al, 2007)



- People might be willing to accept a disease risk as they weigh-up trade-offs, such as their economic well-being or traditional beliefs. (MacGregor and Waldman, 2017)

*Practice of eating raw pork in Laos and it's expected relationship with masculinity (i.e. risk of Taenia solium infection)* (Bardosh et al, 2014)

# Critique of the One Health approach II

- The implementation of One Health focusses predominantly on hierarchical and technically orientated approaches to link science to policy, despite decades of critique. (Bardosh KL et al. 2017)

- Use of disease models in policymaking.

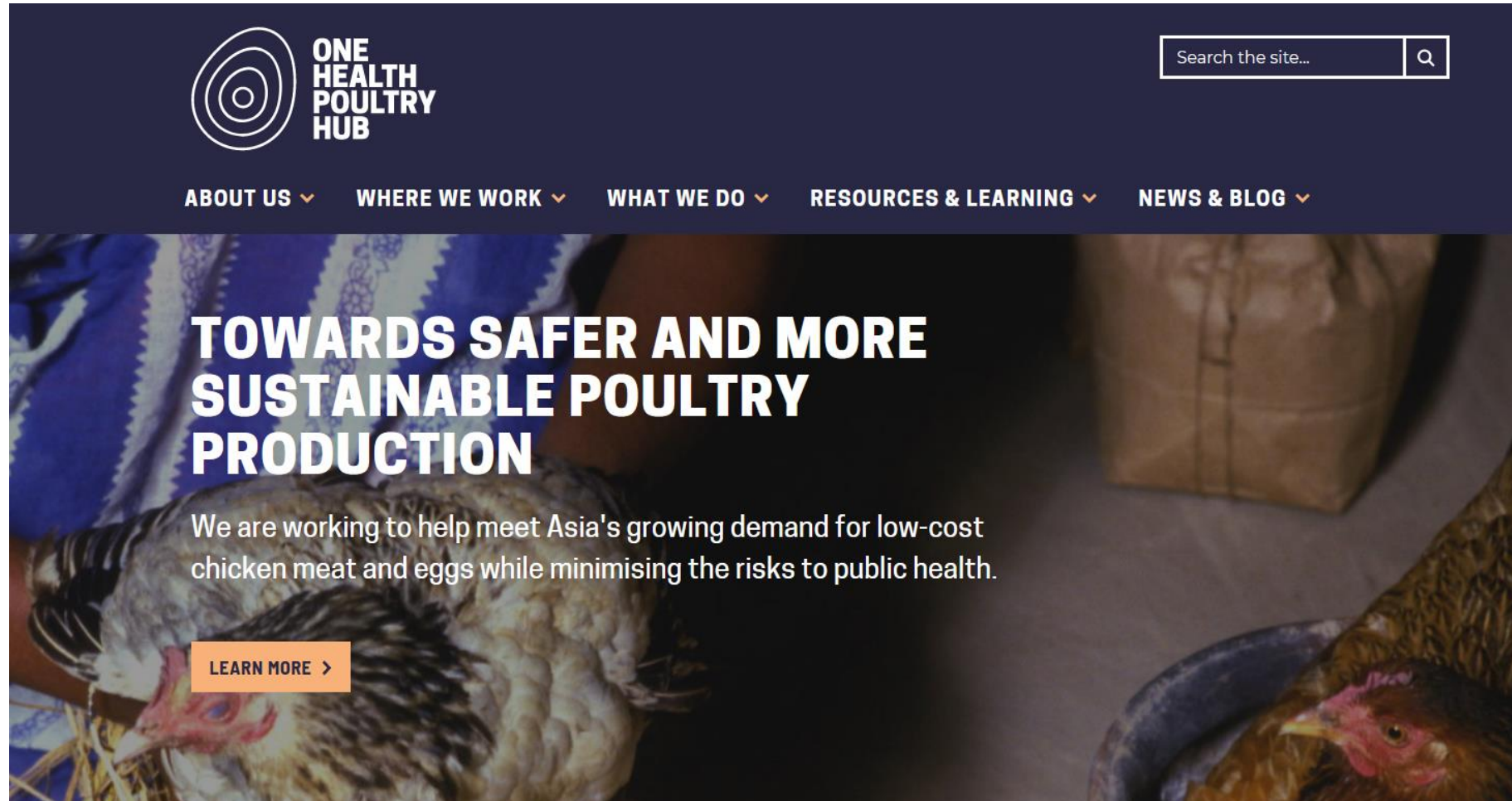
*Disease models are complex assemblages built on different levels of uncertainty; their usability is a product of the networks and discourses that surround them and the functional value they provide. This makes many scientists somewhat uncomfortable in actively engaging the policy world - it is difficult to communicate the intricacies of models and their uncertainties, especially when there is an expedient need for concrete facts and information to make decisions, as during an epidemic.*

(Christley et al., 2013, Bardosh KL et al. 2017)

# One Health – trends and vision

- Transdisciplinary teams must work together including experts from academic, government, public, and private institutions to achieve meaningful change in public awareness, policies, and practices that support implementation of sustainable interventions.
- Key organisations embracing One Health: WHO, FAO, OIE, CDC, OHEJP.
- Establishment of north–south exchanges and the establishment of research centres of excellence.
- One Health approaches have made its way into research and curriculum at universities.
- Programs aim to produce graduates which are “One Health Practitioners”, at an undergraduate, postgraduate and local level (e.g. APCOVE training).

<https://www.onehealthpoultry.org/>



*Our research is guided by a One Health approach which recognises the interconnectedness between animal health, human health and the environment. As such as we are an interdisciplinary team and are considering holistic interventions.*



# One Health Research – scope, focus, examples

# Is this One Health Research?

- Is a study of a zoonotic disease conducted in a livestock species actually One Health research?
- Does One Health research need to consider how providers of data for research projects receive information of the findings of this research?
- How useful are One Health research outcomes when they are not properly communicated?

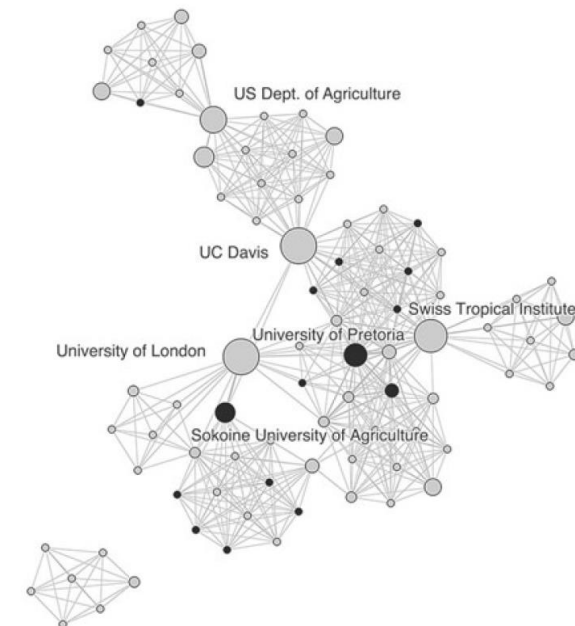
# One health research - collaboration

- Collaboration is an inherent and explicit part of the One Health research, but no common metrics exist to uniformly describe and evaluate such efforts.
- Summary of disciplinary foci and co-authorship of One Health publications, using Web of Science (Valeix et al, 2016)

Disciplines associated with articles published on One Health over the period 2007—2014 based on Web of Science categories

<i>Disciplines associated with publications</i>	<i>Percentage</i>
Veterinary	61
Ambiguous	13
Medical	11
Ecology/environment	5
Other	4
Multidisciplinary sciences	3
Social sciences	3

Network diagram of co-publishing patterns between organizations that have six or more co-authorship relationships.



# One Health research – global vs local, trickle down vs bottom up

- Researchers benefit the most and gain the most prestige from publishing papers presenting new knowledge and innovative concepts. Knowledge production prioritizes ‘global’ audiences in the most prestigious scientific journals and downplays local information sharing and community-based activities.  
(Bardosh KL et al. 2017)
  - The research “reward system” provides limited opportunities to link scientific research with practical dissemination, local implementation and hence societal impact
- Conventional views on the linkage between research knowledge and action/policy, focus on a ‘trickle down’ effect and ‘technology transfer’
  - Alternative: bottom-up approach, involving people “on the ground” to identify areas that require research or work and work on those (Bernhard Bett, ILRI, in Bardosh KL et al. 2017)

*To make research [more] effective [we should allow] people on the ground to speak for themselves . . . in ways that define clearly what their problems are and . . . what it is that they would need to do to resolve them. . . Let’s let people speak for themselves and [One Health] will work. –*  
(Vupenyu Dzingirai in in Bardosh KL et al. 2017)



# Practical implications for One Health Research

- One Health is not a research topic of its own but a truly transdisciplinary approach.
- One Health Research is complex and requires detailed planning.
- *Case study: Impact of improved duck production on human dietary diversification in flood-prone areas of Bangladesh areas, where crop production is unstable and chicken raising not suitable*



Hossain et al., 2021

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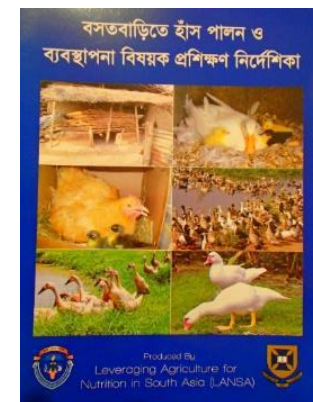
**Impact of improved small-scale livestock farming on human nutrition**

Md. Emran Hossain<sup>1</sup>, Md. Ahasanul Hoque<sup>1</sup>, Emanuele Giorgi<sup>2</sup>, Guillaume Fournié<sup>3</sup>, Goutam Buddha Das<sup>1</sup> & Joerg Henning<sup>4,5</sup>

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# Case study: Impact of improved small-scale duck farming on human nutrition

- Cluster-randomised controlled trial conducted over 12-months in Bangladesh, involving 150 small-scale duck rearing households.
- Interventions focussed on improving duck health and resulted in increased consumption and sales of ducks.
- Household selling more ducks were more likely to purchase and consume milk products, contributing to an improved households' dietary diversity.
- Duck rearing can provide a suitable and sustainable alternative to maintain and improve dietary diversity of households in flood-prone areas.





# One Health and livestock farming in low-income countries

# One Health and low-income countries

- One Health has struggled to be operationalized in low-income countries, due to the resource-limited settings.
- The COVID-19 pandemic is considered indicative of the interrelation of changes to the environment, animals, and human health with low-income countries suffering the most, including:
  - Small-scale producers, households dependent on informal employment and with little recourse to insurance or alternative sources of income during lock-downs
  - People with limited access to basic hygiene goods such as soap and clean water
  - People with limited digital illiteracy, which excluded them from information on how to best protect themselves from COVID-19, from the use of the available online technologies, and from social interactions

# One Health challenges for livestock farming in low-income countries

- Decisions of animal treatment are not straightforward and seldom the domain of one person and depended on availability (i.e. if animal owners live away from veterinarians). (Bardosh KL et al. 2017)
- Avoiding one risk (by treating diseased animals) may expose people to other risks (reduction in ability to sustain livelihoods; inability to pay bills for animal treatment; extended family members' anger as 'inappropriate' decisions were made by the animal keeper). (MacGregor and Waldman, 2017)



Cultural divides and a lack of appropriate communication approaches might hinder the dissemination of One Health messages.



# One Health Communication – case studies from Myanmar

# One Health communication

- **Health Communication** is “the study of how health information is generated and disseminated and how that information affects individuals, community groups, institutions and public policy”. (Harvard School of Public Health)
- The aim of One Health communication is to inform and influence people’s behaviour and attitude in order to improve health.
- WHO considers communication expertise as essential to outbreak control and for a significant reduction of cases during an outbreak when proactive communication is applied.
- There is a disconnect between how the research community channels generated knowledge to non-academic audiences and the type of information that is produced and what these non-academic audiences actually need or can put into practice.



# Case study: One Health Communication in Myanmar

- Problem: In many low-income countries people are illiterate or unable to understand written outcomes of scientific research.
- Delivery of One Health messages through a range of communication approaches:
  - Cartoons
  - Ethnodrama
  - Traditional cultural performances
  - Cooking competitions
  - Celebrities
- *Myanmar case study: Information provided to small-scale poultry producers on improved biosecurity, Newcastle disease vaccination and food hygiene*



# One Health Communication: Cartoons

Explanatory variables	Difference between mean income from sale of chickens (relative to reference category) (Kyat)	95% CI		p
TR1	Reference category			
TR2	787.53	9.86	1565.20	0.05
TR3	2513.06	1853.30	3172.83	<0.001
August 2004	Reference category			
September 2004	-3004.88	-4631.18	-1378.58	<0.001
October 2004	-3891.92	-6258.92	-1524.92	<0.001
November 2004	-4890.82	-6265.54	-3516.10	<0.001
December 2004	-4888.37	-6877.79	-2898.95	<0.001
January 2005	1507.58	-185.49	3200.65	0.08
February 2005	-2984.49	-4585.95	-1383.03	<0.001
March 2005	-4355.45	-5588.49	-3122.41	<0.001
April 2005	-1109.12	-2787.44	569.21	0.20
May 2005	-6775.45	-8991.01	-4559.90	<0.001
June 2005	-5418.21	-8359.74	-2476.68	<0.001
Constant	9232.92	165.64	4867.10	<0.001

*J. Henning et al. / Preventive Veterinary Medicine 90 (2009) 17–30*

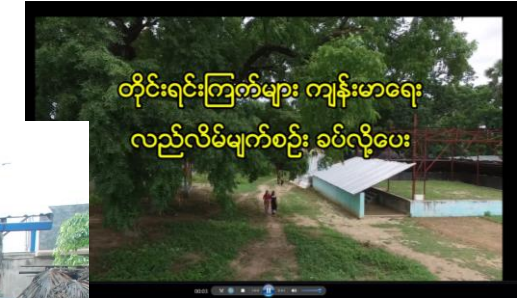
“A GEE Gaussian model was developed to describe the total sale income made from the sale of birds for all the household-months with sales (n observations = 647, n groups = 118, Wald  $\chi^2 = 471.63$ , d.f. = 18,  $p < 0.001$ ). The total amount of income obtained from the sale of birds in households that sold birds was higher for households where altered chick management was applied (TR3) (about 2500 Kyat or US\$2.50 per month higher) relative to I-2 vaccinated households (TR1)”.



*“You will be able to sell about five more birds per year”*



# One Health Communication: Ethnodrama





# One Health Communication: Marionette play





# One Health Communication: Master Chef Myanmar





# One Health Communication: Celebrities

## Thet Mon Myint

- Actress, celebrity and fashion model
- Myanmar academy award winner



## The ND vaccination calendar



# Summary

- How do we 'do' One Health?
- What does One Health mean in practical terms for local people in low-income countries?
- If One Health demands local engagement, how can policies and projects be adapted to local contexts and be effectively scaled-up and sustained?

*[One Health research is] trans-disciplinary research, which co-produces knowledge . . . There is an added-value to this knowledge generation that cannot come from the desk or lab of a scientist and that can only come from the field . . . The scientist becomes more a moderator of the process than just . . . a brain. (Jakob Zinsstag in Bardosh KL et al. 2017)*





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# Thank you

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'Having a smoke', Yangon, Myanmar, 2005

*“People know what they do,  
they frequently know why  
they do what they do, but  
what they don't know is what  
they do does”*

M. Foucault