



Better Training for Safer Food BTFSF

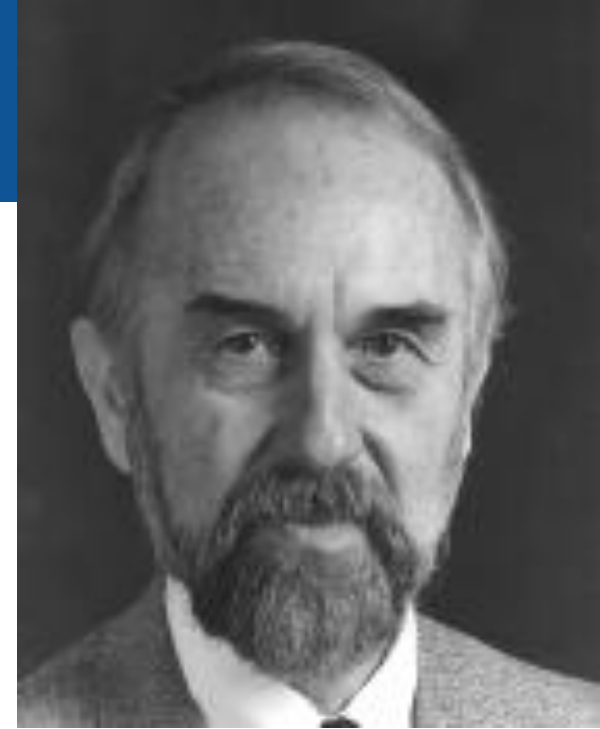
The One Health approach

One Medicine One Health

*Calvin W Schwabe: veterinary
epidemiologist (1927-2006)*

*"Veterinary Medicine and
Human Health" (1984)*

***Human and animal health are
inextricably linked***



One Health

Animals and humans: same biological template

- **Anatomy**
- **Physiology**
- **Immunology**
- **Pharmacology**
- **Epidemiology**

Zoonoses

- **Emerging diseases: H5N1 & H1N1 flu, AIDS...**
- **Epidemic zoonoses: Ebola, Chikungunya...**
- **Endemic zoonoses: Brucellosis, Bovine TB, Hydatidosis...**

Pathogen resistance to drug

- **Transfer**
- **experience**

One Health = Added Value

Increased societal gain: the overall gain of intersectoral collaboration greater than potential individual gains

One health embraces

- **human health**
- **animal health**
- **environment sciences**
- **social science**

$$1+1 > 2$$

Transdisciplinarity: collaboration results in unique outputs

OH ≠ merging disciplines
*OH = maximising
each other's excellence*



OH examples

AIDS: a disease that emerged from animals

H5N1 outbreak

Neglected zoonoses

- **In industrialised countries**
- **In developing countries**

Drug use and drug resistance

HIV/AIDS

Originates from great apes (SIV)

Current HIV strains all derive from a few SIV transmissions to humans

HIV emerged in large African cities

All HIV strains first appeared in the first half of XXth century

How did this happen?



HIV emergence (PhD J D de Sousa)

Ape hunting: SIV has infected hunters for centuries without establishing in human species

Large African cities in early XXth century

- **Large working population**
- **Unbalanced sex-ratio**
- **Large number of female sex workers**
- **Large number of untreated ulcerative genital diseases (absence of antibiotics)**

-> Favourable conditions gave the opportunity to SIV to adapt to humans

HIV emergence: lessons to learn

Infected animals do not necessarily look sick

Humans (and animals) are constantly exposed to infectious agents from other species

Changing environment may have severe consequences on existing equilibriums

Importance of disease surveillance and vigilance in humans, domestic animals and wildlife

SIV epidemiology in apes could be a useful model

H5N1 Influenza

Outbreaks in domestic bird flocks

Ducks and geese highly sensitive

Severe outbreaks in S-E Asia

Severe disease in humans

Great propagation potential

- **Wild bird migratory routes**
- **Commercial routes**

Risk of adaptation to human species (human to human transmission)



H5N1 and One Health

Great public awareness (and fear)

Prompt reaction of OIE and FAO

Advocacy for One Health approach

WHO seemed unaware of the importance to collaborate with OIE and FAO

H5N1 risk eliminated through

- **Huge resources**
- **Close surveillance in humans and animals**
- **Sanitary measures in infected flocks**
- **Vaccination in humans and animals (effect?)**

H5N1 outbreak: lessons learned

Intensive interactions between domestic animals and people = source of emerging pathogens

Rapid spread caused by

- **Trade**
- **Wild bird migrations**

Transdisciplinarity indicated for an integrated response:

- **WHO for human health**
- **OIE for disease surveillance in animals**
- **FAO for integration of animal production systems**

Neglected zoonoses

Defined by WHO and OIE as receiving insufficient attention by decision makers and donors

Parasitic: leishmaniasis, trypanosomosis, cysticercosis and echinococcosis

Bacterial: anthrax, brucellosis and bovine tuberculosis

Viral: rabies

Main impact in low-resource societies



Neglected zoonoses in industrialised countries

Absence of vectors (leishmaniosis and trypanosomosis)

Industrialisation of animal husbandry ruptured the cycle (cysticercosis and echinococcosis)

Processing of animal products: TB and brucellosis

Expensive eradication or control programmes: brucellosis, TB, rabies...

Cost/benefit ratio of interventions?

Neglected zoonoses in developing countries

Epidemiology in animals poorly known

- **often assumed to be the same as in industrialised countries**
- **Endemic situations (e.g. brucellosis and tuberculosis)**
- **Impact on animal health and production?**

Impact on human health often unknown

- **Incidence?**
- **Disease severity?**

Important local variations (epidemiology & impact)

People's perception and understanding of zoonoses

One Health and Neglected Zoonoses

Intersectoral dialogue to evaluate the overall societal impact of each neglected zoonosis

Improved understanding of the local epidemiology of zoonoses

Adaptation of control strategies in function of:

- **Real or estimated impact on human and animal health**
- **Epidemiological considerations**
- **Socio-cultural constraints**

Drug and pesticide resistance

Same molecules used in humans and animals

Drug and pesticide resistance reported in:

- **Arthropods (ticks, mosquitoes...)**
- **Helminths (mostly in livestock)**
- **Bacteria**

Development of resistance

- **Selection of most resistant organisms exposed to repeated or underdosed treatments**
- **Transfer of resistance plasmids in bacteria**

One Health and drug resistance

Lessons learned from veterinary experience

- **Acaricide resistance in ticks**
- **Anthelmintic resistance**

Prevent emergence of resistance in zoonotic pathogens and vectors

- **Bacteria: *Salmonella*, *Campylobacter*, *E. coli*...**
- **Mosquitoes, mangle**

=> *Restrict some molecules to use in humans only*

=> *Improve diagnosis and minimise drug use*

- **Avoid blind treatment**
- **Reduce food adjuvants**

Recommendations

Be aware of what other professions can bring you

Try to value the excellence of your profession

Veterinarians should be seen as useful tools by physicians

=> Need for interaction platforms

=> Sensitization during undergraduate training

Use credible arguments (documented and scientifically sound)

Agree on who pays what?



Thank you for your attention