One Health approaches

Genesis, implementation and best practices

National One Health Symposium
November 26, 2013
Hotel Royal Plaza, New Delhi

Organised by Massey and PHFI

Delia Grace

International Livestock Research Institute

CGIAR Research Program on Agriculture for Nutrition and Health (A4NH)

CGIAR RESEARCH PROGRAM ON Agriculture for Nutrition and Health

LED BY IFPRI

espa ecosystem services for poverty alleviation

A research programme co-funded by DFID, NERC & ESRC and accredited by LWEC

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ILRI INTERNATIONAL LIVESTOCK RESEARCH INSTITUTE

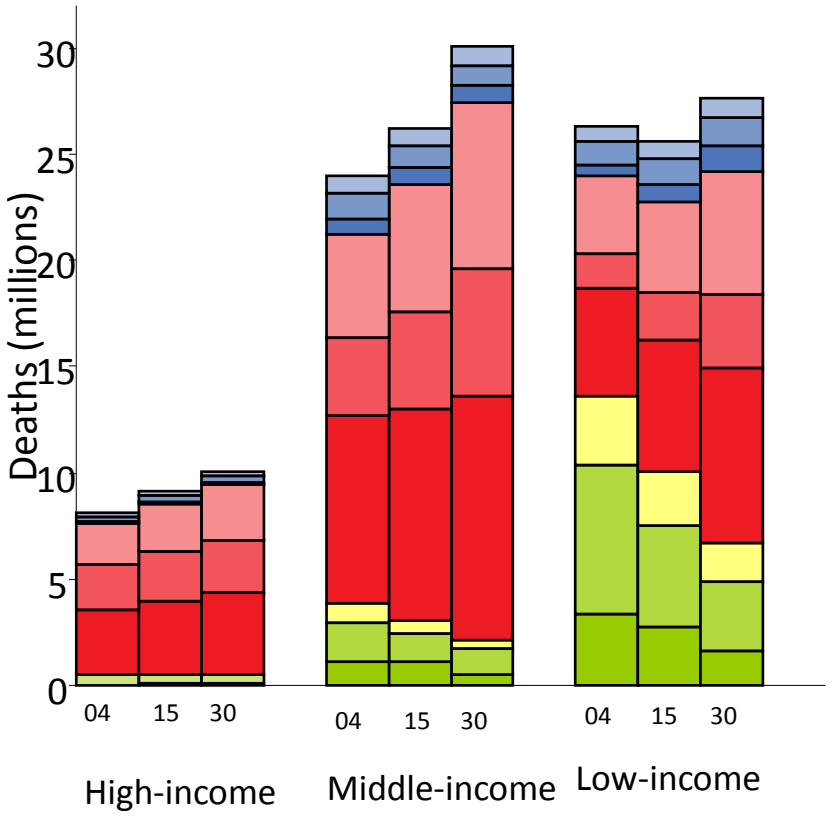
Overview

- Human and animal health in the 21st century
- One Health: its genesis and kindred
- One Health in practice
  - Mapping multiple burdens of disease
  - Making safe food fair
  - Understanding barriers and bridges to One Health
- Building a business case for One Health

Human health in the 21st century

- **7 billion people 2011**
  - 1 billion hungry;
  - 2 billion with hidden hunger;
  - 1.5 billion overweight / obese

- **In 2011 55 million died**
  - 18 million from infection
  - 7 million deaths in under fives (2/3 infectious)
  - One in four of the deaths in under five children occur in India



Animal health in the 21st century

- **24 billion livestock**
  - 19 billion in developing countries
  - 1 billion poor people depend on livestock
    - 600,000 in south Asia

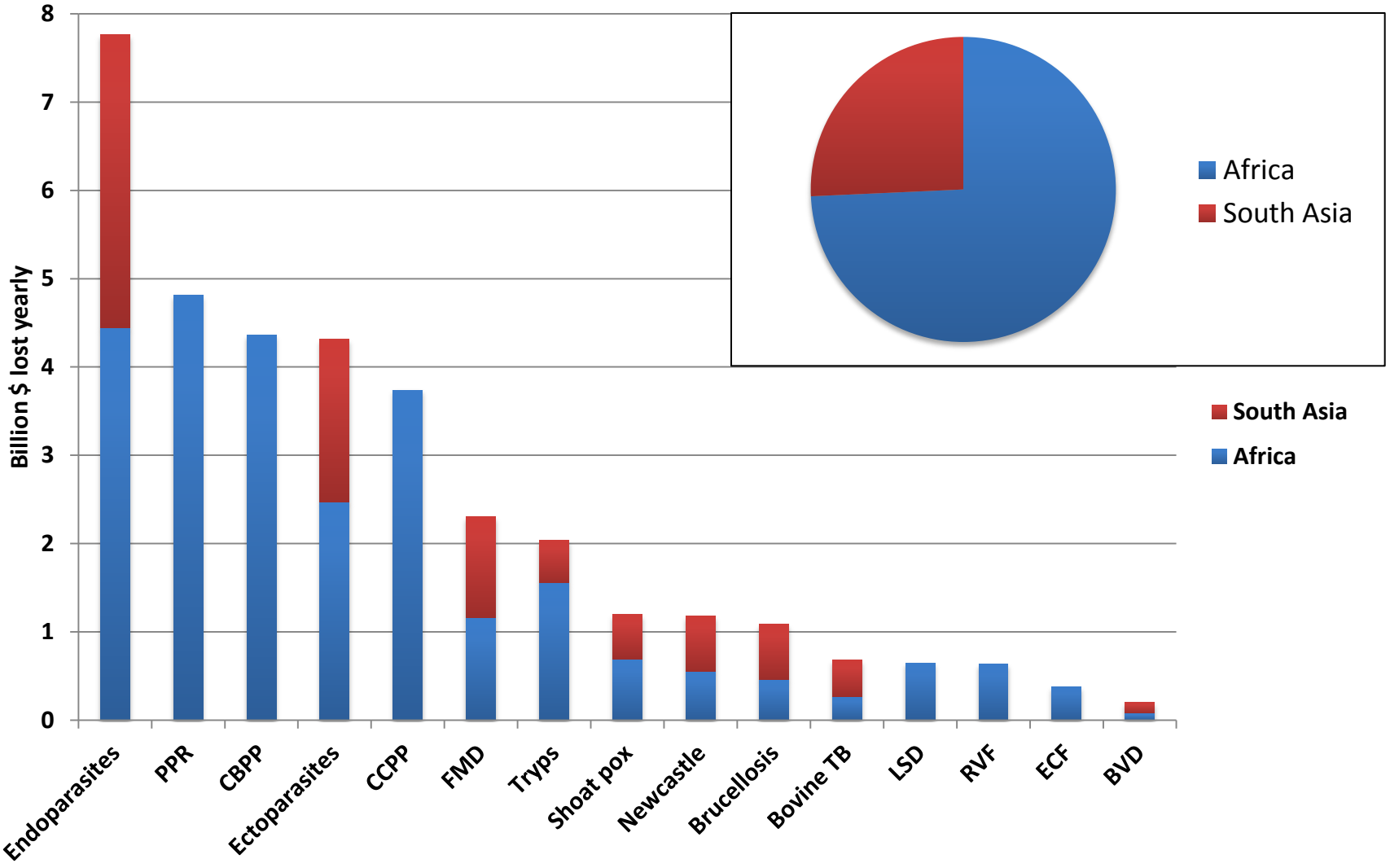
- **5 billion die each year (~25%)**

Annual mortality of African livestock
(About half due to preventable or curable diseases)

	Young	Adult
Cattle	22%	6%
Shoat	28%	11%
Poultry	70%	30%

Otte & Chilonda,

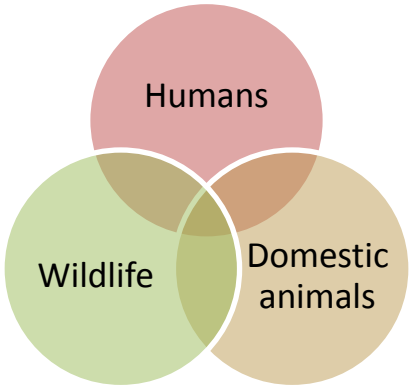
Animal endemic disease costs billions annually



Estimates from BMGF

One Health approach

...encourages the collaborative efforts of multiple disciplines working locally, nationally, and globally, to attain optimal health for people, animals, and our environment

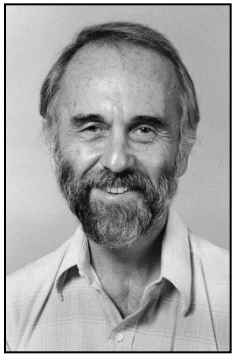


Research Program on Nutrition and Health

“One Health”– Addresses Zoonotic Dieases

19th century

20th century → → →

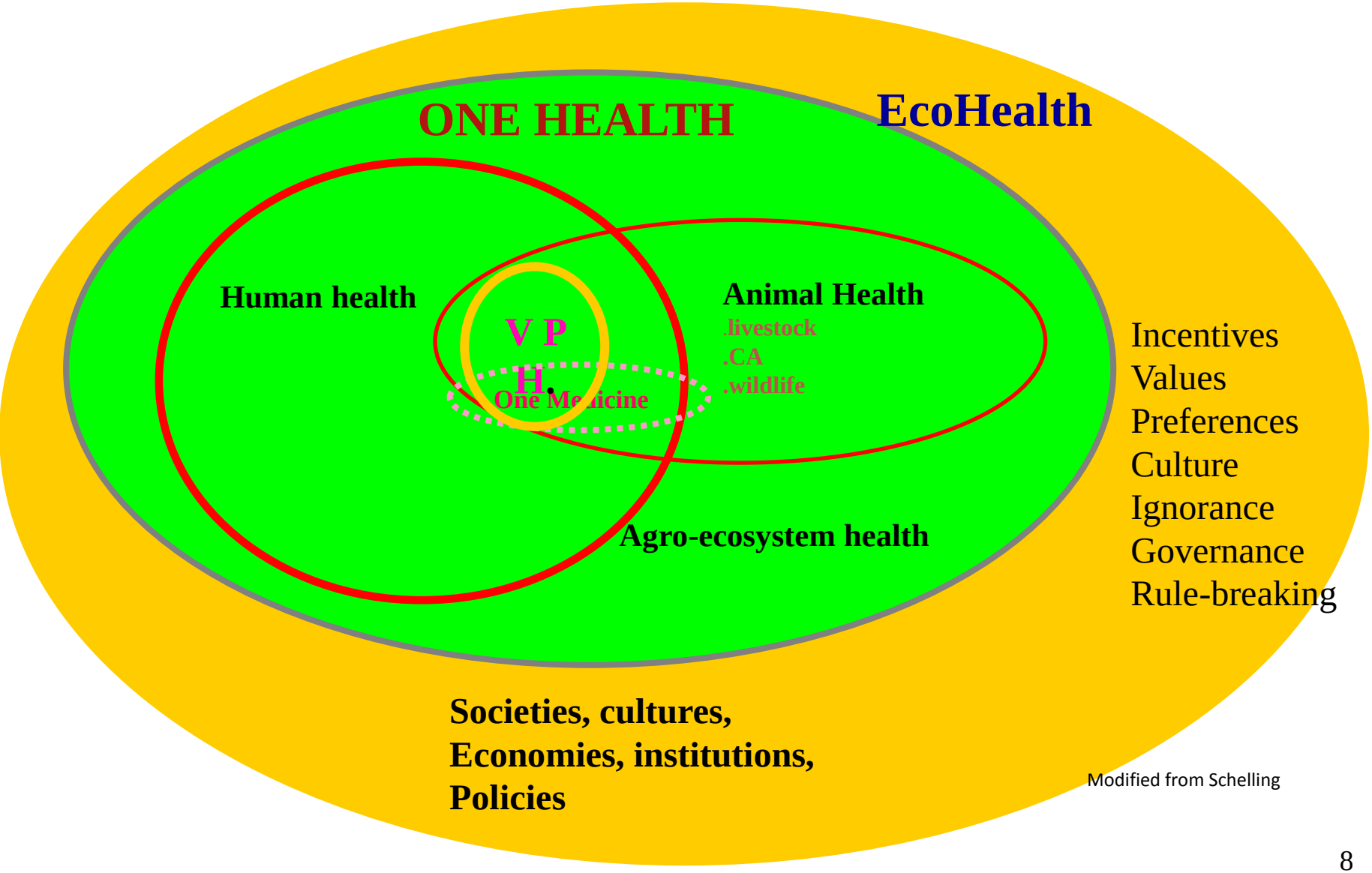


Robert Virchow (1821-1902) : “…between animal and human medicine there is no dividing line” (Kahn et al., 2007).

Calvin Schwabe (1927-2006): veterinary epidemiologist and parasitologist, described and promoted **One Medicine** and proposed a unified human and veterinary approach to zoonoses in his 1964 book **Veterinary Medicine and Human Health.**

The American Veterinary Medicine Association defines **One Health** as “the collaborative effort of multiple disciplines-working locally, nationally, and globally – to attain optimal health for people, animals and our environment.”

Integrative approaches



Modified from Schelling

The unfinished agenda - challenges

- Good experience in linking human and animal health and sometimes environmental but:
  - in specific communities or locations;
  - around specific events / outbreaks; and
  - at pilot intervention scale
- Capacity is more responsive than preventive
- Systems change faster than paradigms

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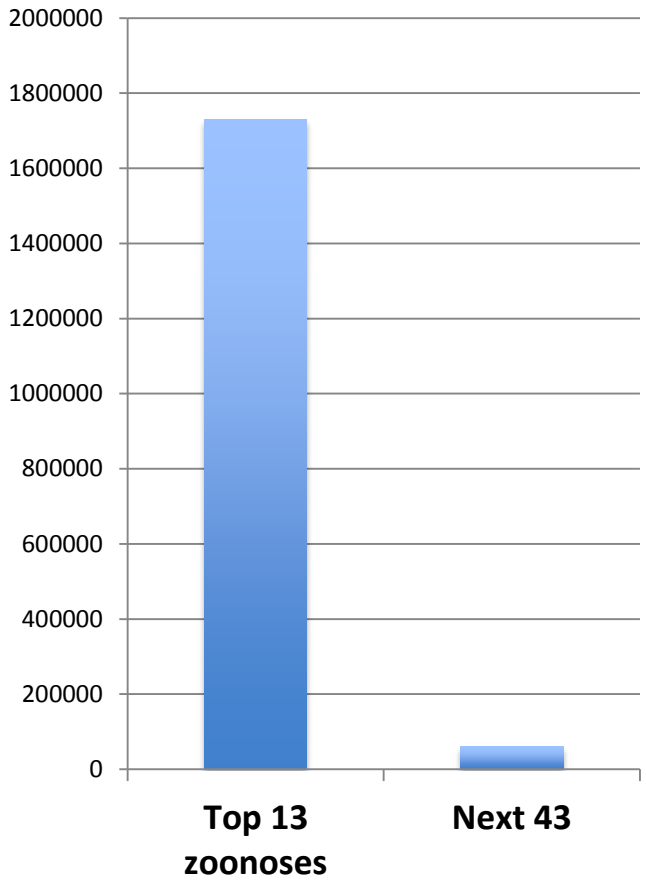
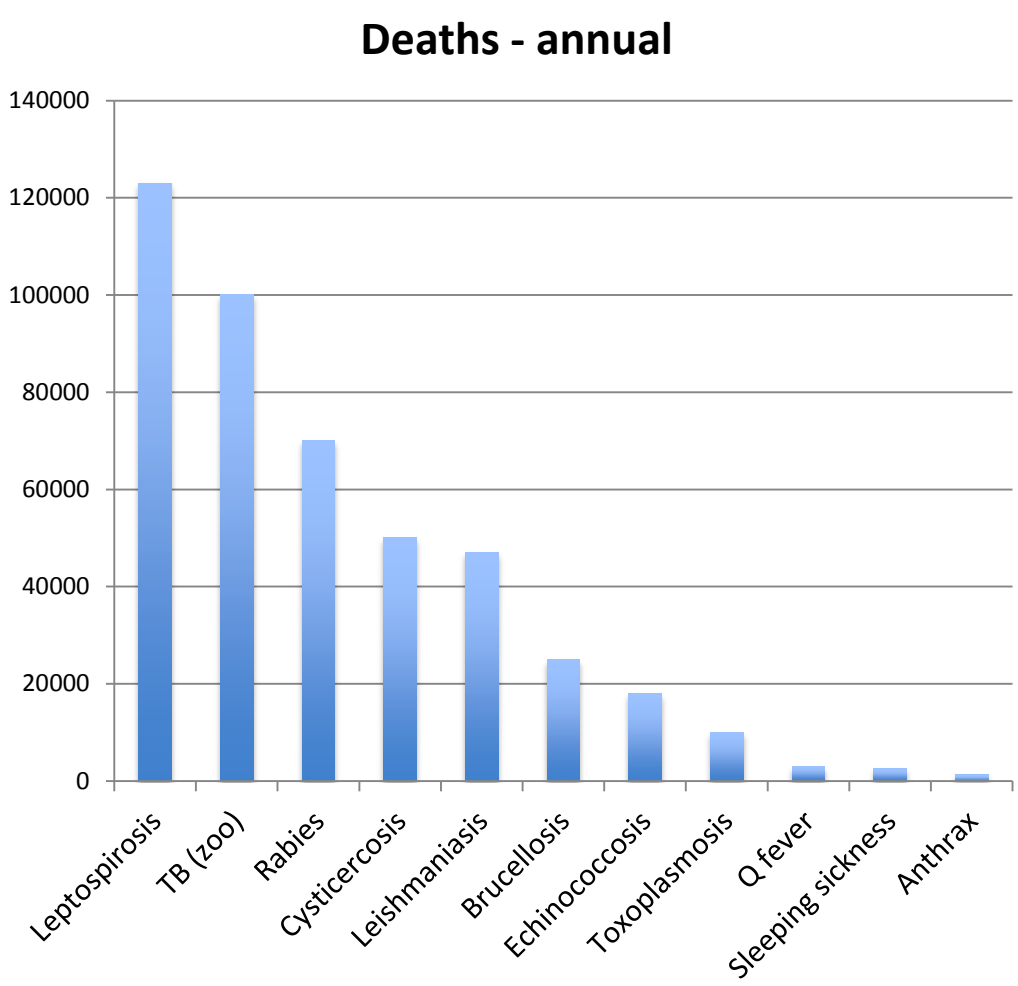
One Health as added value

"One Health" can be defined as the ***added value*** in terms of ***lives*** of animals and humans ***saved, financial savings and improved ecosystem services*** from a ***closer cooperation of human and animal health*** as compared to single sector approaches.

Zinsstag et al. (2012) Onderstepoort J Vet Res. 2012 Jun 20;79(2):E1-5. doi: 10.4102/ojvr.v79i2.492.

Top Zoonoses (multiple burdens)





Official reporting systems

Reporting system	Zoonoses	Scope
WAHID	33	Animal
TAD Info	2	Animal
Pro Med	All	All
GLEWS	19	All
Health Map	All	All

Source: HealthMap

Africa

- 253 million SLU
- 25 million lost annually
- 12-13 million from notifiable disease
- 80,000 reported == 99.8% un-reported

EcoHealth 8, 55–62, 2011
DOI: 10.1007/s10393-010-0357-3

EcoHealth

PRIORITY DISEASES
1: Avian influenza
2: Rabies
3: Leptospirosis

Priority diseases don't reflect importance OR ability to control

Driven by media, donors, misperceptions

Table 2. perceived importance, ability to detect, response, research efforts, and trend (mean and medians) of categories of zoonotic emerging infectious disease by stakeholders in three countries in the mekong region[a]

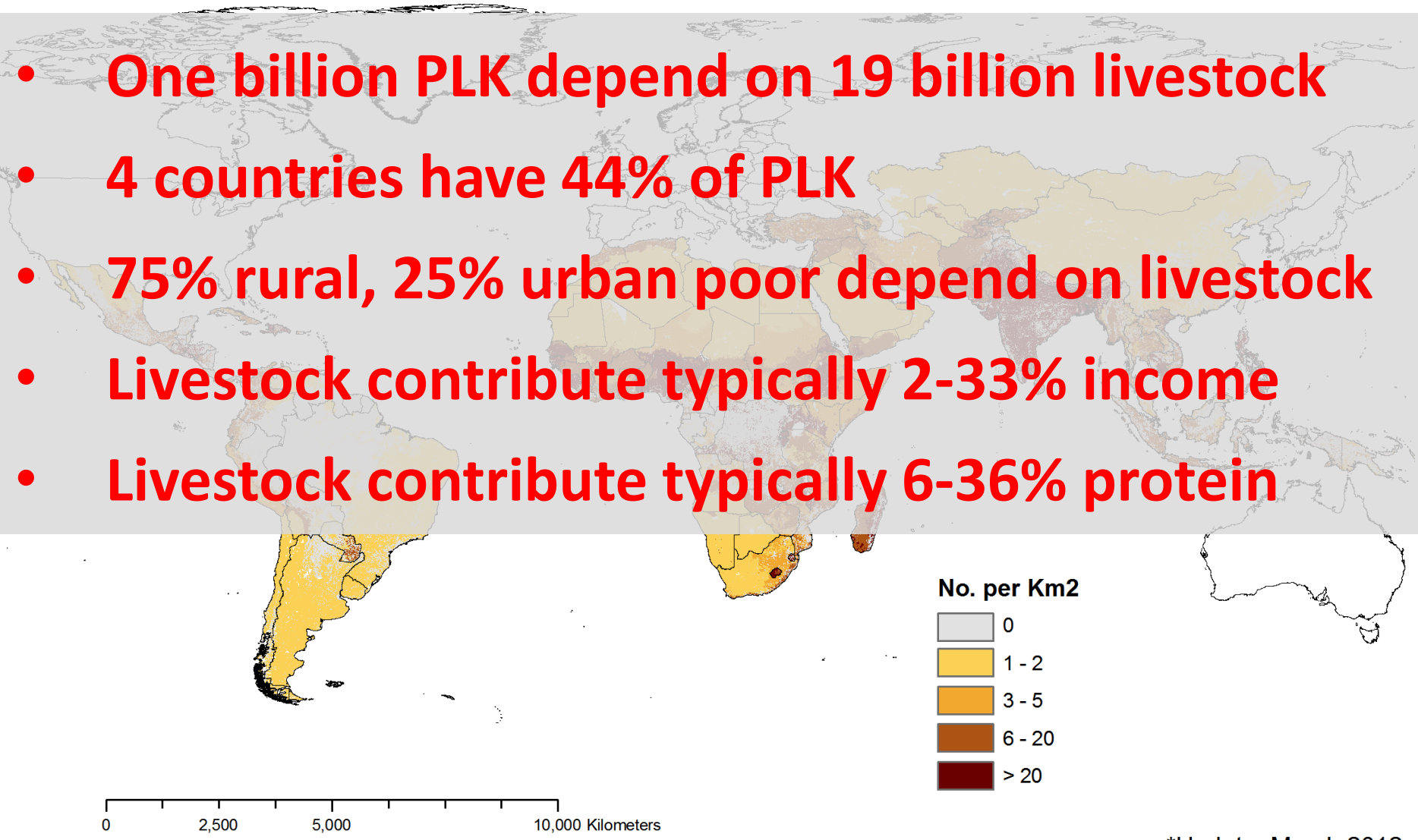
Category	Importance	Ability to detect	Response/Control	Research efforts	Trend
	3 High; 2 medium; 1 low	3 Most cases; 2 some cases; 1 few cases	3 Good; 2 medium; 1 poor	3 High; 2 medium; 1 low	3 Increasing; 2 static; 1 decreasing
Vector-borne zoonoses	2.6 (3)	2.6 (3)	2.2 (2)	2.4 (2)	2.3 (2)
Food-borne zoonoses	2.5 (2.5)	1.9 (2)	1.7 (2)	1.9 (2)	2.5 (3)
Zoonoses transmitted by close contact	2.2 (2)	2.0 (2)	1.9 (2)	1.4 (1)	2.1 (2)
Soil-borne zoonoses	2.1 (2)	1.5 (1)	1.8 (2)	1.4 (1)	1.6 (2)
Wildlife-associated zoonoses	1.7 (2)	1.7 (2)	1.6 (2)	1.4 (1)	1.8 (2)

[a]Medians in parentheses.

Density of Poor Livestock Keepers

Year 2010*

- One billion PLK depend on 19 billion livestock
- 4 countries have 44% of PLK
- 75% rural, 25% urban poor depend on livestock
- Livestock contribute typically 2-33% income
- Livestock contribute typically 6-36% protein



*Update: March 2012

Greatest burden of endemic zoonoses falls on on billion poor livestock keepers

- **Unlucky 13 zoonoses sicken 2.4 billion people, kill 2.2 million people and affect more than 1 in 7 livestock each year**

Map by ILRI, from original published in an ILRI report to DFID: *Mapping of Poverty and Likely Zoonoses Hotspots*, 2012.

Hotspots

- Poor livestock keepers: South Asia 600 m, sub-saharan Africa 300 m
- Zoonoses burden: India, Myanmar, Bangladesh, Pakistan
- Emerging disease risk: West Europe, West USA

- BIG SIX Countries for all risk factors
  - S Asia: India, Bangladesh, Pakistan
  - Africa: Ethiopia, Nigeria, Congo

SAFE FOOD FAIR FOOD

Zoonoses:

- Bacterial
- Viral
- Parasitic
- Prion

Milk

- Xenobiotics
- Chemicals
- Pathogens
- Allergens

Every study finds hazards

Manure

- Xenobiotics
- Chemicals
- Pathogens
- Aesthetic

Social conflict

Traffic accidents

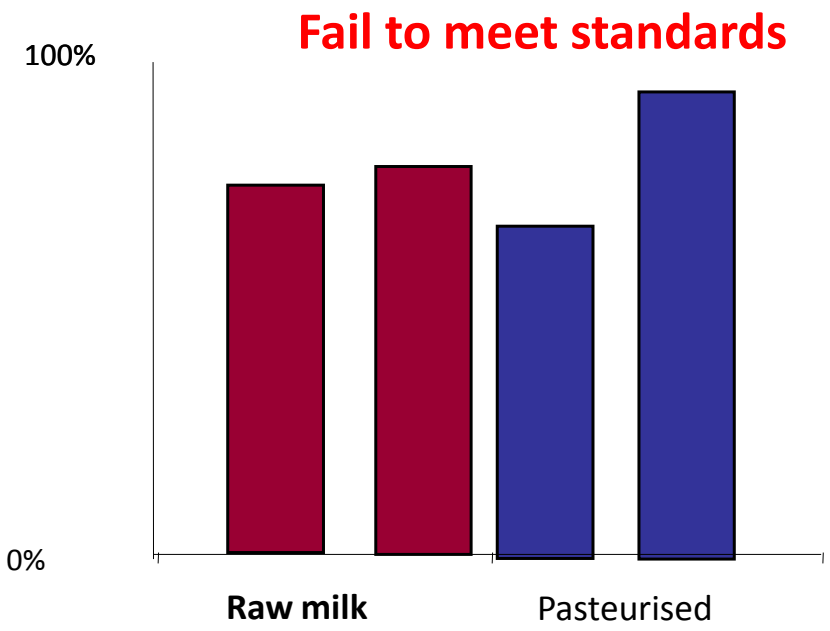
Injuries

Environmental degradation

In many cases the formal sector is no better or worse at meeting standards

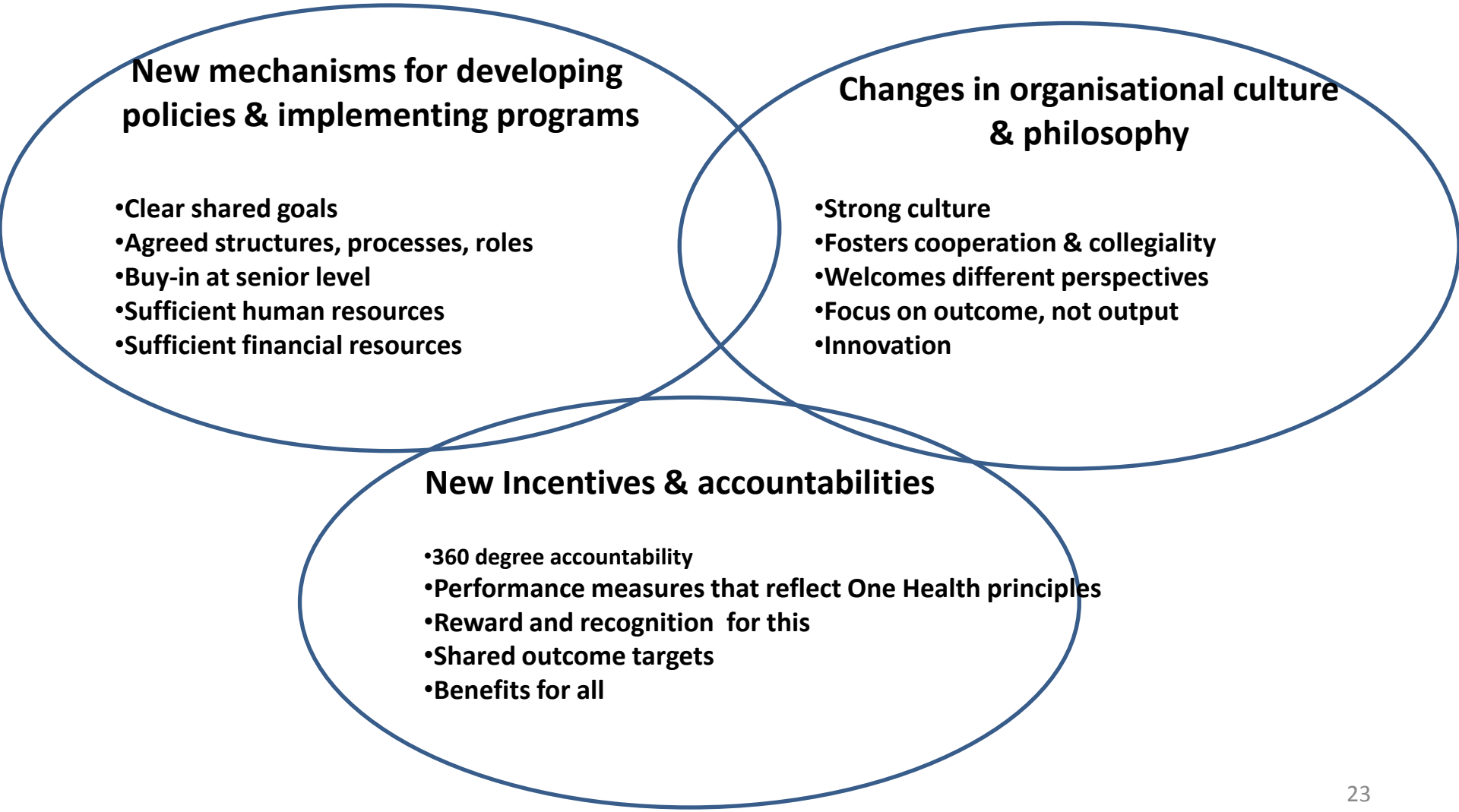
The high hazards of the informal sector often do not translate to risks

Every study finds massive nutrition & livelihood benefits for the informal sector



- Generates million of jobs
- Raw milk earns more for the farmer and costs less for the household
- Consumers prefer taste and provenance of local products

Framework for understanding the barriers & bridges to OH as well as the costs and benefits



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The business case for One Health

1. Sharing resources: efficiency & effectiveness savings
2. Controlling diseases in the animal reservoir rather than human victim
3. Early detection and management of emerging threats
4. Pandemic prevention
5. Generating insights and adding value

Costs & benefits of controlling zoonoses

	Annual benefit	Annual cost	Confidence
Sharing resources	4 billion	1 billion	++
Controlling zoonoses	90 billion	15 billion*	+++
Ensuring timely response	6 billion	3.4 billion	++
Averting pandemics	37 billion		+
Improving research and development	?	?	+++
Bottom line	**137 billion**	**20 billion**	++

20 billion investment for 140 billion benefits

- Extraordinary return to investments
- Need to generate more evidence where lacking, and ramp up lobbying where strong
- Payoff: Avert 2.2 human million deaths, 2.4 million human illnesses, 2 billion animal deaths, 6.7 billion $ outbreak losses

Conclusions: One Health

- Benefits
  - Provides important and non-obvious insights
  - Helps attain multiple societal objectives
  - Improves effectiveness and efficiency
- Challenges
  - Up-scaling and out-scaling
  - Demonstrating added value
- Opportunities
  - Building a business case
  - Overcoming barriers, opening bridges

Agriculture Associated Diseases

http://aghealth.wordpress.com/

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