

## Cost benefit of investing in health systems

**Jonathan Rushton,**

Professor of Animal Health Economics

[jrushton@rvc.ac.uk](mailto:jrushton@rvc.ac.uk)

with

**Derrick Jones and Liz Redmond**

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# Introduction

- Historically the presence of disease has generated societal responses such as improved policies for surveillance, control and prevention.
- The institutionalisation of these responses in many societies has led to a separation between the core investment in health systems and investment in programmes to address specific diseases.

# Introduction

- Over the last decades it has been increasingly important to present the economic assessment of specific disease programmes, and more recently to justify the general costs that underpin the overall health system.
- The OIE has supported this work with the development of the Performance of Veterinary Services (PVS) tool to identify strengths and weakness in core health systems, and the diseases whose control is essential for economic development.

## What is the problem?

- › Despite the successes of the approach of investing

The problem is the **weakness in core activities** undermines specific disease programmes  
Overall there appears to be **underinvestment**, and defining what it should be is critical to **health and disease management**

is weak and always under pressure

## How to address this problem

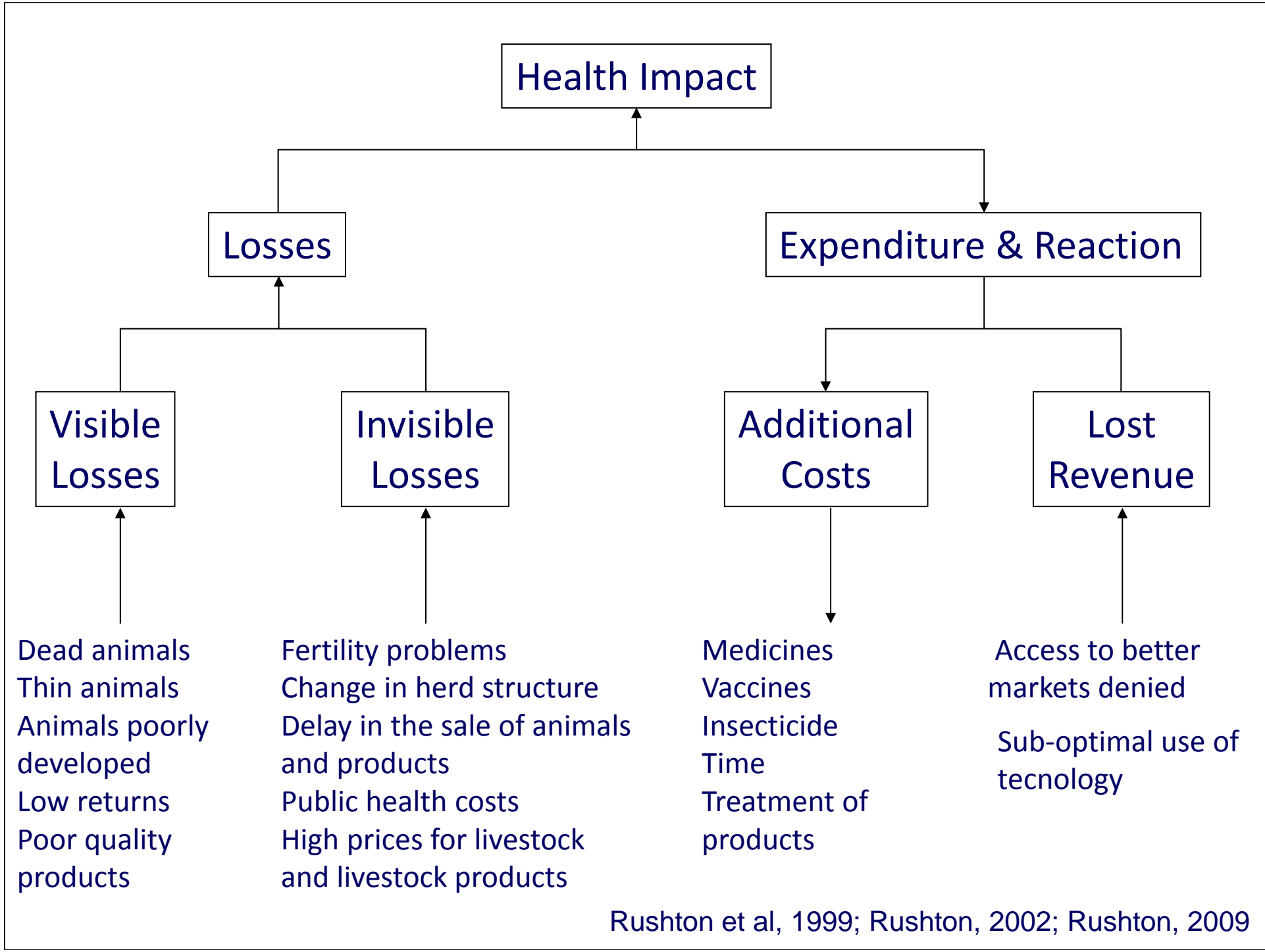
- I want to begin with looking at why we respond to disease problems
- How decisions are made on the interventions selected
- Ability of societies to manage the control of disease
- Suggestions on how this could be improved through a resource allocation lens

# Disease impact and response

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Health Impact

Losses

Expenditure & Reaction

Visible Losses

Invisible Losses

Additional Costs

Lost Revenue

Dead animals  
Thin animals  
Animals poorly developed  
Low returns  
Poor quality products

Fertility problems  
Change in herd structure  
Delay in the sale of animals and products  
Public health costs  
High prices for livestock and livestock products

Medicines  
Vaccines  
Insecticide  
Time  
Treatment of products

Access to better markets denied  
Sub-optimal use of technology



# Health Impact

## Losses

### Visible Losses

Dead animals  
Thin animals  
Animals poorly developed  
Low returns  
Poor quality products

## Impact caused by the disease

### Invisible Losses

Fertility problems  
Change in herd structure  
Delay in the sale of animals and products  
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## Expenditure & Reaction

### Additional Costs

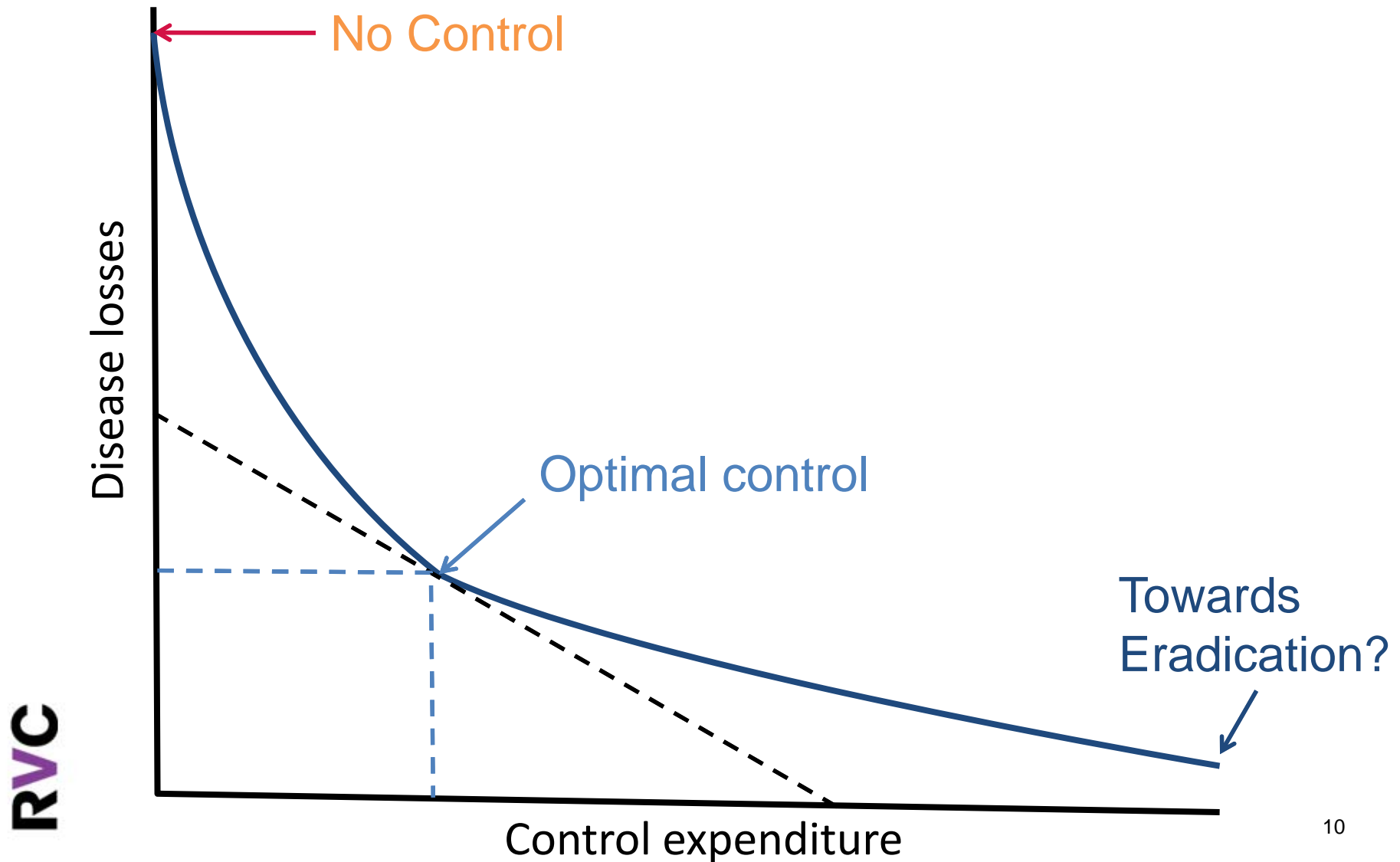
Medicines  
Vaccines  
Insecticide  
Time  
Treatment of products

### Lost Revenue

Access to better markets denied  
Sub-optimal use of technology

## Impact caused by human reaction

# Disease Loss – Expenditure Frontier (adapted from McInerney, 1996)



## The health system

- *Where are the weaknesses?*

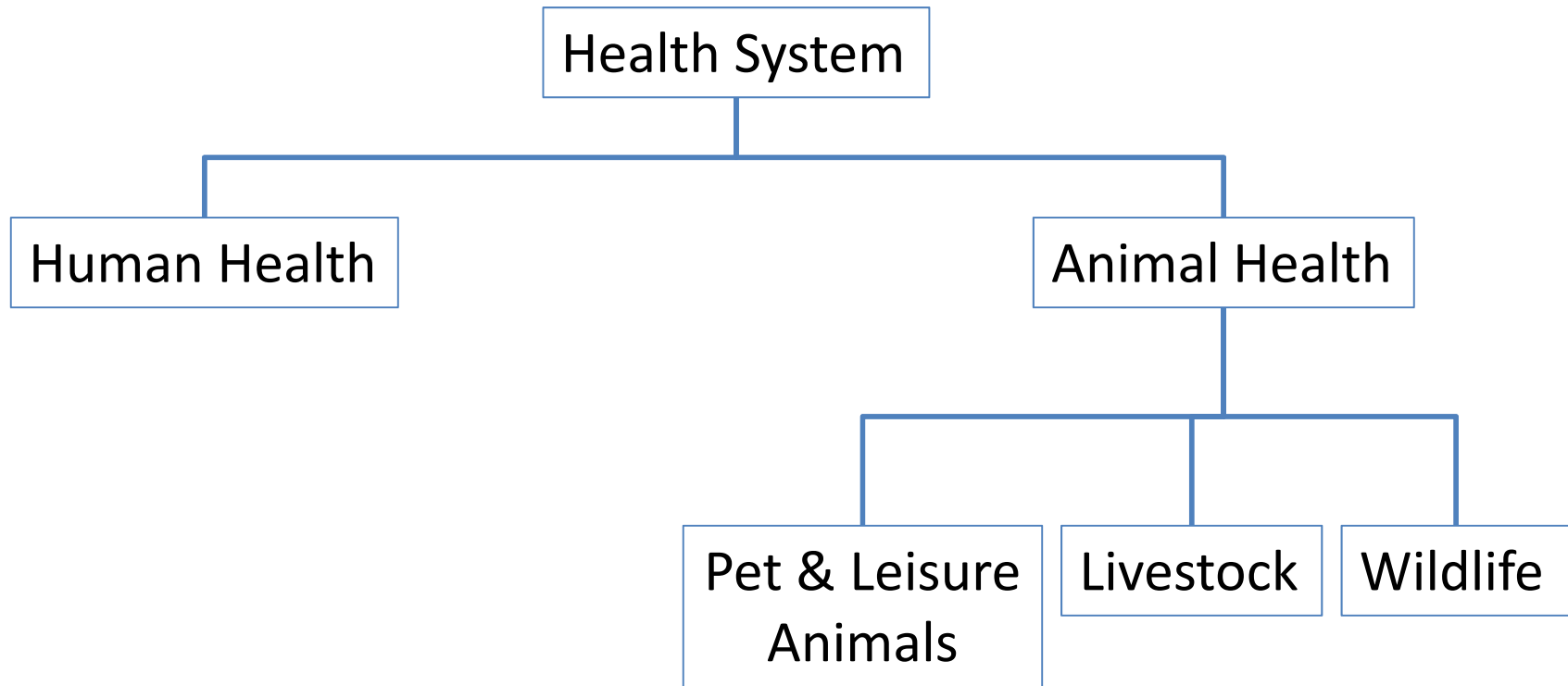
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# Health systems

- › A health system is the organisation of people, institutions and resources that deliver healthcare services to meet the needs of target populations



US\$ 6.5 trillion  
in 2011 (WHO, 2015)  
with approximately 9.7  
million medical doctors

Animal health medicines market is a  
fortieth of the human medicines  
market (AHI, 2015)

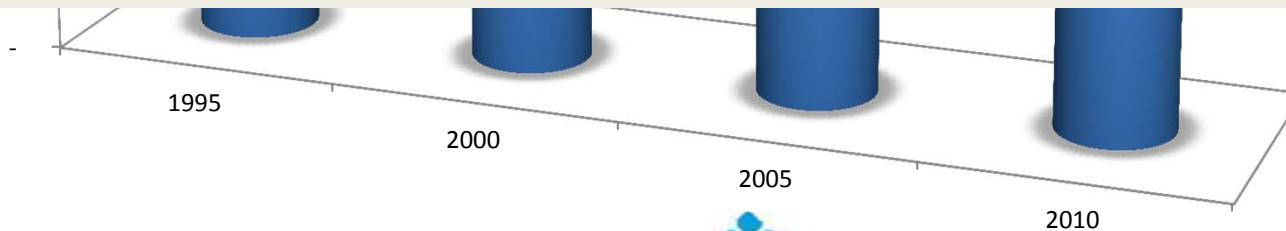
We estimate that there are  
approximately a million vets

## Human and animals (LSUs)



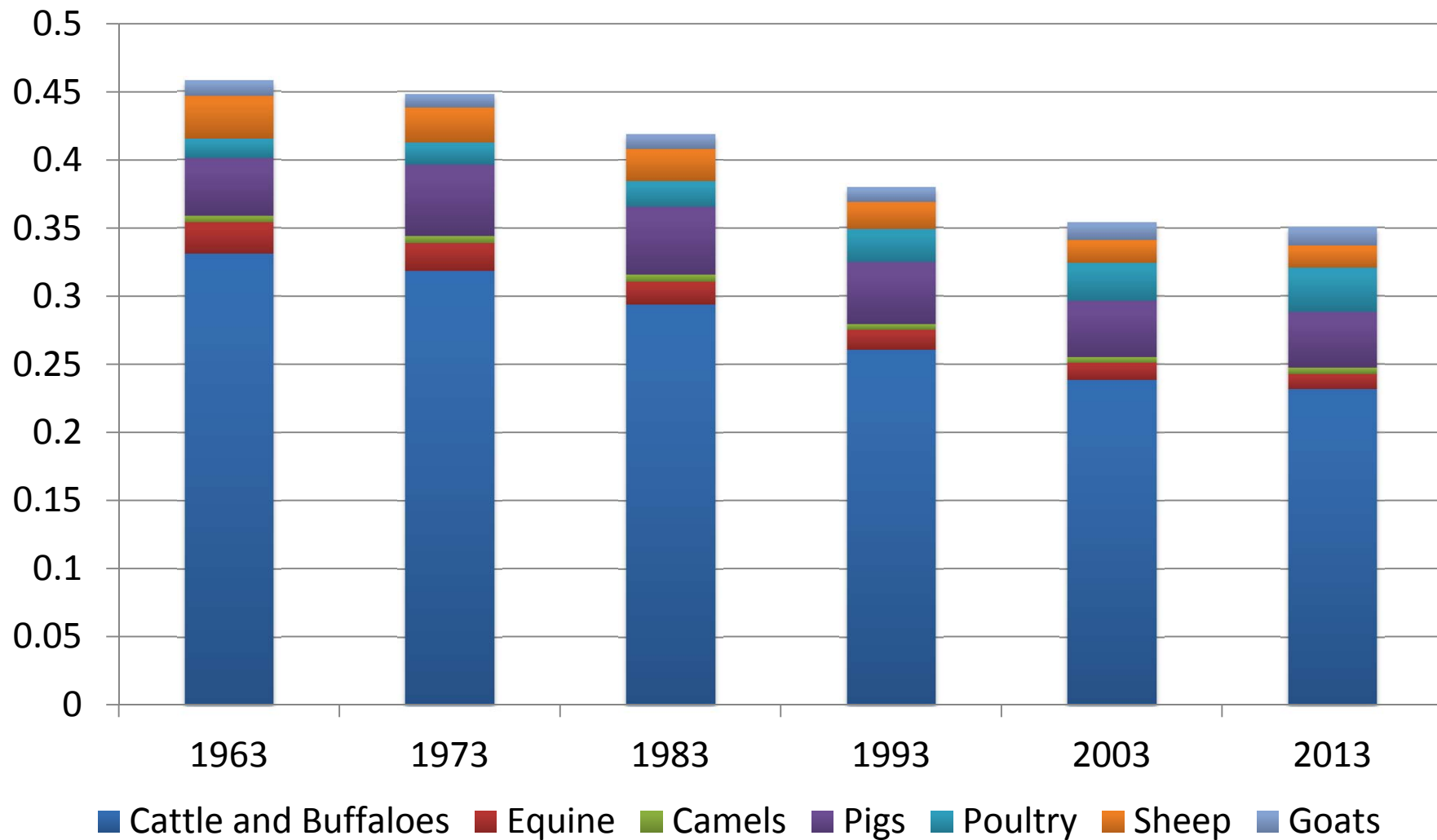
Per person this is equivalent to:

- **0.38 livestock units per person**
- **190 kilos of live animals per person!**
- **3 chickens, a third of a shoat, a fifth of a cow, a seventh of a pig and a tenth of a cat or dog**



# Global livestock units per person by species

- (FAOSTAT, 2015; authors' analysis)



## Diapositive 15

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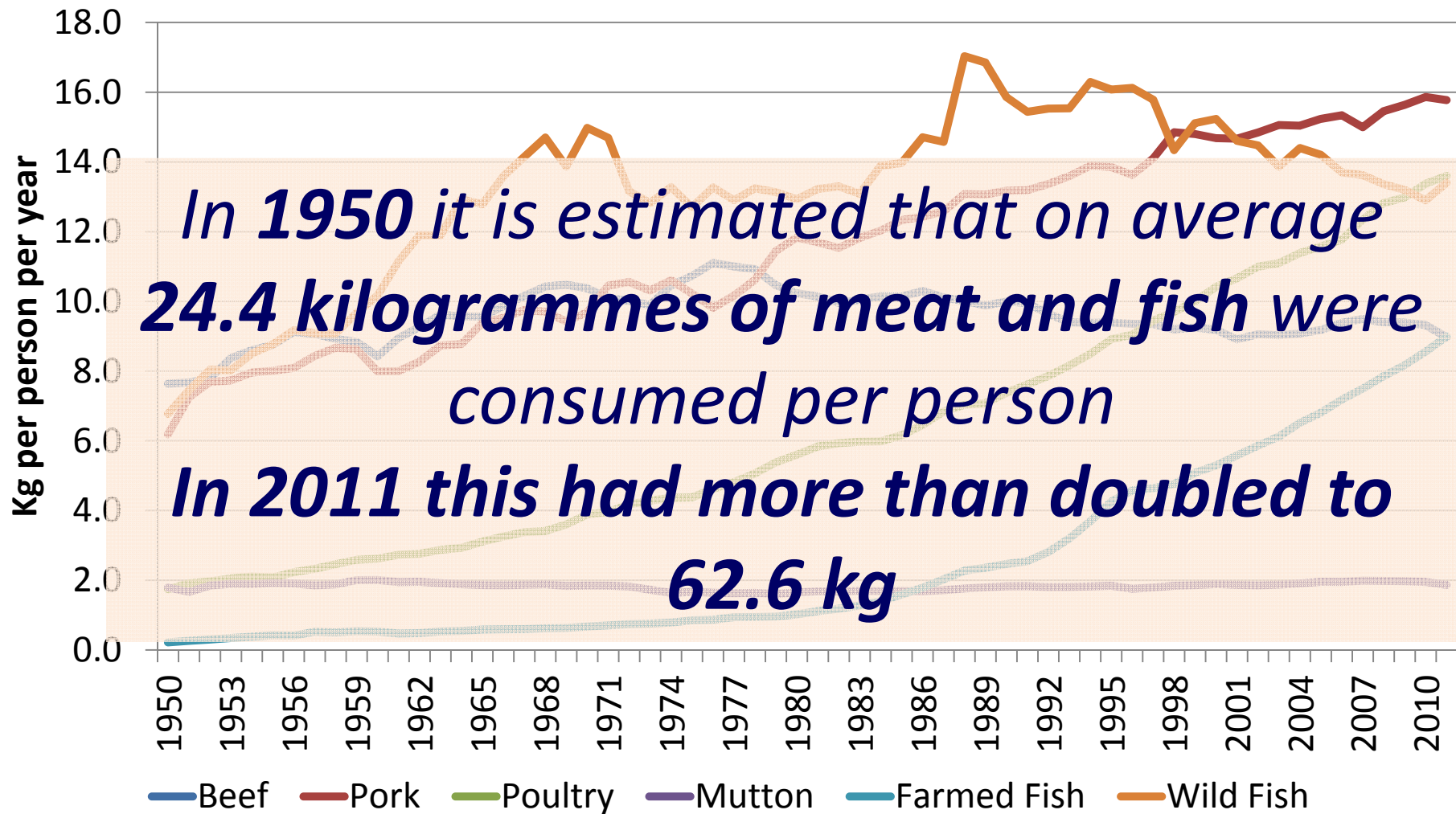
Add lines on the biomass of humans and animals

Jonathan Rushton, 3/15/2015



## And the consequences?

- global meat consumption per person 1950 to 2011



# Health system

## – *the weakness*

- There is strong evidence that many of the human diseases have origins from animals (Cleaveland et al, 2001; Woolhouse & Gowtage-Sequeria, 2005)
- And that this trend has increased in the recent past (Jones et al, 2008)
- Yet our investment across the health system does not seem to reflect either the relationship between the biomass of humans to animals or the risks posed by these biomasses

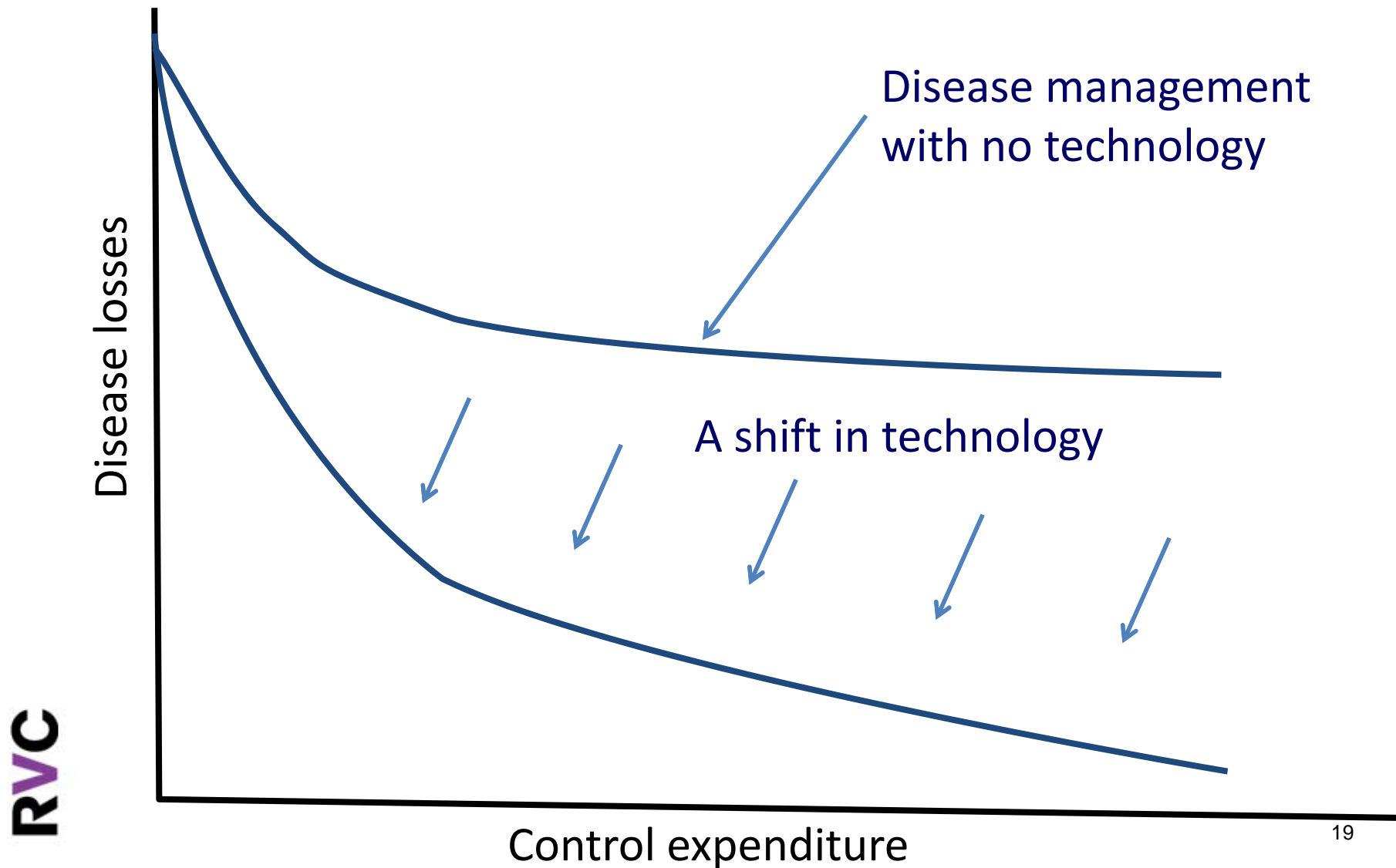
**How could we respond?**  
*- Shifts in technology*

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# Change in technology



# Change in technology

## ▸ Types of technology change

- Immune status
  - Vaccine discovery and vaccine improvements
  - Adjuvant discovery
  - Genetic resistance
- Treatments
  - Antimicrobials
- Methods of detection and delivery
  - Diagnostics
  - Logistics
  - Epidemiology

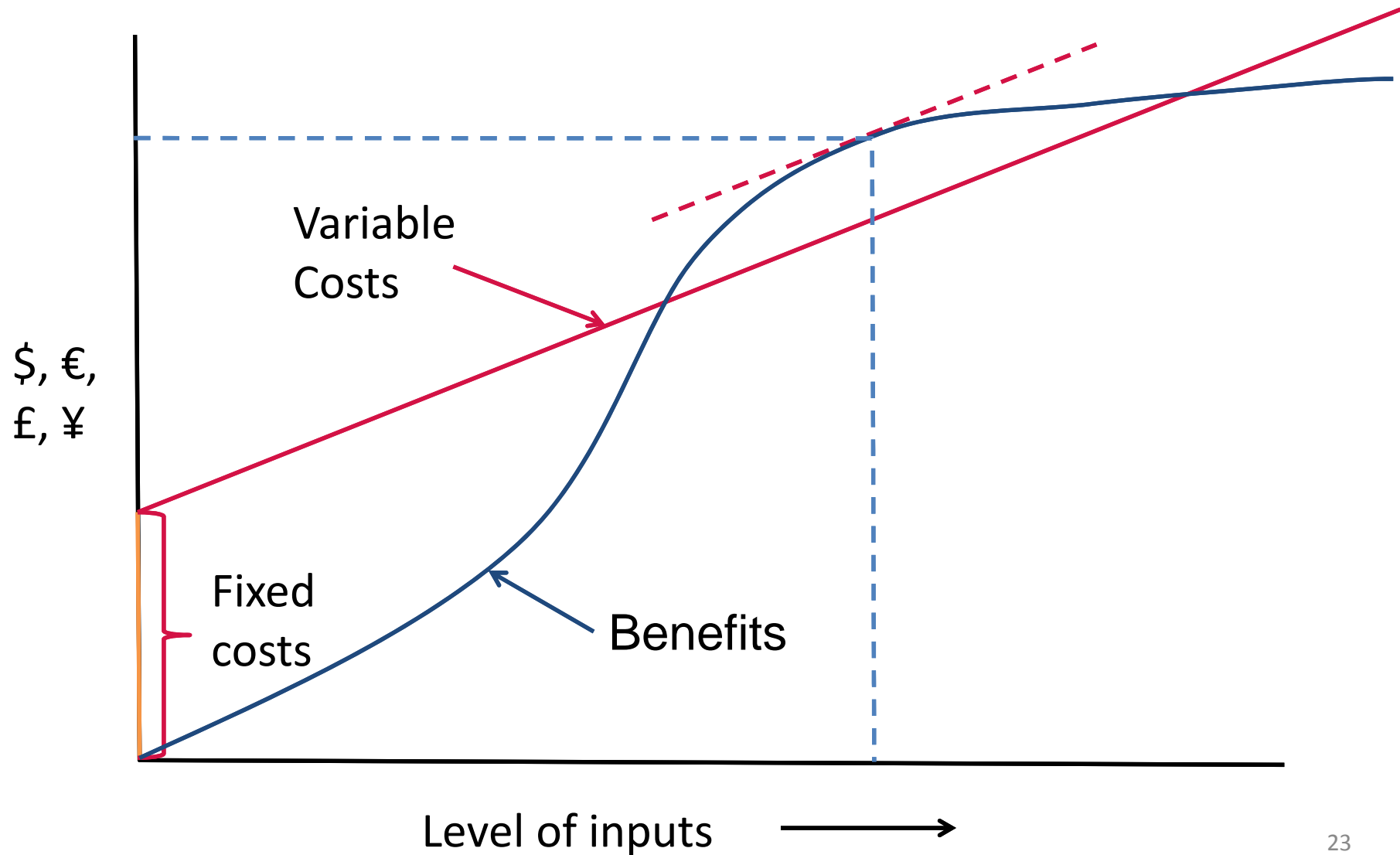
## And the investments for these technology shifts

- Foundations are laid with the education of people
- There also needs to be research into the specific topics
- And research requires people and institutions to be developed
  - These are fixed cost investments of core activities

# Technology shift in health systems

- The classic way of thinking about technology shifts is through the lens of technological advance
- There is a tendency to forget that many of our advances have come about through managerial and institutional development change
- And this requires **fixed cost** investments in health systems across the species
- Investments that need **public funding** support alongside **private sector engagement**

## Cost-benefit model for livestock disease control with fixed costs (adapted from Tisdell, 2009)





# What is needed to assess the investment in fixed cost for the animal health system

- A report on these costs (Civic Consulting for OIE, 2009) indicated that the following issues had an influence on spending
  - Land area, population and livestock
  - Economic development
  - Trade
  - Local ecology and animal health situation
  - Existence of a private veterinary sector
- It did not come up with estimates of what the investments should be to get the best animal health status

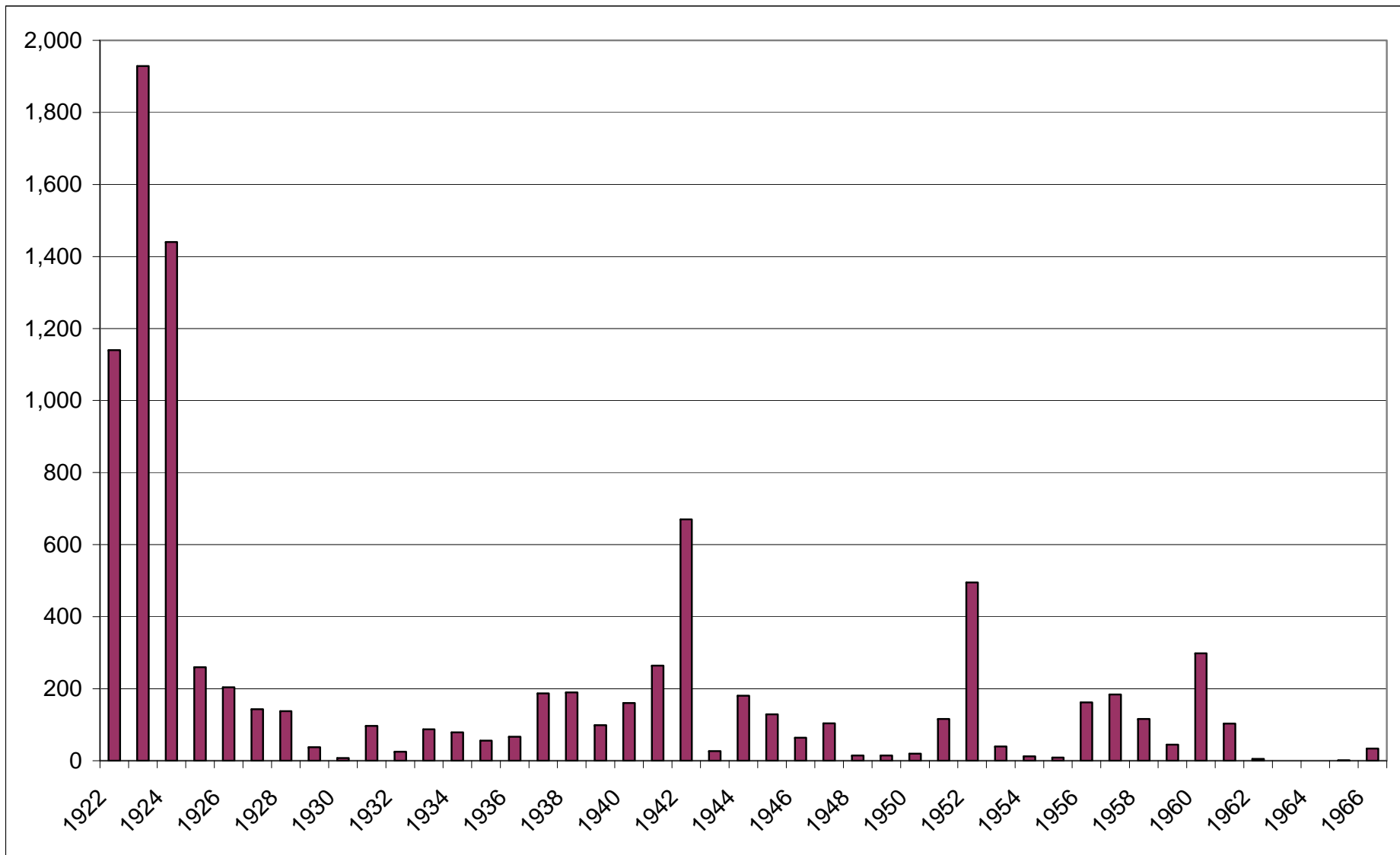
And evidence from specific diseases

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# FMD cases in UK 1922 to 1966



## Issues around the health

- v Imagine a world without the investments of people who surrounded Jenner and Pasteur
- v Imagine a world without the investments over time on smallpox, rinderpest, foot-and-mouth disease
- v These have been, in human history terms, long term investments leading to significant perpetual gains in health and welfare
  - In the case of animal disease through income, food supply and maintenance of wealth

# Summary

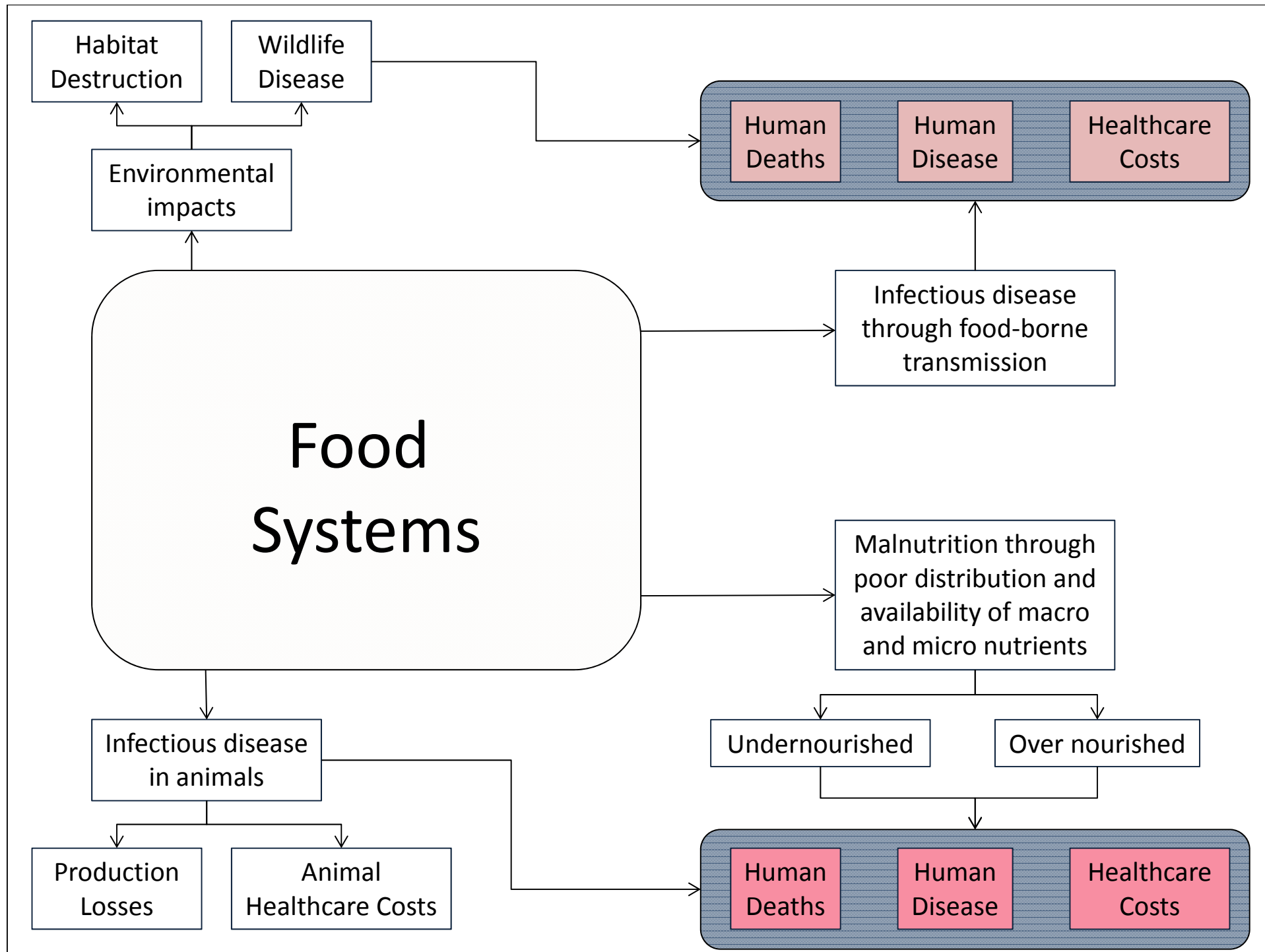
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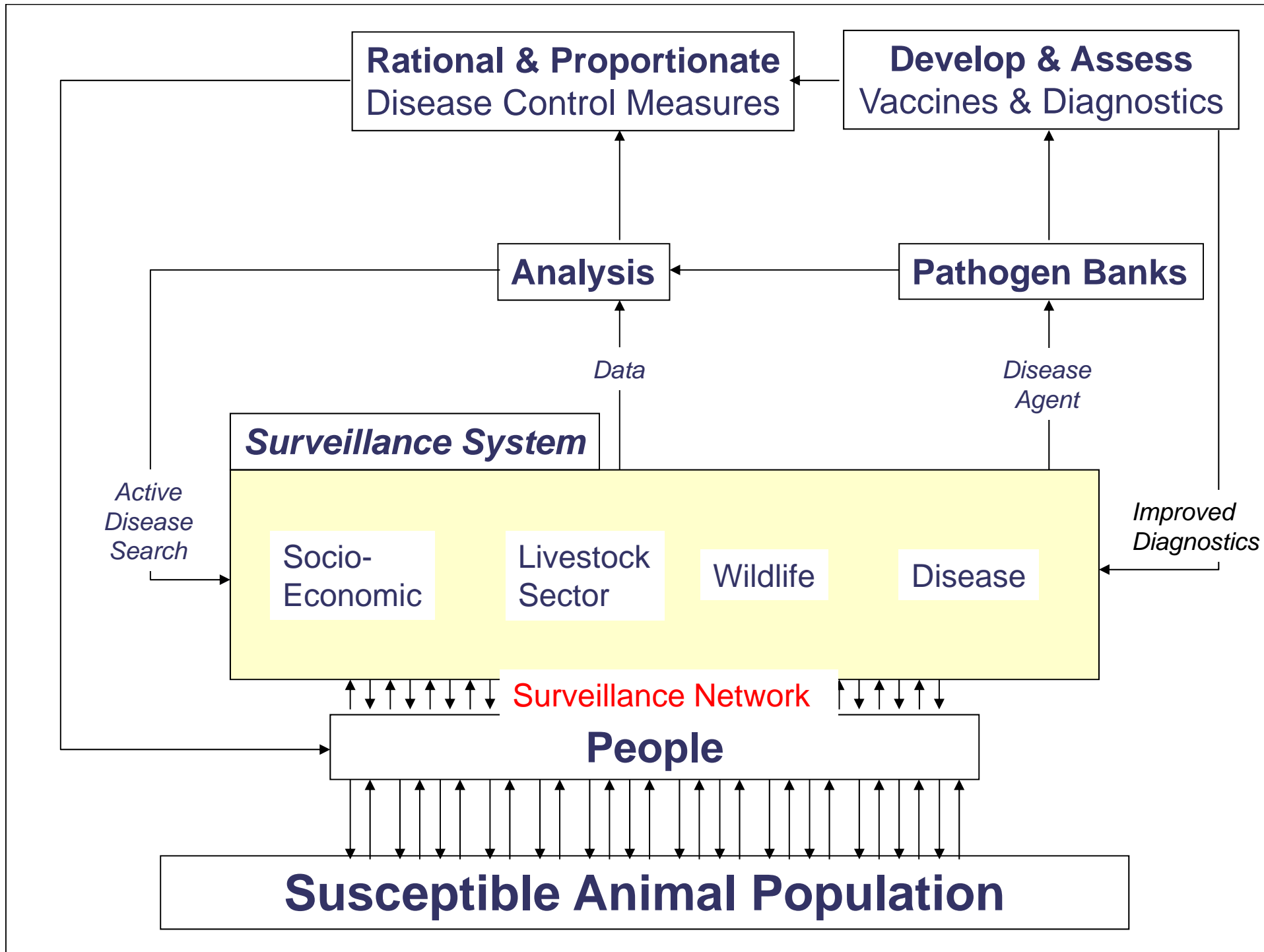


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## The gap

- ▶ OIE are working hard to collect and update data on the animal health system – through ongoing databases and the PVS
- ▶ **There is simply a lack of data** in identifying what is the optimal investment in the health system due to the difficulties in
  - What the balance should be between species
  - What is the impact of diseases not just in humans but across species







## Key messages

- Need for **evidence** which requires data collection and analysis of:
  - Species and their production systems
  - Losses in production and our reaction to the presence of disease
  - Weaknesses in technologies and their prices
  - The weaknesses in the overall health system
- Presenting **business cases** that use economics for **strategic investments**
- Addressing problems with **best scientific practice** with **monitoring** and **advocacy** on how they work

## Further information

- ▼ For more information on NEAT please look at
  - [www.neat-network.eu](http://www.neat-network.eu)
- ▼ For information on the work we are involved in with agriculture and health please look at
  - <http://www.lcirah.ac.uk/home>
- ▼ For courses offered at RVC please look at
  - <http://www.rvc.ac.uk/Postgraduate/Distance/Index.cfm>
  - <http://www.atp-ilhp.org>



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