

# Prevention is better than cure: Examples from the veterinary profession

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**Reference Centre for Veterinary Epidemiology  
of the United Nations - Food and Agriculture Organisation**



# Dedication

- On 13<sup>th</sup> March 2014 we lost Lord Ballyedmond of Mourne an entrepreneur who built a major pharmaceutical company - Norbrook Laboratories
- I would like to dedicate this presentation to him and his family

# Acknowledgements

- ▼ I want to acknowledge the support of RVC, Norbrook Laboratories, LCIRAH, and Erasmus Lifelong Learning Programme
- ▼ Many colleagues have contributed to the ideas and analysis I will present
  - Barbara Haesler, Theo Knight-Jones, Will Gilbert, Nick Lyons
- ▼ Organisers of the conference – in particular Jan Vaarten

# Introduction

- ▶ Whilst we accept the statement “***prevention is better than cure***” we rarely examine how we react to the presence or risk of disease
- ▶ From an economic perspective this would changed to a question of “***Is prevention better than cure?***”

# Introduction

- In order to examine this more carefully it is important to understand the **impact of disease** as a basis to understand our responses
- Through two examples, **FMD and BSE**, I will demonstrate the need for prevention rather than cure at a national level
- And I want to leave some **conclusions** on other diseases

# Disease Impacts

# Animal Health Impact

## Losses

## Expenditure

### Visible Losses

### Invisible Losses

### Additional Costs

- 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

# Animal Health Impact

## Losses

### Visible Losses

### Invisible Losses

**Impact caused by the disease**

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## Expenditure & Actions

### Additional Costs

### Lost Revenue

**Impact caused by human reaction**

- Medicines
- Vaccines
- Insecticide
- Time
- Treatment of products

- Access to better markets denied
- Sub-optimal use of technology



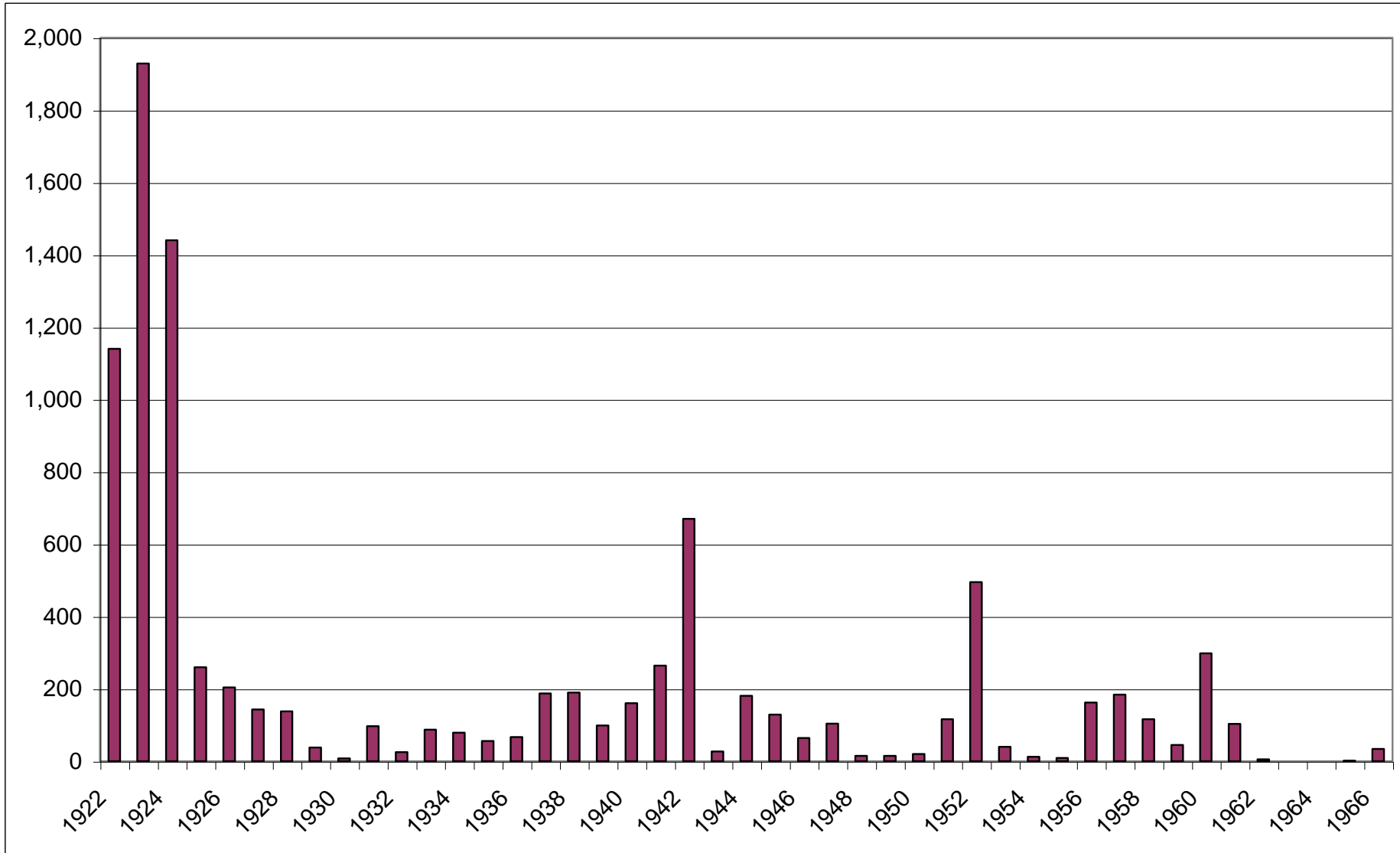
# And the impact if a disease is eradicated?

- v Eradication requires **large investments** in order to have constant benefits of eliminating
  - Disease losses
  - Disease expenditure and actions towards disease
- v BUT if a disease is eradicated then we create:
  - **Naïve populations**
  - **People unfamiliar** with disease detection and management
- v Therefore there needs to be more attention to **PREVENTION**

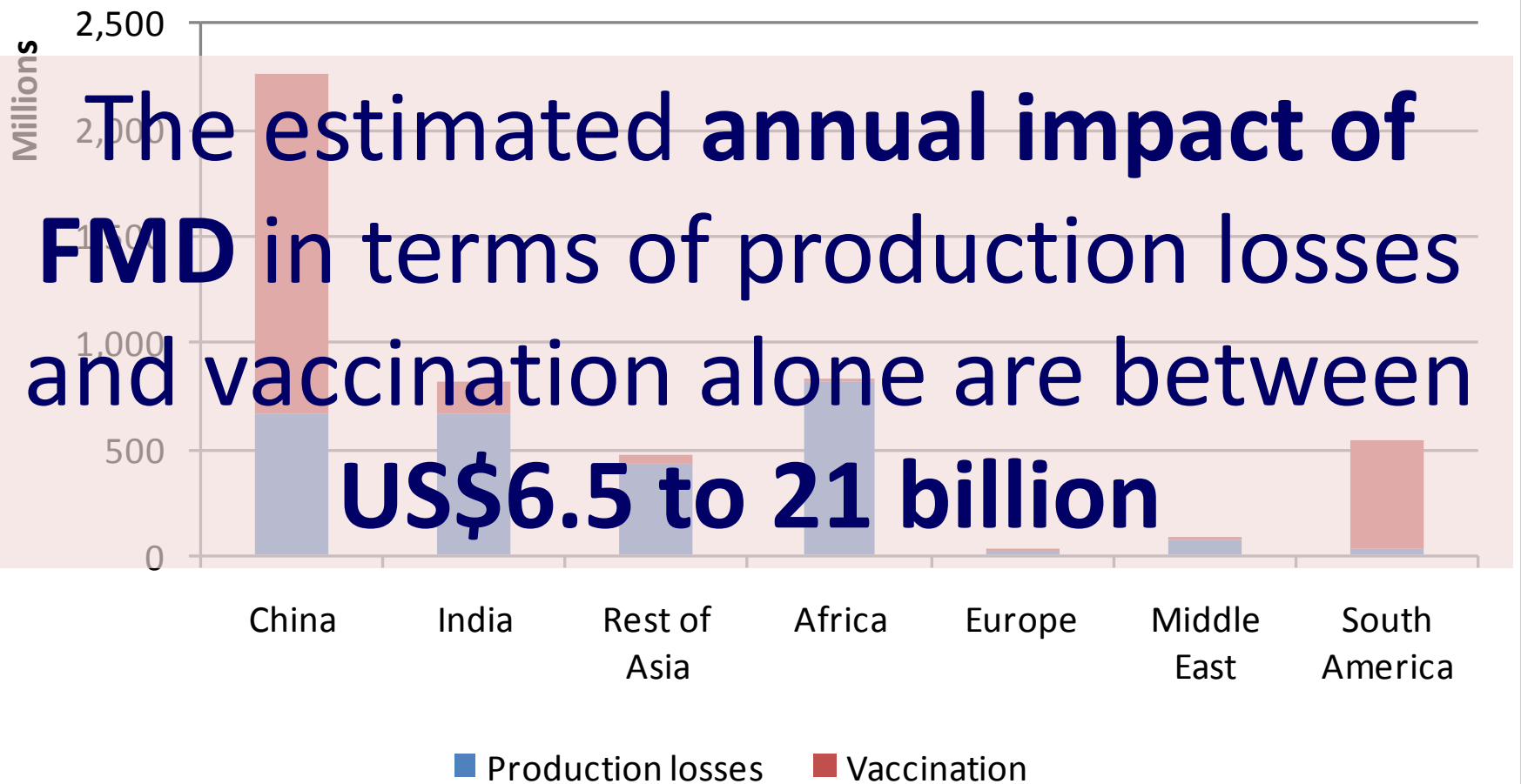
# Foot-and-mouth disease

- *an eradicated disease issue*

# FMD cases in the UK 1922 to 1966



# FMD production losses and vaccination costs by region - US\$ million/year (Knight-Jones & Rushton, 2013)



# Costs of major outbreaks in previously free countries

Year	1997	2001	2001	2010	2010-2011
Location	Taiwan <sup>1</sup>	Uruguay <sup>2</sup>	UK <sup>1</sup>	Japan <sup>3</sup>	Rep. Korea <sup>4</sup>
Costs (US\$ millions)					
Direct costs	254	-	3,558	550	2,780
Indirect costs	5,213		5,645	N/A	N/A
Total cost	6,617	700	9,204	>550	>2,780
As percentage of GDP	1.64%	N/A	0.20%	N/A	N/A
Duration (months)	4.5	4	7.5	4	5
Control Method	S.O. + Vacc	S.O. + Vacc	S.O.	S.O. + Vacc	S.O. + Vacc
Slaughtered Animals	4 million	20,000	6.24m	290,000	3.47m

A further US\$20 billion in losses were incurred due to epidemics in countries that were free since 1997

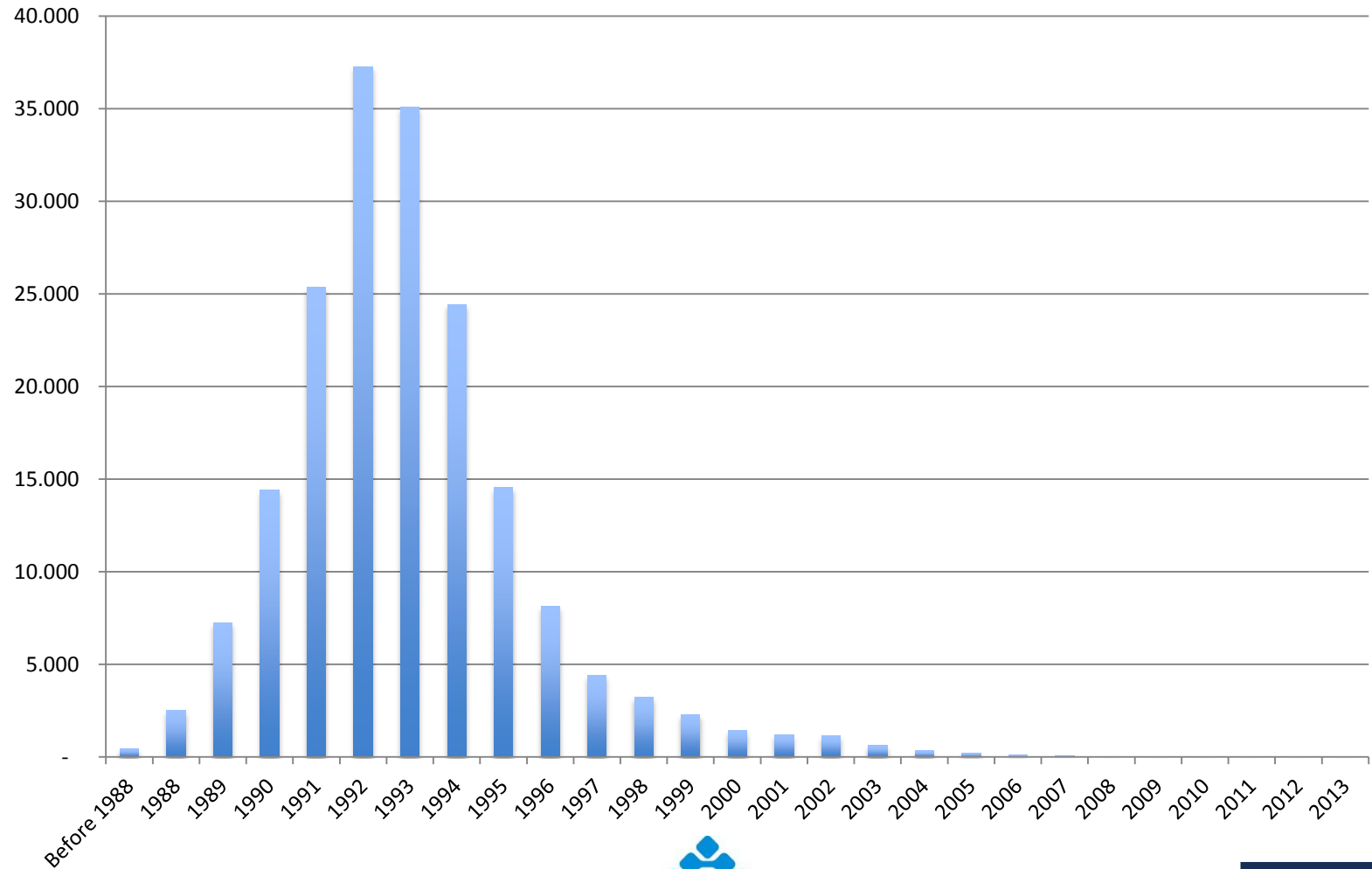
**Key:** S.O.= Stamping out, Vacc = Vaccination. N/A = Data not available.

**Sources:** <sup>1</sup> FAO. <sup>2</sup> Personal Communication F. Muzio <sup>3</sup>Muroga, N. et al., 2011. <sup>4</sup> Yonhap News Agency

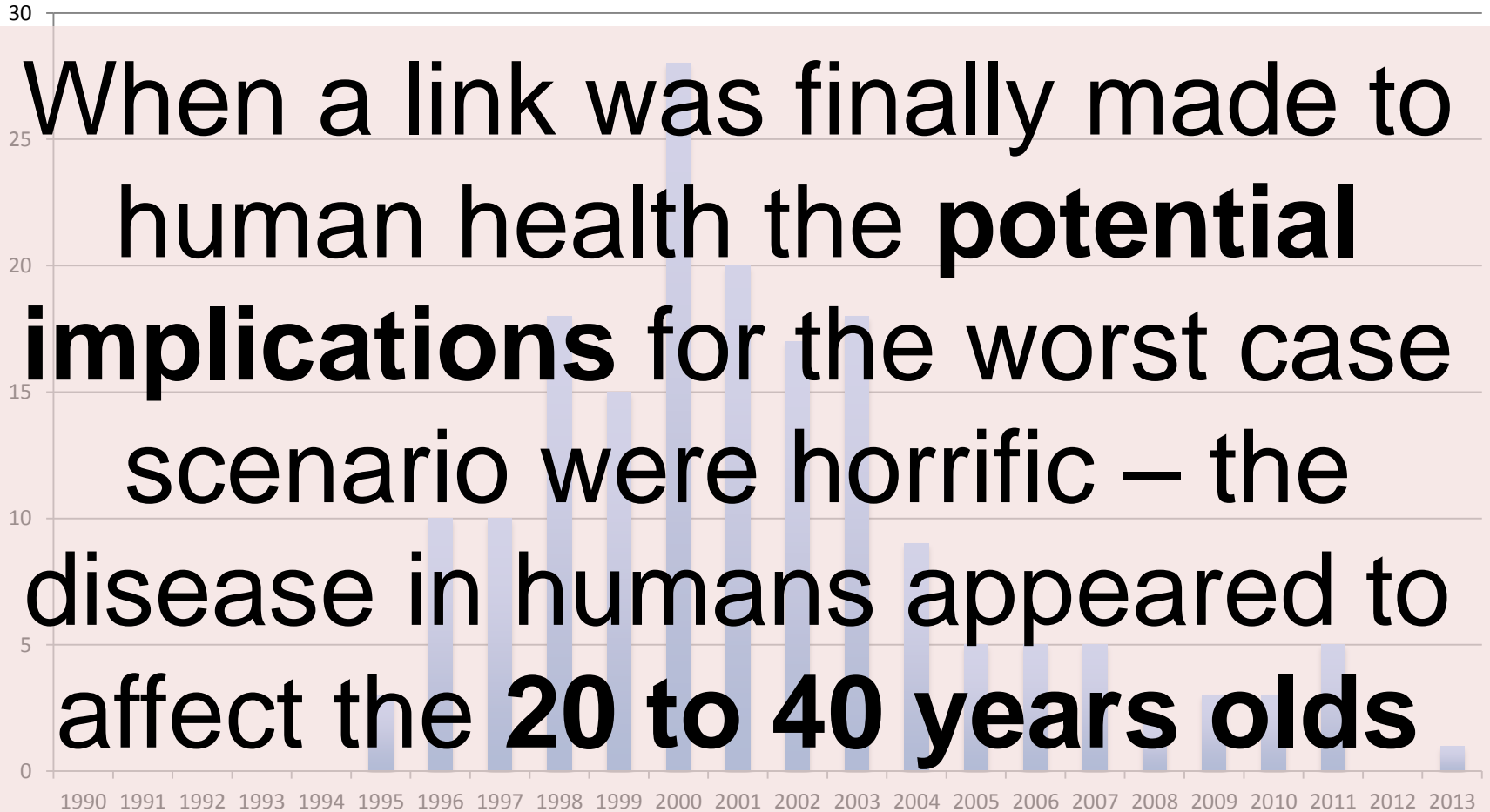
# BSE

*- an emerging problem*

# Confirmed BSE cases in the UK 1988 to 2013



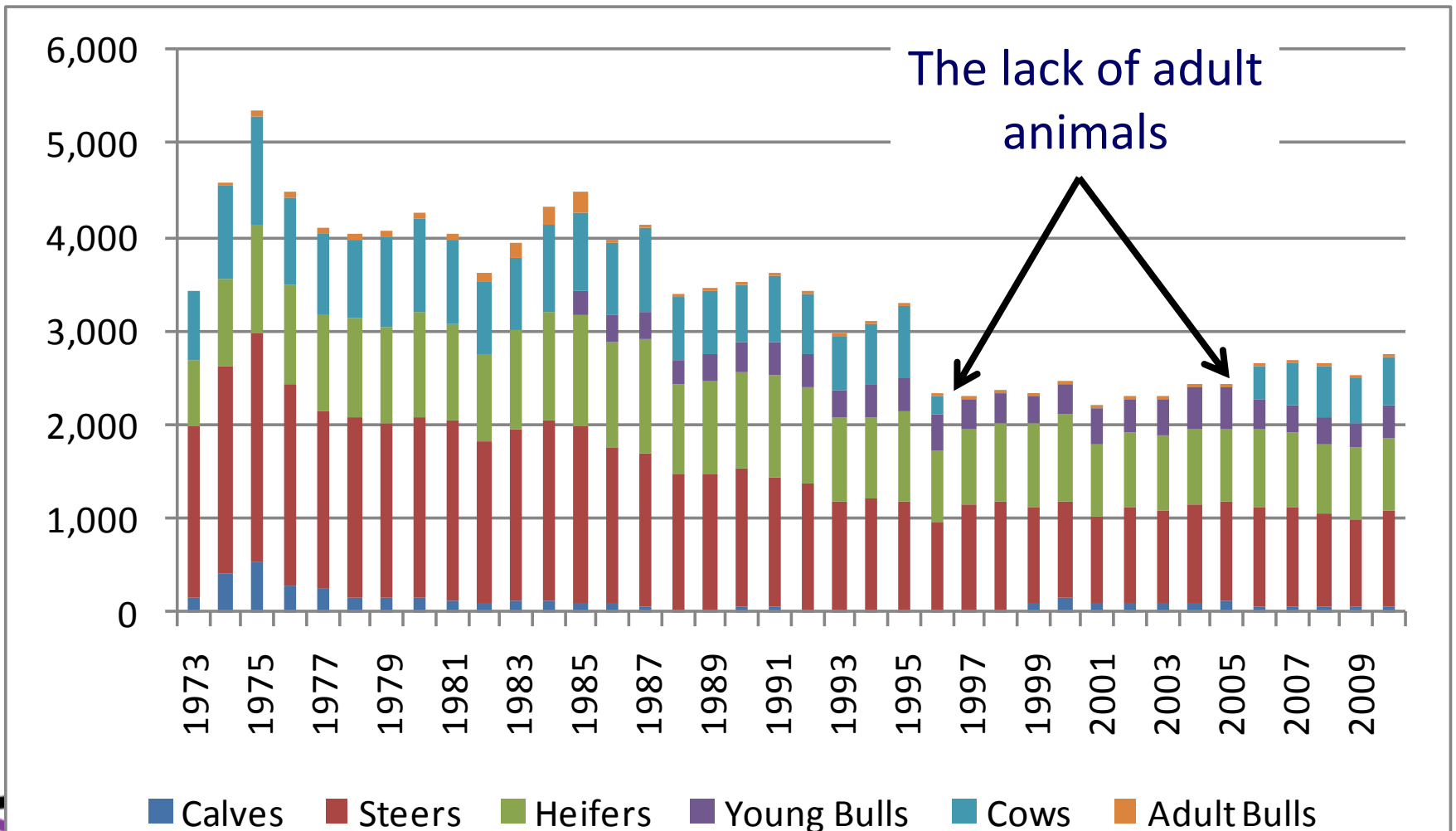
## Confirmed vCJD in the UK 1990 to 2013



When a link was finally made to human health the **potential implications** for the worst case scenario were horrific – the disease in humans appeared to affect the **20 to 40 years olds**



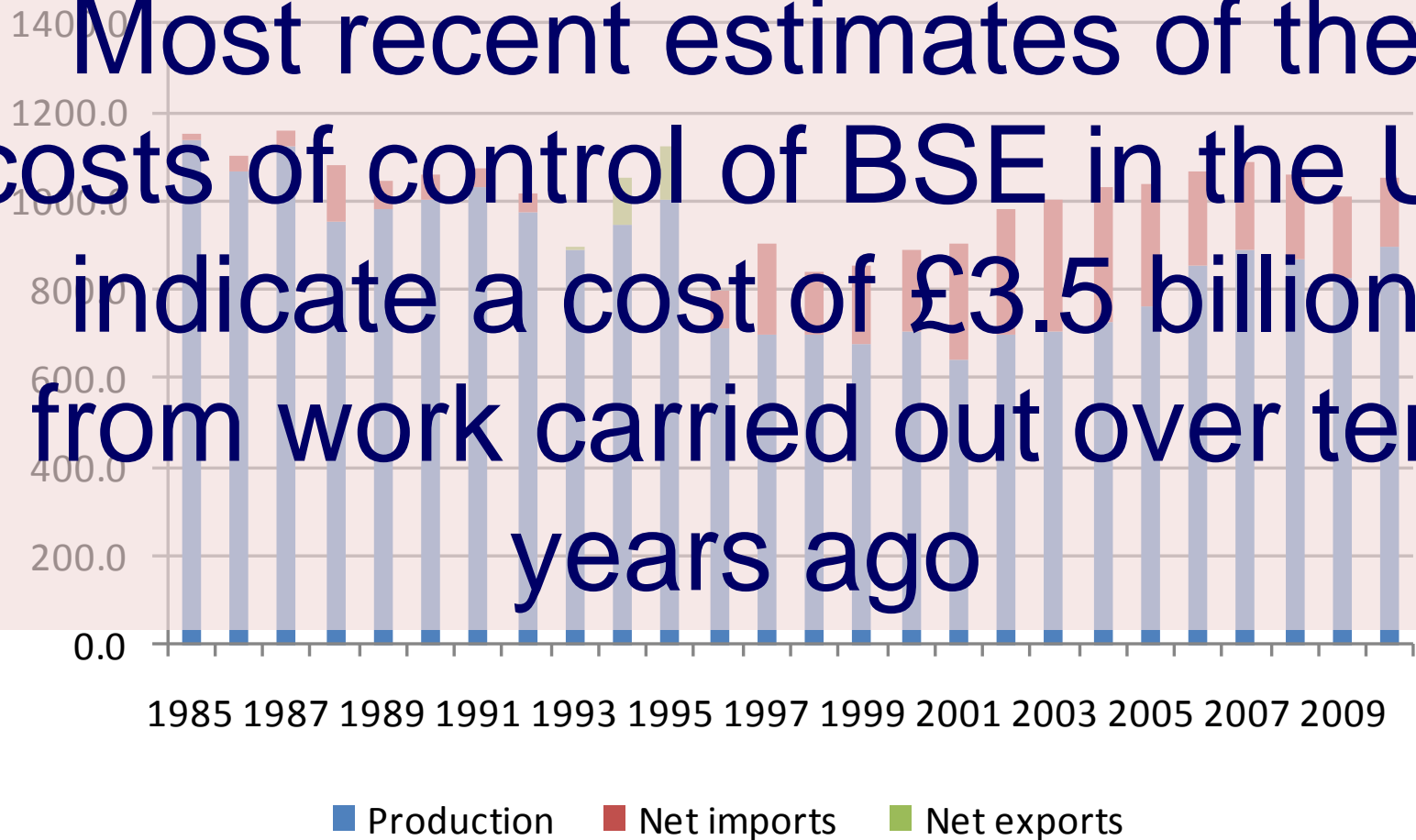
# Slaughter of all cattle by type 1973 to 2010



# Supply of beef in the UK 1985 to 2010

(DEFRA, 2011)

Most recent estimates of the costs of control of BSE in the UK indicate a cost of £3.5 billion from work carried out over ten years ago



# And the impact of BSE in other countries

- In countries with stringent control and limited disease
  - In Germany costs were estimated to range between €1.8 and 2.9 billion for the detection, feed ban, active surveillance measures and incineration of animal protein (Probst et al, 2013)
- In terms of trade
  - International livestock trade ban was was estimated to a drop of \$2.5 billion in cattle sales (Mitura & De Piéto, 2004)
  - Trade ban on the USA was estimated to have an impact of between US\$3.2 to 4.7 billion (Coffey et al, 2005)

# Investments in disease control

- **Major public investments** in coordinated animal health programmes to support the efforts of livestock keepers and private veterinarians has improved animal health status
- Large **populations of animals** now **never encounter the major economic and zoonotic diseases**
- The **absence of disease** is the **basis** for **investments and improvements** of the livestock sector

# Benefits, risks and consequences

- However, there **continue to be risks** of incursions of the eradicated diseases and the emergence of new ones
- The **social and economic consequences** of these **incursions** can be **enormous**
- These are largely underwritten by governments in order to guarantee the stability of animal production and the food industry

# Conclusions

# Conclusions

- Prevention is better than cure appears **clear** for **some animal diseases and zoonoses**
- Yet our actions with regards other diseases requires further evidence on the value of disease management
  - Do we control?
  - Do we eradicate?
  - How do we manage naïve populations?

# Conclusions

- Given the **importance of animals** in societies other animal diseases should be considered for national programmes
- Yet our current **level of knowledge** of disease impacts are **inadequate** to make decisions on prevention rather than cure



# Recommendation

- To make decisions on future preventive or control actions **more information** is required in **disease impacts**
  - Similar to the human health global burden of disease
- This needs to be based on:
  - **Surveillance – disease and livestock sectors**
  - **Epidemiology to identify risk factors and populations at risk**
  - **Socio-economic analysis to determine private and societal benefits**

## 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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