BSE Case Study: Public Health and the Public Good

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What is Public Health?

Public Health:

- the science and art of promoting health, preventing disease, prolonging life and improving the quality of life through the organized efforts of society.

(John Last, 2001)
What does PH do regarding vCJD?

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October 2005
What about vCJD?

- How do people get vCJD?
- Is there any immunity? Treatment?
- Are there people at higher risk?
- Is there a test that can tell people they already are infected? will get the disease?
- Are there ways to stop people from getting BSE? from getting sick?
- Do people die or recover?
Public Health Assessment

- Principle source of exposure for humans is food, just like for other animals
  - Risk must be very low because there are very few cases despite very large amounts of exposure
  - Most infectivity in SBO, MRM
- Human to human is a possible secondary route
  - Risk must be VERY low because almost no cases at all, but involves hospitals and medical practice.
- No test to detect agent in food or living animals
  - Can't screen so can't create fool-proof barriers in food chain
  - Must avoid exposure to source of infection
- Disease leads to death
  - Highly dreaded disease component, high public outrage
- BSE and vCJD - same agent
  - No BSE means no vCJD
BSE Estimates
Infections and Cases (n=1,000,000)

Cattle infected with BSE (model)

Confirmed BSE cases (deaths)

First deaths from vCJD
BSE Reports in UK and Europe, by Year

N=186,487

United Kingdom

before 1988

1990

1992

1994

1996

1998

2000

2002

Continental Europe

0

5,000

10,000

15,000

20,000

25,000

30,000

35,000

40,000

0

200

400

600

800

1,000

1,200

Feed ban in UK

SBO ban for humans

Sale of MBM prohibited

Ban on British beef

OIE Data, 17 February 2003
Total Exports of MBM 1986 -1995

Legend:
(in tonnes)
- No data
- 0 - < 5
- 5 - < 10
- 10 - < 20
- 20 - < 100
- 100 - < 1,000
- 1,000 - < 10,000
- > 10,000
Health Protection: Outbreak management

- Outbreak detection
- Epidemic investigation
- Establishment of case definition
- Establish etiology
- Confirm cases
  - Find cases
  - Define scope of problem
  - Descriptive epidemiology
  - Generate and test hypothesis

Source: Renewal of PH in Canada,
Report of the National Advisory Committee on PH, Oct 2003
Health Protection: Outbreak management

☑ Report Findings to peer review
☑ Communications
☒ Control of epidemic through PH measures
... cont’d
Health Protection: Outbreak management

- Control of epidemic through PH measures
  - Control/reduce exposure
    - Measures taken by animal health authorities
  - Prevent exposure
  - Prevent ongoing transmission among humans
    - Infection control, transplantation, blood safety etc
  - Eliminate or eradicate infection source
What problems can be anticipated?

- **Cases must be identified**
  - Clinical knowledge
  - Awareness, interest and participation of neurologists, neuropathologists ... collaborative networking

- **Diagnostic capacity**
  - Specific laboratory capacity, including EKG, CSF, MRI
  - Neuropathology (high autopsy rates)

- **Surveillance capacity**
  - Centralized collection, analysis and dissemination of information for action

- **Public health responsibilities**
  - Interventions require collaboration of non-PH authorities
What problems can be anticipated?

- **Government support**
  - BSE risk assessment
  - Assessment of population exposure to BSE agent
  - Commitment to supporting surveillance activities

- **NGO support**
  - Many interest groups and many different messages

- **Private industry**
  - Trade based economy is resistant to disclosure
  - Competitive markets are affected by changes
How to manage exposure to BSE when bovine recycling is practiced?

- Motivate reporting
- Control disease spread:
  - Identify at-risk animals using sensible criteria, and destroy them;
  - Destroy cohort (definition of cohort is important)
  - Feed safety requires identify all sources of x-contamination from slaughter to farmyard
- Reduce risk from apparently healthy animals:
  - Remove and destroy SRMs
  - Control feed
- Test where necessary
  - does testing every animal lead to improved safety? Or is this risk perception management?
A Chain is only as Strong as its Weakest Link

- Control the outbreak
- Surveillance
- Remove risk through slaughter
- Reduce risk through targeted interventions
- Elimination through case investigations
- Inspection and inspection infrastructure
“Eradication of BSE must remain the principle public health objective of national and international animal health control authorities”