Brucellosis situation in Asia

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\textsuperscript{2} DLD / NIAH – Bangkok, Thailand
Brucellosis

- Infectious & contagious disease due to *Brucella* sp.
- Of major public health and worldwide importance
- Causes significant economic losses to livestock production
Brucellosis

A zoonosis of worldwide importance

- **Sources**: animals infected by
  - *Brucella melitensis* (small ruminants)
  - *Brucella abortus* (large ruminants)
  - *Brucella suis* (pigs)

- **Transmission route**:
  - occupational direct contact or exposure
  - unpasteurised dairy food consumption

A significant public health challenge

- **Of major economic & financial importance**

- **Human brucellosis** is:
  - The commonest zoonosis worldwide: **500,000** cases/year (WHO)
  - Minimal mortality but,
  - Substantial residual disability if not treated promptly & effectively
  - Important cause of travel-associated morbidity
  - Endemic in the major part of the World
Animal brucellosis

- **Significant economic losses**
  - Decreased productivity:
    - Abortions, orchitis
    - weak offspring, infertility
    - decreased milk production
  - Lost trade opportunities: WTO/OIE/EU Trade rules

- **A significant animal health challenge**
  - Sheep and goats are the main reservoir of *B. melitensis*
  - However increasing evidence of emergence in cattle and camels
Brucellosis is Asia

- Information available is scarce
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</table>

Human cases notified to OIE? (No. / Cases/100,000)
Review and update on Brucellosis

What’s new in Brucellosis?

Mapping of poverty and likely zoonoses hotspots

Zoonoses Project 4
Report to Department for International Development, UK

2011

2012
Livestock Unit (LSU) losses

1 LSU "dead" = 0.8 LSU lost
1 LSU "destroyed" = 1.0 LSU lost
1 LSU "slaughtered" = 0.4 LSU lost.

Brucella Abortus

Brucella Suis


FAO-APHCA/OIE/USDA Regional Workshop on Prevention and Control of Neglected Zoonoses in Asia
Obihiro, Japan, 15-16 July 2015
- Review of the substantial literature on prioritising diseases and identify prioritisation criteria
- Current evidence on poverty and livestock, on livestock systems and their dynamics, and on zoonoses
- Systematic review of over 1,000 studies on the prevalence of the 13 priority zoonoses in people and animals
- Update the map of emerging disease events
# Mapping of poverty and likely zoonoses hotspots 2011

Table 2.1 The most important zoonoses in terms of human health impact, livestock impact, amenability to agricultural interventions, severity of disease and emergence (data from WHO and authoritative literature: when several authoritative estimates the mid point is given)

<table>
<thead>
<tr>
<th>Disease</th>
<th>Wildlife interface</th>
<th>Deaths human annual</th>
<th>Affected humans annual</th>
<th>Death &gt;1000 people</th>
<th>Affected&gt;1 million people</th>
<th>Animal impacts high</th>
<th>Farm intervention</th>
<th>Other (score =1)</th>
<th>Total score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastrointestinal (zoonotic)</td>
<td>Important</td>
<td>1,500,000</td>
<td>2,333,000,000</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>5</td>
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<tr>
<td>Leptospirosis</td>
<td>Very important</td>
<td>123,000</td>
<td>1,700,000</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>5</td>
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<tr>
<td>Cysticercosis</td>
<td>Some importance</td>
<td>50,000</td>
<td>1,000,000,000</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>5</td>
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<tr>
<td>Tuberculosis (zoonotic)</td>
<td>Some importance</td>
<td>100,000</td>
<td>554,500</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
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<td>Important</td>
<td>70,000</td>
<td>70,000</td>
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<td>0</td>
<td>0</td>
<td>1</td>
<td>Severe</td>
<td>4</td>
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<td>Important</td>
<td>47,000</td>
<td>2,000,000</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
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<td>500,000</td>
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<td>4</td>
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<td>300,000</td>
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<td>1</td>
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<td>4</td>
</tr>
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<td>Toxoplasmosis</td>
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<td>1</td>
<td>0</td>
<td>4</td>
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<td>Q fever</td>
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<td>3,000</td>
<td>3,500,000</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
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<tr>
<td>Trypanosomosis (zoonotic)</td>
<td>Important</td>
<td>2,500</td>
<td>15,000</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
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<td>Anthrax</td>
<td>Some importance</td>
<td>1,250</td>
<td>11,000</td>
<td>2</td>
<td>0</td>
<td>1</td>
<td>1</td>
<td>0</td>
<td>4</td>
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<tr>
<td>Hepatitis E *</td>
<td>Some importance</td>
<td>300,000</td>
<td>14,000,000</td>
<td>2</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>4</td>
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<tr>
<td>Chagas</td>
<td>Important</td>
<td>10,000</td>
<td>8,000,000</td>
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<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Chickungunya</td>
<td>Very important</td>
<td>12,500</td>
<td>500,000</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>Emerge</td>
<td>3</td>
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<tr>
<td>Clostridium difficile disease</td>
<td>Possible importance</td>
<td>3,000</td>
<td>300,000</td>
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<td>0</td>
<td>0</td>
<td>Emerge</td>
<td>3</td>
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<tr>
<td>Dengue fever</td>
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<td>20,000</td>
<td>50,000,000</td>
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<td>800</td>
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<td>1,750</td>
<td>175,000</td>
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<td>Avian influenza</td>
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<td>77</td>
<td>145</td>
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<td>0</td>
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<td>1</td>
<td>Emerge</td>
<td>3</td>
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<tr>
<td>Bov. Spongiform Encephalopathy*</td>
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<td>182</td>
<td>188</td>
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<td>0</td>
<td>1</td>
<td>1</td>
<td>Severe</td>
<td>3</td>
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<td>Psittacosis</td>
<td>Important</td>
<td>2,250</td>
<td>22,000</td>
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<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
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<tr>
<td>Japanese encephalitis</td>
<td>Possibly, bats</td>
<td>11,000</td>
<td>40,000</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>0</td>
<td>3</td>
</tr>
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<td>Buffalo pox</td>
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<td>Common</td>
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<td>1</td>
<td>0</td>
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<td>Rift Valley fever</td>
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<td>45</td>
<td>150</td>
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<td>0</td>
<td>1</td>
<td>1</td>
<td>Emerge</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: high human mortality gets a double weight of as the most important criterion for many stakeholders. Total score = (human death x 2) + (humans affected) + (high livestock impacts) + (farm intervention possible) + (other concerns: severe or emerging disease). The maximum possible score is therefore 6 and the minimum 0.

* Importance of zoonotic transmission not fully known

^ Not a problem in poor countries
Table 1.3 Predicting the number of annual cases of brucellosis based on sero-prevalence and comparing to the numbers reported to the World Animal Health Organisation

<table>
<thead>
<tr>
<th>Region</th>
<th>Livestock prevalence %</th>
<th>Number of ruminants</th>
<th>Predicted cases a year</th>
<th>Cases reported 2010</th>
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</thead>
<tbody>
<tr>
<td>East Africa</td>
<td>8.2</td>
<td>257,377,760</td>
<td>21,104,976</td>
<td>12</td>
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<tr>
<td>West Africa</td>
<td>15.5</td>
<td>197,716,517</td>
<td>30,646,060</td>
<td>37</td>
</tr>
<tr>
<td>South Africa</td>
<td>14.2</td>
<td>59,806,724</td>
<td>8,492,555</td>
<td>6305</td>
</tr>
<tr>
<td>North Africa</td>
<td>13.8</td>
<td>57,629,367</td>
<td>7,952,853</td>
<td>1073</td>
</tr>
<tr>
<td>South Asia</td>
<td>16.0</td>
<td>683,181,040</td>
<td>109,308,966</td>
<td>156</td>
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<tr>
<td>South East Asia</td>
<td>2.9</td>
<td>21,247,586</td>
<td>616,180</td>
<td>164</td>
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</tbody>
</table>

Our review captured information from 241 community surveys (that is, surveys from the general livestock community and not targeting high risk animals) of bovine, sheep and goat populations, representing 475,968 samples. The prevalence for different regions is shown in Table 1.2. From the number of ruminants, the prevalence of seropositive cases, and the relation between sero-positivity and disease we can predict the number of cases of brucellosis a year. The discrepancy between the number reported and the number predicted is several orders of magnitude. For example, for every 1 million cases in East Africa less than one case is reported to OIE. The situation is similar for other diseases reported to OIE. When there are 999,999 missed cases for every one report, surveillance is not fulfilling its purpose.
### Table 2.1 Probable impact of intensification on priority zoonoses

<table>
<thead>
<tr>
<th>Zoonosis</th>
<th>Likely impacts of agricultural intensification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gastrointestinal (zoonotic)</td>
<td>Most gastro-intestinal zoonoses are food-borne and likely to increase with intensification and associated lengthening and branching of food supply chains. Many gastro-intestinal zoonoses cause little visible signs in animals reducing farmer incentives for control.</td>
</tr>
<tr>
<td>Leptospirosis</td>
<td>Leptospirosis is associated with smaller farms, and pasture-grazing especially where there is stagnant water. Intensification may reduce prevalence.</td>
</tr>
<tr>
<td>Cysticercosis</td>
<td>Associated with free-range, scavenging pigs. Intensification will reduce prevalence.</td>
</tr>
<tr>
<td>Tuberculosis (zoonotic)</td>
<td>Associated with larger farms and confined systems. Intensification likely to increase.</td>
</tr>
<tr>
<td>Rabies</td>
<td>No clear link. Most human transmission from dog bites or wildlife.</td>
</tr>
<tr>
<td>Leishmaniasis</td>
<td>No clear link. Transmitted by sandflies. Domestic dogs are the most important reservoir.</td>
</tr>
<tr>
<td>Brucellosis</td>
<td>Associated with larger farms and confined systems. Intensification will increase. However, artificial insemination, often associated with intensification, will decrease.</td>
</tr>
</tbody>
</table>

- **Brucellosis spread is linked to intensification (larger farms and confined systems)**
- **Brucellosis is more problematic in intensive systems than extensive and pasture-based systems**
- **Brucellosis is a brake on further livestock development**
Worldwide incidence of human brucellosis 2006

Annual incidence of brucellosis per 1,000,000 population
- >500
- 50–500 cases
- 10–50
- 2–10
- <2
- Possibly endemic, no data
- Non-endemic/no data

Mapping of poverty and likely zoonoses hotspots 2011
Bovine brucellosis in the Asia-Pacific Region (OIE)

1st sem.

2010

2011

2012

2nd sem.

No information
Never reported
Not reported in this period
Suspected
Infection
Clinical disease
Disease limited to one or more zones

Bovine Brucellosis
(WAHID OIE 2015)
Bovine brucellosis in the Asia-Pacific Region (OIE)
Bovine brucellosis in the Asia-Pacific Region (OIE)
Fiji agriculture ministry to continue brucellosis testing

Fiji officials are continuing to test for brucellosis in cattle this year, to prevent the disease that devastated the dairy industry last year.

Minister for Agriculture, Lieutenant Colonel Mason Smith says the ministry has kept up with the testing.

A shipment of cattle from New Zealand arrived in Fiji last week, but the ministry is taking steps to curtail any diseases that could be detrimental to milk production.

The FFA and New Zealand's Ministry of Primary Industries have tested and cleared the shipment from a number of other areas around the world.

The ministry has also adopted the improvement of cattle genetic standards to prevent the disease from spreading in to other areas around the country.

One of the key points in the improvement is the reduction of the number of brucellosis cases in New Zealand, which has led to the country being designated as a disease-free region.
Sheep/Goat brucellosis in the Asia-Pacific Region (OIE)

1st sem.  

2nd sem.  

2010  

2011  

2012  

No information
Never reported
Not reported in this period
Suspected
Infection
Clinical disease
Disease limited to one or more zones

Sheep & Goat Brucellosis  
(WAHID OIE 2015)
Sheep/Goat brucellosis in the Asia-Pacific Region (OIE)

2012
Porcine brucellosis in the Asia-Pacific Region (OIE)

1st sem.

2010
2011
2012

2nd sem.

Porcine Brucellosis (WAHID OIE 2014)

No information
Never reported
Not reported in this period
Suspected Infection
Clinical disease
Disease limited to one or more zones
Porcine brucellosis in the Asia-Pacific Region (OIE)
Modern international travel practices have resulted in increased exposure to a series of pathogens, including brucellosis, that are not encountered in everyday clinical practice of the developed world.

The global epidemiology of the disease, has seen the emergence of Central Asia, along with the Middle East, as the primary worldwide foci.

Due to political changes and evolution of free trade in many countries.

Open borders have resulted in a faster, often uncontrollable movement of bacteria and diseases.

Although the illegal importation of infected animals or dairy products has been acknowledged as crucial in many areas, this trend has significantly evolved in later years.

There have been persuasive data that, the disease already existed but was not recognised because of a policy of denial or even inadequate health policy in general (e.g. Albania).
The prime example is the Balkan Peninsula.

- In 1990 the disease was only present in Greece and the European part of Turkey but by 1995, after a period of political and military turmoil that led to dramatic political changes, civil wars and the formation of new countries, the disease was also recognised to be alarmingly endemic in Albania and the former Yugoslav Republic of Macedonia.

- By 2010 the disease had travelled over almost all the Balkans.
  - Bosnia-Herzegovina is facing the greatest problem, with the annual incidence of human disease rising geometrically. Cases have subsequently been imported to Croatia and the disease has been reintroduced to a brucellosis-free country, Bulgaria, in two ways – through the illegal importation of animals and animal products to the southern Muslim areas of Bulgaria from Turkey, but also through Bulgarian workers contracting the disease in farms in north-eastern Greece and returning to their homeland for treatment.
  - Thus, at present, four Balkan countries are leading the map of European endemicity for Brucella, and we are not counting in the region of Kosovo, where the burden of the disease has yet to be adequately quantified.

Importation of the disease because of illegal practices is not limited to neighbouring countries.

- Animal disease has been recognised in sheep and goats exported to Vietnam from the United Arab Emirates under a cooperative programme that would have seen the animals bred in Vietnam and their meat subsequently returned to the Emirates.
- There is ongoing emergence of animal brucellosis in the Fiji Islands, with extensive animal slaughter performed as a control measure.

The actual mode of introduction of the disease to a place one would certainly not expect to find it remains unknown, but shows how easily the disease can travel nowadays.

- Increasing recognition of the disease in sub-Saharan Africa is promising, although public health policies in these settings would be extremely difficult to implement:

Thus the global map remains practically unchanged in 2010, although hot spots are continuously added, even where least expected.

- South Korea is an example with a relatively massive increase in annual human cases and the background of this surprising epidemiological evolution cannot be adequately explained.
The prime example is the Balkan Peninsula. In 1990 the disease was only present in Greece and the European part of Turkey but by 1995, after a period of political and military turmoil that led to dramatic political changes, civil wars and the formation of new countries, the disease was also recognised to be alarmingly endemic in Albania and the former Yugoslav Republic of Macedonia.

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South Korea is an example with a relatively massive increase in annual human cases and the background of this surprising epidemiological evolution cannot be adequately explained.
**BRUCELLOSIS - GERMANY (02): ex MYANMAR, ALERT**

Date: Fri 11 Jan 2013

The patient travelled with her partner from Yangon to Lake Inle, then Mandalay and Bagan. The patient remembered the consumption of milk and lassi (typical Indian dairy product) only in Mandalay. Her partner did not drink it and is not infected with brucella. Blood culture is underway with prolonged incubation.

**BRUCELLOSIS - TAIWAN: 2011, IMPORTED**

Date: Tue 7 Feb 2012

Taiwan had been free of brucellosis for 3 decades, but there were 5 imported cases last year between May and October 2011, Chou said, explaining why CDC has taken the decision to list brucellosis as a notifiable disease. The 5 confirmed cases were Taiwan nationals who had contracted the disease during overseas travel, one in North Africa, 3 in Malaysia, and the 5th in China, Chou said.

**BRUCELLOSIS, CAPRINE, HUMAN - MALAYSIA: (PULAU PINANG)**

Date: Fri 23 Jul 2010

Penang is conducting checks on goat milk suppliers and has culled 98 of the animals after a 7-year-old boy became the 1st person to be infected with brucellosis/…

The boy fell sick after drinking raw goat’s milk. He was admitted to a private hospital after coming down with fever on 24 Apr 2010, said state exco member Phee Boon Poh. He was transferred to the Penang Hospital several days later after failing to respond to the antibiotics given.

Phee said that following the incident, the state Veterinary Services Department began conducting checks on milk suppliers./…

Phee said the department had so far tested 3243 serum samples of goats from 11 farms in the state. "98 of the goats were culled after the test results came in positive," he said. He said the owners of the culled goats were paid compensation of RM 5.60 [USD 1.65] per kilo.

Phee advised the public to boil milk before drinking. He also urged those selling mutton, including for the coming fasting month, to ensure the meat was free from the disease.

"An awareness campaign will be held on 27 Jul 2010 by the various government departments and the municipal councils," he said.
BRUCELLOSIS, HUMAN, MELITENSIS - UK ex THAILAND: (NAKOM PATHOM)

A 51 year old UK resident presented to our clinic on 5 May 2015 with a 21-day history of daily rigors, profuse sweating attacks and high fever starting in mid-March 2015, followed by malaise, weight loss of 13 kg and intermittent fever and sweats for the next 4 weeks. This was associated with pain and swelling in his left knee, in which he had an uncomplicated total knee replacement 5 years previously for early-onset osteoarthritis following a motorcycling accident.

The patient made frequent visits to Thailand, where he had stayed with a friend on his farm in Nakom Pathom province from 11 Dec 2014 to 8 Jan 2015. During that time he helped deliver several parturient goats and handled newly born kids and other products of conception with his bare hands. He had not consumed unpasteurized dairy products and had no contact with cattle or buffaloes. When his diagnosis was established, he informed us that a farm laborer was simultaneously being investigated in a Thai hospital for a mysterious fever.

After the UK diagnosis was relayed to the physicians in Thailand, a diagnosis of brucellosis was thought likely and empiric treatment was commenced pending test results, with clinical improvement. The friend who owns the farm has now also been admitted with a similar illness, and investigations for suspected brucellosis are under way.

Despite our local interest in brucellosis (1,2), this is not a diagnosis we would normally consider in a traveler returning from Thailand. As a contributing center, we reported this case within the GeoSentinel network and interrogated the GeoSentinel database, which now includes over 235,000 returning travellers (3). It includes only 82 patients with brucellosis. Only 22 from Asia: 2 cases from Thailand, 16 from South Central Asia (India 11, Iran 2, Nepal 2, Afghanistan 1) and 4 from North East Asia (China 2, Taiwan 1, 1 not specified).

Foci in China, Mongolia and Central Eurasia are well recognised but the range of other countries newly affected by brucellosis continues to expand (4-6). Human infections seem to be grossly underreported compared to the patchy knowledge of its increasing incidence in livestock in South Asia (7).

There have been sporadic case reports and 2 more detailed reviews of emerging brucellosis endemicity in Thailand over the past decade (8,9). As demonstrated by our patient, the highest risk to humans in Thailand is exposure to parturient goats ( _B. melitensis_ ) but there is a separate risk of _B. abortus_ transmission from buffaloes. The areas of highest incidence appear to be Nakhon Si Thammarat Province and Kanchanaburi Province (8), which borders Nakom Pathom Province.

Clinicians should consider brucellosis as well as more commonly encountered causes of fever in returnees from Thailand and neighboring countries, such as dengue, scrub typhus, murine typhus, leptospirosis and malaria, and rarer bacterial infections such as melioidosis. A detailed risk exposure history will provide useful clues, and diagnosis of illness in travellers may aid diagnosis of unexplained illness in the country of origin.
Bayesian estimation of true prevalence, sensitivity, and specificity of indirect ELISA, Rose Bengal Test and Slow Agglutination Test for the diagnosis of brucellosis in sheep and goats in Bangladesh.
It's time to control brucellosis in Central Asia

Brucellosis is a livestock disease that is transmissible to humans, causing severe health concerns in livestock. Industrialization's consequences have led to a massive loss of livestock and severe brucellosis-related problems, but these are not yet recognized as a threat.

Brucellosis has re-emerged in Central Asia, and the situation is critical. There is a need to implement strategies for controlling the disease in these areas. This requires a multi-sectoral approach involving government, farmers, and veterinary professionals. The aim is to promote awareness, improve vaccination practices, and implement effective control measures.

Seroprevalence survey of brucellosis among rural people in Mongolia

Sengyu Tseng, Zulfiya Bajirimayam, Bujirkhoom Soum, Enkhbayar Dashdul, Beadarshuu Odorj, Felix Koh, Jakob Zingeg, Cather Schilling, and Daneluikher Dashdороөжор

Background: After the transition to socialism in the 1990s, human brucellosis re-emerged in Mongolia. The aim of our study was to estimate the seroprevalence of brucellosis and determine risk factors for infection.

Methods: A cross-sectional study with multistage random sampling was conducted in eight provinces of Mongolia. Study participants were interviewed using a questionnaire to obtain their medical history, current symptoms, and risk factors. Blood samples were drawn to determine brucellosis seropositivity.

Results: A total of 2856 randomly selected rural people aged 40–90 years were enrolled in the study. The seroprevalence of brucellosis was 11.1% (95% confidence interval: 10.0–12.2), ranging from 2.6% in the eight provinces to 39.2% in the capital Ulaanbaatar. Risk factors associated with brucellosis seropositivity were being older than 45 years (adjusted odds ratio [AOR] = 6.3; 95% CI = 5.1–8.7) and being a veterinarian (AOR < 2.8; 95% CI = 1.5–5.0).

Conclusions: Our study confirms that human brucellosis seropositivity among rural people in Mongolia is high. Human brucellosis can be effectively controlled if high coverage livestock mass vaccination and improved health care services are provided in the area.
What’s new in Brucellosis in Asia-Pacific

➢ Nothing new in surveillance/reporting!
  ❖ Bovine brucellosis is endemic in Central and South-East Asia and no progress observed (Exc. Fiji and South-Korea) Lao PDR? / Myanmar? / Philippines?
  ❖ Sheep and goat brucellosis is underestimated or under-reported or ignored
  ❖ Porcine brucellosis might be underestimated in the Pacific region: surveillance?
  ❖ Investigating human cases (exotic/ autochthonous) is essential but remains unpractised in most countries
### Human cases notified in France

#### Probable origin

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<thead>
<tr>
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<td>-</td>
<td>6</td>
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<td>4</td>
<td>7</td>
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<td>3</td>
<td>4</td>
<td>5</td>
<td>47</td>
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<td>-</td>
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<td>7</td>
<td>9</td>
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<td>11</td>
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<td>1</td>
<td>4</td>
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<td>USA ?</td>
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<td>-</td>
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<tr>
<td><strong>French B. suis 1 endemic zone (French Polynesia - Wallis &amp; Futuna)</strong></td>
<td>1</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>1</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>3</td>
<td>12</td>
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<td>Polynésie (B. canis)</td>
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<td>-</td>
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<tr>
<td>Contamination en France métropolitaine</td>
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<td>1</td>
<td>2</td>
<td>1</td>
<td>-</td>
<td>13</td>
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<tr>
<td>Wild boar or Hare France (B. suis 2)</td>
<td>-</td>
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<td>1</td>
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<tr>
<td>Relapse or autochtonous contamination in France (B. abortus or B. melitensis)</td>
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<tr>
<td><strong>Total</strong></td>
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<td>16</td>
<td>38</td>
<td>23</td>
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<td>18</td>
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#### Notes

- **FAO-APHCA/OIE/USDA Regional Workshop on Prevention and Control of Neglected Zoonoses in Asia**
Investigating human cases is essential

- Dec. 2011: one autochthonous human case in France *(2nd case in the same family in 2013)*
  - \( B. \textit{melitensis} \) biovar 3
- Jan-April 2012: one bovine outbreak
  - \( B. \textit{melitensis} \) biovar 3
- Investigations 2012-2013:
  - **Domestic ruminants:** no cases
  - **Wildlife:**
    - Hunted: 2 cases in Chamois \( (Rupicapra \ rupicapra) \)
    - Protected Alpine ibex:
      - 29 seropositive/77 = 38 %
      - 16 culture+/34 \( \rightarrow B. \textit{melitensis} \) biovar 3
Investigating human cases is essential

- Orchitis & Arthritis
- Excretion in genital secretions + urine + milk
- Same genotype as the last bovine outbreak in 1999!!
- Source of the bovine outbreak (summer pasture)

First report of a *B. melitensis* reservoir in wildlife
What’s new in Brucellosis in Asia-Pacific

- Political changes, open borders and evolution of free trade result in a faster, often uncontrollable movement of the disease
- Development of livestock and production intensification might result in easier spread of the disease
- Changes in travel practices might result in increased exposure to human populations

Brucellosis should be on the top-priorities of control and eradication programmes
Brucellosis Control /eradication strategies ….

Which tools…
Which strategy…
Preliminary considerations

The epidemiological situation is almost never homogeneous in a given country/region

**Different epidemiological / livestock contexts** within a country/region

↓

**Different & adapted control / eradication strategies** to be implemented

↓

**Primary goals** of a control programme:

- **Knowledge** of situation & definition of
- **Epidemiological units** of intervention
Implementing surveys to evaluate the local situation

Brucellosis control and eradication programme in Thailand:
Preliminary evaluation of the epidemiological situation in cattle, buffalo and sheep & goats


National Institute of Animal Health (NIH) and Bureau of Disease Control & Mitigation Services, Department of Animal and Plant Health (DAPH), Bangkok, Thailand.

Introduction

Brucellosis was first reported in Thailand in 1958 and is now endemic.

In Thailand, brucellosis in cattle and buffalo is primarily due to Brucella abortus and Brucellosis in sheep and goats is Brucella melitensis. Brucellosis is a notifiable disease in Thailand.

Methods

NIH/DAPH involves:
- Animal identification and registration
- Epidemiological surveillance
- Culling and compensation
- Vaccination (519 strain in cattle and buffalo female calves)
- Movement control

Epidemiological surveillance (2010):
- Blood samples were collected from:
  - adult cattle and buffaloes (> 1 year-old)
  - sheep and goats (> 6 month-old)
- Serotype was submitted to NIH and to 7 Regional Veterinary Research and Development Centres (RVRDCs) (Fig.1).

Results & Discussion

In total, 269,676 samples were collected nationwide from 13,598 herds/flocks of cattle, buffaloes and sheep & goats in 2010.

<table>
<thead>
<tr>
<th>Region</th>
<th>Beef cattle</th>
<th>Dairy cows</th>
<th>Buffaloes</th>
<th>Sheep &amp; goats</th>
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<td>2</td>
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<td>6.03</td>
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<td>8.09</td>
<td>0.33</td>
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<td>9</td>
<td>4.99</td>
<td>2.74</td>
<td>0.00</td>
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<tr>
<td>Total</td>
<td>2.4</td>
<td>5.1</td>
<td>0.6</td>
<td>4.9</td>
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</tbody>
</table>

Serological surveillance (2010):
- Blood samples were collected from:
  - adult cattle and buffaloes (> 1 year-old)
  - sheep and goats (> 6 month-old).
- Samples were submitted to NIAH and to 7 Regional Veterinary Research and Development Centres (RVRDCs) (Fig.1).
- All tests were performed according to OIE standards.
- RBT and I-ELISA (in-house) were used for screening.
- CFT was used as a confirmatory test.

In total, 269,676 samples were collected nationwide from 13,598 herds/flocks of cattle, buffaloes and sheep & goats in 2010.

Table 1.: Estimated prevalence of brucellosis, at herd and animal levels for beef and dairy cattle, buffaloes, and sheep & goats in Thailand in 2010.
Is brucellosis present in a certain area/country?

Yes

Are there adequate means / expertise / vet. services?

Yes

No

Surveillance/test-and-slaughter/movement control

No

Mass vaccination

High prevalence

Combined young animal vaccination and test/slaughter

Intermediate prevalence

Test/slaughter

Low prevalence

(survey/prevalence/epidemiological units)
Control, surveillance & Eradication of Brucellosis…

Epidemiology is the main key…
- A sound knowledge of the situation is required before deciding of a strategy
- Adequate epidemiological parameters are required for evaluating the results and monitoring the program…
- Changes in strategy should always be based on epidemiological evidences
Control, surveillance & Eradication of Brucellosis…

» Diagnosis is the 2nd key…
  - Standardised tests
  - Quality assurance of test performance
  - Tests associations (series or parallel)
    » to increase the result predictive values
  - Test result interpretation…always in relation with:
    • risk-factors
    • status of the herd, the area, the country
Don’t forget the iceberg!

- Diagnostic tests
- Vaccines

- Political long-term will
- Strategy adapted to real situation
- Adequate means
- Individual identification
- & movement control

Control pressure – Periodic test repetition
Commitment of professionals
The 3\textsuperscript{rd} FAO-APHCA/OIE Regional Workshop on Brucellosis Diagnosis and Control
with an Emphasis on \textit{B. melitensis} (in collaboration with DLD)
(Sukhothai and Phitsanulok Provinces, Thailand, 21-25 November 2010)

Conclusions and Recommendations
14. That in countries where Brucellosis is observed with low to moderate prevalence and there are constraints/limitations in undertaking an appropriate control and eradication measures, the long-term vaccination is the main tool to control the disease.

15. That, where the infection is endemic, the long-term mass vaccination is the best option to be considered to control the disease.

16. That, where the disease has never been reported in member countries, an appropriate surveillance programme should be implemented to detect possible introduction of the disease and any new outbreak in the country.

19. Progress in some countries in terms of improvement of laboratory diagnostic capacity on Brucellosis such as quality assurance including standardization of testing procedures and diagnostic reagents. However, continuous efforts are still needed to be made by the member countries to utilise the knowledge and techniques acquired from the workshops to improve/strengthen their laboratory diagnosis capacity taking into consideration the epidemiological situation in animals and humans in each country.

20. That, there is a need for: (i) sharing information on epidemiological situation of Brucellosis in the region, (ii) the establishment of a regional laboratory network, and (iii) promotion of regional collaboration on the disease diagnosis and control.
ขอบคุณครับ

ご清聴ありがとうございました

Thanks for your attention...