ADDRESSING ZAIRE EBOLAVIRUS (EBOV) OUTBREAKS
Qualitative entry and exposure assessment update

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FAO risk assessment update - context

* Trigger event - May 2018: Ebola outbreak in Équateur District of Democratic Republic of Congo (DRC)

- Existing FAO risk assessment – 2015
- Updated based on new information:
  - Literature review
  - Updates from partner agencies and institutions
  - Expert opinion
- Published: August 2018

3 risk questions addressed

1. Close contact with domestic mammals
   - Handling/consumption

2. Close contact with wild mammals
   - Handling/consumption

3. Hunting wild animals
   - Trade
   - Handling, consumption

Introduction into unaffected area

Suitable Areas

Wild mammals

EBOV
EBOV suitable areas

- Model takes into account:
  - Bat species distribution
  - Previous disease occurrence
  - Environmental factors
    - Elevation
    - Mean evapotranspiration rate
    - Enhanced vegetation index
    - Day/night land surface temperature

- Overlap with dense human population areas

Pigott et al. 2016. Updates to the zoonotic niche map of Ebola virus disease in Africa. [https://elifesciences.org/articles/16412](https://elifesciences.org/articles/16412)
Definitions: likelihood and uncertainty

• **Five risk levels:**
  - **High** – highly likely to occur
  - **Moderate** – potentially occurring
  - **Low** – unlikely to occur
  - **Very low** – very unlikely to occur
  - **Negligible** – extremely unlikely to occur

• **High uncertainty for risk assessment**
  - Important knowledge gaps remain on EBOV characteristics and ecology in the wild
Assessments – Risk Question 1

**Question:** What likelihood that humans are exposed to EBOV in suitable areas of Africa through close contact, handling or consumption of...

**Considerations**

- Fruit bats
  - No virus isolation (+ PCR & serology)
  - Asymptomatic
  - Reproduce multiple times/year
  - Migration patterns

- Susceptible wild mammals*
  - Mortalities in NPH, duikers, porcupines, pigs
  - RNA detected in wild rodents/shrews
  - Behaviors: bats as prey species, sharing feeding spots

**Likelihood**

- Very low to low (increased during bat migration & with high density of juveniles)
- Very low

**Main risk factor:** close contact with infected wild animal (dead or alive) and consumption of wild meat

* Non-human primates (NPH), duikers, bush pigs, rodents
Assessments – Risk Question 2

**Question:** What likelihood that **humans are exposed** to EBOV in suitable areas of Africa through close contact with domestic mammals, such as...

**Considerations**

- Immune reaction seen in dogs
- No RNA/antigen detected
- Canine/feline cells susceptible to EBOV-GP
- Behavior: feeding on carcasses

**Likelihood**

- **Very low to low**
  (low occurrence in areas of ongoing human Ebola)

**Dogs**

- Susceptible to virus (+/- clinical signs)
- Pigs shed virus → transmit to naïve pigs/macabques
- Anti-Ebola antibodies detected in pigs (Uganda)
- Behaviors: sharing feeding spots with wildlife

**Domestic pigs**

**Mechanical transmission of virus from dogs/cats possible?** → Needs verification

**Very low**
### Assessments – Risk Question 3

**Question:** What is the likelihood of EBOV spreading from suitable areas of Africa to an unaffected area through trade, handling or consumption of...

<table>
<thead>
<tr>
<th>Considerations</th>
<th>Likelihood</th>
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<tr>
<td><em>Wildmeat hunting is very common</em>&lt;br&gt;<em>EBOV survival in meat/carcasses not well known → can survive freezing</em>&lt;br&gt;<em>Informal cross-border movements for wild meat trading purposes</em>&lt;br&gt;<em>Ebola outbreaks in forested areas are comparatively less likely to expand nationally or regionally</em></td>
<td><strong>Very low</strong>&lt;br&gt;<em>For unaffected areas of affected countries or countries neighbouring affected areas</em>&lt;br&gt;<em>Decreases with proper processing method applied</em></td>
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![Meat, products from susceptible wildlife](image)

**Thorough cooking inactivates EBOV in animal products**
Conclusions

• Ebola spillover from wildlife to human populations appears to be a rare event compared to other zoonotic diseases

• But one event can lead to tragic consequences: high case-fatality rate, human-human transmission, discrimination of survivors...

• Communities awareness regarding hunting, food hygiene and preparation is critical

• Many unknowns remain to this date
Thank you for your attention

Any questions?

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