Ebola 2019: Current Status and Are We at Risk

April 25, 2019
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Texas Health Physicians Group
Ebola Timeline

December 26 2013
Guinea

Ebola identified
March 23, 2014

Dallas

June 9, 2016 end of outbreak Liberia

May 18, 2018 2 cases in Equateur, Democratic Republic of Congo (DRC)

July 24, 2018 end of Equateur outbreak

August 1, 2018 North Kivu province, DRC
Ebola Countries

**Ebola 2014-2016**
- Sierra Leone, Liberia, Guinea, Nigeria, Mali, USA, Italy, Senegal, Spain, United Kingdom

**Ebola 2018-**
- DRC:
  - Equateur Province
  - North Kivu Province
Ebola 2014-2016

- **Widespread outbreak**
- **Limited local cases**
- **Isolated cases**

Countries affected:
- Guinea
- Sierra Leone
- Liberia
- Côte d'Ivoire
- Guinea-Bissau
- Senegal
- Gambia

Other countries:
- Mauritania
- Mali
- Burkina Faso
- Niger
- Benin
- Togo
- Ghana
- Cameroon
- Nigeria

[Map of Africa showing affected countries]
Current Ebola 2018 DRC

EBOLA CASES IN AFRICA

DR CONGO - 319 DEATHS AS OF 17 DEC
Ebola DRC- Equateur and North Kivu
Ebola DRC - Equateur Province

- 2.5 million people
- 284 registered health facilities
- Bikoro: pop 163,000
  - 3 hospitals
  - 19 health centers
  - Remote area

Source: WHO
Ebola DRC – North Kivu Province

- Over 8 million inhabitants
- Over 1 million displaced people (Uganda, Rwanda)
- Efflux refugees Uganda, Burundi, Tanzania
Ebola outbreaks in DRC

1995: 315 Cases (250 Deaths) in Kikwit
1976: 318 Cases (280 Deaths) in Yambuku
1977: 1 Case in Tandala
2007: 264 Cases (187 Deaths) in Kasai-Occidental
2008-2009: 32 Cases (15 Deaths) in Kasai-Occidental
2014: 66 Cases (49 deaths) in Equateur (now Tshuapa)
2012: 36 Cases (13 Deaths) in Orientale
2017: 8 Cases (4 Deaths) in Likati

Currently Affected Area (Bikoro, Ingende, Iboko)

Location of dots do not indicate actual location of outbreaks.
Ebola outbreaks mapped

Ebola outbreaks, 1976–2018
Number of confirmed cases

Sources: WHO; CDC

Economist.com
Ebola outbreaks since 1976
Areas predicted to have high probability of Ebola transmission to humans

Pigott et al. eLife. 2014
Origin of Ebola outbreak - 2014

- Index case 18 month of boy from village in Guinea (bats) December 2013
- 1/24/14 Medical alert to district health officials
- 3/13/14 Ministry of Health issues alert after virus spreads to Conakry (capital)
- Xxxx EVD confirmed (France)
- 3/23/14 EVD outbreak declared (WHO)
Ebola – 2019 Origin

- **Equateur province**: unknown
  - Cluster of 21 cases of undiagnosed illness, 17 deaths in Ikoko-Impenge area reported 5/3/19
  - 5/5/19 Ministry of Health/WHO/MSF team visited and found 5 case patients → 5/7/19 2 + Ebola PCR

- **Kivu province**: unknown
  - 7/28/18 North Kivu Provincial Health authority notified Ministry of Health
  - Ministry of Health notified WHO of new outbreak 8/1/18-cluster or 26 cases acute hemorrhagic fever, 20 deaths, 4 + Ebola
Ebola Outbreak Statistics

**Ebola 2014-2016**
- 28,652 cases
- 11,325 deaths
- Cost: $4.3 billion, ($2.2 billion lost GDP)
- Travel screenings: > 339,000 exiting Guinea, Liberia, Sierra Leone
- US screened > 38,000 travelers from Guinea, Liberia, Sierra Leone

**Ebola 2019**
- 1273 cases
  - Equateur: 54
  - North Kivu: 1207
- 821 deaths
  - Equateur: 33
  - North Kivu: 755

CDC.gov

- At least 881 HCW infected (513 deaths)
  - Liberia lost 8% doctors, nurses and midwives
  - Sierra Leone lost 7%
  - Guinea lost 1%
  - 50% healthcare services reduction → 10,600 additional lives lost to HIV, TB, malaria

- CDC trained 24,655 HCW in W Africa on IPC
  - > 160 clinical webinars and conference calls
  - > 6,500 people trained in live training events
  - Up to 24 labs set up for EVD testing

Alyssa. EID. xxx
Ebola 2019 Impact on HCW

- **Equateur Province**: 7 HCW (2 deaths)
- **Kivu Province**: 87 (31 deaths)
- July 2018 WHO workshop to harmonize, reconcile, & validate the data
- WHO and Ministry of Health:
  - Strategic Response Plan
  - Consolidation and Stabilization Plan
    - Surveillance
    - Infection prevention and control
    - Case management
    - Lab
    - Psychosocial care
    - Community engagement
    - Food security
Impact of Ebola 2014-2016 on Children

- > 20% cases in children < 15
- > 17,300 children orphaned
- School closures June 2014-2015: lost 1848 hours of education
- Immunizations decreased 30%

cdc.gov
Ebola 2018- Equateur- declared over 7/24/2018
# Ebola - 2019 - Equateur Province

<table>
<thead>
<tr>
<th>Description</th>
<th>Bikoro</th>
<th>Iboko</th>
<th>Wangata</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cumulative cases</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total probable</td>
<td>11</td>
<td>5</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Total confirmed</td>
<td>10</td>
<td>24</td>
<td>4</td>
<td>38</td>
</tr>
<tr>
<td>Total number of cases</td>
<td>21</td>
<td>29</td>
<td>4</td>
<td>54</td>
</tr>
<tr>
<td><strong>Deaths</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Deaths in probable cases</td>
<td>11</td>
<td>5</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>Deaths in confirmed cases</td>
<td>7</td>
<td>7</td>
<td>3</td>
<td>17</td>
</tr>
<tr>
<td>Total deaths</td>
<td>18</td>
<td>12</td>
<td>3</td>
<td>33</td>
</tr>
</tbody>
</table>
Ebola 2019 - Kivu Ongoing
Figure 1: Confirmed and probable Ebola virus disease cases by week of illness onset, as of 14 April 2019
Current situation Ebola – North Kivu

- Average 1065 alerts/day over past 7 days (86% investigated within 24 hours)
- 73,500 contacts registered - 10979 under surveillance (83-89% followed in past 7 days)
- 8 labs with Ebola virus diagnostic capacity using automated PCR (Cepheid Xpert Ebola)
- 12 operational treatment centers
- From 4/8-4/14 1,703,901 screenings (total > 50,000,000 screenings cumulative) → 694 alerts → 300 validated → 8 + EVD

WHO situation report
Current situation Ebola – North Kivu

- Continued rise in cases as of 4/12/19
- > 50% of deaths in the community
- Largest outbreak in DRC
- Second largest Ebola outbreak ever
- WHO: NOT Public Health Emergency of International Concern
Infection Prevention and Control (IPC) – Ebola North Kivu

- Since 1/2019 IPC field teams have:
  - decontaminated over 250 health facilities and households
  - Provided > 100 supply kits
  - Trained > 3000 heathcare workers in IPC
  - National IPC workshop (Goma) March 21-23 (Ministry of Health, WHO, UNICEF, implementing partners)

- HCW infections and nosocomial transmission drive transmission in health facilities!

WHO
Treatment

Ebola 2014-2016

- Convalescent serum
- Supportive care
- Oral rehydration
- IV fluids
- Zmapp – monoclonal antibodies
- Favipiravir

Ebola 2019

- Ring vaccination: rVSV-ZEBOV-GP Ebola vaccine
  - By 4/16/19 - 101,195 contacts and contacts of contacts vaccinated
    - 26,361 children (1-6 years old)
- Randomized trials of 4 experimental drugs

WHO
Ring vaccination

Gerlier. Virologie. 2015
A front-line aid worker receives an experimental Ebola vaccine in Mbandaka, Congo. (AP Photo/Sam Mednick)
Ring vaccination prelim data

Reported EVD cases, with and without rings, EVD cases among vaccinated individuals

### Confirmed EVD cases in persons at risk

880 cases in non-vaccinated during same time

<table>
<thead>
<tr>
<th>Number of EVD cases (rings with EVD cases)</th>
<th>Onset of symptoms &lt;10 days after vaccination</th>
<th>Onset of symptoms ≥10 days after vaccination</th>
<th>All cases among vaccinated people</th>
</tr>
</thead>
<tbody>
<tr>
<td>56</td>
<td>15</td>
<td>71</td>
<td></td>
</tr>
<tr>
<td>(45)</td>
<td>(15)</td>
<td>(60)</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Type of contact with index case</th>
</tr>
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<tbody>
<tr>
<td>Contact of contact</td>
</tr>
<tr>
<td>Non high-risk contact</td>
</tr>
<tr>
<td>High-risk contact ^a^</td>
</tr>
<tr>
<td>Healthcare worker</td>
</tr>
<tr>
<td>Clinical Outcome</td>
</tr>
<tr>
<td>Death (rings with EVD cases)</td>
</tr>
<tr>
<td>Alive</td>
</tr>
<tr>
<td>Illness ongoing ^3^</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Contact of contact</th>
<th>5</th>
<th>2</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non high-risk contact</td>
<td>1</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>High-risk contact ^a^</td>
<td>48</td>
<td>6</td>
<td>54</td>
</tr>
<tr>
<td>Healthcare worker</td>
<td>2</td>
<td>7</td>
<td>9</td>
</tr>
<tr>
<td>Death (rings with EVD cases)</td>
<td>9</td>
<td>0</td>
<td>9</td>
</tr>
<tr>
<td>Alive</td>
<td>39</td>
<td>15</td>
<td>54</td>
</tr>
<tr>
<td>Illness ongoing ^3^</td>
<td>8</td>
<td>0</td>
<td>8</td>
</tr>
</tbody>
</table>

^a^ This also includes health care workers / front line workers enrolled as part of community rings

^3^ CT value available for 50 EVD cases (37 before 10 days, 13 after 10 days)

^3^ As of March 25, 8 vaccinated individuals who became cases are still under treatment at ETUs. Among them, 0 case developed EVD 10 or more days after vaccination.

Attacks on HCW

**Coordinated assaults**
- Criminal gangs
- Rebel militia
- Active conflict
- Response: military, police, UN peacekeepers

**Spontaneous eruptions of rage**
- Community members
- Mistrust responders who take suspected EVD patients for testing/treatment
- Ebola is a “scam cooked up by the government and aid groups to raise money and control the population”

Aizenman. NPR. 2019
MSF’s ETU attacked and burned

2/24/2019

"This attack has crippled our ability to respond to what is now the epicentre of the outbreak."

EMMANUEL MASSART, MSF’S EMERGENCY COORDINATOR IN KATWA

Msf.org
ETU burned
4 attacks on ETU (last 3/9/19)
Conflict, war, attacks threaten control

- > 1 million refugees and internationally displaced people traveling through and out of North Kivu and Ituri
  - Risk of spread- Uganda, Rwanda, South Sudan
  - Many cases have no connection to contact

- Continued attacks on ETU may slow response efforts
  - Risk of increased death
  - Spike in cases
  - Increased spread
Implications for US

- Ensure PPE preparedness
- Be aware of signs/symptoms of Ebola
- Be vigilant about returning travelers with febrile syndrome from DRC, Uganda, Rwanda, South Sudan (careful geography review)
- Reinforce communication links with local health department
- Re-affirm the local Ebola assessment centers and Ebola treatment centers your facility would refer patients to
Thank you!