Potential Scenarios for Arboviruses in the Americas: What’s Next?

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8th International Conference on Global Health
Arboviruses in Latin America and the Caribbean: Strategies and Challenges for Prevention and Control
May 23, 2018
Objectives

▪ To present potential arboviruses scenarios in Latin America and the Caribbean region

▪ Introduction to discussion: How to prepare for future arboviral disease outbreaks?
La fiebre amarilla aumenta

Las 25.140 personas que acudieron al UD-Betis firmaron la sexta mejor asistencia de un encuentro oficial en la historia del club

MANUEL BORREGO Siete jornadas de fútbol armonioso y óptimos resultados aceleran la fiebre balompédica que se vive otra vez en Gran Canaria. La Unión Deportiva Las Palmas sintoniza con sus graderíos y conquista aliados partido a partido. Los 25.140 espectadores que acudieron el sábado a presenciar el encuentro con el Betis firmaron la sexta mejor entrada en la historia de la entidad, que ahora dispone de un escenario que supera en casi diez mil asientos la cifra oficial del viejo Estadio Insular, vigente entre 1949 y 2003. Esta afluencia es, además, la tercera en el ranking de esta temporada en toda la
How to predict which one(s)?

- Historical data
- Current scenarios
- Scientific knowledge
- Modeling

- Expect the unexpected
Three potential scenarios
Dengue epidemics with low levels of Zika virus circulation
1. Dengue epidemics with low levels of Zika circulation

Reported cases of dengue in the Americas and the Caribbean
Cumulative cases: 1988-2018

Data: PAHO
1. Dengue epidemics with low levels of Zika circulation

- **Paraguay, 2018**
  - Population: 6.7 million
  - 22,000 suspected dengue cases
    - Serotypes 1 and 4
  - Ongoing Zika transmission
American Samoa

1. Dengue epidemics with low levels of Zika circulation

DENV-2  DENV-3  DENV-?  DENV-?  CHIKV  ZIKV  DENV-2


DENV-1  DENV-1  DENV-1/4  DENV-3
Considerations

- 160,000 dengue cases in 2018
- Low herd immunity
- Potential large scale outbreaks
- WHO goal: Case fatality rate <1%
Preparedness for scenario 1

- Surveillance
- Focus on clinical management
  ✓ Surge capacity
- Rapid diagnostic testing for surveillance
- Strengthen confirmatory diagnostic testing
  ✓ Including testing for other arboviruses
Zika epidemics with low levels of dengue virus circulation
2. Zika epidemics with low levels of dengue virus circulation

CDC – Countries with risk of Zika virus transmission
### 2. Zika epidemics with low levels of dengue virus circulation

<table>
<thead>
<tr>
<th>WHO Regional Office</th>
<th>Category 1: Area with new introduction or re-introduction with ongoing transmission</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFRO</td>
<td>Angola; Guinea-Bissau</td>
<td>2</td>
</tr>
<tr>
<td>AMRO/PAHO</td>
<td>Anguilla; Antigua and Barbuda; Argentina; Aruba; Barbados; Belize; Bonaire, Sint Eustatius and Saba; British Virgin Islands; Cuba; Curacao; Dominica; Grenada; Montserrat; Saint Kitts and Nevis; Saint Lucia; Saint Martin; Saint Vincent and the Grenadines; Sint Maarten; Trinidad and Tobago; Turks and Caicos Islands; United States Virgin Islands</td>
<td>21</td>
</tr>
<tr>
<td>WPRO</td>
<td>Samoa; Singapore; Solomon Islands; Tonga</td>
<td>4</td>
</tr>
</tbody>
</table>

**Subtotal** 27

<table>
<thead>
<tr>
<th>WHO Regional Office</th>
<th>Category 2: Area either with evidence of virus circulation before 2015 or area with ongoing transmission that is no longer in the new or re-introduction phase, but where there is no evidence of interruption</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AFRO</td>
<td>Burkina Faso; Burundi; Cabo Verde; Cameroon; Central African Republic; Côte d'Ivoire; Gabon; Nigeria; Senegal; Uganda</td>
<td>10</td>
</tr>
<tr>
<td>AMRO/PAHO</td>
<td>Bolivia (Plurinational State of); Brazil; Colombia; Costa Rica; Dominican Republic; Ecuador; El Salvador; French Guiana; Guatemala; Guyana; Haiti; Honduras; Jamaica; Mexico; Nicaragua; Panama; Paraguay; Peru; Puerto Rico; Suriname; Venezuela (Bolivarian Republic of)</td>
<td>21</td>
</tr>
<tr>
<td>SEARO</td>
<td>Bangladesh; India; Indonesia; Maldives; Myanmar; Thailand</td>
<td>6</td>
</tr>
<tr>
<td>WPRO</td>
<td>Cambodia; Fiji; Lao People's Democratic Republic; Malaysia; Papua New Guinea; Philippines; Viet Nam</td>
<td>7</td>
</tr>
</tbody>
</table>

**Subtotal** 44

<table>
<thead>
<tr>
<th>WHO Regional Office</th>
<th>Category 3: Area with interrupted transmission and with potential for future transmission</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>AMRO/PAHO</td>
<td>Bahamas; Cayman Islands; Guadeloupe; ISLA DE PASCUA - Chile; Martinique; Saint Barthélemy; United States of America</td>
<td>7</td>
</tr>
<tr>
<td>WPRO</td>
<td>American Samoa; Cook Islands; French Polynesia; Marshall Islands; Micronesia (Federated States of); New Caledonia; Palau; Vanuatu</td>
<td>8</td>
</tr>
</tbody>
</table>

**Subtotal** 15
2. Zika epidemics with low levels of dengue virus circulation

Considerations

- Herd immunity – regional differences
- New susceptible individuals in the next decade
- Zika as an endemic (?) and epidemic-prone pathogen
- 15 million children born in the Americas each year
Preparedness for scenario 2

- Pregnant women enhanced diagnostic testing
- Surveillance and follow-up testing for babies
- Strengthen confirmatory diagnostic testing
  ✓ Including testing for other arboviruses
3. Introduction of Yellow Fever
3. Introduction of yellow fever

- July 2017 - May 2018: 1,261 cases and 409 deaths in Brazil
- More than 8 million people vaccinated
- Cases reported in densely populated cities and states
- 10 cases confirmed in unvaccinated international travelers
- Potential of international spread
3. Introduction of yellow fever

Countries with risk of yellow fever virus transmission

<table>
<thead>
<tr>
<th>Argentina*</th>
<th>Guyana</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bolivia*</td>
<td>Panama*</td>
</tr>
<tr>
<td>Brazil*</td>
<td>Paraguay</td>
</tr>
<tr>
<td>Colombia*</td>
<td>Peru*</td>
</tr>
<tr>
<td>Ecuador*</td>
<td>Suriname</td>
</tr>
<tr>
<td>French Guiana</td>
<td>Trinidad and Tobago*</td>
</tr>
<tr>
<td>Venezuela*</td>
<td></td>
</tr>
</tbody>
</table>

*Solo parte del país a riesgo
Preparedness for scenario 3

- Surveillance
- Early detection
- Clinical training
- Strengthen confirmatory diagnostic testing
  - Testing for other arboviruses
- (Targeted) vaccination campaigns
Preparedness for emerging arboviral diseases

✓ Reactive vs Proactive surveillance
✓ Improved laboratory testing
✓ Focus on viruses with high potential to emerge/reemerge
✓ Vector Control – Novel interventions
✓ Vaccines
✓ Research questions
Other possible scenarios

4, 5, 6?
Gracias!
Thank you!
Obrigada!

For more information, contact CDC
1-800-CDC-INFO (232-4636)

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

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Mayaro virus has been reported in: French Guiana, Bolivia, Peru, Suriname, Costa Rica, Guatemala, Venezuela, Mexico, Ecuador, Guyana, Panama, and Brazil.

- No evidence of urban cycle
- Population susceptibility
- Evidence that Aedes mosquitoes can transmit the virus
Oropouche virus

- Brazil, Venezuela, Peru, Panama, Trinidad and Tobago
- 30 outbreaks and 500,000 cases reported since 1955
- Vectors: *Culicoides paraensis* (*Ceratopogonidae*) and mosquito *Culex p. quinquefasciatus*
Outbreaks have occurred during and after the Zika outbreak

- Herd immunity

Chikungunya virus
Alerta por el chikungunya

Min-Salud anda mosca porque van más de 100 casos confirmados del virus en islas del Caribe

A aún no ha llegado a Venezuela, pero "la diseminación a otros países es cuestión de tiempo", advierten las autoridades. El Instituto de Higiene se prepara para diagnosticar casos sospechosos, con apoyo de la OPS. P2
La Tribuna

SUBE LA TARIFA ELÉCTRICA
ELIMINADOS SUBSIDIOS

INNOVACIÓN Y FINANZAS

ARA COMBATIR EL ZIKA

EL CALENTAMIENTO GLOBAL
LA OTRA CARTA

EMPRESAS EXITOSAS EN ANIVERSARIO DE MARCA PAIS
MÁS AMENAZAS DENONCIAN DEPURADORES

OEAACTIVA
LA CARTA DEMOCRÁTICA
MADURO: METASELA DONDE LE QUEPA

ENCONTRONAZO 3 MUJERES PERECEN
1. Dengue epidemics with low levels of Zika circulation

Counts of Laboratory Confirmed Symptomatic Dengue patients per week from by week of symptom onset, November 2016 - April 2018, Am. Samoa Dengue Outbreak Response, May 13, 2018

Total Laboratory Confirmed cases: 885
Origin, Spread, and Distribution of Chikungunya Virus and Its Vectors.
1. Dengue epidemics with low levels of Zika circulation

Counts of Laboratory Confirmed Symptomatic Dengue patients per week from by week of symptom onset, November 2016 - April 2018, Am. Samoa Dengue Outbreak Response, May 13, 2018

Total Laboratory Confirmed cases: 885
- Susceptible humans
- Competent vector presence
- Early identification
- Limited resources
Are you ready?
SAMPLE CONTENT for Side By Side Display

- **Bullet**
  - Sub bullet
  - Customize chart colors to match your center’s palette
  - HINT: Use the eyedropper tool in the FILL menu to sample the colors in the color bar at the bottom of the page
Will we have a new epidemic soon?
Let’s see...

- Globalization/
  International travel
- Rapid urban growth
- Climate change
If you think you are too small to make a difference, you haven’t spent a night with a mosquito.

African proverb.
Fonte: CGDT/DEVIT/SVS/MS. Os pontos no mapa estão plotados no centroide do município e não georreferenciados no local de ocorrência do evento.