Background for a comparative analysis of JE vaccination strategies for U.S. travelers to Asia

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JE among U.S. travelers

- Risk of JE for most travelers is very low but varies based on travel destination, duration, season, and activities.

- From 1992–2017, 12 JE cases reported among US travelers or expatriates (<1 case per year).

- Among the 12 cases:
  - 8 cases: Duration of travel ≥1 month
  - 3 cases: Shorter travel but rural exposure for ≥1 night
  - 1 case: No information

- Low case numbers likely not related to JE vaccination:
  - 11–28% of adult higher risk travelers vaccinated*
  - 2–4% of adult lower risk travelers vaccinated*

Current ACIP recommendations for prevention of JE among travelers

- For all travelers to Asia, discuss risks of JE and need to take precautions to avoid mosquito bites
- For some travelers, JE vaccine can further reduce the risk for infection
- Providers should assess a traveler’s risk based on their itinerary (i.e., location, duration, season, and activities)
- Decision whether to vaccinate should weigh:
  - Risk for JE
  - High morbidity and mortality of JE
  - Low probability of serious adverse events
  - Vaccine cost
JE vaccine **recommended** for travelers who plan to spend a month or longer in endemic areas during JE virus transmission season, including expatriates and recurrent travelers

JE vaccine **should be considered** for shorter-term travelers to endemic areas if itinerary will increase the risk of JE virus exposure

JE vaccine **not recommended** for short-term travelers whose visit restricted to urban areas or times outside of transmission season

CDC. MMWR Recomm Rep 2010.
Risk groups for comparative analysis

- Risk group I
  - Travel for $\geq 1$ month
  - Approximates “Recommended”

- Risk group II
  - Travel $< 1$ month but planning to spend $> 20\%$ time doing outdoor activities in rural areas
  - Approximates “Consider”

- Risk group III
  - Remainder of U.S. travelers to Asia
## Incidence estimates by risk group

<table>
<thead>
<tr>
<th>Risk group</th>
<th>Number of JE cases*</th>
<th>Proportion of travelers†</th>
<th>Number of travelers‡</th>
<th>Incidence (per million)</th>
</tr>
</thead>
<tbody>
<tr>
<td>I</td>
<td>5</td>
<td>19.5%</td>
<td>9.38 million</td>
<td>0.53</td>
</tr>
<tr>
<td>II</td>
<td>3</td>
<td>25.4%</td>
<td>12.22 million</td>
<td>0.25</td>
</tr>
<tr>
<td>III</td>
<td>1</td>
<td>55.1%</td>
<td>26.50 million</td>
<td>0.04</td>
</tr>
</tbody>
</table>

*US surveillance data for 2007–2016

†Airport survey of US travelers to Asia (Duffy MR. J Travel Med 2013)

‡Estimated from total number of trips to Asia by US citizens from 2007–2016 (US National Travel and Tourism office)
Background on travel vaccine cost effectiveness studies

- No cost-effectiveness studies for use of JE vaccine among travelers
- ACIP has not considered cost effectiveness analyses for other rare travel-associated vaccine-preventable diseases (e.g., rabies, meningococcal disease)
JE vaccine cost-effectiveness studies in endemic countries

- JE vaccination is cost-effective or cost-saving for local populations in JE endemic countries

- Higher disease incidence in endemic areas
  - 1–10 cases per 100,000 population in endemic countries
  - <1 case per million US travelers

- Substantially lower cost vaccines used
  - <$1 per dose for live attenuated vaccine in endemic areas
  - $600 for 2-dose schedule for US travelers for JE-VC

In 2010, ACIP WG decided not to evaluate cost-effectiveness when considered current recommendations for US travelers.

**Rationale**
- Clear not cost-effective due to low disease incidence and high vaccine cost.
- Travel vaccines usually paid for by travelers.
- Not covered under Vaccines for Children program or by most private insurers.

CDC. MMWR Recomm Rep 2010.
Rationale for current comparative analysis

- Provide perspective on numbers needed to be vaccinated and cost per case averted
- Compare relative costs of vaccination for travelers with different itineraries and disease risk
- Understand the cost implications of possibly expanding the current JE vaccine recommendations to a broader group of travelers.