COUNTERING EMERGING INFECTIOUS DISEASE THREATS

AN ARMY ACCELERATED RESPONSE TO ZIKA

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Building on Decades of Experience to Pivot toward Public Health Emergencies

MRMC (WRAIR & USAMRIID) has been able to leverage longstanding capabilities to respond quickly to emerging infectious disease outbreaks:

- Subject Matter Expertise
- Basic/Translational Science
- Manufacturing
- Broad Network of International Sites
- Clinical Trial Infrastructure
- Partnerships
  - Government, Academia, Industry
Woolhouse ME 2012
Introduction of Zika to the West
Clinical Manifestations

ZIKA VIRUS INFECTION IN MAN

1) A strain of Zika virus was isolated from an adult male.
2) The clinical picture of the infection was that of a mild febrile illness of short duration accompanied by a generalized maculopapular rash.
3) A rise in antibody to Zika virus was demonstrated.

- Only 20% of infections are symptomatic

- Also characterized by:
  - Non-purulent conjunctivitis
  - Diffuse myalgia
  - Polyarticular arthralgia

- Neurologic manifestations
  - Guillain-Barre Syndrome (~1/4000)
  - Encephalitis, Cerebritis
  - Congenital Zika Syndrome
Zika Threatens Readiness

>160 confirmed current Zika virus cases in MHS beneficiary

3 cases in pregnant Service Members

1 in pregnant dependent

Devastating Impacts:

- Sexual transmission—impact on military families with potential birth defects
- Rare occurrence of Guillain-Barre Syndrome
Zika Vaccine (ZPIV)
Rapid Countermeasure Development

Early Zika Detection
Biosurveillance in South East Asia aided vaccine design

Proven Vaccine Platform
Successfully developed licensed vaccine for Japanese Encephalitis, another flavivirus

In-house Capabilities
Developed and produced > 1,500 doses for clinical testing
Phase I Clinical Trials of ZPIV

First vaccination at WRAIR: 09 November 2016

In 9 months, WRAIR went from vaccine concept to clinical testing
Impact of prior flavivirus immunity on Zika virus infection in rhesus macaques


High Infection Rates for Adult Macaques after Intravaginal or Intrarectal Inoculation with Zika Virus

Soldier Health. World Health