Partial Evidence to Recommendations for use of chikungunya vaccines among persons in U.S. territories at risk for chikungunya virus transmission

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Advisory Committee on Immunization Practices meeting

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Background

- Two licensed chikungunya vaccines
  - Live attenuated vaccine licensed in November 2023 for use in persons aged ≥18 years (manufactured by Valneva)
  - Virus-like particle vaccine licensed in February 2025 for use in persons aged ≥12 years (manufactured by Bavarian Nordic)

- Chikungunya Vaccines Work Group formed in May 2022
  - Approved recommendations exist for use of vaccines in travelers and laboratory workers
  - Recent topic under discussion has been use of chikungunya vaccines in persons in U.S. territories and states at risk for chikungunya virus transmission

Evidence to Recommendations (EtR) for use of chikungunya vaccines among persons in U.S. territories at risk for chikungunya virus transmission: Public health problem and value of a vaccine

EtR framework

EtR Domain	Question
Public health problem	• Is the problem *(chikungunya)* of public health importance?
Benefits and harms	• How substantial are the desirable anticipated effects of CHIK-VLP? • How substantial are the undesirable anticipated effects? • Do the desirable effects outweigh the undesirable effects? • What is the overall certainty of this evidence for the critical outcomes?
Values	• Does the target population feel the desirable effects are large relative to the undesirable effects? • Is there important variability in how patients value the outcomes?
Acceptability	• Is the intervention acceptable to key stakeholders?
Resource use	• Is the intervention a reasonable and efficient allocation of resources?
Equity	• What would be the impact of the intervention on health equity?
Feasibility	• Is the intervention feasible to implement?

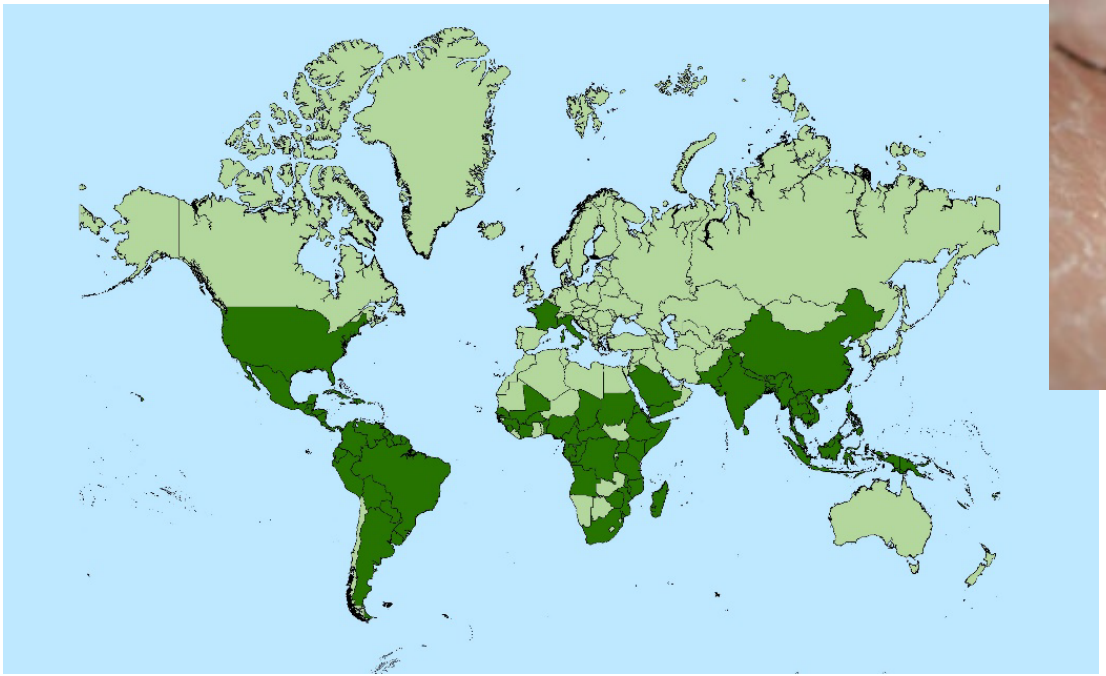
Public Health Problem

Question: Is the problem of public health importance?

Key related questions include:

- Are the consequences of the problem serious?
- Are a large number of people affected by the problem?
- Is the problem related to emerging diseases …. or epidemic potential?

Chikungunya virus transmission



Countries and territories with current or past transmission of chikungunya virus

Globally, ~620,000 cases reported in 2024 but likely underestimate

Outbreaks can be large and explosive

- One-third to three-quarters of population affected
- Substantial morbidity
- Stresses healthcare capacity

No highly effective alternatives to vaccination for disease control

- Mosquito prevention and control measures
  - Use of insect repellent challenging as requires daily use during outbreaks
  - Source reduction important but difficult to remove enough water-holding containers where mosquitoes lay eggs
- Other prevention measures have had variable impact

Acknowledgement: Claudia Colon-Burgos & Coral Rosado-Santiago, CDC Dengue Branch

Impact of acute illness

- Fever and joint pain
  - Arthralgia often severe and can be debilitating
  - Multiple joints involved, most commonly hands and feet
- Other symptoms include headache, myalgia, fatigue, rash, abdominal pain, and vomiting
- No anti-viral treatment
  - Supportive management

Image above from : https://www.paho.org/en/topics/chikungunya

Impact of disease: severe presentations

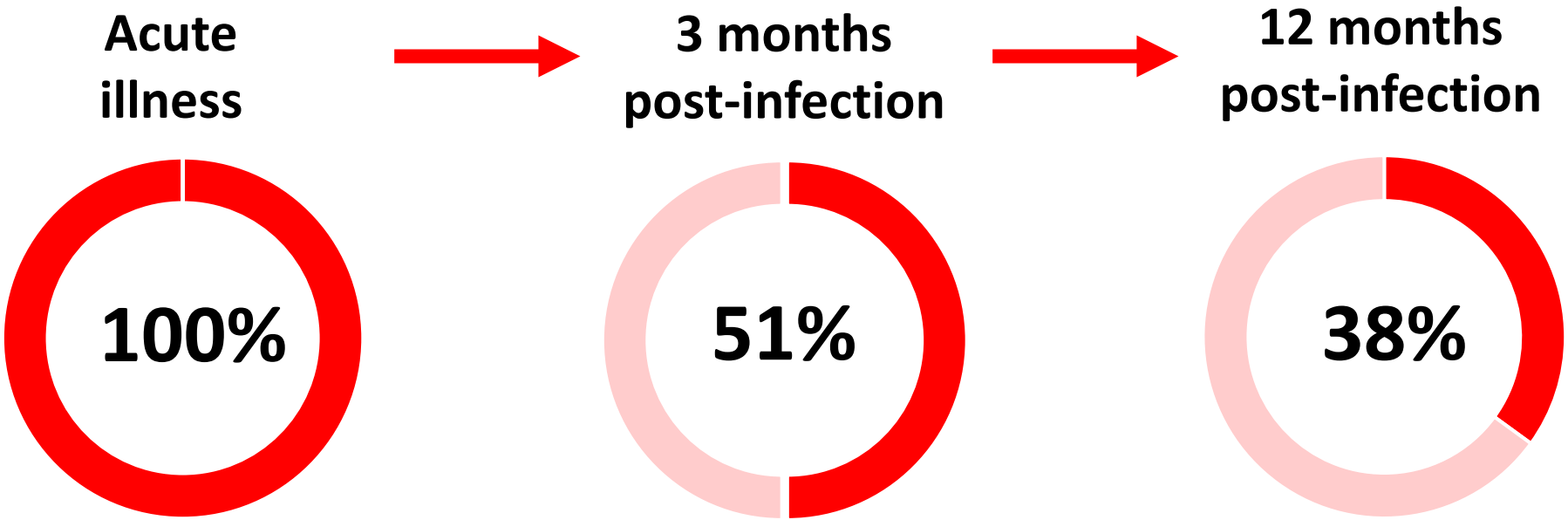
- Rare serious complications (e.g., cardiac, renal, ocular, neurologic illness)
- Hospitalization rate ~3%
- Case fatality rate: 0.01%–0.5%
- Serious outcomes mostly in older adults and young infants

Images from : https://www.paho.org/en/topics/chikungunya

Impact of disease: Arthralgia that persists or recurs

- Most patients have arthralgia that resolves in 7–10 days
- Arthralgia sometimes persists or relapses with other symptoms e.g., fatigue

Impact of disease: Arthralgia that persists or recurs

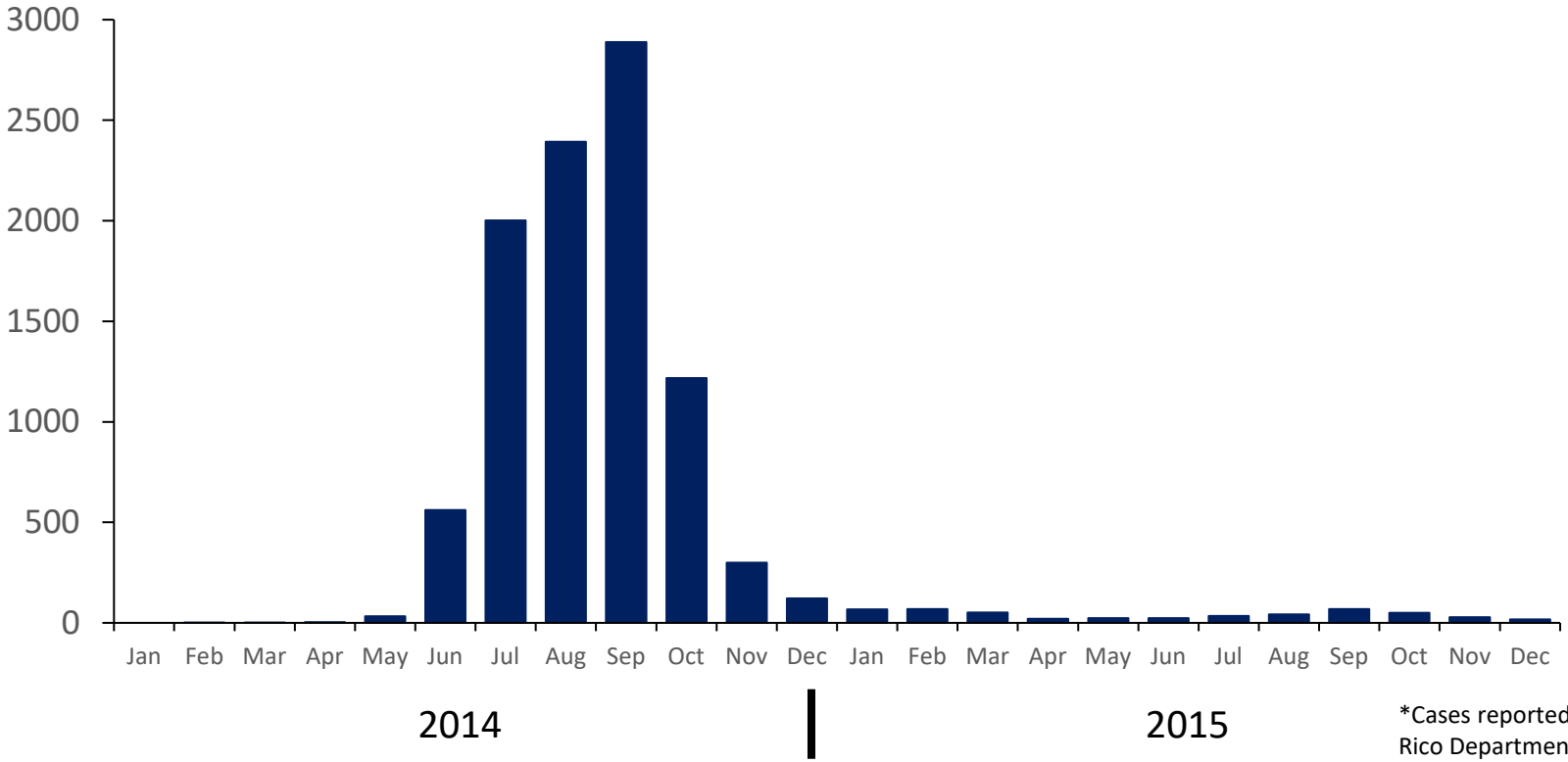


Based on recent meta-analysis (Lindsey N. Chronic arthralgia after chikungunya. US Advisory Committee on Immunization Practices meeting, June 2023)*
*Rates likely overestimated as background rate of arthralgia in the population could not be taken into account

Chikungunya previously documented in five U.S. territories and affiliated states

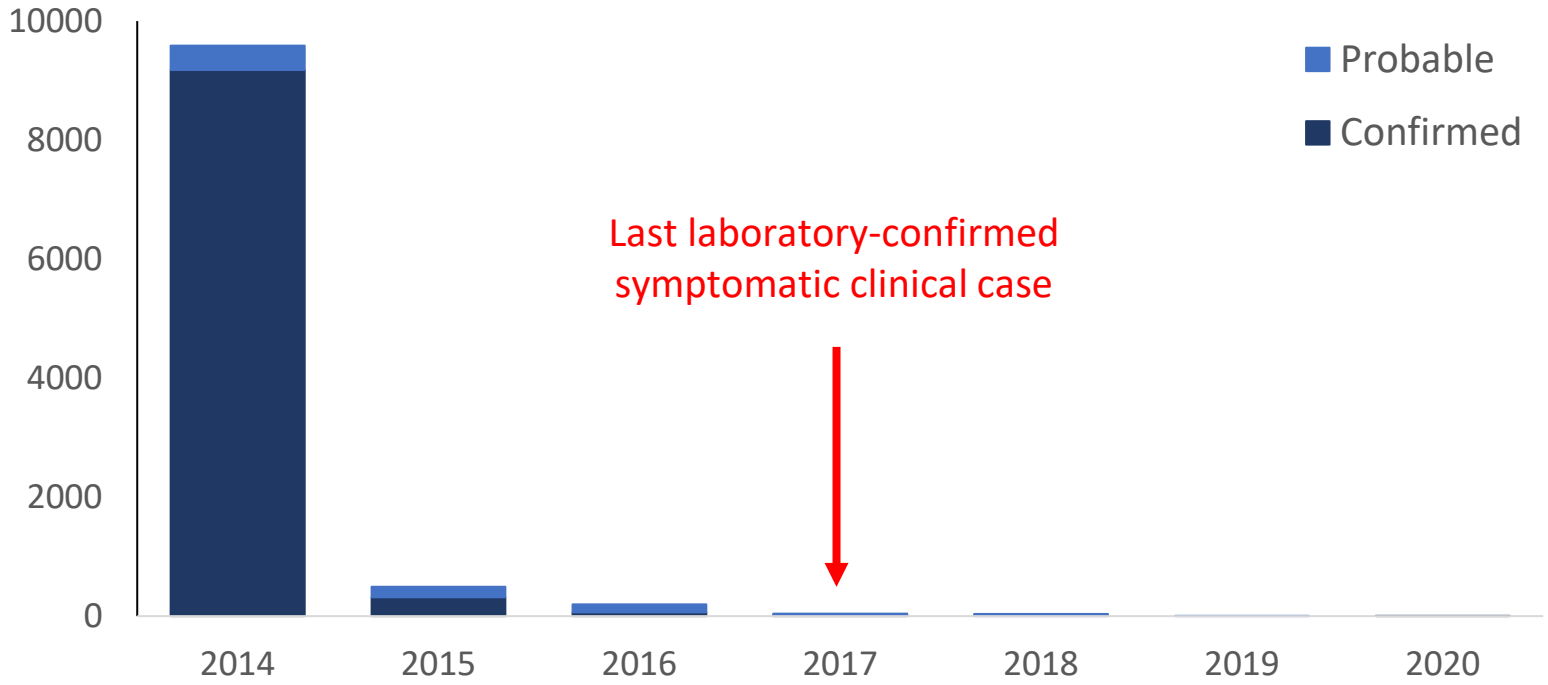
- Puerto Rico
- United States Virgin Islands (USVI)
- American Samoa
- Federated States of Micronesia
- Marshall Islands

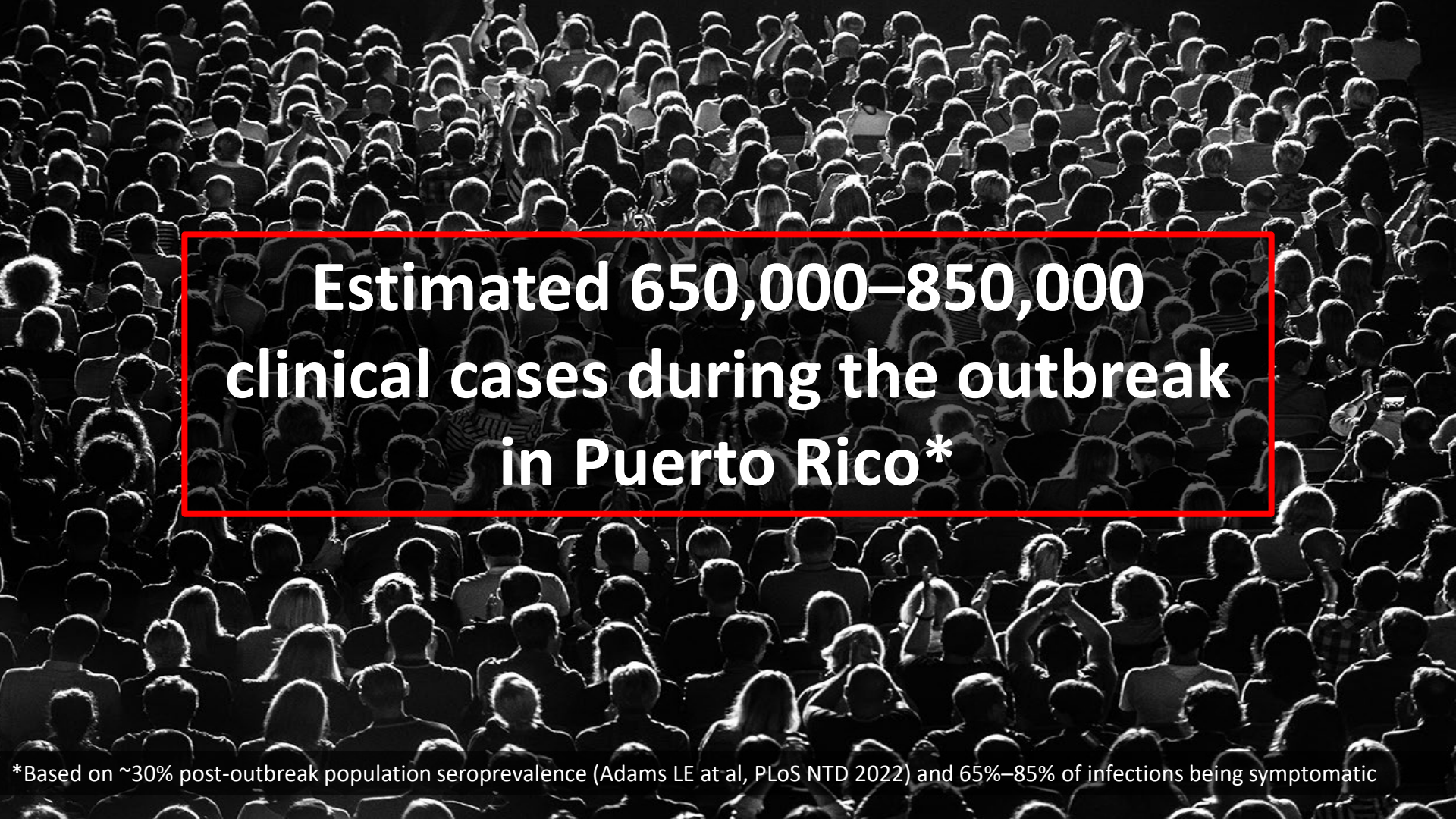
Reported chikungunya cases by month of illness onset, Puerto Rico, 2014–2015*



*Cases reported to Puerto Rico Department of Health

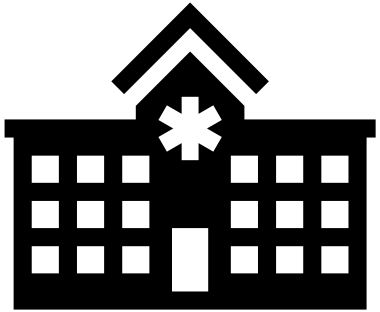
Reported chikungunya cases by year and case status, Puerto Rico, 2014–2020



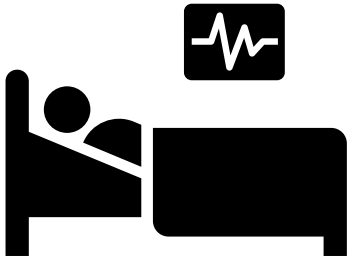


*Based on ~30% post-outbreak population seroprevalence (Adams LE at al, PLoS NTD 2022) and 65%–85% of infections being symptomatic

Estimated hospitalizations and deaths in chikungunya outbreak in Puerto Rico, 2014–2015



19,500–25,500 hospitalizations*



65-85 deaths#

*Based on 3% hospitalization rate

#Based on 0.01% case-fatality rate

Chikungunya in other U.S. territories and affiliated states*

- **Federated States of Micronesia (Yap State):** 2013–2014
- **USVI:** 2014–2015
- **American Samoa**: began June 2014
- **Marshall Islands**: began February 2015

*ACIP presentation, June 2024 (https://www.cdc.gov/acip/downloads/slides-2024-06-26-28/03-Chikungunya-Hills-508.pdf)

Summary: Is chikungunya of public health importance in U.S territories with risk of transmission?

1. Acute illness can be severe, hospitalizations can occur (particularly in vulnerable groups), and arthralgia can persist for months or years
2. Timing of next outbreak is unknown but is likely to evolve rapidly and might affect a substantial proportion of population
3. Outbreaks can impact health services through patient loads and staff absenteeism
4. No highly effective control measures exist apart from vaccination

Question: Is the problem of public health importance?

- ☐ No
- ☐ Probably no
- ☐ Probably yes
- ☐ Yes
- ☐ Varies
- ☐ Don’t know

Values and preferences

Values and preferences

1. **Target population perception of value**
   - Do potential vaccine recipients feel that the desirable effects are large relative to undesirable effects?

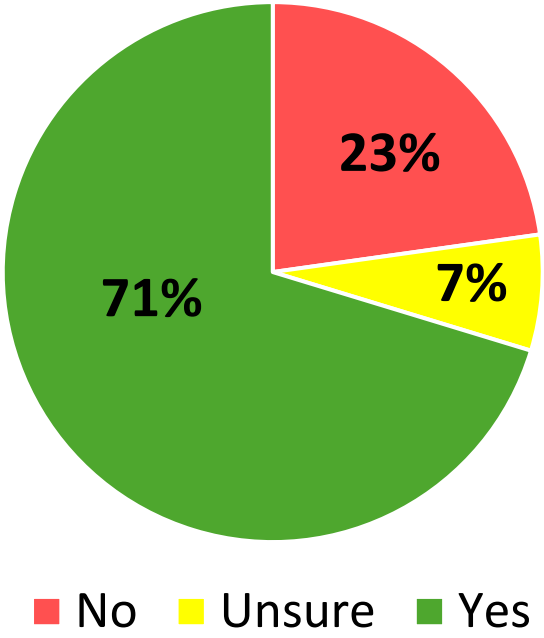
2. **Uncertainty around target population perception of value**
   - Is there important uncertainty about, or variability in, how much people value the main outcomes?

Value of a chikungunya vaccine for residents of Ponce, Puerto Rico: Study methods

- Data collected as part of larger study mosquito-borne disease study*
- Chikungunya component conducted in 2024, **~10 years after chikungunya outbreak** in Puerto Rico
- Included 2,437 individuals or caregivers aged 1–56 years
- Asked basic question about interest in vaccination with hypothetical chikungunya vaccine if free of charge or at ≤$10, and reasons if not interested or unsure

*Adams LE et al. PLoS Negl Trop Dis 2022

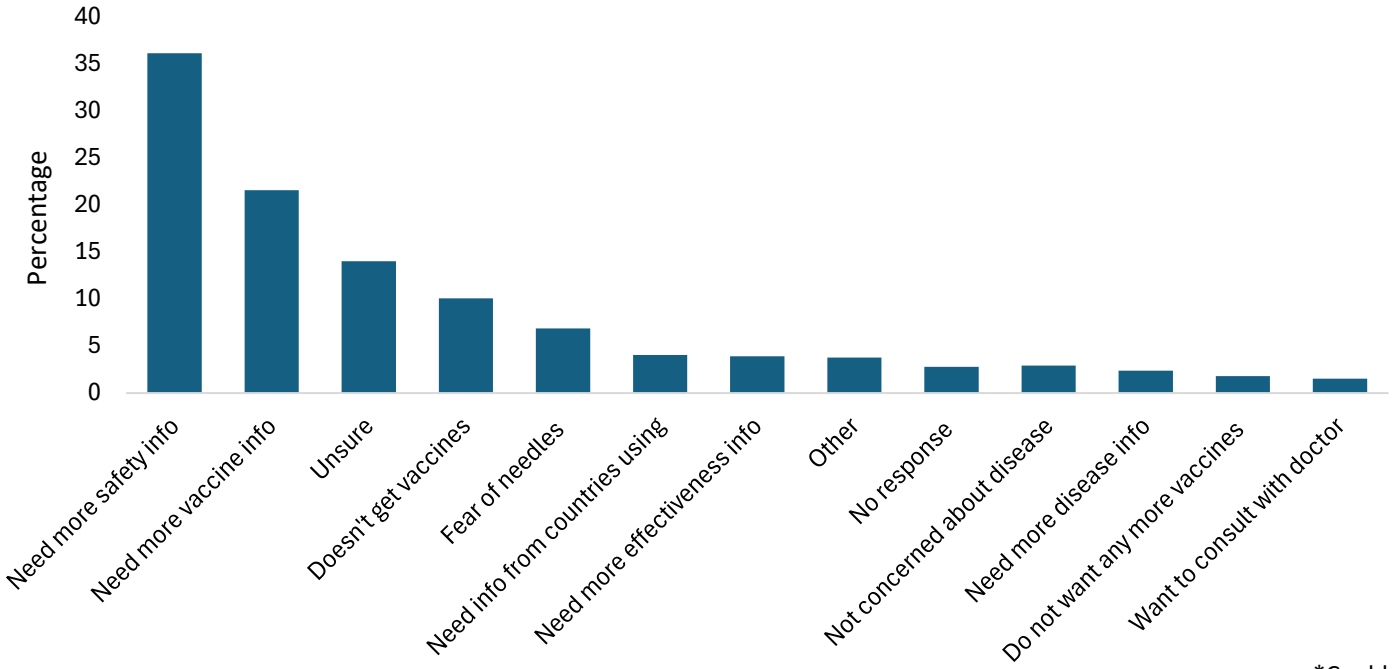
If there was an approved chikungunya vaccine available in Puerto Rico, free of charge or at low cost ($ 10 or less), would you get vaccinated (N=2,437)?



Participants who had completed at least some higher education or had no history of chikungunya more likely to respond "no" or "don't know"*

*Preliminary analyses

What are the reasons why you would not be interested or are not sure if you would be interested in getting vaccinated against chikungunya?*



*Could select ≥1 reason

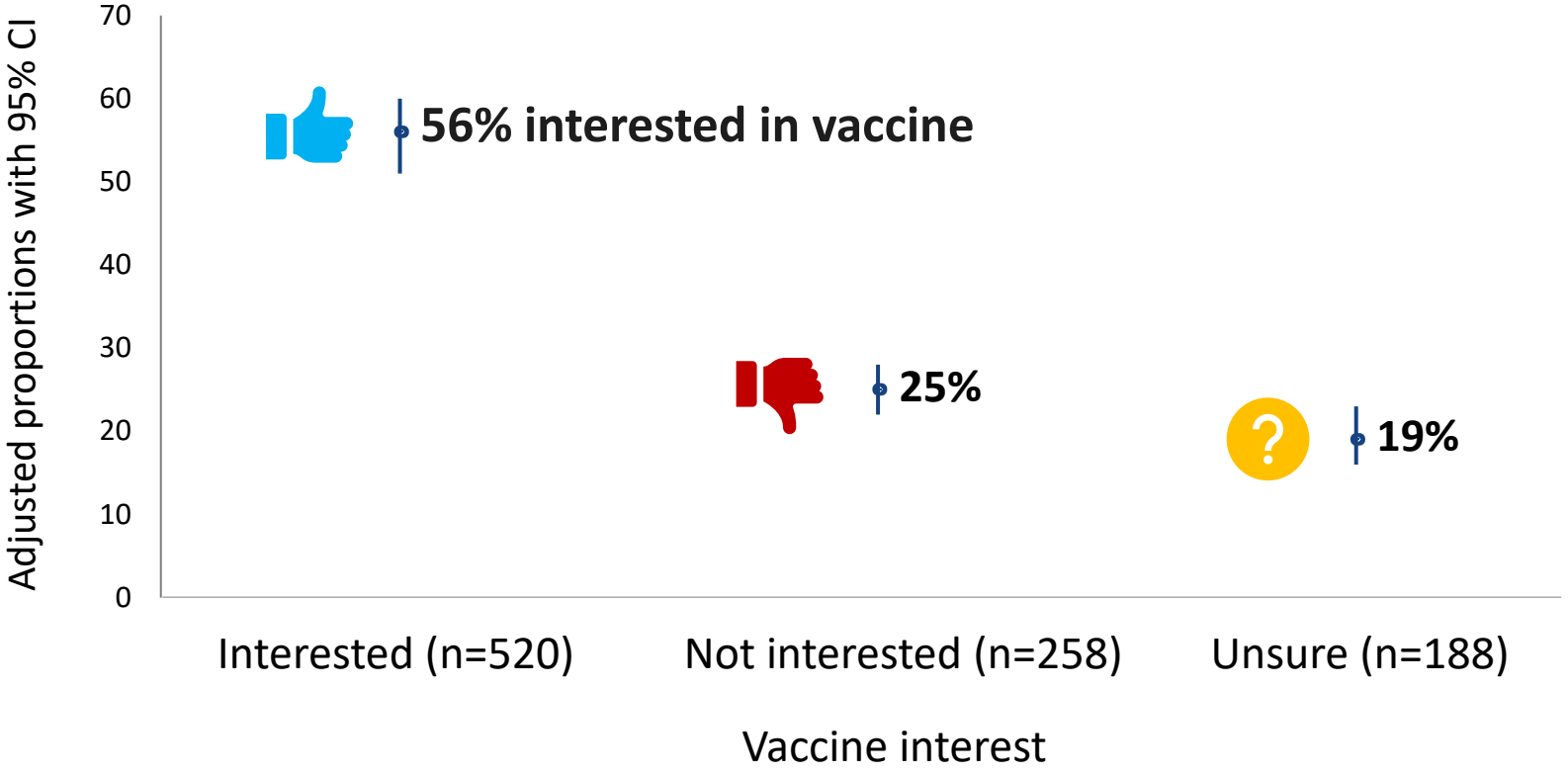
Value of chikungunya vaccine in United States Virgin Islands

- Part of larger population-based household study
- Conducted **soon after end of outbreak in June 2015**
- Included 966 participants aged 1–91 years
- Subjects or caregivers questioned about interest in receiving a hypothetical chikungunya vaccine
- Estimates calibrated to age and sex of USVI population

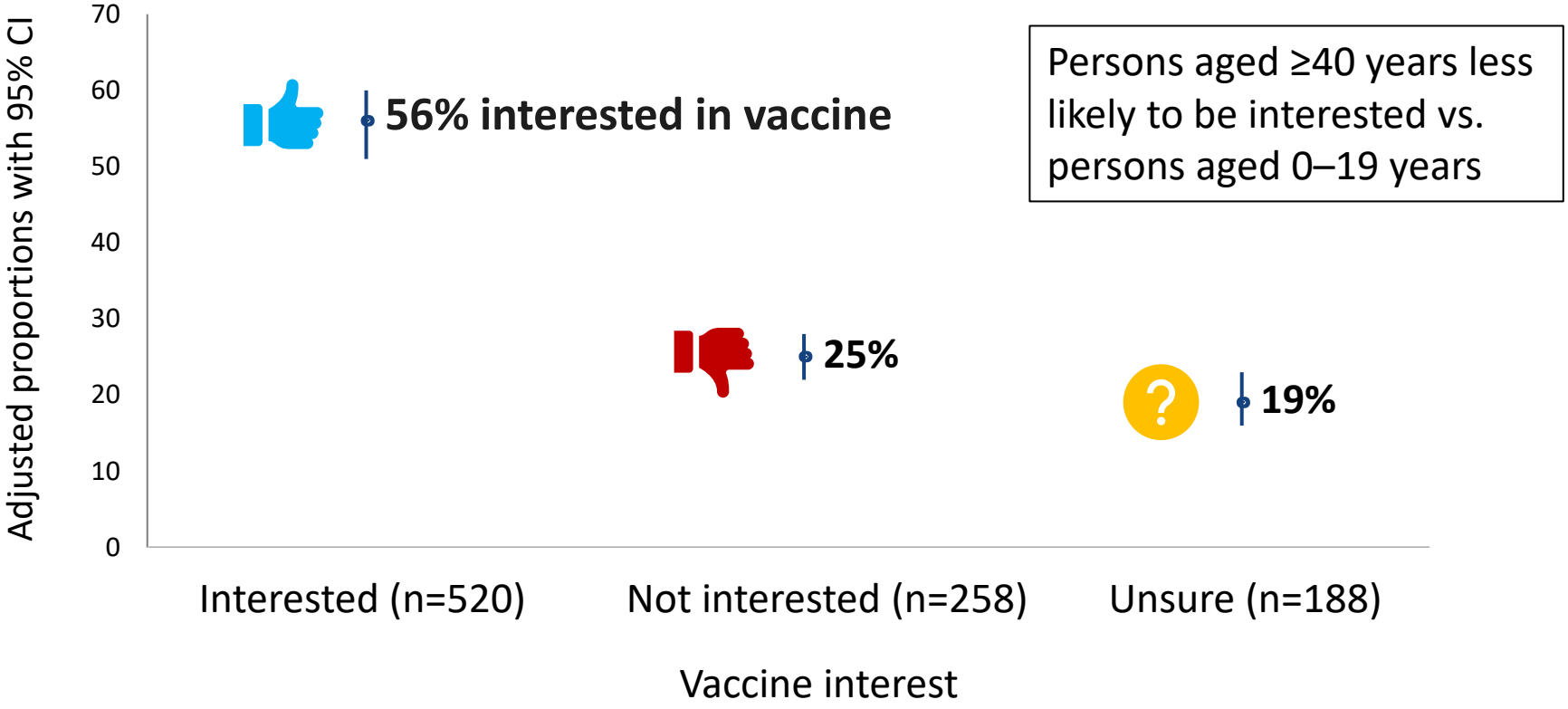
Population of 106,405 in 2010

Curren EJ et al. Am J Trop Med Hyg 2022

Vaccine interest among participants (adjusted proportion)



Vaccine interest among participants (adjusted proportion)



Persons aged ≥40 years less likely to be interested vs. persons aged 0–19 years

Reasons for potential lack of interest in vaccine among those not interested or uncertain about vaccination (N=446)

- Wanting more safety information: 47% (95% CI: 41–52%)
- Lack of concern for getting disease: 16% (95% CI: 13–20%)
- Already had chikungunya disease: 10% (95% CI: 7–13%)

Summary

- Majority of participants indicated interested in a hypothetical vaccine at time surveys implemented
  - Higher interest in Puerto Rico (71%) vs. USVI (56%) possibly influenced by timing of surveys in relation to outbreaks and general vaccine uptake differences in two territories
- For respondents potentially not interested in vaccine, key concern was needing a better understanding of vaccine safety
  - Will be important to provide resources and education on vaccine safety if chikungunya vaccine introduced

Question: Does the target population feel that the desirable effects of vaccination are large relative to undesirable effects?

- ☐ No
- ☐ Probably no
- ☐ Probably yes
- ☐ Yes
- ☐ Varies
- ☐ Don’t know

Question: Is there important uncertainty about or variability in how much people value the main outcomes?

- ☐ Important uncertainty or variability
- ☐ Probably not important uncertainty or variability
- ☐ No important uncertainty or variability
- ☐ No known undesirable outcomes

Update on safety of live attenuated chikungunya vaccine in older persons

Serious adverse events in older persons

- **Status as of April 2025 ACIP meeting**
  - 6 serious adverse events (SAEs) occurred in US persons aged ≥65 years during 2024*
  - Discussed at ACIP meeting on April 16 and CDC determined age ≥65 years is precaution to vaccination with live attenuated chikungunya vaccine

- **Updates since April 2025 ACIP meeting**
  - In the 3 weeks following ACIP meeting, 11 additional SAEs reported internationally in persons aged 62–89 years, most with underlying medical conditions[#]
  - European Medicines Agency recommended temporary pause in vaccine use in ages ≥65 years (May 7)
  - FDA and CDC recommended temporary pause in the live, attenuated vaccine use in ages ≥60 years to allow investigations of reports (May 9)[¥]
  - Awaiting outcome of FDA investigations

*Reported through Vaccine Adverse Events Reporting System (VAERS) [#]Mainly from Reunion where large outbreak occurring

[¥]FDA and CDC Recommend Pause in Use of Ixchiq (Chikungunya Vaccine, Live) in Individuals 60 Years of Age and Older While Postmarketing Safety Reports are Investigated | FDA

Acknowledgements

ACIP Chikungunya Vaccines Work Group

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- Erin Staples

Dengue Branch, CDC

- Laura Adams

For more information, contact CDC
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