

# **West Nile Virus**

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West Nile Virus Workshop

December 9, 2004

# Panel Members

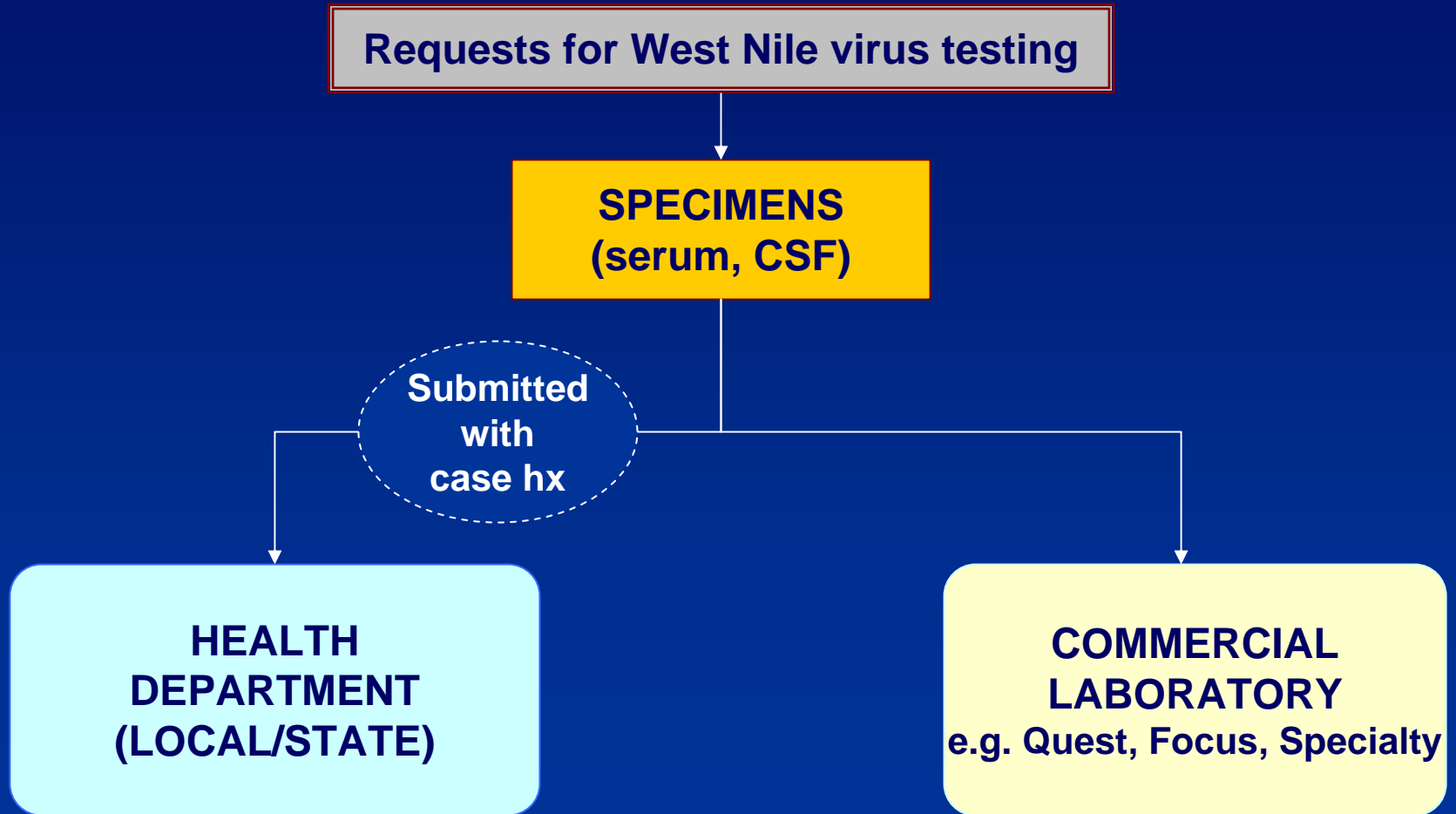
- Rachel Civen, MD, MPH
  - Los Angeles County
- Eric Frykman, MD, MPH
  - San Bernardino County
- Carol Glaser, DVM, MPVM, MD
  - DHS Viral and Rickettsial Disease Laboratory
- Cynthia Jean, MPH
  - DHS Viral and Rickettsial Disease Laboratory
- Anne Kjemtrup, DVM, MPVM, PhD
  - DHS Vector-Borne Disease Section

# Presentation Outline

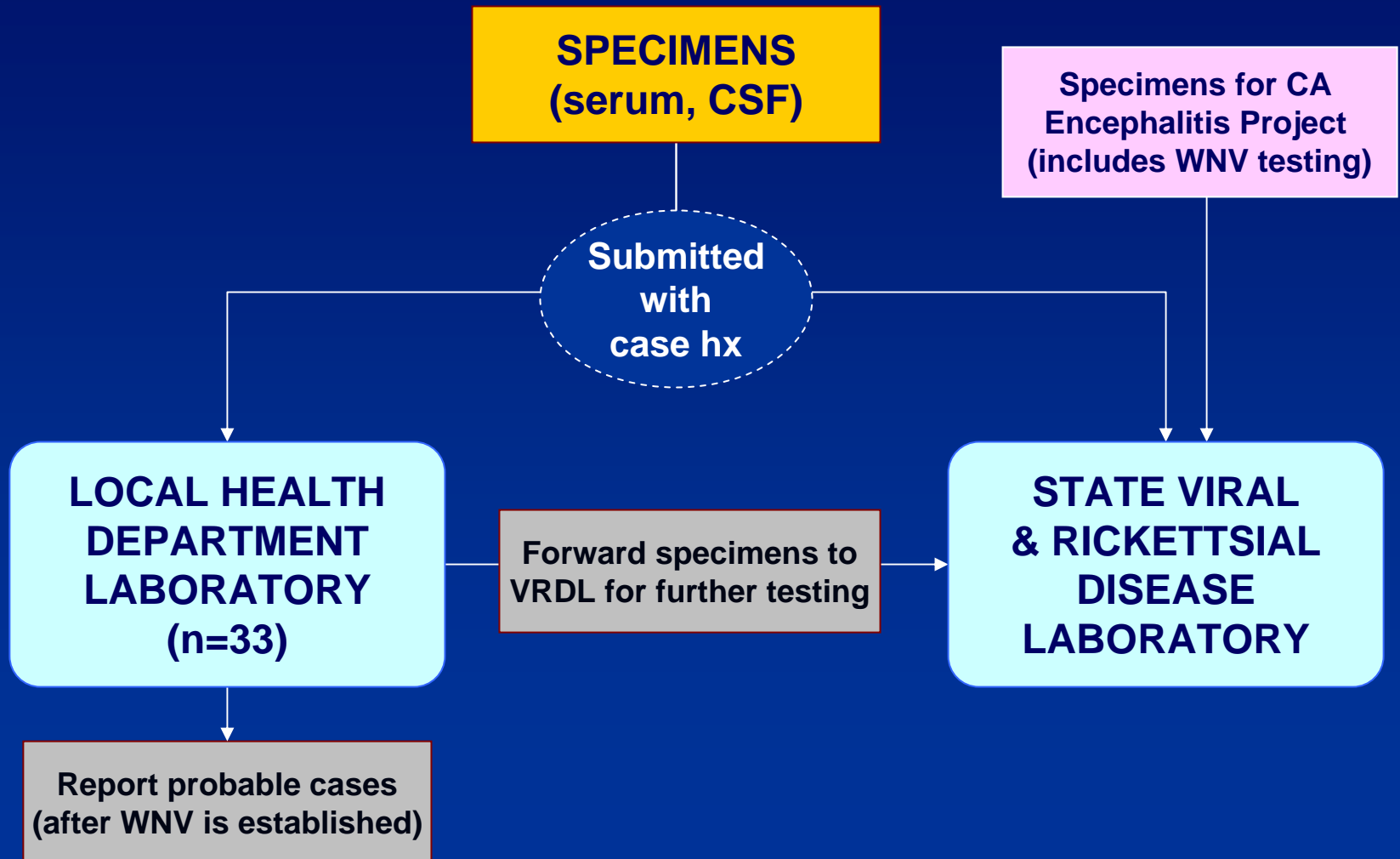
- Human cases in 2004
  - Summary of testing and reporting process for regional laboratory network (public health labs and Kaiser) and commercial laboratories
  - Expectations for California -- 2004
  - National and State numbers
- Issues for 2005
  - WNV being made reportable
  - Communication between LHDs and vector control agencies
  - Inconsistent numbers State vs County
  - Surveillance and clinical issues

# **Background: Testing and Reporting of Human West Nile Virus Cases**

# WNV Testing Algorithm



# WNV Testing - Public Health Labs



# West Nile Case History Form

This **case history form** is required for testing (specimens will not be tested without this form)!

Specimens submitted via public health laboratories must meet the criteria for West Nile virus testing.  
(See "Diagnostic Testing Guidelines for West Nile virus")

## Patient Information:

Last name \_\_\_\_\_ First name \_\_\_\_\_ DOB \_\_\_\_/\_\_\_\_/\_\_\_\_ Medical Record # \_\_\_\_\_

Street Address: \_\_\_\_\_ City \_\_\_\_\_ Zip Code \_\_\_\_\_ Occupation \_\_\_\_\_

## Physician Information Mandatory

Name: \_\_\_\_\_ Facility: \_\_\_\_\_

Pager: \_\_\_\_\_ Fax: \_\_\_\_\_ Email: \_\_\_\_\_

**Race:** ☐ White ☐ Black ☐ Native American  
☐ Asian/Pacific Islander ☐ Other ☐ Unknown

**Date of 1st symptom(s):** \_\_\_\_/\_\_\_\_/\_\_\_\_

☐ Hospitalized **or** ☐ ER /Outpatient

**Date of admit:** \_\_\_\_/\_\_\_\_/\_\_\_\_

Do the following apply anytime during current illness:

In ICU ☐ No ☐ Yes

Fever  $\geq 38^{\circ}$  ☐ No ☐ Yes

Headache ☐ No ☐ Yes

Rash ☐ No ☐ Yes

Stiff neck ☐ No ☐ Yes

Muscle Weakness ☐ No ☐ Yes

Altered Consciousness ☐ No ☐ Yes

Encephalitis ☐ No ☐ Yes

Aseptic Meningitis ☐ No ☐ Yes

**Ethnicity:** ☐ Hispanic ☐ Non-hispanic

**Sex:** ☐ Female ☐ Male

**Exposures within 4 wks of onset** (specify details):

Mosquito bites/exposure: ☐ No ☐ Yes

Outdoor activity (camping, hiking, etc) ☐ No ☐ Yes

Received Blood Transfusion: ☐ No ☐ Yes

**Date:** \_\_\_\_\_

**Travel within 4 wks of onset**

(specify location, dates):

Within California (out of local area) ☐ No ☐ Yes

Within the United States? ☐ No ☐ Yes

Outside of the United States? ☐ No ☐ Yes

Ever traveled outside the US? ☐ No ☐ Yes

# Testing for WNV

In public health laboratories:

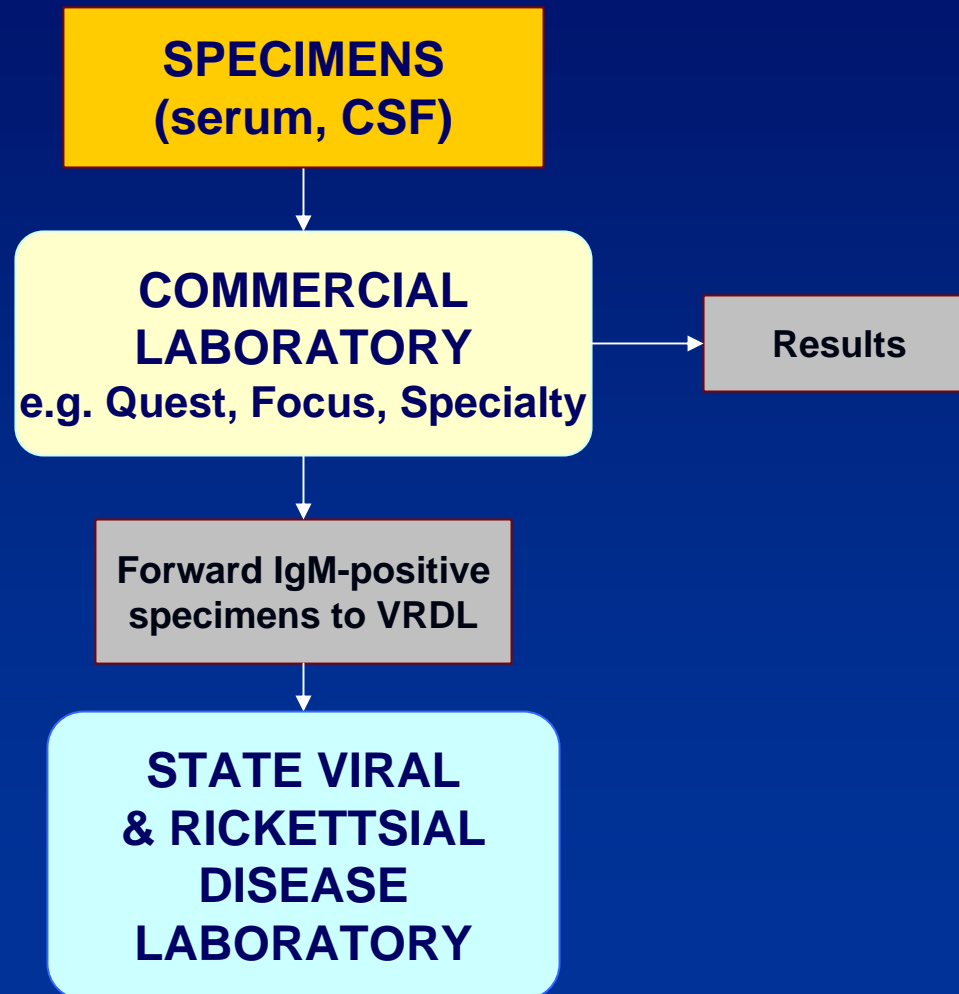
- Preliminary positives - need two of the following different assays positive:
  - EIA IgM positive
  - EIA IgG positive
  - IFA IgM positive
- Confirmation
  - PRNT test: takes ~1-2 weeks



# Turnaround Time (VRDL)

- Time from receipt of specimen → report back to county:
  - Positives:
    - Preliminary, straightforward result: 1-3 days
    - Preliminary indeterminate: indefinite
    - Confirmation (first positives in county): ~2 weeks
    - For press reports-we went with preliminary positives
  - First positive in a county: called health officer & laboratory director; after first 10 or so cases: email distribution list generated
  - Negatives: 3-5 days : usually via email

# WNV Testing - Commercial Labs



# Notes: Commercial Lab Testing

- Commercial labs receive specimens from many different states
- Laboratories often get
  - Name of patient
  - Date of birth
  - Ordering clinician OR the laboratory where specimen came from (e.g hospital or clinic name)
  - County of residence not usually specified—this information can be obtained but takes some back-tracking
  - No clinical information: encephalitis vs meningitis vs fever vs asymptomatic
  - VERY limited information on case available to lab

# Commercial Laboratory WNV Testing

- Agreement made with Quest, Focus and Specialty laboratories in 2004 for positive WN specimens to be sent to VRDL
- Often batched, sometimes weeks after initial testing
  - With following info;
    - Name
    - Gender
    - Date of birth or age
    - Sometimes but not always:
      - address, county of residence or
      - Clinician
- Voluntary on the part of the commercial lab

# Collaboration with Kaiser

- Kaiser Regional laboratories testing for West Nile IgM
  - Agreement to send any positives to VRDL for additional testing

# How much testing was there for WNV in CA in 2004?

- 33 local public health laboratories performed WNV testing: >2500 specimens (~1500 individuals)
- VRDL : 1750 individuals tested at VRDL (overlap with above)
- Commercial labs tested 'a few thousand' (estimate)
  - >200 specimens received by VRDL from commercial laboratories
- Kaiser South tested 2000+ individuals
- Kaiser North tested ~140 individuals

# Human cases 2004

# **Colorado was the ‘epicenter’ in 2003...**

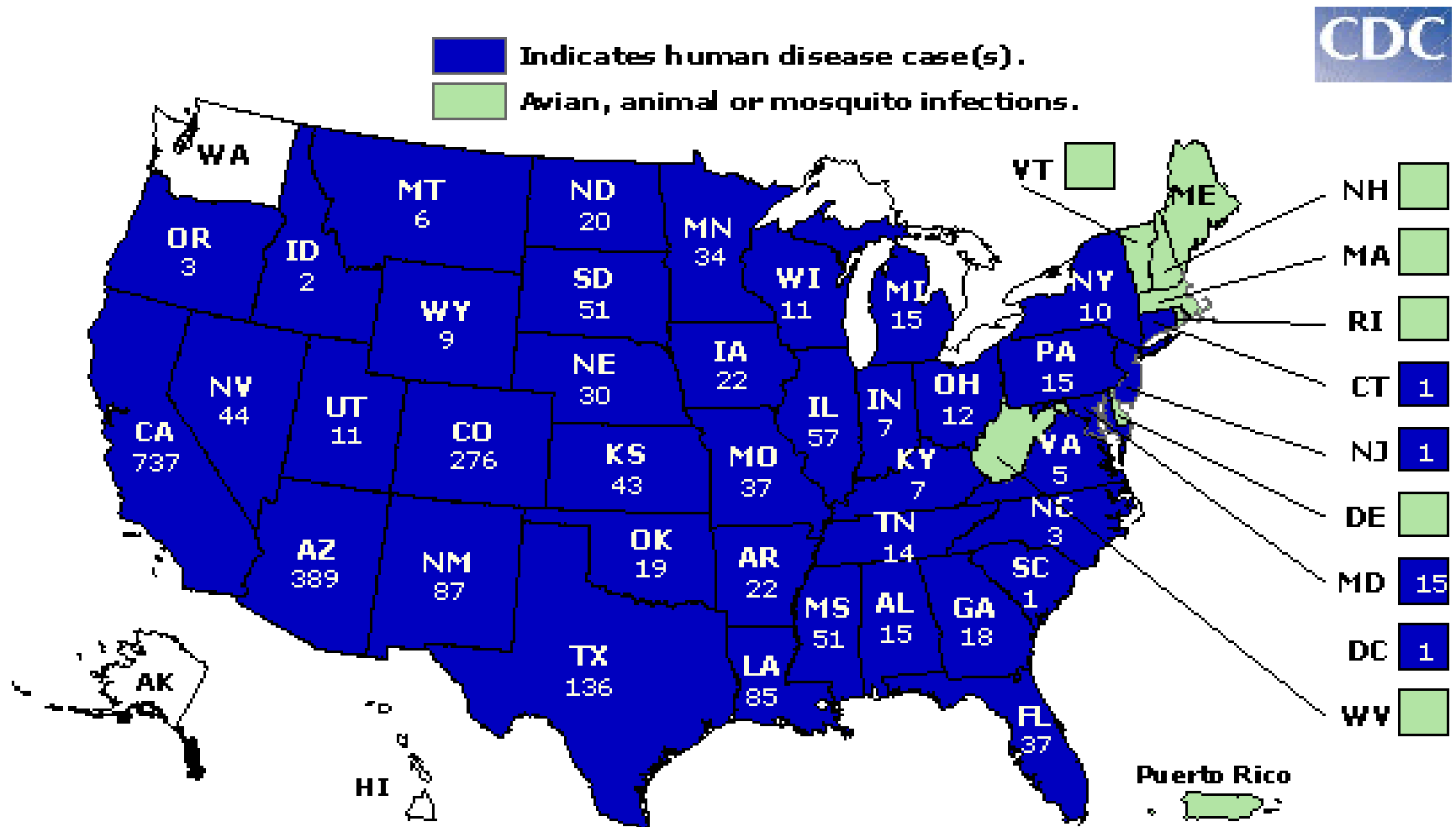
## **Prediction: California would be the epi-center in 2004**

- Colorado had : 2947 cases, 63 deaths
- Colorado population: 4.3 million residents
- California population: 35 million residents
- “projecting for our population”:  
~24,000 cases, ~500 deaths

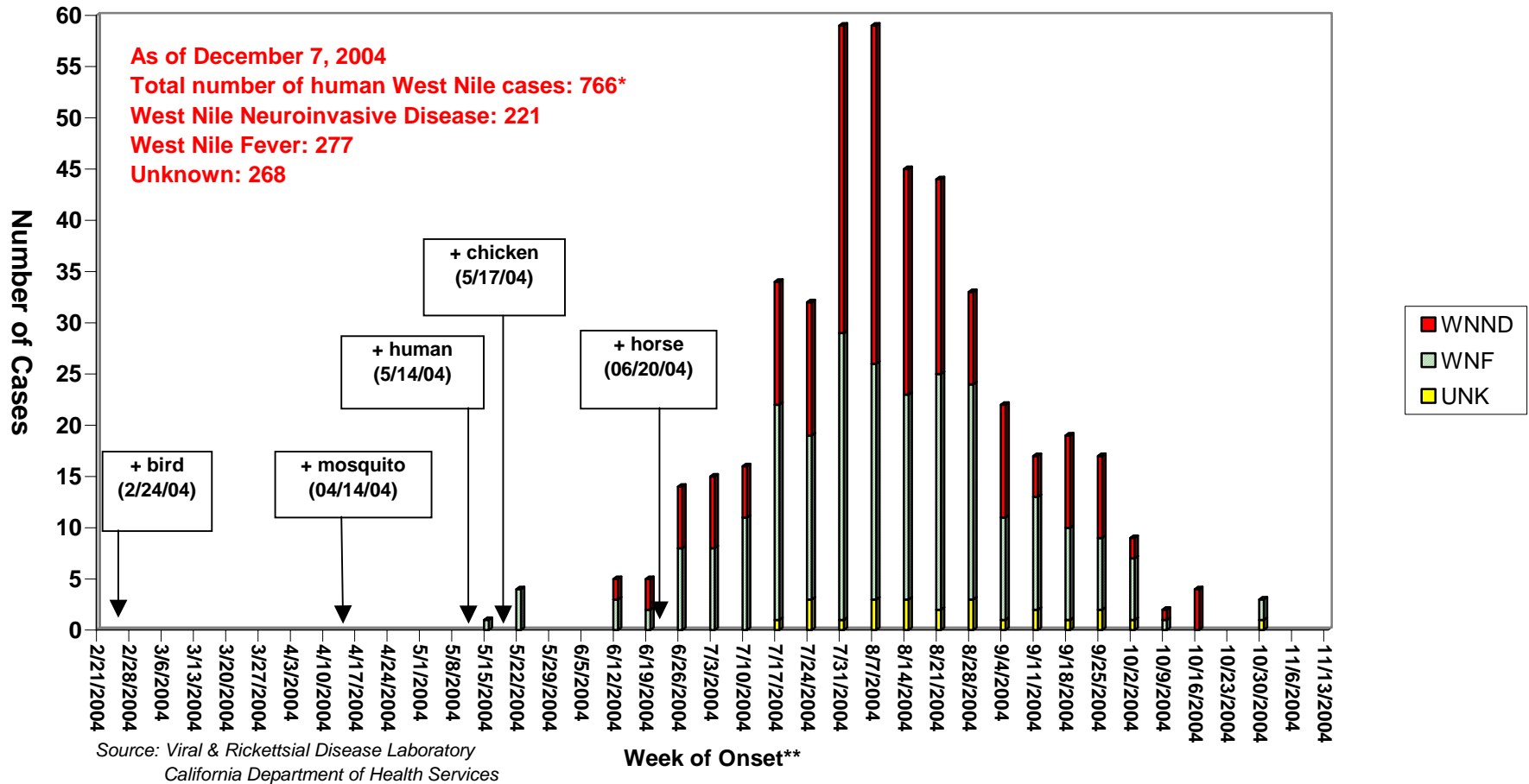


# As of November 30, 2004

## n=2359 cases



## Human West Nile Virus Cases California, 2004



\* Onset dates not available for all patients

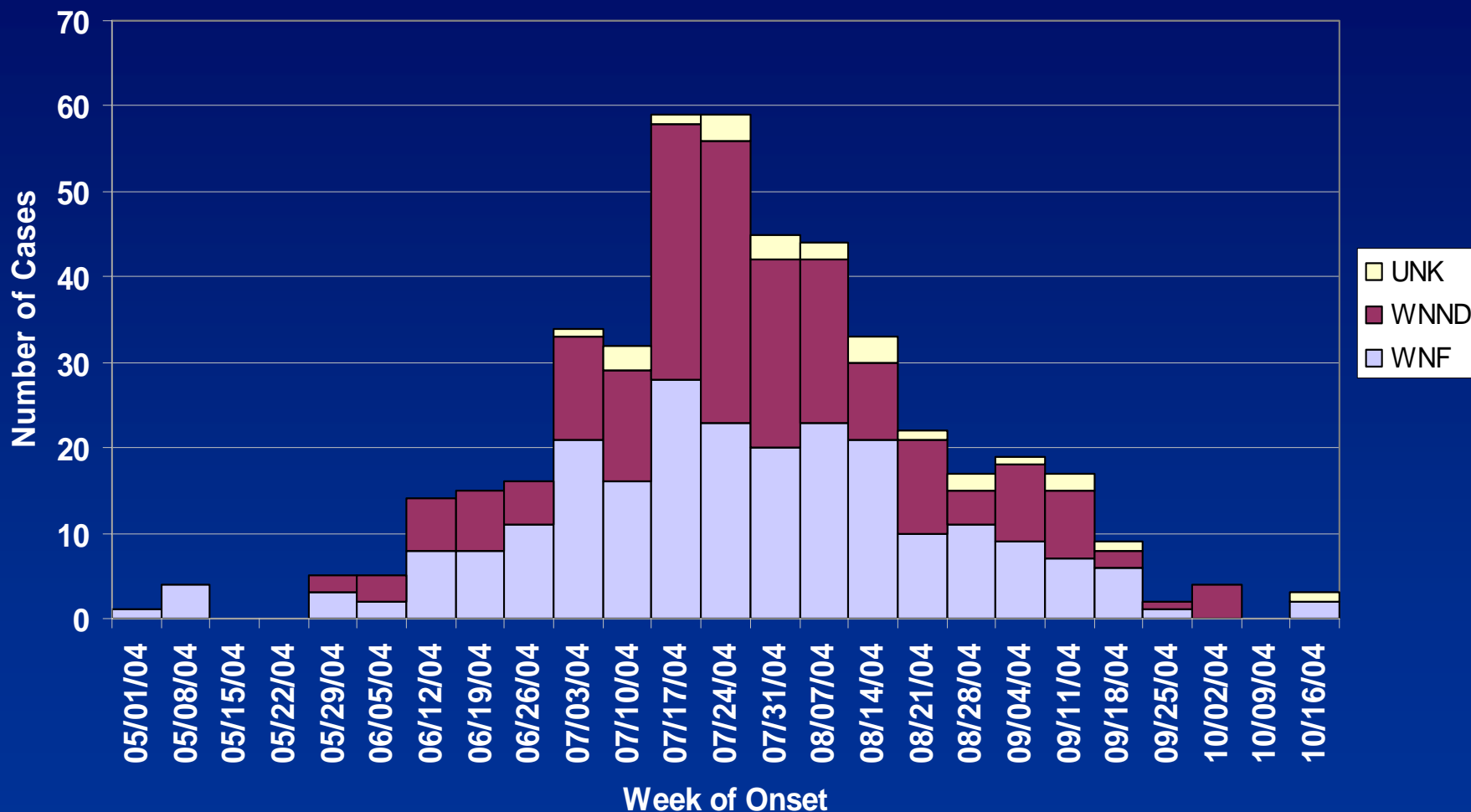
\*\* Birds: date of collection; Mosquitos: date of collection; Chickens: date of probable seroconversion

# West Nile Virus - California, 2004

As of December 7, 2004:

- 819 human infections from 23 counties
  - 66 from blood banks → 13 developed symptoms
- 766 symptomatic cases
  - 277 West Nile fever (WNF)
  - 221 West Nile neuroinvasive disease (WNND)
  - **268 unknown clinical presentation → 70% of these are specimens from commercial labs**
- 25 fatalities

# Human WNV Cases, California, 2004\* (n=459\*\*)



\* As of December 7, 2004

\*\* Onset dates not available for all patients

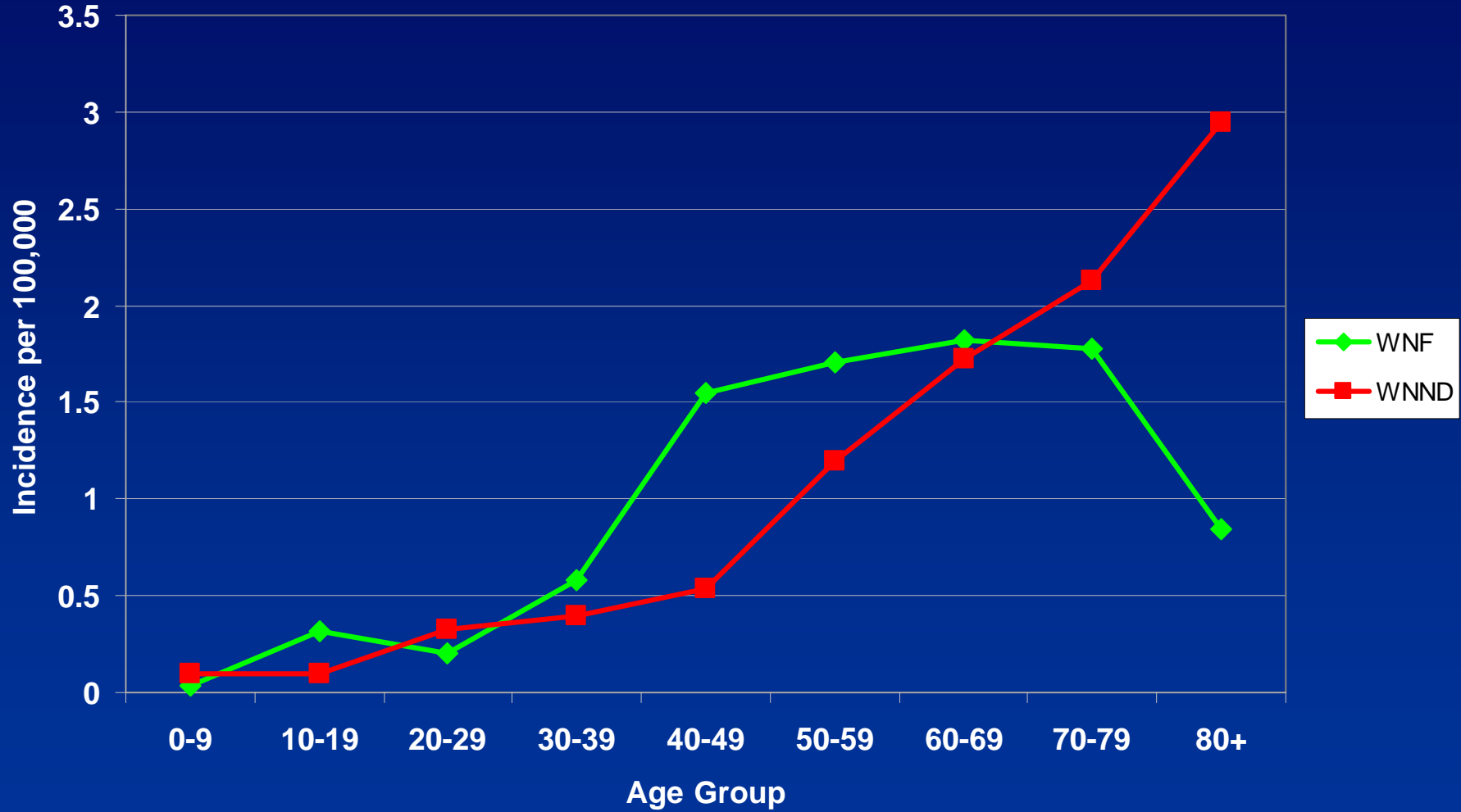
# West Nile Virus - California, 2004

- Of the 766 symptomatic cases:
  - 62% male
  - Median age all cases = 52 years (range: 2-94)
  - Median age WNND = 58.5 years (range: 4-91)
  - Median age WNF = 49 years (range: 7-89)
- Of the 25 WNV-associated fatalities:
  - Median age = 76 years (range: 57-91)

# Pediatric (<18 yrs) Cases, 2004

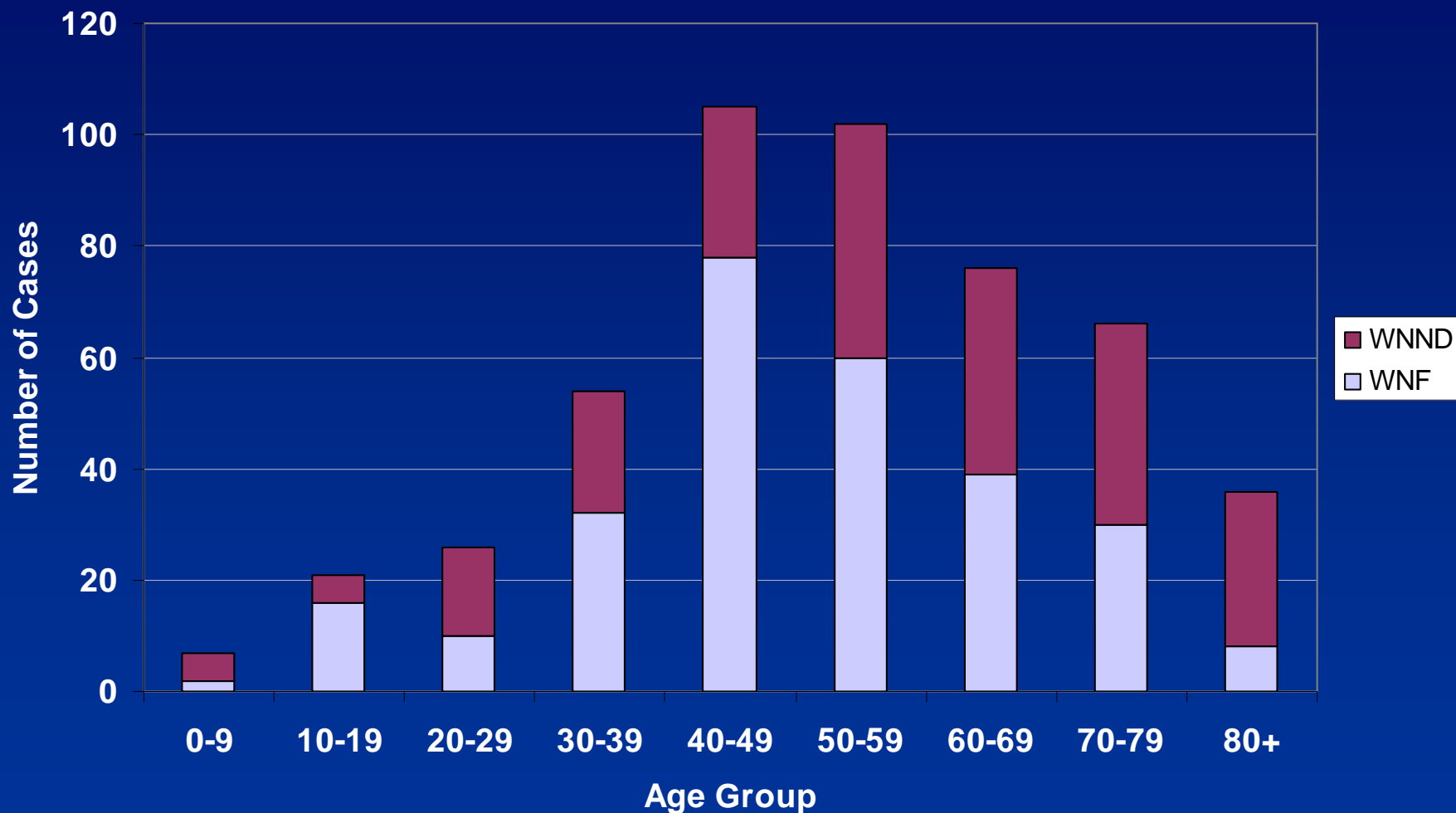
- 386 tested
- 27 WNV-positive cases
- 26 with available clinical data
  - 15 with West Nile fever
  - 11 with neuroinvasive disease

# Human WNV Incidence, by Age Group and Clinical Category California, 2004\* (n=493)



\* As of December 7, 2004

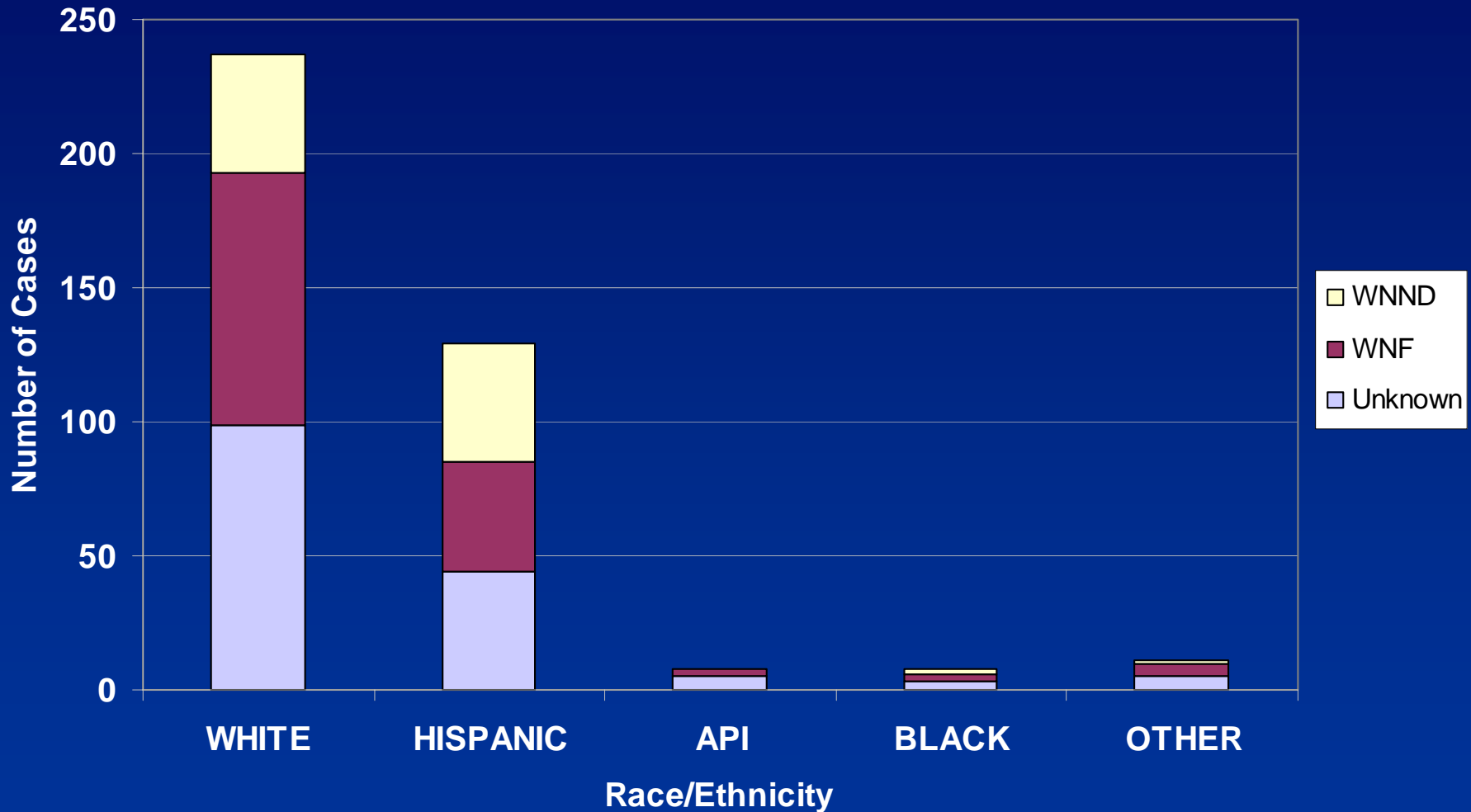
# Human WNV Cases by Age Group and Clinical Category California, 2004\* (n=493)



\* As of December 7, 2004



# Human WNV Cases by Race/Ethnicity and Clinical Category California, 2004\* (n=393)



\* As of December 7, 2004

# 2005 Issues

# West Nile virus becomes 'reportable' in 2005

- By clinician
- By laboratory
- How will that change things?
  - Probably will help but will still have problems:
    - Clinicians are notoriously bad at reporting (estimates are that only ~10% diseases reported)
    - Laboratory reporting generally works well but if the commercial laboratories don't have complete data, e.g. county of residence, clinical information, etc inherent delays
- Solutions?

# Communication Issues for 2005

- Inconsistencies between State and county-reported line listing of human cases--how to fix?
  - Ask counties to use State ID as well as county ID (e.g. San Bernardino)
  - Website: updated twice/week, probably not do-able more often
  - Blood bank data used by State, inconsistently used by county, will ask for consistency

# Communication Issues for 2005

- Telecons in 2004 went well
- In 2005:
  - Health officers and Communicable disease officers ~ every 2 weeks
  - Laboratory Directors/staff ~ every 2 weeks
  - Vector Control Districts ~every 2 weeks

# Communication Issues for 2005

- Information from LHD to Vector control agency:
  - Ensure Vector control given complete information from LHD
    - Need to know where this is a problem
    - LAC/SB, please comment
    - Need to ensure confidentiality of information—not to press
- What information to give to the press?
  - Developed ‘guidelines’ for how much info to give based on size of county and circumstances of the case

# Laboratory Issues for 2005

- Local public health laboratories will continue to test human cases as in 2004
- VRDL will not request serum from commercial laboratories to retest
  - Agreement in 2004 >95%
  - Problems were more with interpretation at clinician and local level—need to educate
  - develop guidelines for counties for positive/negative

# Surveillance issues for 2005

- What to count, track and compare
  - Neuroinvasive
    - Encephalitis
    - Meningitis
    - Acute flaccid paralysis
  - These numbers are probably fairly reliable...almost all neuroinvasive cases seen by clinician, most clinicians probably test and +/- whether reported
  - These cases are probably most reliable for comparison of year to year trends
  - First several years CDC tracked primarily neuroinvasive disease cases



# Surveillance issues for 2005

- West Nile fever cases—how valuable is this data?
- We know it is only a sampling of the cases...but what proportion?
  - inconsistent visits to health care provider
  - inconsistent testing
  - these cases more likely to be falsely negative early on
  - inconsistent reporting
- Will continue to test but recognize limitations of these data
- Blood bank data

# Surveillance issue for 2005

- When to call a death a "WNV-associated death"
  - Instances where a patient is WNV positive and death occurs but the two not necessarily related
  - Reviewing the 25 deaths related to WNV for last season and will develop guidelines

# Clinical Issues for 2004/2005

- Follow-up studies:
  - Neuroinvasive diseases: 3, 6, 12 month followup
  - West Nile fever: 3 month follow-up
- Clinical trials
  - 3 different randomized trials for WNV treatments, very poor enrollment