

# *Changes in Circulating Enterovirus Serotypes in the United States, 2001*

Andy Mullins, DVM, MPH, DACVPM

Respiratory and Enteric Viruses Branch

Centers for Disease Control and Prevention

# *Overview*

- Enterovirus surveillance
- Enterovirus activity, USA - 2001
  - Echovirus 13
  - Echovirus 18
- Discussion
- Summary

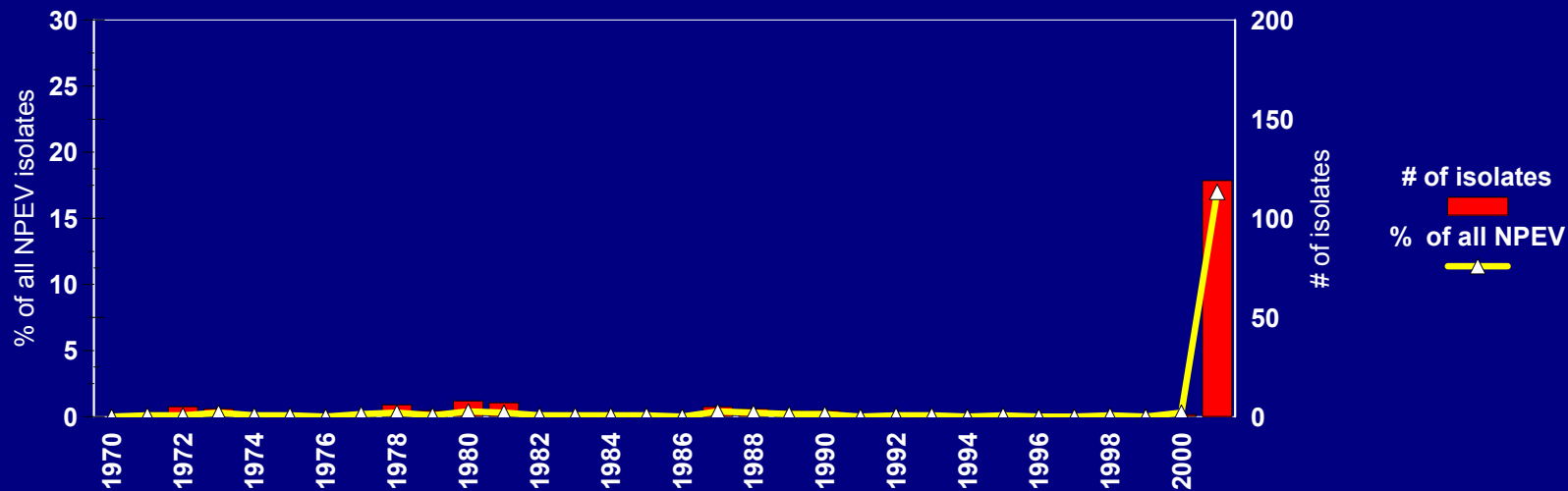
# *Enterovirus Surveillance*

- National Enterovirus Surveillance System, CDC
  - Voluntary reporting by state labs
  - Participation declining over last decade
- Specimens submitted to CDC lab
- Private diagnostic laboratories
- Enterovirus surveillance by Viropharma, Inc.
  - Manufacturer of Pleconaril (anti-enterovirus drug)
  - Voluntary reporting by state labs

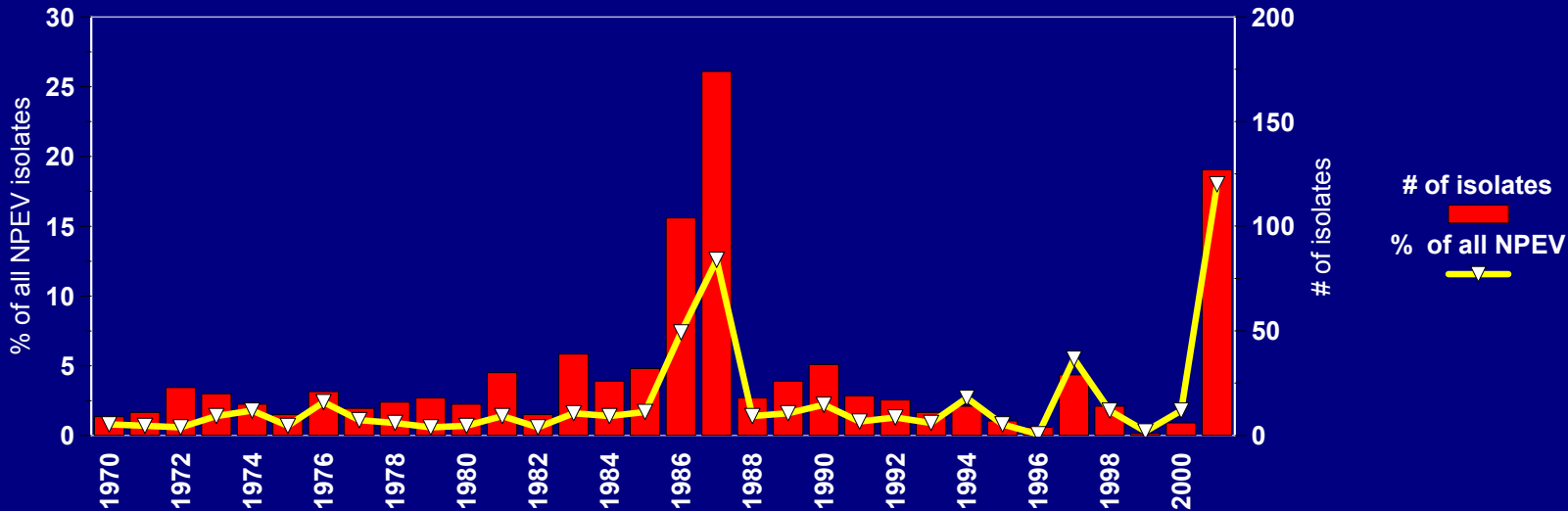
## *Enterovirus Activity, USA - 2001*

- Echoviruses 13 and 18 predominant serotypes
  - Echo 13 – widespread circulation for first time
  - Echo 18 – current increase exceeds previous reports
- Both implicated in several aseptic meningitis outbreaks

## Echovirus 13 isolations in the USA, 1970-2001



## Echovirus 18 isolations in the USA, 1970-2001



## *Echovirus 13*

- First isolated in 1953
- Prior to 2000
  - Very rarely encountered (65 of > 47,000 isolates)
  - No outbreaks described
- Since 2000
  - Sudden increase in global circulation (England/Wales, Ireland, Germany, Australia)
  - Associated with aseptic meningitis outbreaks

## *Echovirus 18*

- First isolated in 1958
- Prior to 2000
  - Fairly uncommon isolate (786 of > 47,000 isolates)
  - Outbreaks in Japan, USA, Sweden in 1970s, 1980s
  - Common isolate in 1986, 1987 in US
  - Resurgence in activity seen in late 1990s

# *Echovirus 13*

## *2001*

Detected in 24 states

- CDC – 119 isolates (17%) from 16 states
- Viropharma – 220 isolates (21%) from 12 states
- Contributed to at least 5 outbreaks of aseptic meningitis (TN, MS, LA, MT, MD)

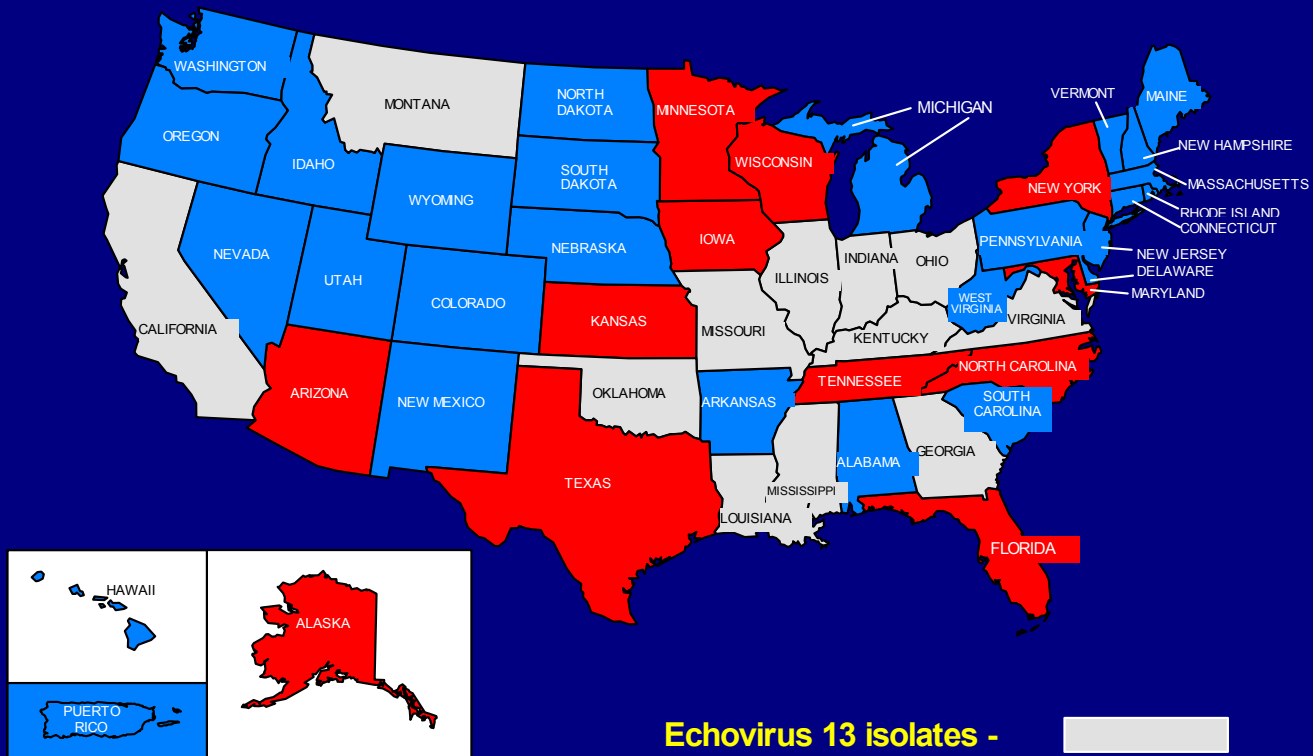
# *Echovirus 18*




## *2001*

Detected in 12 states

- CDC – 128 isolates (18%) from 7 states
- Viropharma – 289 isolates (27%) from 9 states
- Contributed to at least 3 aseptic meningitis outbreaks (TN, AK, MD)

# Isolations of Echovirus Type 13 and 18 by State, United States, 2001

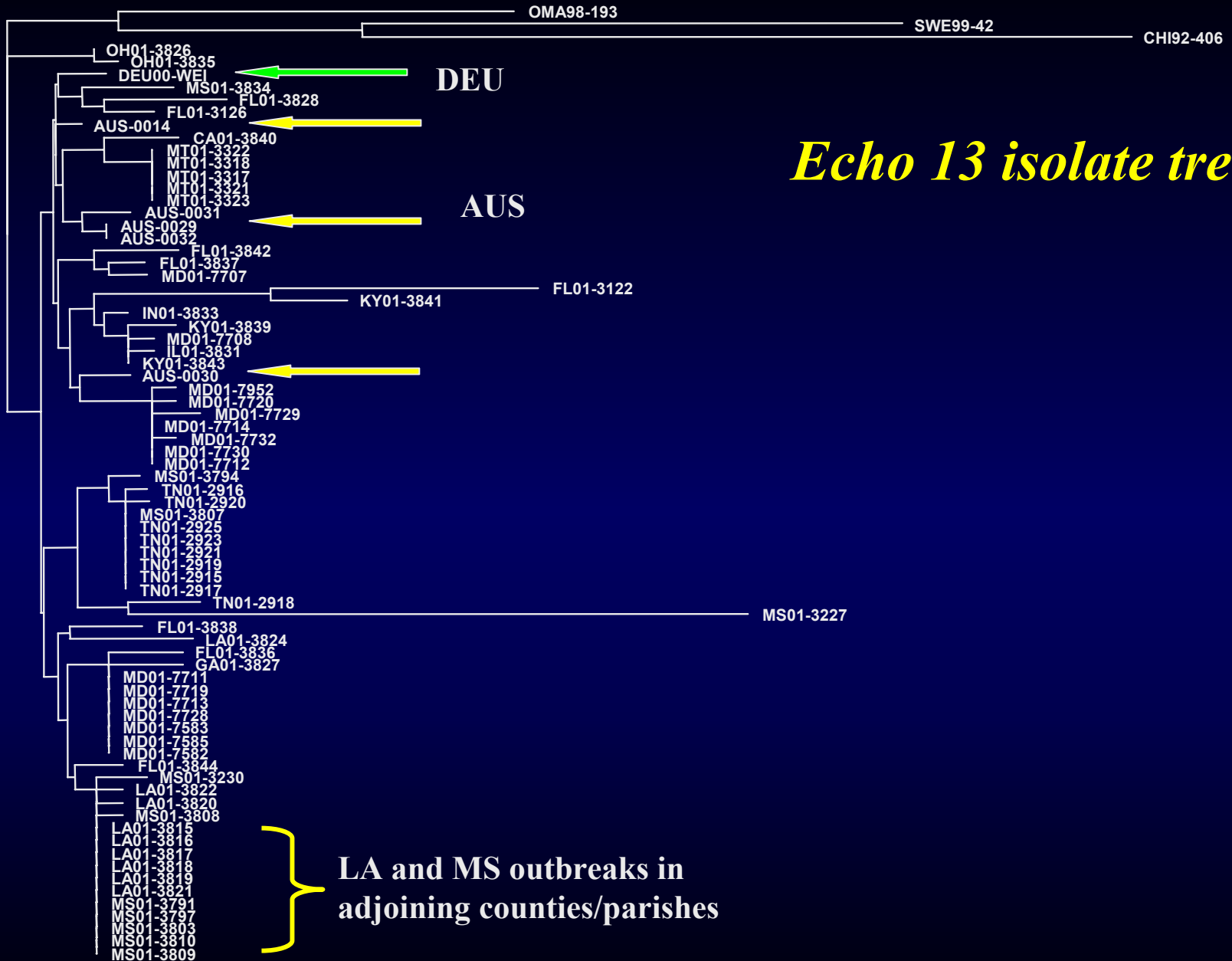


Echovirus 13 isolates -   
Both echovirus 13 & 18 -   
No echo 13 or 18 isolated - 



10% genetic change

1% genetic change



# *Discussion*

- Predominant serotypes change over time
  - Changes in reporting laboratories
  - Ability to identify serotypes
  - Serotype predilection for causing clinical disease
  - Epidemic vs. endemic circulation
- Increased morbidity from changing serotypes undetermined
  - Background rates of disease unavailable
  - Only test those seeking medical care
  - Susceptible population, more clinical disease?
  - Change in serotype genetics

# *Summary*

- Emergence of echovirus 13, re-emergence of echovirus 18 as predominant serotypes in 2001
- Responsible for several aseptic meningitis outbreaks
- Reasons for current increase in circulation unclear
- Enterovirus surveillance important
  - More accurately identify circulating serotypes
  - Identify serotypes implicated in outbreaks

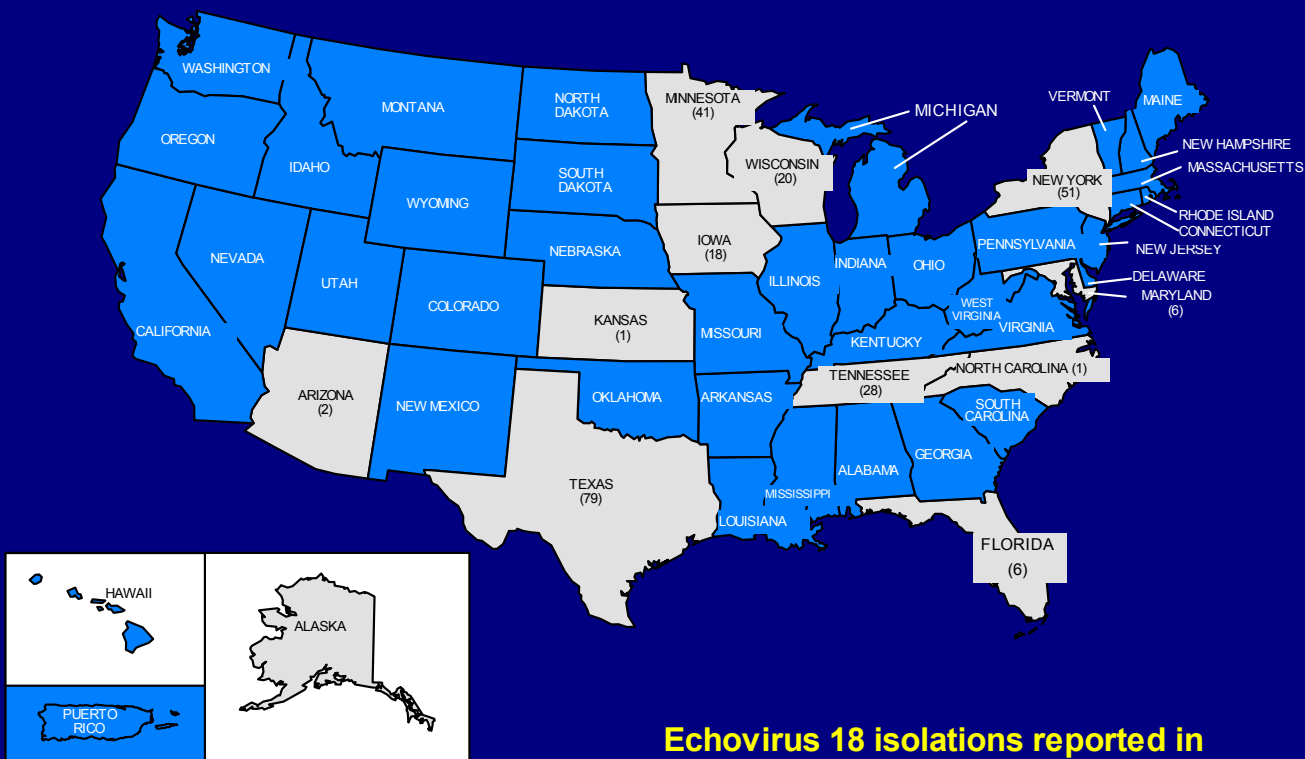
# *Acknowledgements*

- CDC enterovirus laboratory
  - Allan Nix
  - Mary Flemister
- EIS officers
  - Kathleen Julian, CDC - Ft. Collins
  - David Kirschke, Tennessee
  - Joe McLaughlin, Alaska
  - Sally Slavinski, Mississippi
- State and local health departments
- State public health labs
- Viropharma, Inc.

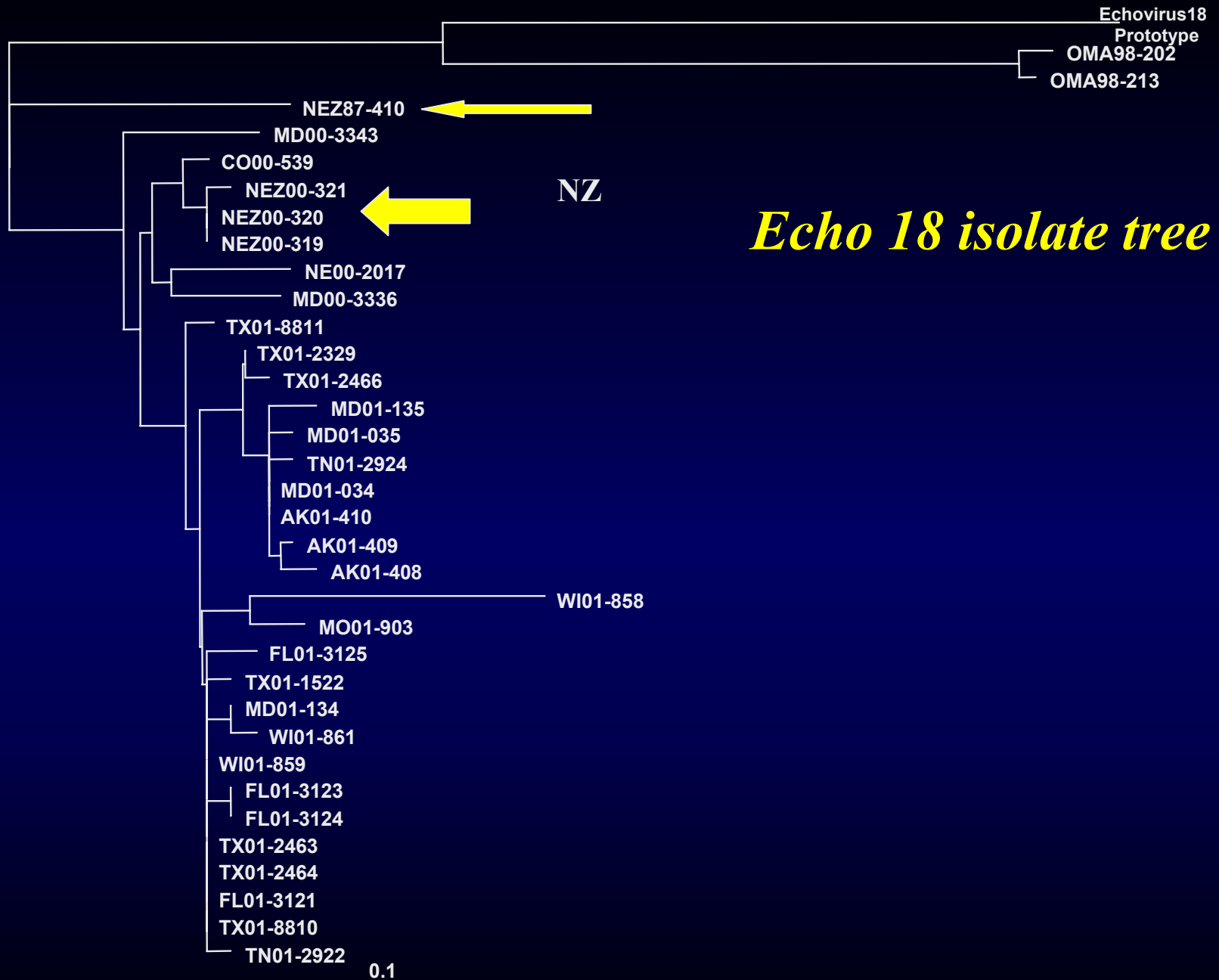


*Back up slides*

# Isolations of Echovirus Type 18 by State, United States, 2001



Echovirus 18 isolations reported in 12 states





# Summary of Outbreaks of Aseptic Meningitis, USA, 2001

State	Setting	Cases, n	Age groups	Viruses
TN	Community	289	<3 mo - 26% 4-11 mo - 6% 1-14 yrs - 67%	Echo 13 - 41 Echo 18 - 7 Echo 6 - 1
MS	Community	56	< 3 mo - 20% 4-11 mo - 5% 1-14 yrs - 59%	Echo 13 - 11
LA	Community	27	<3 mo - 33% 1-14 yrs - 52%	Echo 13 - 9 Echo 6 - 1
MT	Community	23	< 3 mo - 26% 4-11 mo - 9% 1-14 yrs - 61%	Echo 13 - 3 Echo 25 - 1
MD	Community	>200	< 1 yr - 4% 1-14 yrs - 24%	Echo 13 - 17 Echo 18 - 6 Others - 6
AK	Summer camp	64	School-age	Echo 18 - 9

## *Background*

- 64 enterovirus serotypes currently recognized
- Several serotypes commonly co-circulate
- Predominant serotypes change over time
  - Often accompanied by outbreaks
  - New clinical presentations observed

# *Echovirus 18*

- First isolated in 1958
- Prior to 2000
  - Fairly uncommon isolate (786 of > 47,000 isolates)
  - Outbreaks reported in Japan, USA, Sweden in 1970s and 1980s
  - Common isolate in 1986, 1987 in US
  - Resurgence in activity seen in late 1990s

## *Echovirus 18 -2001*

- Most common serotype identified
- Detected in 12 states
  - CDC – 128 isolates (18%) from 7 states
  - Viropharma – 289 (27%) from 9 states
- Contributed to at least 3 aseptic meningitis outbreaks (TN, AK, MD)