

Changes in Circulating Enterovirus Serotypes in the United States, 2001

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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

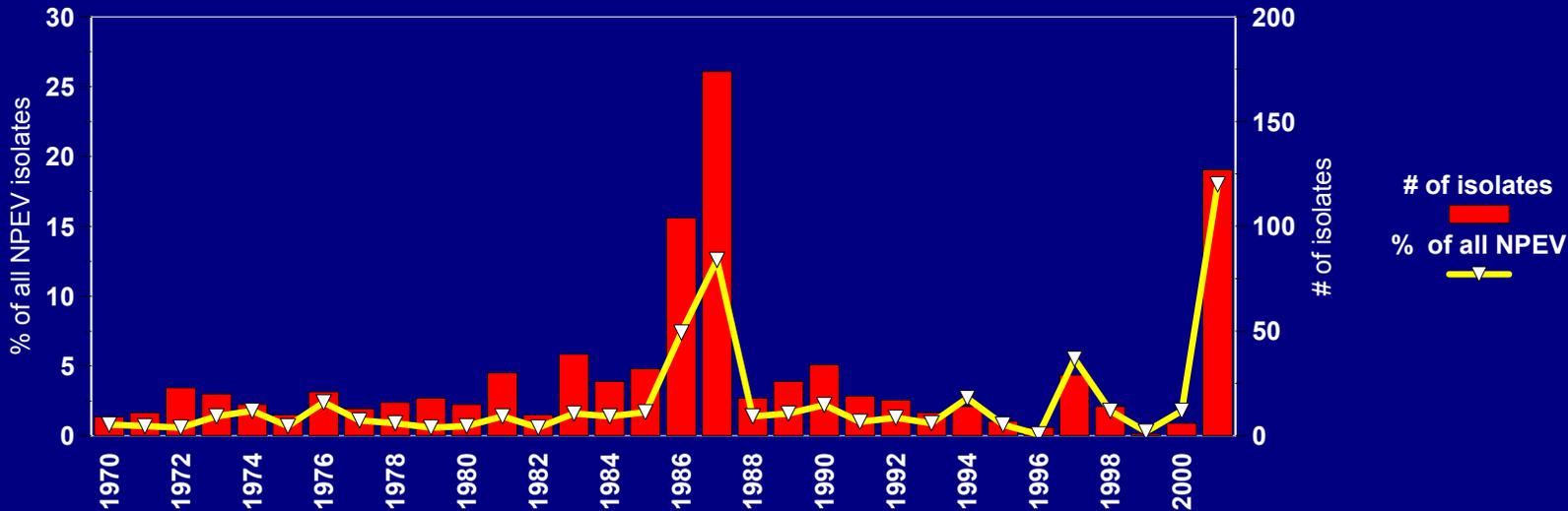
Enterovirus Activity, USA - 2001

- 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)

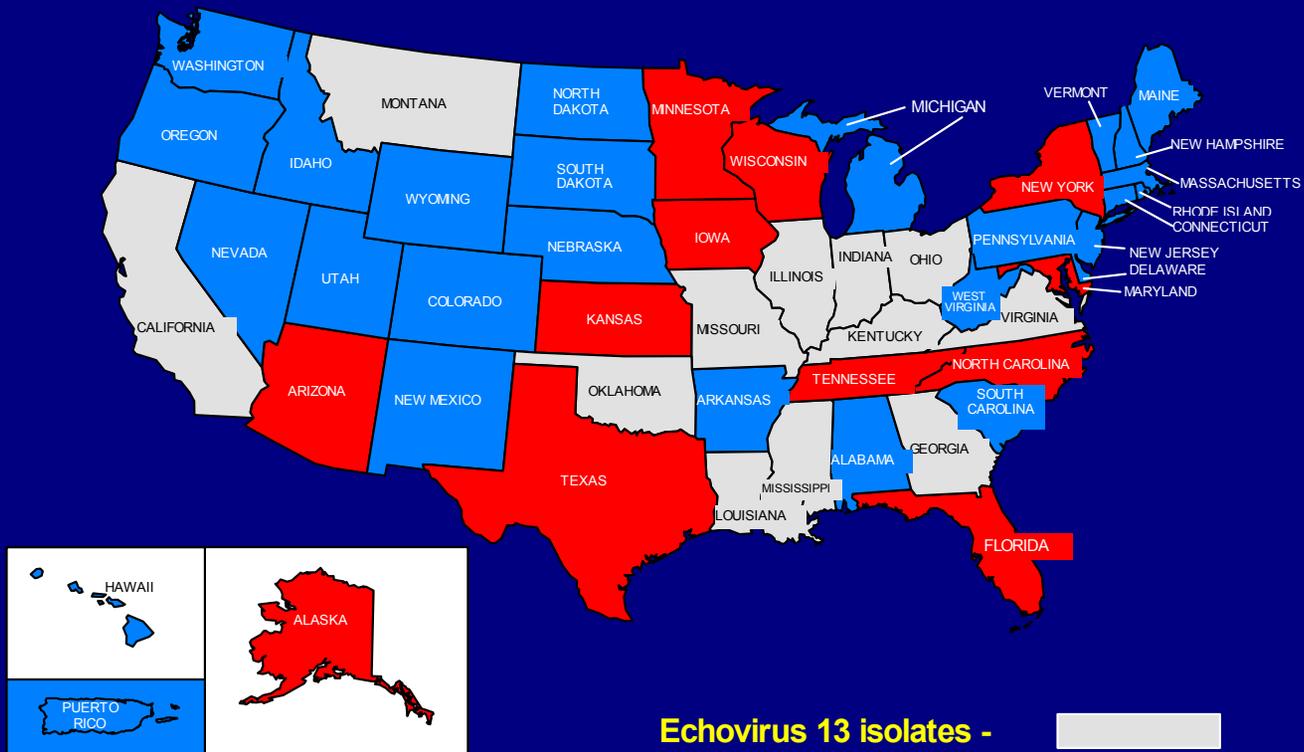
Echovirus 18

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)

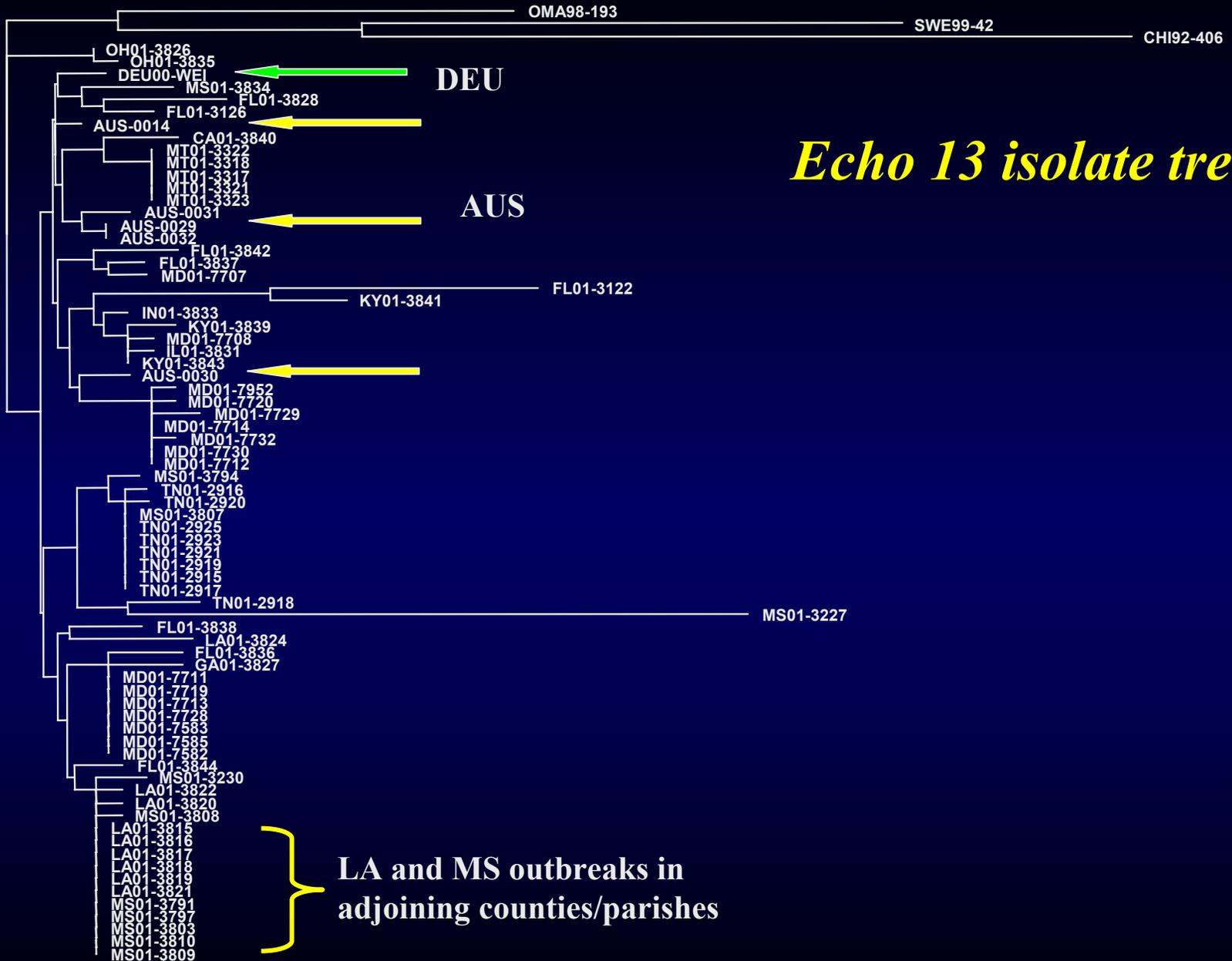
Isolations of Echovirus Type 13 and 18 by State, United States, 2001



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

10% genetic change

1% genetic change



Echo 13 isolate tree

LA and MS outbreaks in adjoining counties/parishes

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

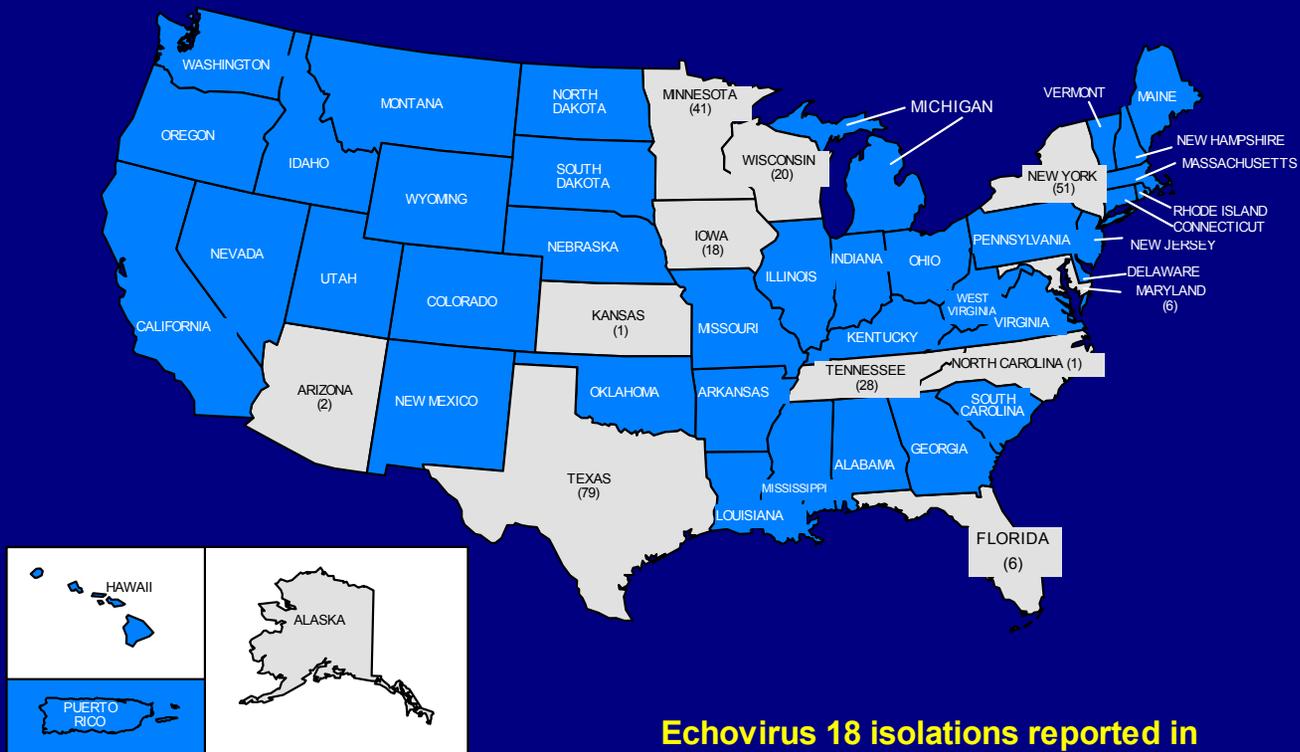
- Emergence of echovirus 13, re-emergence of echovirus 18 as predominant serotypes in 2001
- Responsible for several aseptic meningitis outbreaks
- Reasons for current increase in circulation unclear
- Enterovirus surveillance important
 - More accurately identify circulating serotypes
 - Identify serotypes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

Acknowledgements

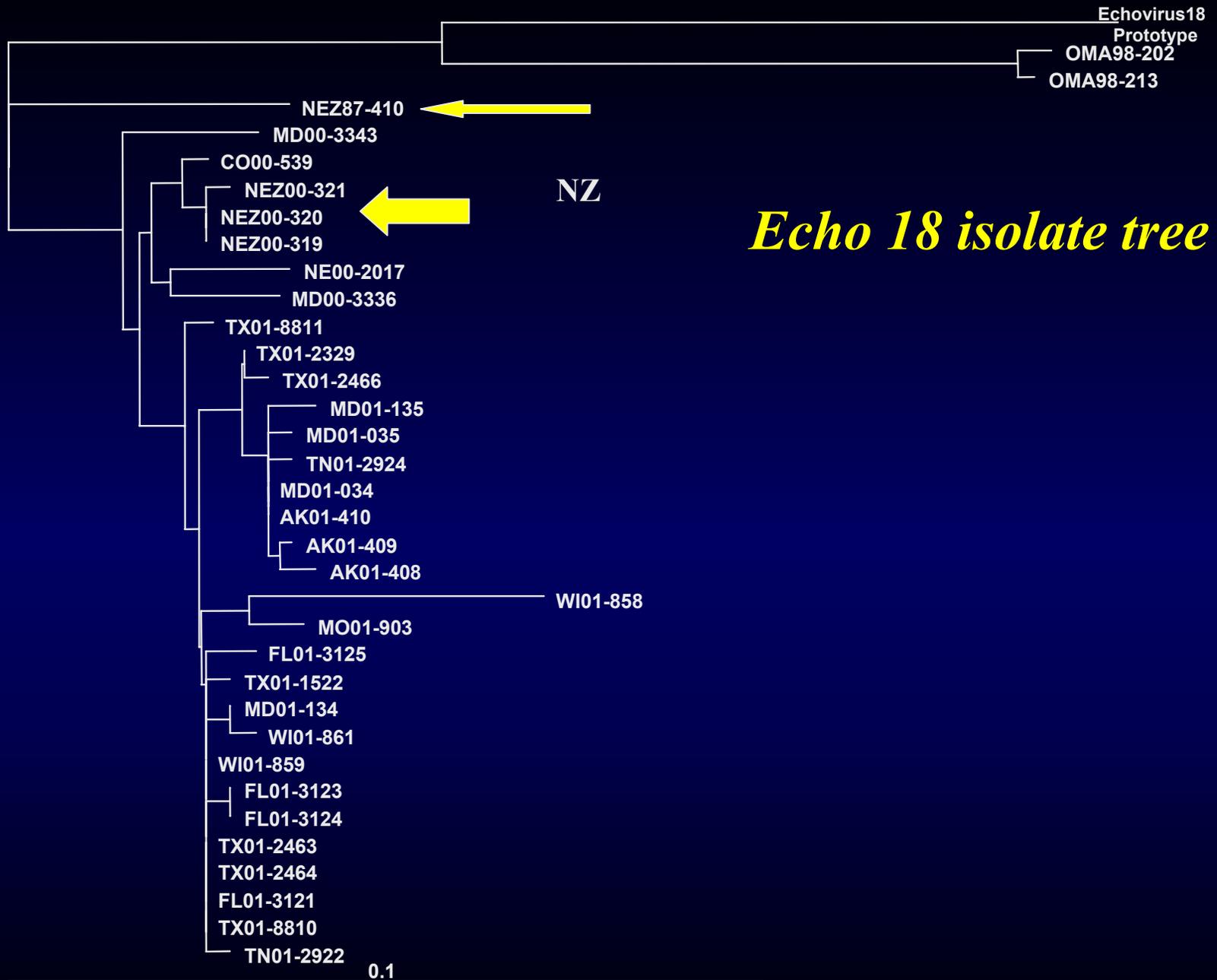
- CDC enterovirus laboratory
 - Allan Nix
 - Mary Flemister
- EIS officers
 - Kathleen Julian, CDC - Ft. Collins
 - David Kirschke, Tennessee
 - Joe McLaughlin, Alaska
 - Sally Slavinski, Mississippi
- State and local health departments
- State public health labs
- Viropharma, Inc.

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

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Echovirus 18 -2001

- Most common serotype identified
- Detected in 12 states
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