Salmonella Saintpaul Infections Linked to Imported Cucumbers – United States, 2013

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Salmonella in the United States

- 1.2 million illnesses and 400 deaths annually

- Many different sources
  - Produce
  - Poultry
  - Meat
  - Animal contact
- >2,500 serotypes of *Salmonella* enterica
  - Saintpaul is common serotype
    - Top 10 serotype

Outbreak Detection

- PulseNet reported a cluster of 6 human isolates of *Salmonella* Saintpaul infections sharing an indistinguishable PFGE pattern
- PFGE pattern rare in PulseNet database
  - Only identified in 19 human isolates prior to cluster
  - Domestic cilantro isolate (2009)
  - Cattle carcass swab isolate (2011)
- CDC and state public health partners initiated an investigation into this cluster

Case Definition

PulseNet USA
The National Molecular Subtyping Network for Foodborne Disease Surveillance

Illness in a person with

- *Salmonella* Saintpaul
- Outbreak strain (PFGE pattern JN6X01.0161)
- Illness during January 12th – April 28th

PFGE Pattern

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DNA Fingerprint

Epidemiologic Investigation

- Early state interviews identified
  - Cucumbers
  - Mangoes
  - Strawberries
  - Ground turkey

Epidemiologic Investigation

- Expanded Hypothesis Generating Questionnaire
- Focused Questionnaire
- Engaged partners in hypothesis generating
  - FDA CORE Response Team 1
  - FDA Produce Safety
  - Industry Experts

Epidemiologic Investigation

- Reported Exposures vs. FoodNet Pop Survey
- FoodNet Pop Survey
- Binomial Comparison

Interview Results (n=49)

Exposure	Yes	No	% Yes/Total*	FoodNet Pop Survey %	p-value
Cucumbers	34	10	69.4%	44.4%	<0.001
Tomatoes	25	18	52.1%	68.3%	0.994
Strawberries	23	22	48.9%	46.5%	0.424
Iceberg	21	20	43.8%	45.7%	0.660
Romaine	16	30	33.3%	46.5%	0.979
Spinach	12	31	25.0%	23.6%	0.465
Mangoes	8	37	17.0%	11.8%	0.184
Ground Turkey	6	39	13.0%	10.8%	0.205

* Maybe responses included in the denominator for percent totals

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Interview Results

- 19 case-patients reported a type of cucumbers
  - 74% Garden cucumbers
  - 21% English cucumber
  - 16% Persian or Mini-cucumbers

Garden

English

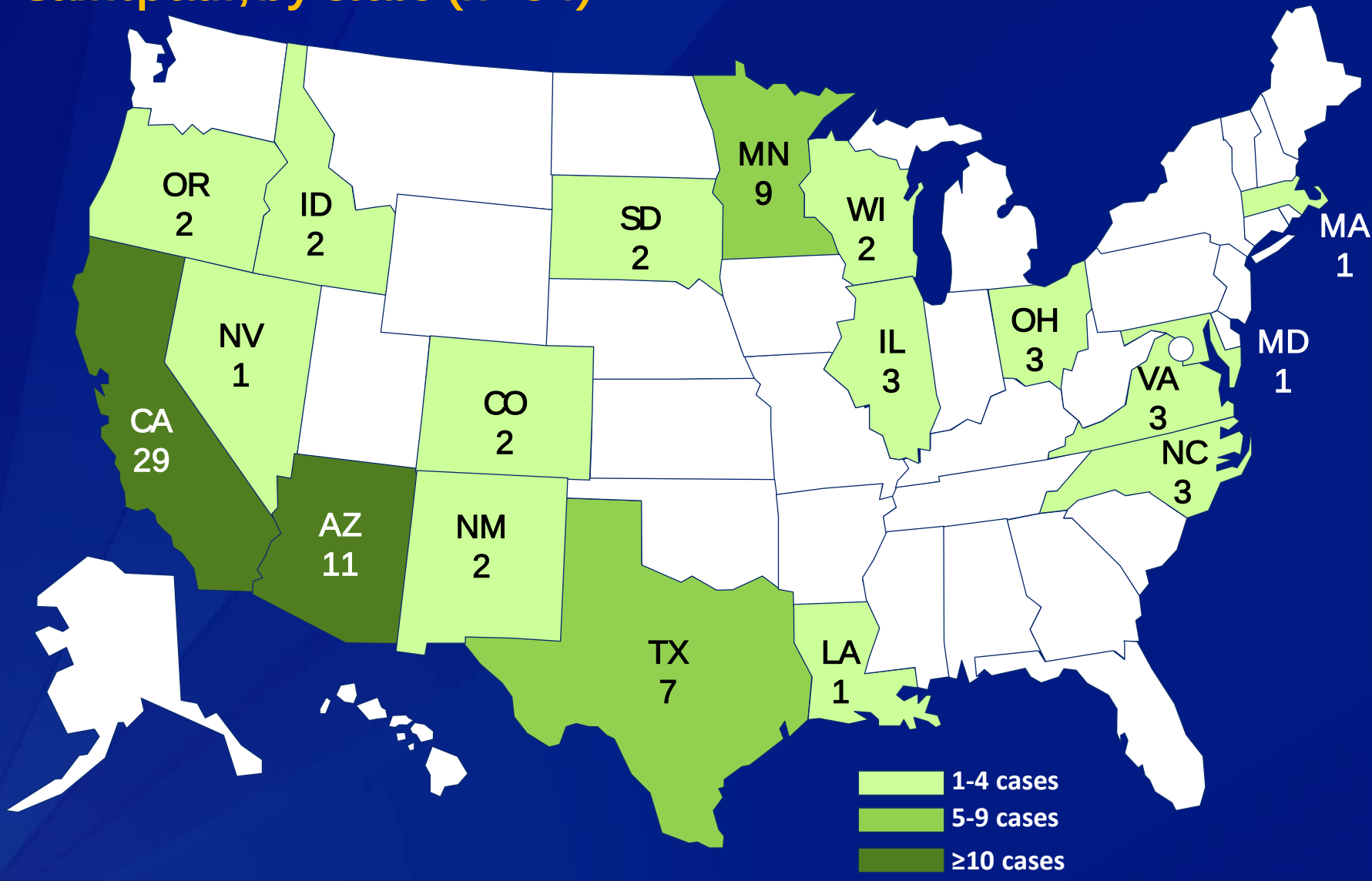
Persian

Mini

Traceback and Product Testing

- MN Dept. of Agriculture collected left over cucumbers from a case-patient's home
  - Product tested negative for *Salmonella*
- Point of Service
  - Restaurant Chain A
  - Grocery and Warehouse Stores
  - Shopper Card information collected
- MN Dept. of Agriculture and FDA performed traceback investigations

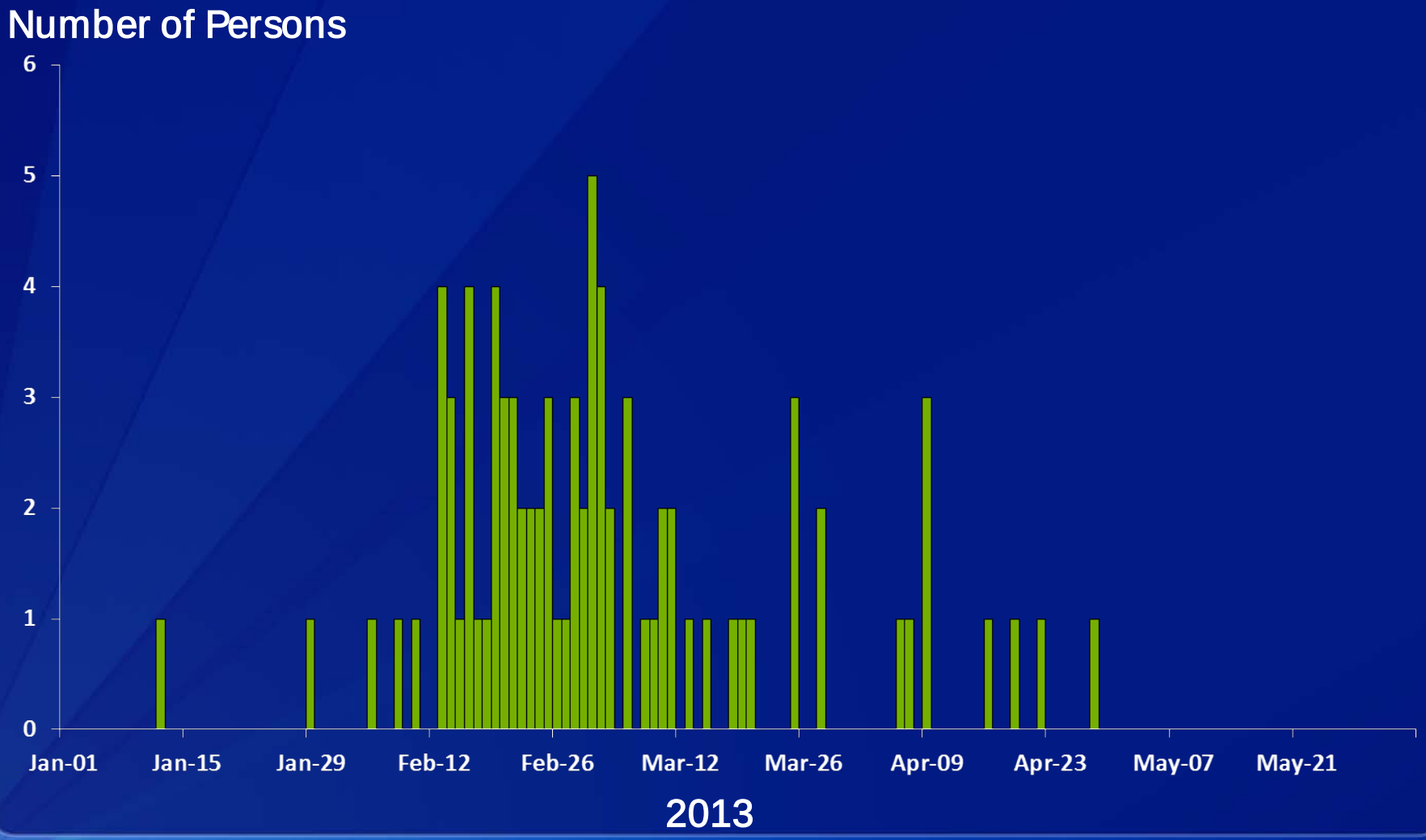
Persons infected with the outbreak strain of *Salmonella* Saintpaul, by state (n=84)



Clinical Characteristics (n=84)

Characteristics	
Female	52 (62%)
Median age (range)	27 years (< 1 – 89 years)
Hospitalized	17 (28%)
Death	0 (0%)

Persons infected with the outbreak strain of *Salmonella* Saintpaul, by date of illness onset (n=84)



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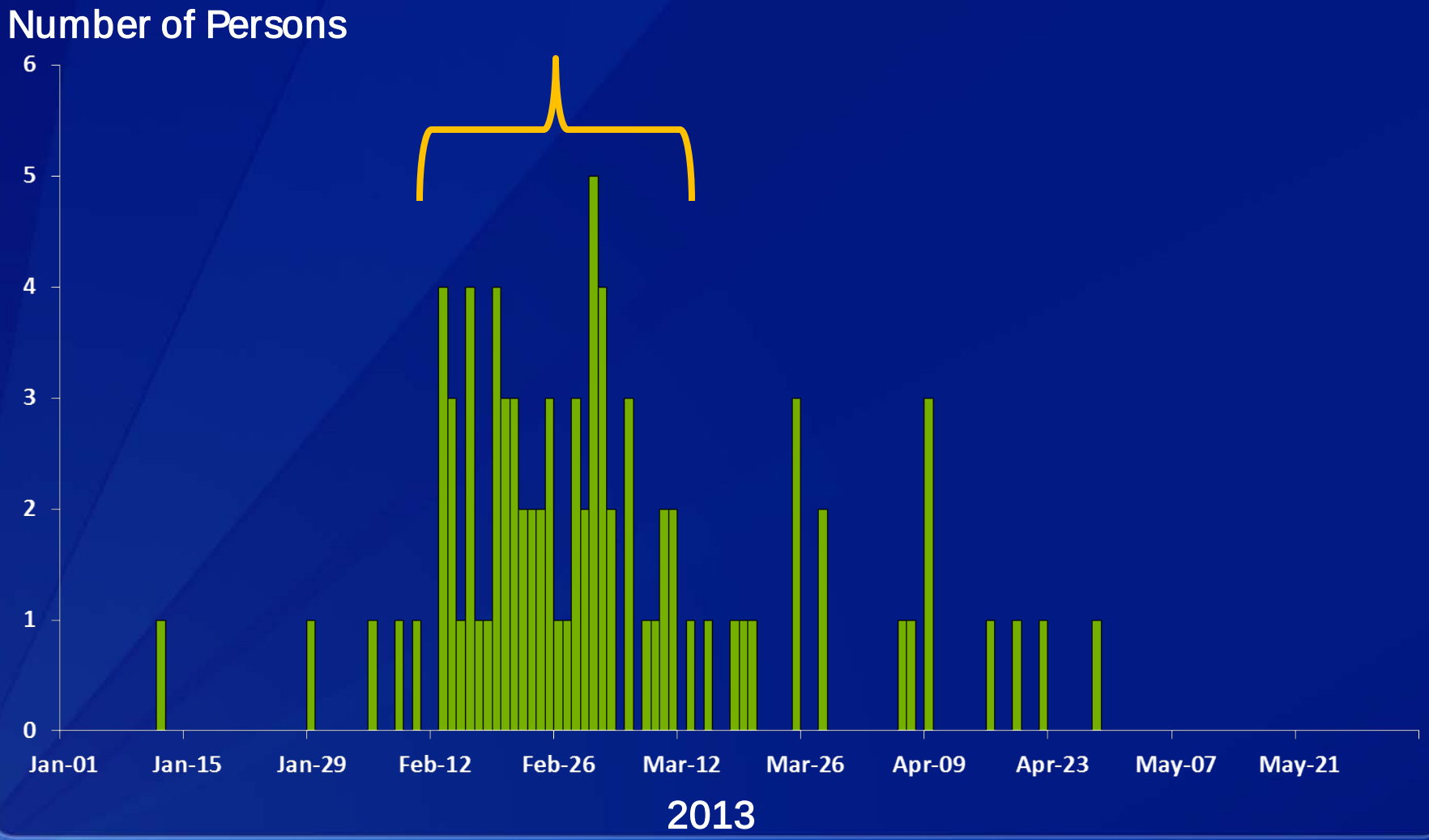

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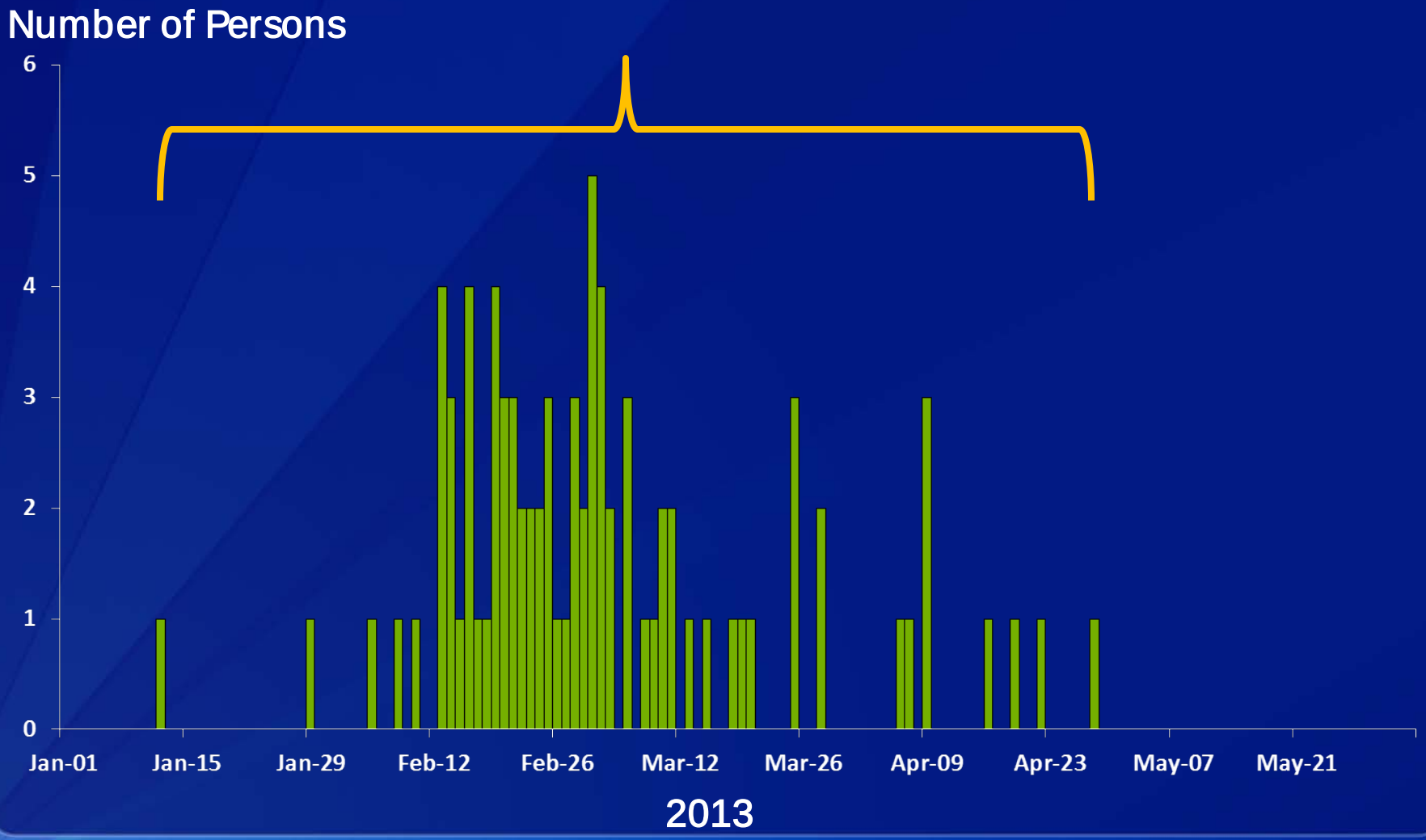

Investigation Challenges

- Difficulty identifying cucumber types
- Uncertain of growth practices
- Poor labeling of cucumber

Conclusions

- Cucumbers were the most likely source of this outbreak
  - Multiple types of cucumbers
  - Multiple purchase locations

First *Salmonella* outbreak linked to cucumbers in the United States

- Traceback efforts essential

Acknowledgements

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State and Local Health Departments and Public Health Laboratories

Arizona
California
Colorado
Idaho
Illinois
Louisiana
Maryland
Massachusetts
Minnesota
Nevada
New Mexico
North Carolina
Ohio
Oregon
South Dakota
Texas
Virginia
Wisconsin

Thank You

For more information please contact Centers for Disease Control and Prevention

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Telephone: 1-800-CDC-INFO (232-4636)/ TTY: 1-888-232-6348
E-mail: cdcinfo@cdc.gov Web: http://www.cdc.gov

Questions?