84 member countries from 7 national and regional PulseNet networks

www.pulsenetinternational.org
Why having PulseNet International

- Foodborne illnesses do not respect any borders: international trade, international travel
- PulseNet International is a network of National and regional laboratory networks dedicated to tracking foodborne infections world-wide. Each laboratory utilizes standardized genotyping methods, sharing information in real-time.

www.sciencedirect.com/science/article/pii/S0140673612611519

Global Meat Trade, source: Center for Global Food Issues
Objectives

- Building molecular surveillance capacity for foodborne infections
  - Partnering with WHO GFN
- International outbreak detection and response
  - Partnering with INFOSAN, ECDC & WHO GFN
  - Communicating about suspected international spread, even in the absence of confirmed source
- Development, validation and implementation of global standardized subtyping methods
- Collaborative studies

Governance

- Steering Committee
  - Working groups
PulseNet International Communication

- Steering Committee
  - Working groups

- All Members
  - Email
  - Conference calls, Webinars

- The Public

www.pulsenetinternational.org
Governance by the Steering Committee

Members:
- Peter Gerner-Smidt (Chief, PulseNet USA, Steering Committee Chair)
- Gladys Gonzalez-Aviles (International PulseNet Coordinator)
- Mariana Pichel (PulseNet Latin America Co-Coordinator)
- Suleiman Al-Busaidy (PulseNet Middle East Coordinator)
- Brent Gilpin (PulseNet Asia Pacific, web-site manager)
- Kai Man Kam (PulseNet Asia Pacific Coordinator)
- Anthony Smith (PulseNet Africa Coordinator)
- Johanna Takkinen (PulseNet Europe Co-Coordinator)
- Celine Nadon (PulseNet Canada Coordinator)
- Eva Nielsen (PulseNet Europe Co-Coordinator)
- Enrique Perez (PulseNet Latin America Co-Coordinator)

Duties divided in working groups: Website/web forum; Next generation Method Evaluation and Implementation; Advocacy; Partnership; Outbreak Investigation/Communication; Training
PulseNet International WGS working group:

- Initiative from the face-to-face meeting of the steering committee, Stockholm-Helsinki February 2013
- Charge: to assess the NGS technology currently available, the different bioinformatics approaches for cluster detection and investigation. Suggest and lead projects to test them for their utility in PulseNet
- Proposed members: Eva Nielsen, Martin Maiden, Katie Grant, Lee Katz, Efraim Ribot/Eija Trees, Celine Nadon/Gary Van Domselaar, Mariana Pichel and others
  - Align with GMI progress
  - Keep non-bioinformatician PulseNet-users in mind
    - Applications need to be simple and output readily understandable
84 member countries from 7 national and regional PulseNet networks

* Some countries in the network have real time surveillance

www.pulsenetinternational.org
International Food Contamination Happens!

Yellowfin tuna linked to salmonella outbreak in 20 states

WASHINGTON (AP) — A yellowfin tuna product used to make dishes like sushi and sashimi sold at restaurants is linked to an outbreak of salmonella that has sickened at least 16 people in the District of Columbia, federal health officials said Wednesday.

No deaths have been reported. People who have been hospitalized. The FDA says a yellowfin tuna product used to make dishes like the sushi sold at restaurants has been linked to an outbreak of salmonella.

The product is not available for sale to consumers but may have been used to make sushi, the FDA said. Many of the people who became ill reported eating dishes with raw yellowfin tuna.

In sushi as “spicy tuna,” the FDA said.

Fatal listeria outbreak linked to imported cheese

by Elizabeth Weise, USA TODAY

A national outbreak of listeria linked to imported cheese has killed at least 13 people in seven states, the Centers for Disease Control and Prevention said Tuesday.

Mexico is the source of the imported cheese, according to the CDC.

Up to 1 million mangoes recalled in Salmonella outbreak

Up to 1 million mangoes are being recalled as a possible source of Salmonella infections nationwide, a food distributor announced.

Italy

India

Mexico
PNI Outbreaks and Urgent Notifications 2012

• **Salmonella** Newport Infections in Europe, February 2012: at the time of notification 30 cases, 1 death (Scotland, Ireland and Germany)
• **Salmonella** Herston Infections in South Africa, March 2012: rare serotype, at the time of notification 4 cases.
• **Salmonella** Bareilly infections in the USA, March 2012: linked to sushi from India, at the time of notification 76 cases, at the end of the investigation more than 500.
• **Escherichia coli** O157 infections linked to travel to Mexico, Canada April 2012: at the time of notification 4 cases.
• **Salmonella** Paratyphi B Infections in the USA, April 2012: request of information hypothesis possible travel exposure
• **Vibrio cholera** Infections in Zimbabwe, June 2012: at the time of notification 6 cases.
• INFOSAN alert **Salmonella** Oranienburg in GOS from Republic of Korea, July 2012
• INFOSAN alert **Salmonella** Stanley Infections in Europe: at the time of notification 22 cases Belgium, 34 cases Germany, 68 cases Hungary
• **Listeria monocytogenes** Infections in the USA linked to imported cheese from Italy, July 2012: at the moment of notification 6 cases, at the end of the investigation 20+.
• **Listeria monocytogenes** Infections in New Zealand, July 2012: at the time of notification 6 cases (3 died).
• **Vibrio parahaemolyticus** simultaneous outbreaks in Atlantic Coast of USA and Spain. Summer 2012
• **Shigella sonnei** in Canada, August 2012: increment of cases in the Province of Ontario.
• **Salmonella** Weltevreden in Costa Rica, August 2012: at the time of notification 20 cases.
• **Salmonella** Braenderup Infections in the USA and Canada, August 2012: linked to mangos imported from Mexico
• **Salmonella** Typhimurium Infections in Denmark, September 2012: linked to beef
• **Salmonella** Thompson Infections in the Netherlands, September 2012: linked to salmon
PNI Outbreaks and Urgent Notifications 2013 (so far)

- *Salmonella* Cubana linked to sprouts in the USA (cluster on October 2012). Posted on January 2013.
- *Salmonella* Typhi linked to travel to India. Posted February 2013.
- *Salmonella* Enteritidis in Argentina, linked to chicken rolls, matched PN-USA pattern JEGX01.0002.
- Shigellae with decrease susceptibility to Azithromycin in the USA. Posted April, 2013.
- *Salmonella* Senftenberg outbreak linked to pistachios. Posted May 2013 (active investigation).
**Vibrio parahaemolyticus** simultaneous outbreaks in Atlantic Coast of USA and Spain Summer 2012

- Collaboration between CDC, FDA, ECDC, Environmental Agencies  
- Outbreaks on the Atlantic Coast of USA (28 cases, 9 states) and Spain (51 illnesses, 9 lab confirmed).  
- USA linked to shellfish harvested from Oyster Bay Harbor, NY 4/2012-06/2012.  
- Spanish outbreak linked to cooked seafood cooled using ice from untreated local sea water  
- Unknown introduction of the strains in the Atlantic (before only PNW)

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<th>Year</th>
<th>Source</th>
<th>Country</th>
<th>Serotype</th>
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</tbody>
</table>

**Vibrio parahaemolyticus** simultaneous outbreaks in Atlantic Coast of USA and Spain Summer 2012

- Explanations: importation and storage of live contaminated shellfish in local waters, ballast water movement, long distance oceanic transportation of strains into new regions
- Outbreaks correlated with warmer waters
- The two outbreak sites are close to the two biggest ports in the world
- Great example of the utility of PNI, data sharing and One Health Initiatives

[Maps and data visualizations showing temperature changes over time with dates April 28th, May 23rd, June 20th.](http://www.ncdc.noaa.gov/oa/climate/research/sst/weekly-sst.php)

[Transportation data at transportcity.wordpress.com](transportcity.wordpress.com)
Salmonella Mbandaka, Montevideo and Maastricht linked to Tahini from Turkey

Outbreak of salmonellosis in New Zealand linked to Salmonella-contaminated tahini imported from Turkey

Subject: Outbreak of salmonellosis in New Zealand linked to Salmonella-contaminated tahini imported from Turkey
Date: Fri, 2012-12-21
Reporting Authority: Ministry for Primary Industries, Wellington, New Zealand
Affected country(ies)/Territory (ies): New Zealand
Hazard: Montevideo
Mbandaka
Salmonella
Bacteria
Food category: Nuts and oilseeds
Food involved: Tahini
Distribution: International
Salmonella Mbandaka and Salmonella Montevideo

Data provided by Dr. Brent Gilpin, New Zealand
Conclusions

PulseNet Works because:
- Standard laboratory protocols
- Standard analysis
- Standard database structure
- Network communication systems

**But we are as strong as our weakest link***
... Thank you

Disclaimers:
The findings and conclusions in this presentation are those of the author and do not necessarily represent the official position of the Centers for Disease Control and Prevention.

*Use of trade names is for identification only and does not imply endorsement by the Centers for Disease Control and Prevention or by the U.S. Department of Health and Human Services*

*For more information please contact Centers for Disease Control and Prevention*

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