

Culture-Independent Diagnostics Forum: Charting a Path for Public Health

The Consumer Perspective

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A Basic Human Right



“Food is strength, and food is peace and food is freedom, and food is a helping hand to people around the world whose goodwill and friendship we want.”

- John F. Kennedy

A Global Health Issue



World Health
Organization

- **2 billion cases** of diarrheal disease worldwide.
- **1.8 million deaths**, predominantly children.
- Leading cause of child mortality and morbidity.
- Mostly results from contaminated food/water sources.
- Affects **up to 30%** in industrialized countries.

Source: WHO, <http://www.who.int/mediacentre/factsheets/fs330/en/>

U.S. Burden of Foodborne Illness



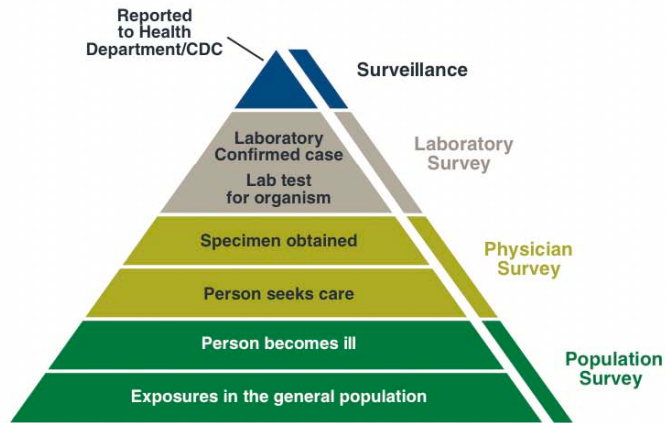
- **48 million** illnesses
- **128,000** hospitalizations
- **3,000** deaths
- **\$78 Billion** in lost productivity and medical expenses
- **Long-term health outcomes** include irritable bowel syndrome, reactive arthritis, hypertension, kidney failure, neurological dysfunction.



The Tip of the Iceberg

FIGURE 1:

CDC's FoodNet Surveillance, Burden of Illness Pyramid



Source: CDC, National Center for Infectious Diseases.
http://www.cdc.gov/foodnet/surveillance_pages/burden_pyramid.htm



The Levels of Surveillance

1950's – 1960's	Basic	Outbreaks associated with events or establishments: large groups, short incubation periods.	Church Supper (local event)
1970's – 1980's	Intermediate	Community outbreaks associated with large clusters, uncommon serotypes, geographic and temporal clustering.	Restaurant (regional event)
1998 - 2012	Advanced	Widely dispersed outbreaks, caused by common serotypes. Sensitive, non-culture methods available to identify a wide range of pathogens for which no clinical laboratory testing is available.	Multi-state outbreak (national event)

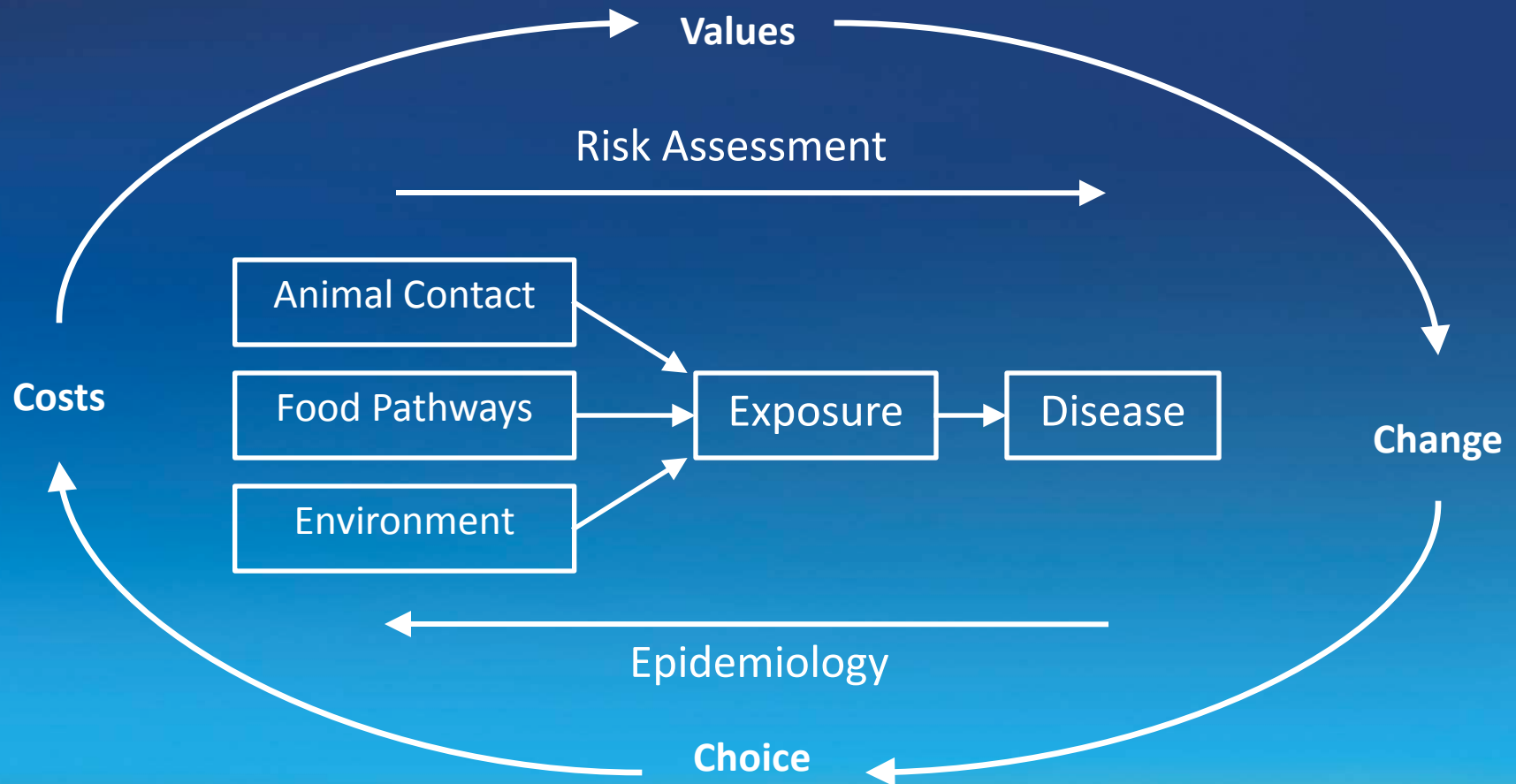
Adapted from Dr. Craig Hedberg

2006 Spinach Outbreak

- *E.coli* O157:H7 in bagged, pre-washed spinach
 - 276 illnesses in 26 states
 - 141 hospitalizations
 - 31 cases of HUS
 - 3 deaths
- Cost spinach industry estimated \$100 million
- Run-off from upstream cattle farm and wildlife suspected contributing factors
- Demonstrates need for One Health approach

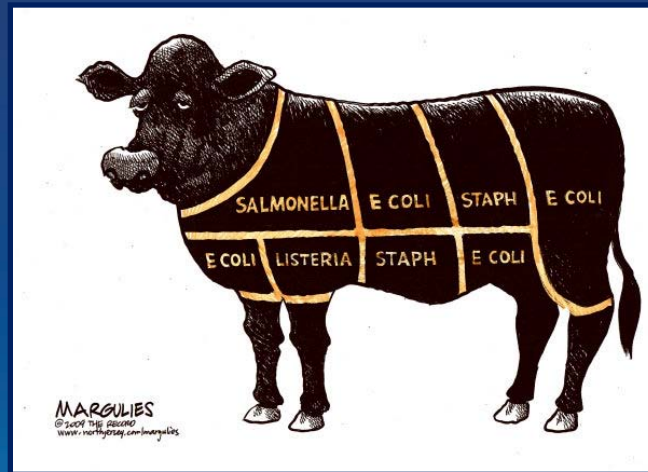


An Integrated Food Safety System



Source: Modified from Havelaar AH, Braunig J, Christiansen K et al. Towards an Integrated Approach in Supporting Microbiological Food Safety Decisions. *Zoonoses Public Health* 2007; 54:103-117.

Foodborne Illness Attribution



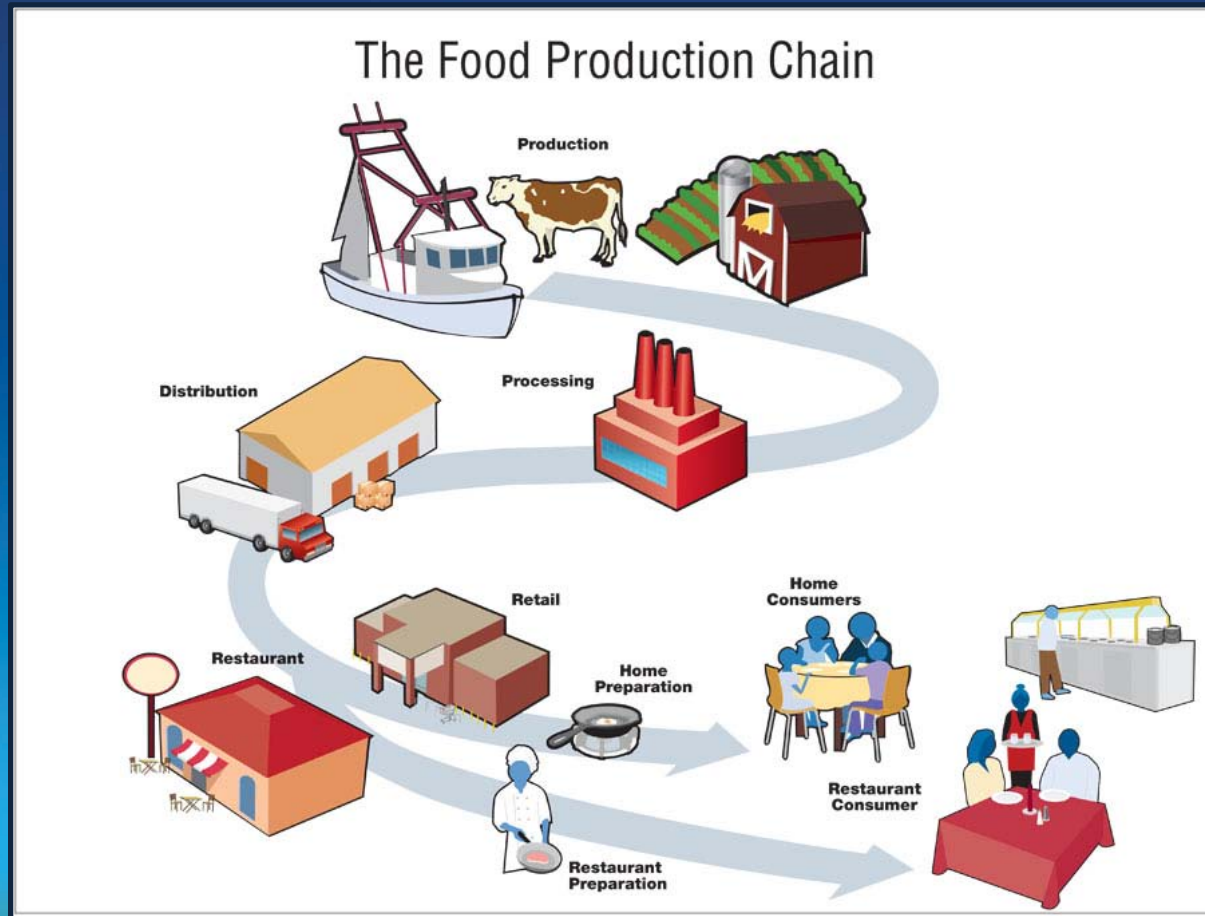
Partitions human disease burden to specific sources, including animal reservoirs and vehicles (e.g., foods).

“Solid epidemiological attribution data form the cornerstone of risk-based prioritization, management and evaluation.”

- NAS/IOM Report “Enhancing Food Safety”

June 2010

An Integrated Surveillance System

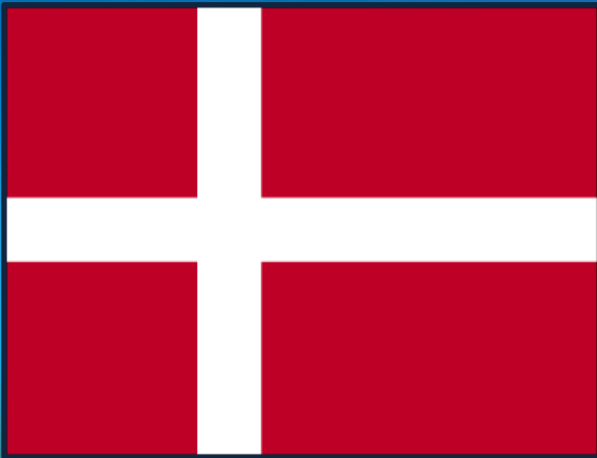


The Benefits of Investing



PulseNet

- Cost Benefit Analysis in review
- Benefits significantly outweigh implementation costs



Denmark

- Integrated national surveillance
- Molecular attribution models
- Dramatic results

The Purpose is People



Kevin Michael Kowalczyk, age 2 1/2
12/10/98 - 8/11/01

**“ Even though you are on the right track –
you will get run over if you just sit there.”**

-Will Rogers

Our Destination



An integrated surveillance system that tracks and links – through molecular methods – human, animal, environment and food with the goal of preventing foodborne illness and improving public health.

Thank You!

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