"Local Public Health Agency Notification and Detection During a Multi-state E. coli O157:H7 Outbreak"

Think Health. Act Now!
CITY OF MILWAUKEE
HEALTH DEPARTMENT

Paul A. Biedrzycki, MPH, MBA

City of Milwaukee Health Department

APHA 135th Annual Meeting & Exposition

November 6, 2007

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Co-Authors

- Angela Hagy, MSPH, City of Milwaukee Health Department
- Mat Wolters, MS, City of Milwaukee Health Department
- Geoffrey R. Swain, MD, MPH, City of Milwaukee Health Department
- M. Stephen Gradus, Ph.D, ABMM, City of Milwaukee Health Department Laboratories
- Ajaib Singh, DVM, Ph.D, City of Milwaukee Health Department Laboratories

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

E. Coli O157:H7

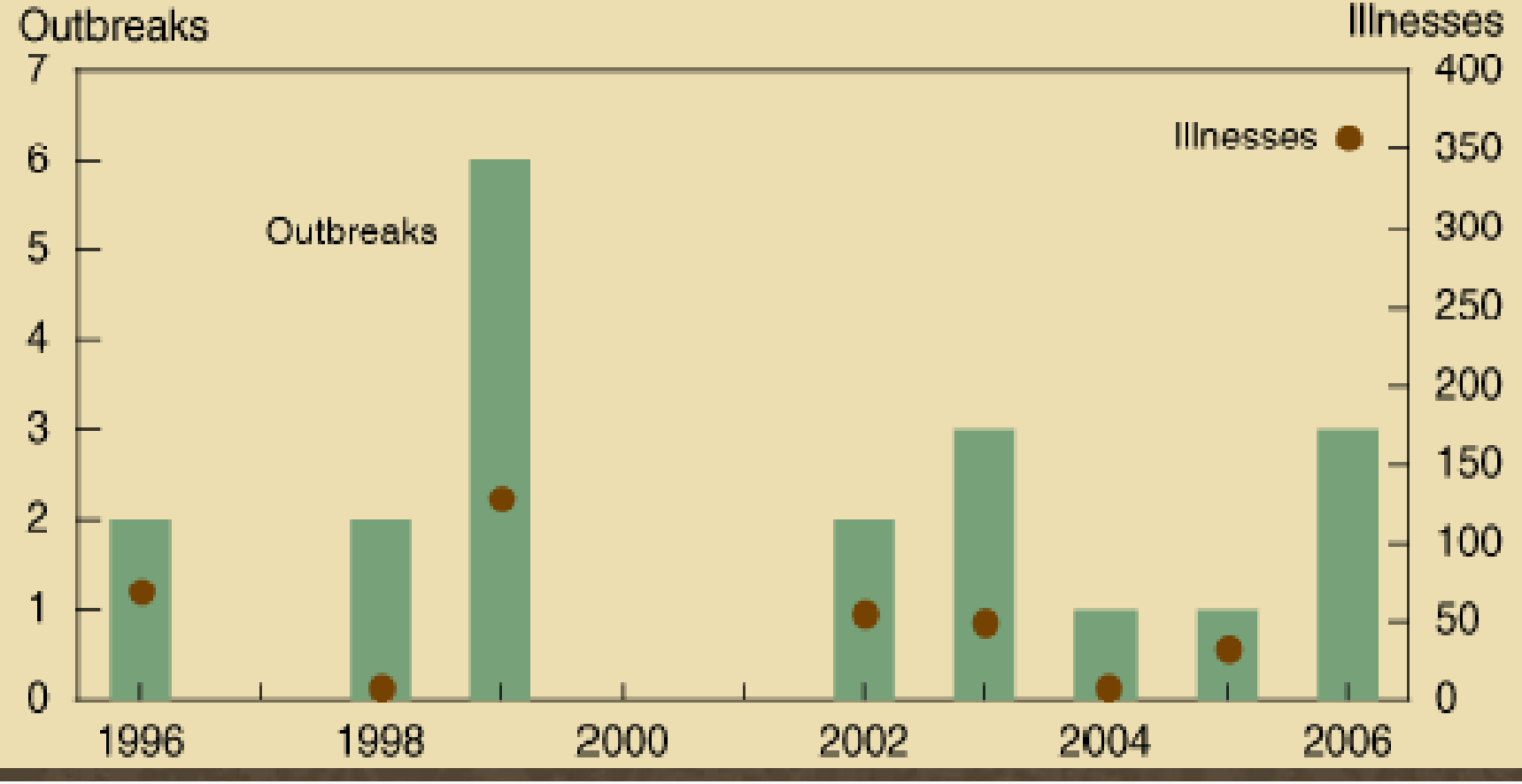
- CDC estimates 73,000 infections and 61 deaths annually
- Young children, elderly and immuno-compromised at highest risk of disease complications
- Common sources of E. coli O157:H7 include beef, leafy greens, sprouts and unpasteurized juice
- Water contaminated with animal feces has been implicated in outbreaks
- Fresh produce is now leading cause of E. coli O157:H7 infection in United States

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

E. coli O157:H7 illnesses linked to leafy greens reached new record in 2006



Source: U.S. Food and Drug Administration.

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

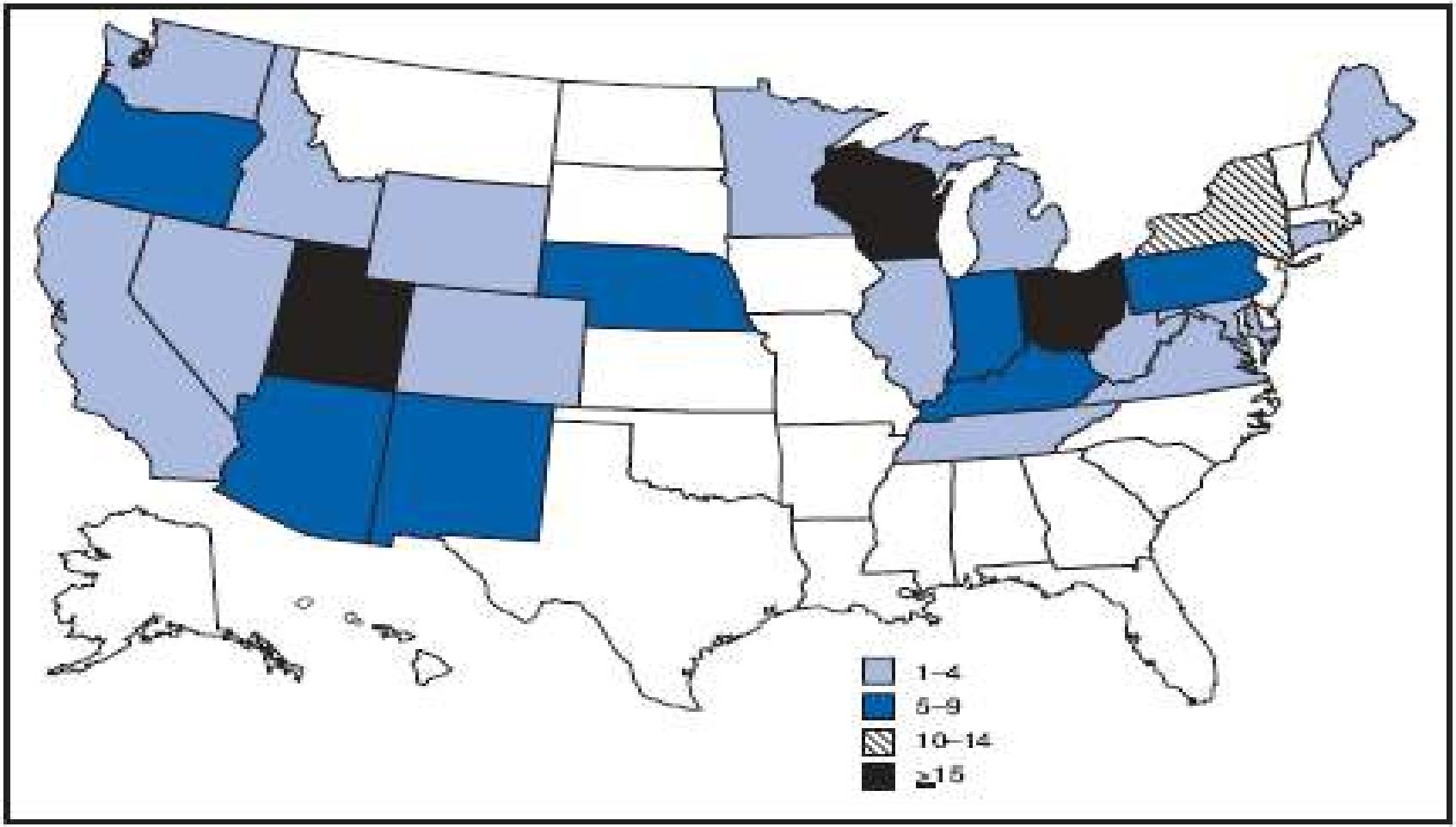
Summary of Outbreak

- August 2006 – outbreak begins
- Sept 8th – clusters identified in WI
- Sept 13th - CDC alerted by WI and OR (PFGE confirmed by CDC on September 12th)
- Sept 14 – FDA alert not to eat fresh bagged spinach (no fresh spinach sales in U.S. for 5 days)
- Linked to fresh spinach contamination (>90% of cases reported eating fresh spinach within 10 days of illness onset)
- 204 cases, 104 hospitalized, 31 HUS and 3 deaths in 26 states and Canada (First fatality was in WI)

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

FIGURE 1. Number of confirmed cases (N = 183)* of *Escherichia coli* serotype O157:H7 infection, by state — United States, September 2006

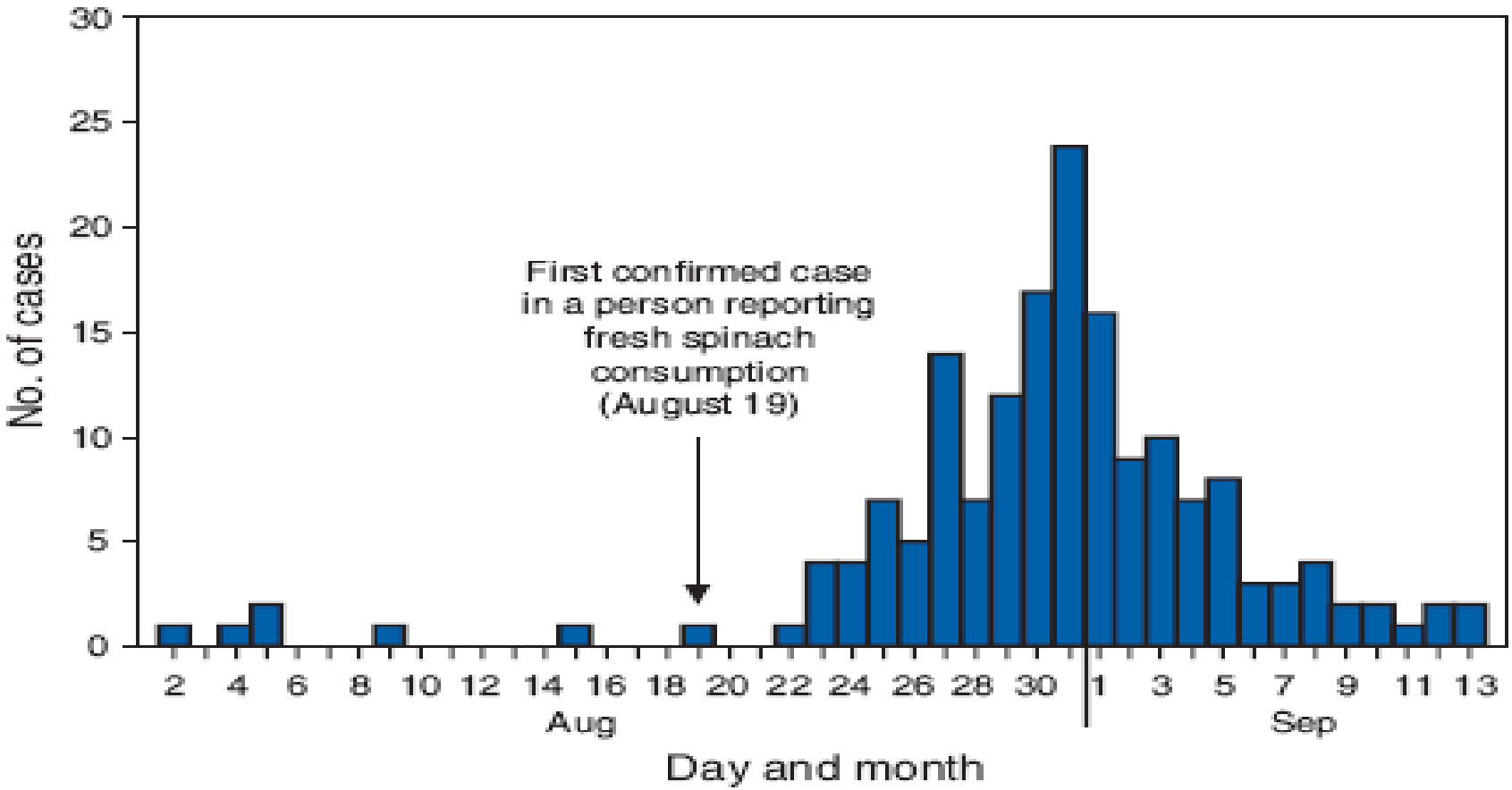


* Confirmed cases reported as of 1:00 p.m. EDT on September 26, 2006.

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

FIGURE 2. Number of confirmed cases (n = 171)* of *Escherichia coli* serotype O157:H7 infection, by date of illness onset — United States, August–September 2006



* Confirmed cases with known dates of illness onset reported as of 1:00 p.m. EDT on September 26, 2006.

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Surveillance and Early Detection at the MHD

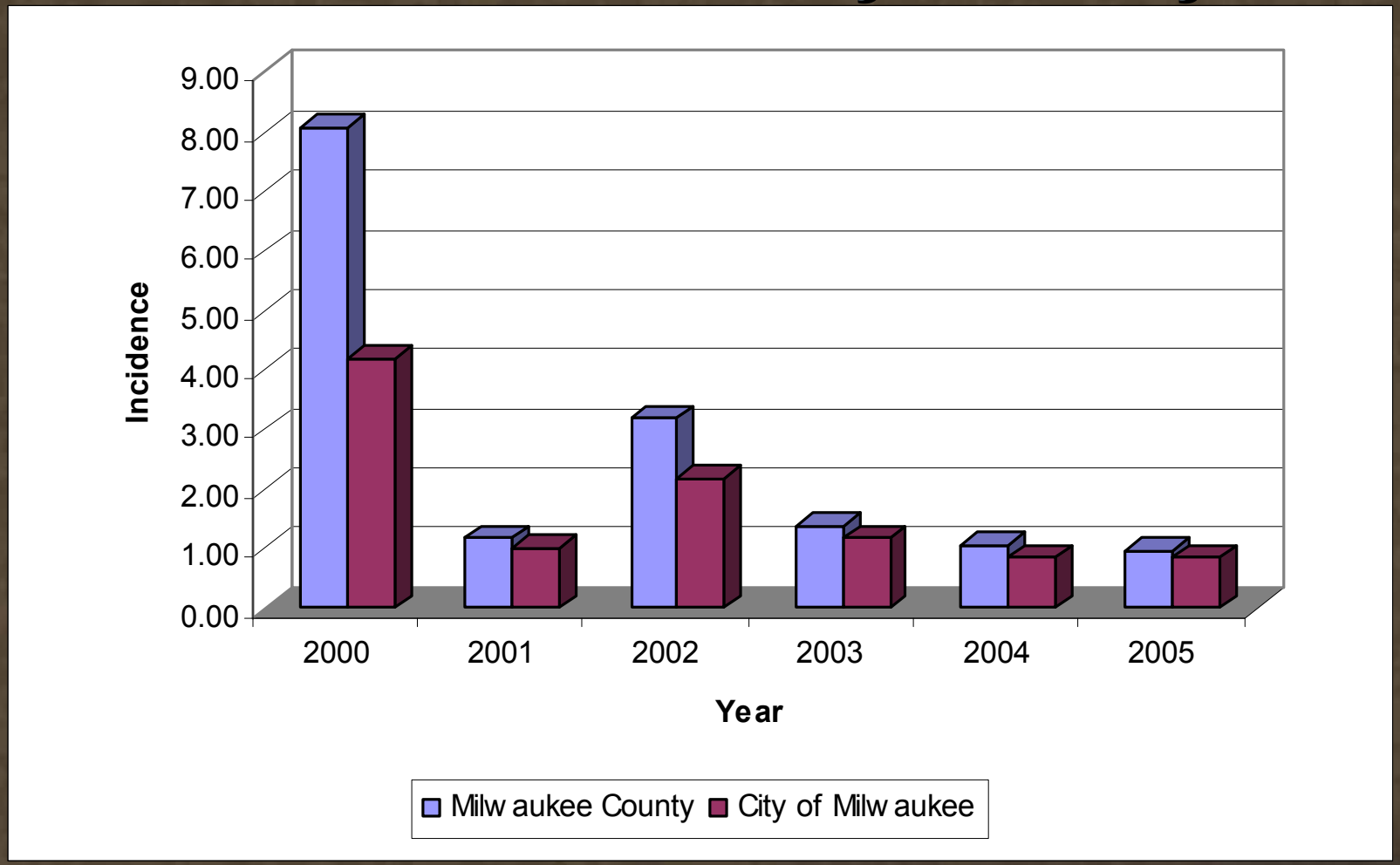
- Survnet
- WEDSS
- BioSense/ESSENCE
- Laboratory Networks (LRN, e*Lab)
- Infection Control Practitioners
- Epi-X, HAN
- Astute healthcare partners

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

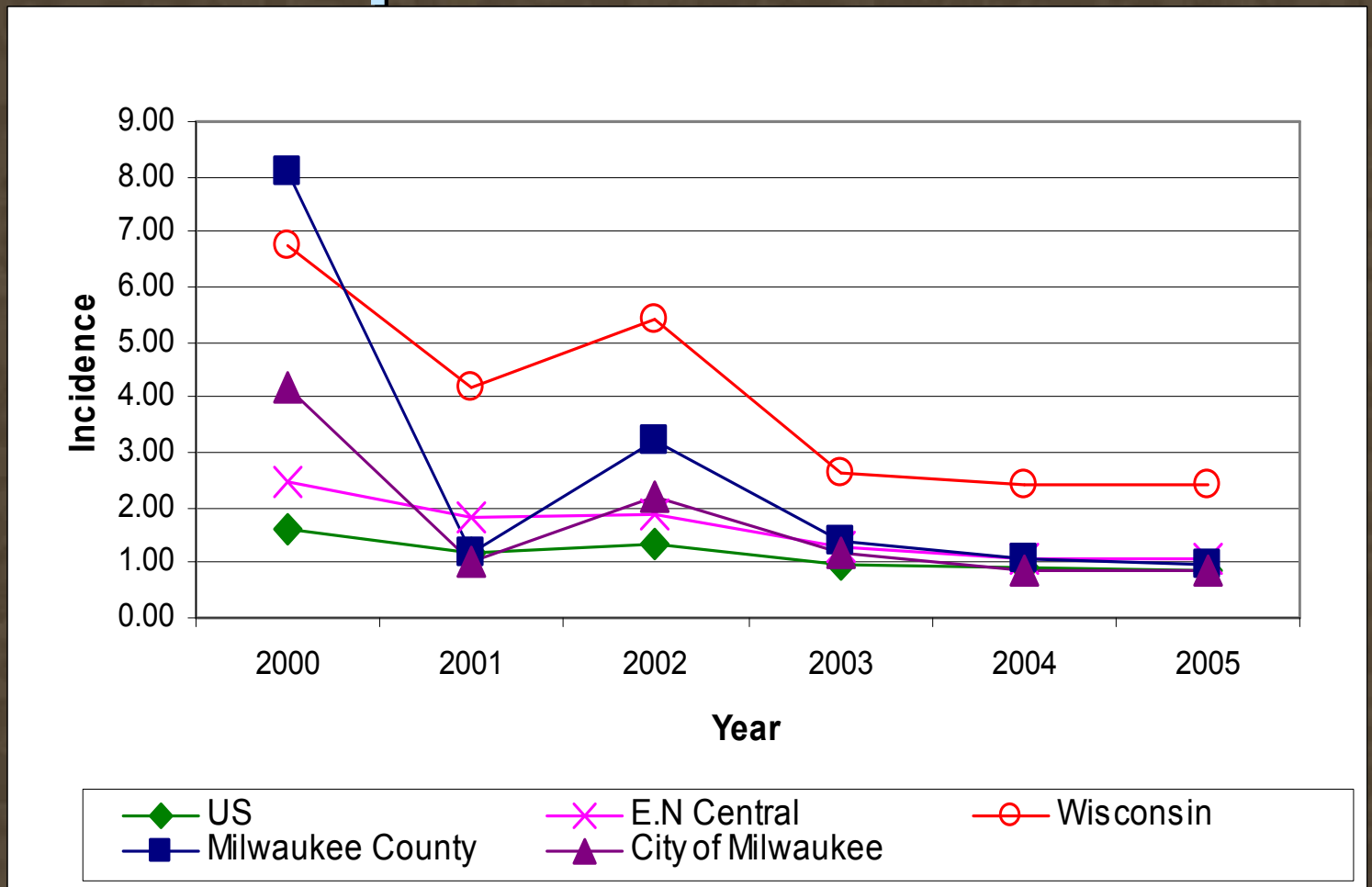
E. Coli O157:H7 Cases
Milwaukee County vs. City



Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

2000 – 2005 E. Coli O157:H7 Comparative Incidence



Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Summary of MHD Activities

September 5-8, 2006 (slide 1 of 2)

- **Sept 5th** – regional increase in cases via Survnet, Call from Hospital IC regarding status of 3 isolates at MHDL

- **Sept 6th** – 5 isolates at MHDL, call from Blood Center regarding plasma exchanges, call from regional LPHAs regarding cases , notification to DPH, suspect dining histories including lettuce/salads.

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health. Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Summary of MHD Activities

September 5-8, 2006 (slide 2 of 2)

- **Sept 7th** – 8 isolates at MHD lab, call to LPHAs regarding additional cases, Survnet alert re: regional increase, EMSystem alert to hospitals, increase in clinical lab reports, continued suspect dining histories including lettuce/ salads.

- **Sept 8th** – MHD PFGE analysis on 4 isolates match, call to DPH regarding regional activity, initiate public hotline, update website, e*lab alert to clinical labs.

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health. Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

PulseNet

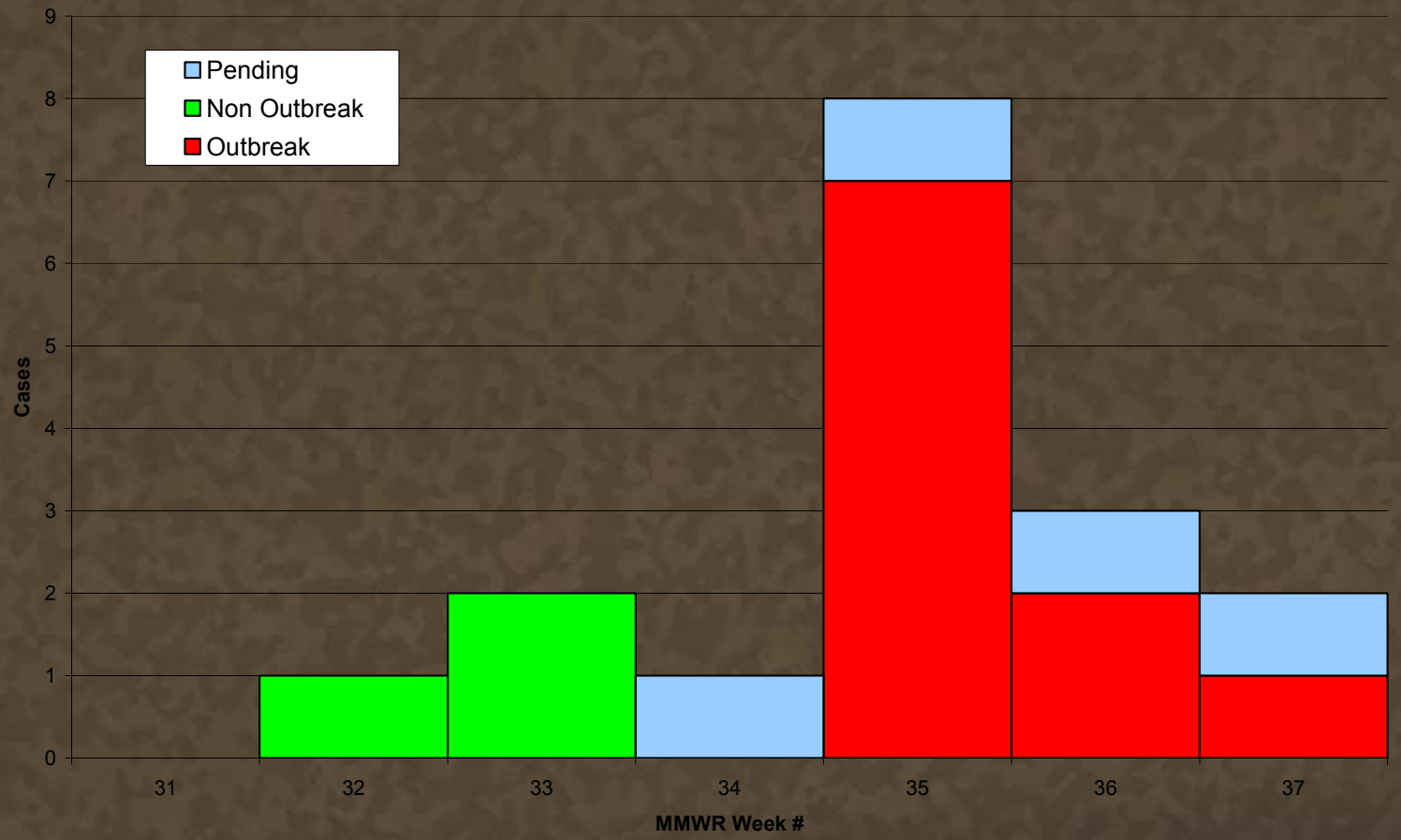
- National network of public health and food labs
- Standardized molecular "fingerprinting" (PFGE)
- PFGE patterns used to identify strains
- Allows for rapid comparison and ID of regional/national outbreaks
- MHDL "read only" to PulseNet

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

MHD Epidemic Curve
(Milwaukee County Cases)

E. Coli Milwaukee County 0157:H7



Think Health. Act Now! · CITY OF MILWAUKEE HEALTH DEPARTMENT · www.milwaukee.gov/Health

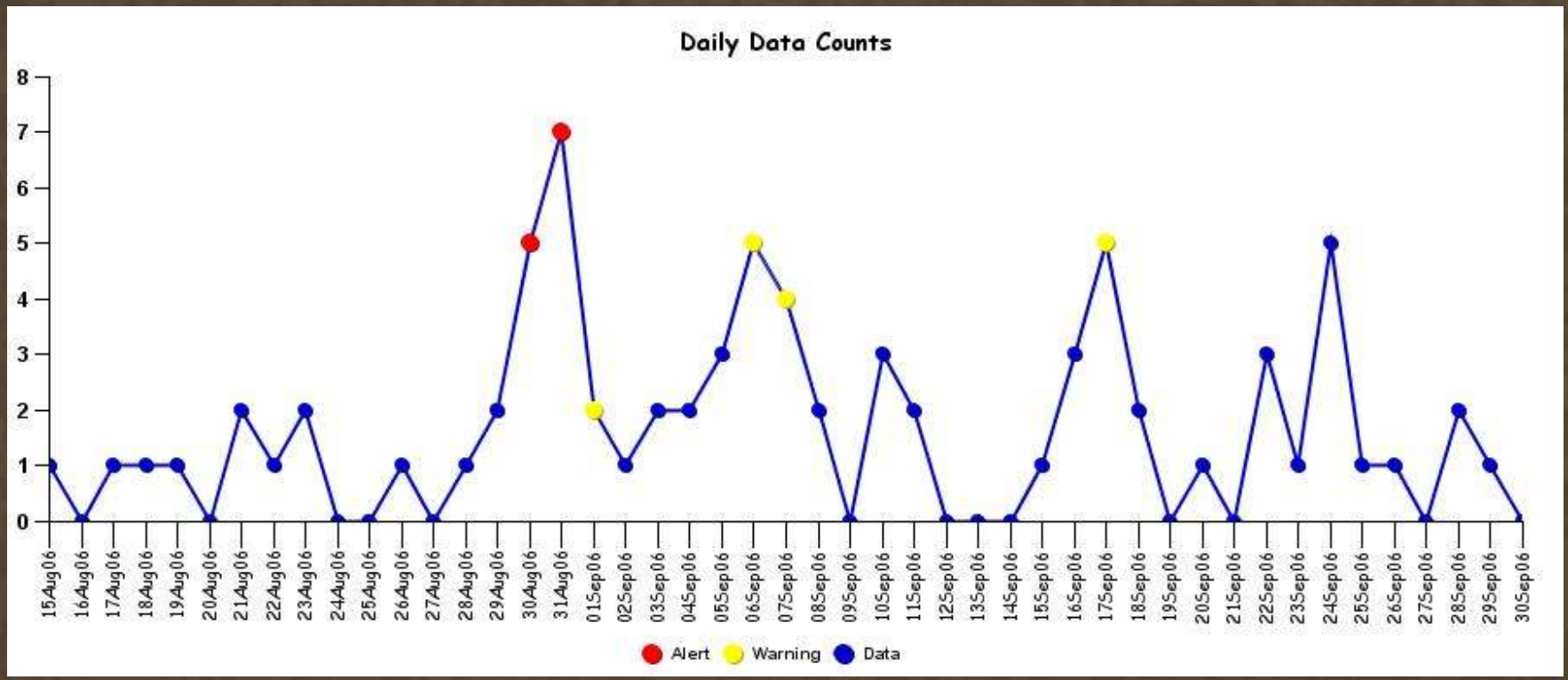
Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health. Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

ESSENCE

Chief Complaint Sub-syndrome → Diarrhea



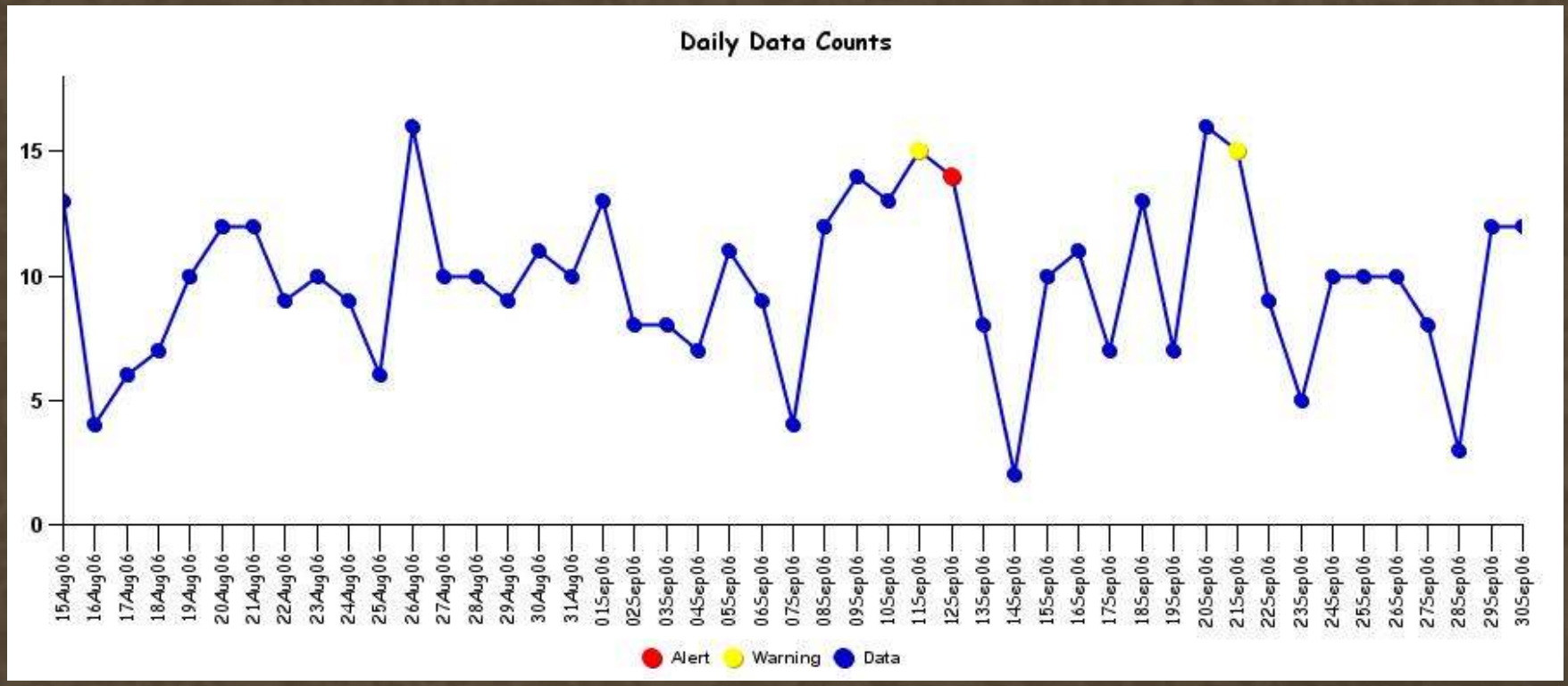
Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

ESSENCE (cont.)

Chief Complaint Sub-syndrome → Abdominal Pain



Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

A new era of surveillance?

- **Pre-WEDSS**
  - Access to data limited to local jurisdiction
  - Limited to manual and hardcopy reports via fax, mail or phone
  - Access database that required data export for analysis with a limited number of data fields
- **Post-WEDSS**
  - Receive electronic lab and clinical reports; trend locally and statewide in near real time
  - Electronically linked to SAS web server for analysis
  - Complete electronic surveillance data set of risk factors
  - Ability to link related cases in the database
  - Automatic threshold alerts

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Some Challenges

- Concurrent E. coli outbreak in WI involving county fair (petting zoo)
- Seasonality of E. coli reporting
- Lack of MHDL full enrollment in PulseNet
- Lack of coordinated State and LPHA response protocols

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Lessons from the frontlines (1)

- Relationships and informal communications networks between public health and private healthcare are absolutely essential in early detection and response.
- Strive for seamless connectivity between lab and epi data (both clinical and environmental specimen) in standardizing reporting and interpretation.
- PFGE and PulseNet can be powerful tools in "connecting the dots" early during an outbreak
- Outbreaks don't end on weekends or after regular business hours

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Think Health. Act Now! CITY OF MILWAUKEE HEALTH DEPARTMENT

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Lessons from the frontlines (2)

- Put all data on the table all the time – especially early in the investigation
- Multiple unrelated regionally outbreaks can and do occur (coincidentally)
- Media should be dealt with early and routinely through coordinated briefings
- Keep public informed of investigation findings and say what you know

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Lessons from the frontlines (3)

- Engage other emergency response "partners" outside of public health (law enforcement, fire, EMS, EM)
- Keep policymakers "in the loop" (resource and constituency issues)
- Monitor public concerns and adjust messages accordingly to allay fears

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

''It is of fundamental importance that local public health to foster relationships with diverse <u>healthcare partners</u> whose index of suspicion remains at the core of effective early warning systems''

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov

Paul A. Biedrzycki, MPH, MBA

Manager, Disease Control & Prevention

pbiedr@milwaukee.gov

414-286-5787

November 6, 2007

Content in this presentation may not be duplicated, copied, or reproduced outside the purview of MHD without permission.

Copyright 2007, Paul A. Biedrzycki, pbiedr@milwaukee.gov