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Title: Direct Observation of Local Public Health: The Role of Local Health Departments in Prevention of Foodborne Outbreaks

Meeting/Workshop: Annual Meeting & Exposition

Organization Holding Meeting: American Public Health Association

Date: October 29, 2012

Place: San Francisco, CA

Direct Observation of Local Public Health

The Role of Local Health Departments in Prevention of Foodborne Outbreaks

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Ohio Research Association
for Public Health Improvement

Public Health Practice-Based Research Network

- 🌳 No financial disclosures
- 🌳 The Ohio Research Association for Public Health Improvement (RAPHI) is a grantee of Public Health Practice-Based Research Network, a national program of the Robert Wood Johnson Foundation



What is RAPHI?

- 🌳 RAPHI is a Public Health Practice-Based Research Network (PH PBRN)
- 🌳 Organized group of Ohio public health agencies
- 🌳 1 of 12 funded PH PBRNs and 12 affiliate PH PBRNs nationally (total 24)
- 🌳 PH PBRNs support the development & dissemination of evidence-based public health practices
- 🌳 Funded by the Robert Wood Johnson Foundation (RWJF)—December 2009 through 2013



Purpose of RAPHI

- Grounded in public health practice
- Ongoing collaborations with public health research centers
- Conducts rigorous, applied studies
- Identify ways of improving the organization, financing and delivery of public health services in real world community settings



Ohio RAPHI Coordination

- 🌳 PI—Scott Frank, MD, MS, Case Western Reserve University
- 🌳 Co-PI (former)—Matthew Stefanak, MPH, RS (former Health Commissioner, Mahoning County District Board of Health)
- 🌳 Co-PI (new)--Gene Nixon, MPA, RS, Health Commissioner, Summit County Public Health
- 🌳 Project Coordinator—Michelle Menegay, MPH



Direct Observation of Local Public Health: **Rationale**

- ❁ Lack of credible evidence regarding the types and levels of workforce, infrastructure, related resources, and financial investments in public health
- ❁ Offer evidence to provide a rational approach to changing the public health system in the face of health reform



Choosing Foodborne Outbreaks as an Archetypal Public Health Problem

- 🌳 Enforcement is among the 10 essential public health services
- 🌳 Food safety is among the CDC's 6 winnable battles
- 🌳 Represents the face of public health to much of the public



Direct Observation of Local Public Health

- 🌳 **Purpose:** To characterize public health practice—structure, process, and outcome of the local health department (LHD) role in foodborne illness prevention, investigation, and management



Direct Observation of Local Public Health

- 🌳 **Secondary purpose:** To examine the accuracy, practicality and differential utility of a direct observation approach to understanding the complexity of public health practice while reducing research error variation



Examine Myth vs Reality

- 🌳 Sanitarians are nothing more than “mayonnaise police”
- 🌳 Food services establishments hate inspections
- 🌳 Relationships between RS and PIC are contentious
- 🌳 Little is really accomplished during food inspections



Burden of Foodborne illness

- 🌳 CDC 2011 estimates foodborne illness :
 - Affects roughly 1 in 6 Americans (or 48 million people) each year
 - 128,000 are hospitalized
 - 3,000 die

Source: <http://www.cdc.gov/outbreaknet/outbreaks.html>

<http://www.cdc.gov/foodborneburden/2011-foodborne-estimates.html>



Economic burden of Foodborne illness

- 🌳 Economic burden from health losses due to foodborne illness in the United States is estimated to be on average \$1,626 per case
- 🌳 The overall aggregated annual cost of foodborne illness is roughly \$77.7 billion

Source: Scharff RL.(2012), Economic burden from health losses due to foodborne illness in the United States, J Food Prot. Jan;75(1):123-31

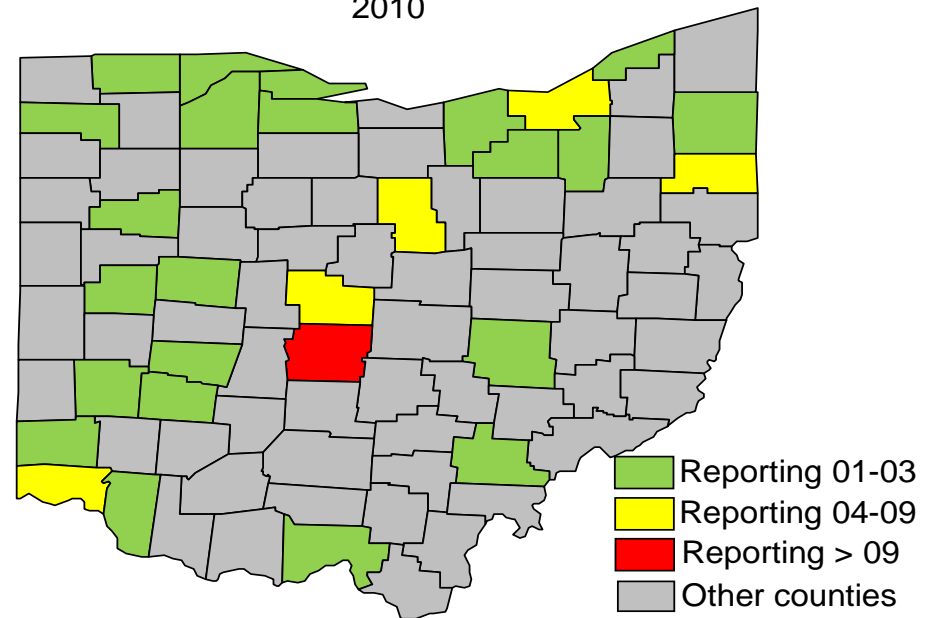


Foodborne Outbreaks

🌿 Statistics

- 67 outbreaks affecting
🌿 911 people in 28 of
🌿 Ohio's 88 counties
- One multi-state
(*E. coli* O145)

Counties Reporting Foodborne Outbreaks
Ohio Department of Health
2010



Ohio Department of Health

Ohio Department of Health Provisional Data



Direct Observation of Local Public Health Research Structure

- 🌳 Seven academic public health programs
 - DOLPH liaison(s) at each program
 - Regular conference calls
- 🌳 3 to 5 local health departments per program
 - Regular contact with liaison to report on progress and assure opportunity for feedback
- 🌳 3 to 5 student observers
 - Statewide and local training



DOLPH Academic Research Sites



DOLPH Co-Investigators



Case Western Reserve University

- Michelle Menegay, MPH



University of Cincinnati

- William Mase, DrPH, MPH, MA



Kent State University

- Scott Olds, MS, PhD



Consortium of Eastern Ohio, NEOMED

- Amy Lee, MD, MBA, MPH
- Tom Albani, MPH



Ohio State University

- Michael Bisesi, MS, PhD



Northwest Consortium, University of Toledo

- Barbara Saltzman, PhD, MPH
- Brian Fink, PhD, MPH



Wright State University

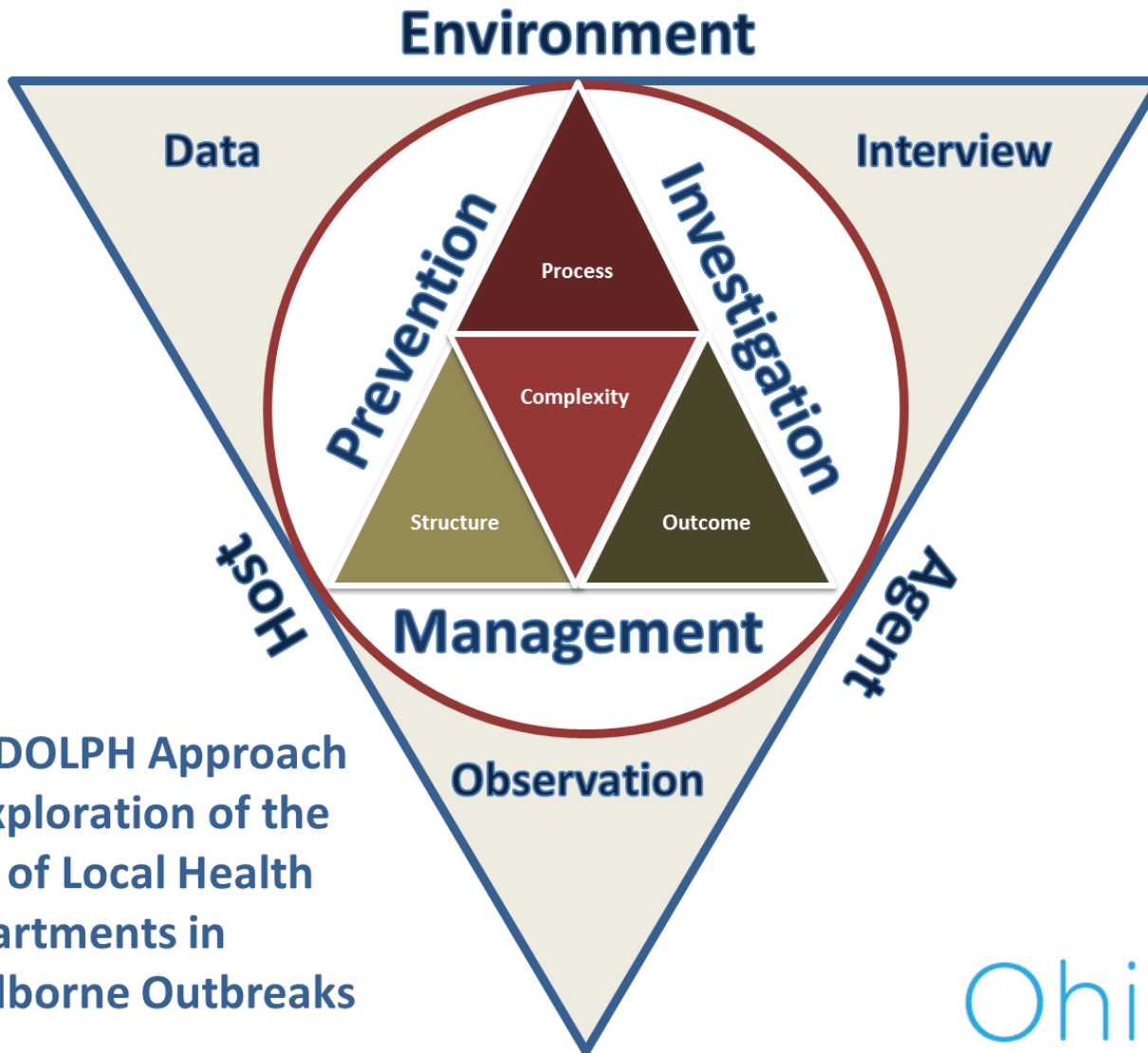
- Sylvia Ellison, MA



Direct Observation of Local Public Health Methods

- 🌳 Mixed methods approach
 - Qualitative and quantitative interview, observation data
 - Secondary data (health department, jurisdictional profiles)
- 🌳 Combines original qualitative and quantitative data with existing statewide quantitative databases
- 🌳 Ohio statewide databases for public health services and systems research:
 - Socio-demographic census data
 - Ohio Annual Financial Report data
 - Local health department performance standards data





The DOLPH Approach
to Exploration of the
Role of Local Health
Departments in
Foodborne Outbreaks



This Presentation is Reporting on

- 🌳 273 observed FSE inspections
- 🌳 52 Sanitarians
- 🌳 45 Student observers
- 🌳 5 sites



DOLPH Observational Protocol Validity and Inter-Rater Reliability

Variable	N	Percent Correct	Gold Standard
RS threaten punitive action	45	100	No
RS uses unexplained jargon	45	97.8	Not at all
Argumentation occurs	45	97.8	Not at all
Favors offered to RS	45	97.8	No
RS gives Positive Feedback	45	95.6	More than once
RS gave clear feedback	45	88.6	More than once
RS gives Negative Feedback	45	84.4	Not at all
RS admits uncertainty	43	82.2	Not at all
RS uses humor	45	82.2	More than once
RS discuss improvement plan	44	79.5	More than once
PIC interrupts RS	45	75.6	Not at all
RS confirms understanding	34	64.7	More than once
RS offers education	43	51.2	More than once
PIC admits uncertainty	44	44.4	Once
PIC uses humor	44	40.0	Not at all



DOLPH Observational Protocol Validity and Inter-Rater Reliability

Inspection – Content			
Variable	N	Percent Correct	Gold Standard
Tobacco enforcement	45	100	No
Clean indoor air	45	100	No
Spoiled foodstuff	45	100	No
RS squats/bends over	45	88.9	> 5 times
RS checks menu	33	84.8	No
RS checks cold/hot food temp	45	82.2	> 5 times
Date marking	44	81.8	Apparently
RS looks under item	45	71.1	> 5 times
Cross contamination	45	66.7	Comment made
Cleaning solutions labels	44	65.9	Apparently
Presence of vermin	43	62.8	Apparently
Thermometer calibration	45	62.2	Apparently
Surface cleanliness	45	62.2	Comment made
Checks food labels	45	57.8	> 5 times
Hand washing	45	57.8	Apparently



DOLPH Observational Protocol Validity and Inter-Rater Reliability

Check-In and Check-Out			
Variable	N	Percent Correct	Gold Standard
PIC Gender	43	100	Male
PIC Cooperative	45	100	Yes
PIC question RS fairness	45	100	No
RS Wash Hands	45	100	Yes
PIC engaged	45	97.8	Engaged
PIC question RS authority	45	97.8	No
PIC voiced raised in anger	45	97.7	No
RS voiced raised in anger	45	97.7	No
RS accompanied by PIC	32	96.9	No
PIC thank RS	45	95.6	Yes
RS thank PIC	45	95.6	Yes
PIC question RS judgment	45	95.6	No
PIC and RS Shake Hands	45	93.3	Yes
Check-In Time	45	93.3	1-5 minutes
RS Interact with PIC solely	45	91.1	No



Registered Sanitarian Profile

- 🌳 Average age 38 years
- 🌳 50% male/female
- 🌳 15% African American
- 🌳 4% Hispanic
- 🌳 7.4 years in current position
- 🌳 10.8 years working as a Sanitarian
- 🌳 55% Generalist
 - Among those with experience in both roles 53% preferred functioning as a generalist, while only 20% preferred specialist

Registered Sanitarian Profile


Time allocation

- 59% of time spent conducting food inspections
- 23% of time with paperwork
- 10% Nuisance inspection
- 8% School inspection
- 7% Swimming pool
- 3% Water/Septic
- 10% other

Registered Sanitarian Profile

- 🌳 In the past 2 years
 - 83% have experience with suspected foodborne outbreaks
 - 65% have experienced verified foodborne outbreaks
- 🌳 49% consider their job very demanding
- 🌳 86.5% report experiencing good decision latitude on the job

Limiting Factors

 RS who perceive some limitations in their ability to conduct FSE inspections because of:

- Competing demands 73.5%
- Work load too heavy 71.2%
- LHD Relationships 41.2%
- FSE Relationships 36.5%



RS by Demographics

- 🌳 Males showed a trend towards considering their job more demanding (62.5% vs 34.8%, $p = .057$)
- 🌳 Women were more likely to feel limited by relationships in the LHD (60.9% vs 17.4%, $p = .003$)
- 🌳 No differences by gender in any other attitudes, experience
- 🌳 No differences by race in any attitudes, experience

RS by Generalist vs Specialist

- 🌳 Specialists showed a trend toward liking FSE inspections more than generalists (73.9% vs 51.7%, $p = .1$)
- 🌳 Specialists showed a trend toward greater likelihood of having investigated an FBO in the past 2 years (47.8% vs 23.1%, $p = .07$)
- 🌳 No differences by gender in any other attitudes, experience

RS Experience

- 🌳 No influence on attitudes about PIC or job except less experienced more likely to feel limited in effectiveness by :
 - Competing environmental health demands (≤ 5 years 50%; 6-12 years 23.5%; >12 years 11.1%; $p=.036$)
 - Competing expectations on time (≤ 5 years 62.5%; 6-12 years 22.2%; >12 years 5.6%; $p=.001$)

Pre-Inspection Interview

- 🌳 87% had inspected this FSE previously
- 🌳 66% of those related a positive history (4% negative)
- 🌳 6.9% “Heart Sink” inspections
- 🌳 94% unannounced
- 🌳 FSE risk category
 - 1 or 2: 8%
 - 3: 45%
 - 4: 47%



Pre-Inspection Interview

Inspection Type

- 89% routine inspections
- 7% follow-up or complaint investigations
- 4% pre-licensing or new establishment

Type of Establishment

- 22% national franchise restaurant
- 21% local privately owned restaurant
- 11% local franchise restaurant
- 13% fast food
- 10% grocery, corner store, or gas station

Person in Charge (PIC) Characteristics

- 🌳 51% female
- 🌳 Age estimate
 - 18-30 years 17%
 - 31-40 years 29.5%
 - 41-50 years 33%
 - >50 21%
- 🌳 PIC role
 - Manager 56%
 - Owner 17%
 - Other/DK 28%
- 🌳 Facility with English
 - Speaking good or excellent 95%
 - Speaking fair or worse 5%
 - Comprehension good or excellent 98%
 - Comprehension fair or worse 2%



Starting the Inspection

- 🌳 66% addressed the PIC by name or title
- 🌳 73.5% introduced themselves
 - 59% by first name
- 🌳 51% had a previous relationship with the PIC
- 🌳 42.5% shook hands
- 🌳 86% washed hands
- 🌳 83% interacted with more than just the PIC
 - Average of 3 additional employees/inspection
- 🌳 20.5% interacted with patrons
- 🌳 88% spent less than 5 minutes speaking with the PIC before the inspection
- 🌳 8% of the time PICs appeared to be stalling the start of inspections










RS-PIC Interaction






Behavior	Person in Charge	Registered Sanitarian
Admitted uncertainty	46%	8%
Used humor	62%	54%
Interrupted	18%	23%
Voice raised in anger	2%	.7%
Favors (offered/accepted)	10%	None



RS-PIC Interaction

 Unexplained jargon used	2.5%
 Positive feedback offered	78%
 Feedback offered negatively	15%
 Argumentation/conflict	5%
 Punitive action threatened	3.5%
 Feedback occurred privately	74%
 Feedback interrupted	10%

Inspection Tools Utilized

 Probe thermometer	73%
 Laser thermometer	60%
 pH paper	52%
 Flashlight	23%
 Educational handouts	13.5%














Areas Inspected

- 🌳 Shelves/cupboards 4.2/inspection (11% not at all)
- 🌳 Preparation area 3/inspection (5% not at all)
- 🌳 Food labels 3/inspection (14% not at all)
- 🌳 Sinks 2.5/inspection (4% not at all)
- 🌳 Cooking area 2.5/inspection (14% not at all)
- 🌳 Water temperature 1.7/inspection (22% not at all)
- 🌳 Trash 1.6/inspection (18% not at all)

Sanitarian Actions

- 🌳 Check cold temperatures 7.5/inspection
 - 6% not at all
- 🌳 Squat or bends 3.8/inspection
 - 14% not at all
- 🌳 Looks under or behind 2.8/inspection
 - 12.5% not at all
- 🌳 Gives advice or direction 2.8/inspection
 - 11% not at all
- 🌳 Check hot temperatures 2.6/inspection
 - 47% not at all

Sanitarian Actions: Checked...

 Refrigeration	99%
 Cleanliness of cloths, surfaces, etc	98%
 Food storage	97%
 Hand washing facilities	97%
 Food holding time or temp	89%
 Cross contamination control	89%
 Date stamping	89%
 Dishwasher	88.5%
 Ice machine	88%
 Sanitizing fluids	81%
 Disposal of food waste	69.5%
 Temperature log	53%
 Menu	49%



Check out

- 🌳 Observed spoiled food discarded 59.5%
- 🌳 Clear feedback and assessment 98.5%
- 🌳 Discuss improvement plan 87%
- 🌳 Offer food safety education 69%
- 🌳 Elicit questions 77.5%






Food Safety Violations

- 🌳 Citation given 2.19/inspection
 - 67% of inspections
- 🌳 Verbal corrections given 1.93/inspection
 - 89% of inspections
- 🌳 Violations dealt with:
 - During inspection 54%
 - Follow up scheduled 22.5%%
 - No follow up scheduled 24%

Check Out

- 🌳 PIC questioned RS knowledge 2.6%
- 🌳 PIC questioned RS judgment 2.6%
- 🌳 PIC questioned RS fairness 1.4%
- 🌳 PIC questioned RS authority 1.5%

Check out

 PIC/Employees Cooperative	97.5%
 PIC/Employees Engaged	88%
 PIC thanked the RS	91%
 RS thanked the PIC	89%
 Hand on the doorknob	8%

Check Out

Duration of checkout

- 0 minutes 1%
- 1-5 minutes 38%
- 6-10 minutes 40%
- 11-20 minutes 16%
- 21-40 minutes 4.5%

Post Inspection Interview

How hard was the inspection?

- Challenging or very 7%
- Average 21%
- Easy 40%
- Very Easy 33%

How hard were the interpersonal interactions

- Challenging or very 8%
- Average 16%
- Easy 39%
- Very Easy 37%

Post Inspection Interview

How satisfied with what you accomplished?

- Very dissatisfied 2%
- Dissatisfied 4%
- Average 15%
- Satisfied 51%
- Very satisfied 27%

Perception of time spent with PIC

- Not sufficient 5%

Post Inspection Interview

- 🌳 Surprises or unexpected findings 27%
- 🌳 How concerned about future problems?
 - Very 6%
 - A little 25%
 - Not 69%
- 🌳 Student Observer influence action?
 - 88.5% not at all

Limitations

- 🌳 Student observer influence actions (observer bias)
- 🌳 Preliminary findings
- 🌳 Tests of association not yet examined

Strengths

- 🌳 Good inter-rater reliability
- 🌳 Different approach
- 🌳 Detailed data available
- 🌳 Geographic spread
- 🌳 Ability to combine original research with publicly available data in the future
- 🌳 Decreased error variation

Key Findings

- 🌳 RS/PIC relationship is uniformly cordial
- 🌳 Highly positive RS/PIC interaction characteristics
- 🌳 This positive atmosphere exists despite verbal corrections and citations being usual
- 🌳 Food safety education is a very prominent part of the inspection process
- 🌳 Sanitarians interact with a broad number of employees and patrons in addition to the PIC
- 🌳 PIC generally expresses gratitude at the end of the session

Examining Myth vs Reality

Myth	Reality (Findings)
Sanitarians are nothing more than “mayonnaise police”	Enforcement is an essential component of FSE inspection, but much more occurs
Food services establishments hate inspections	There is little evidence of PIC loathing during the inspections or toward the RS
Relationships between RS and PIC are contentious	Evidence strongly indicates a predominance of mutually respectful, cordial relationships
Little is really accomplished during food inspections	Inspections are complex with high levels of skill demonstrated



Lessons Learned

- 🌳 The methodology works
 - Strong inter-rater reliability
 - Rich intriguing findings
 - Does indeed examine complexity
 - Student observers enthusiastic
 - RS enthusiastic and don't feel it interferes with getting the job done
 - Printed handouts are not widely used



Lessons Learned

- 🌳 Multisite studies are difficult
 - Especially when doing them on a small budget (less leverage)
 - IRB across sites took much longer than necessary
 - Could not have done this study from one site



 Thanks!

 And, Questions or Comments

