

Food Safety Interventions of Food Service Establishments: Current Evidence

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September 17, 2012 | CIPHI National



National Collaborating Centre
for Environmental Health

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BC Centre for Disease Control
An Agency of the Provincial Health Services Authority

Outline

- Introduction: Purpose of this project
- Methods: How food safety is evaluated in the literature
- Results of the four evidence reviews
- Discussion: Trends in the field of research
- Limitations & Evidence Gaps

Purpose

- Examine the evidence on the effectiveness of existing interventions for reducing food-borne illness among food service establishments
- Identify evidence gaps of existing food safety interventions

Methods

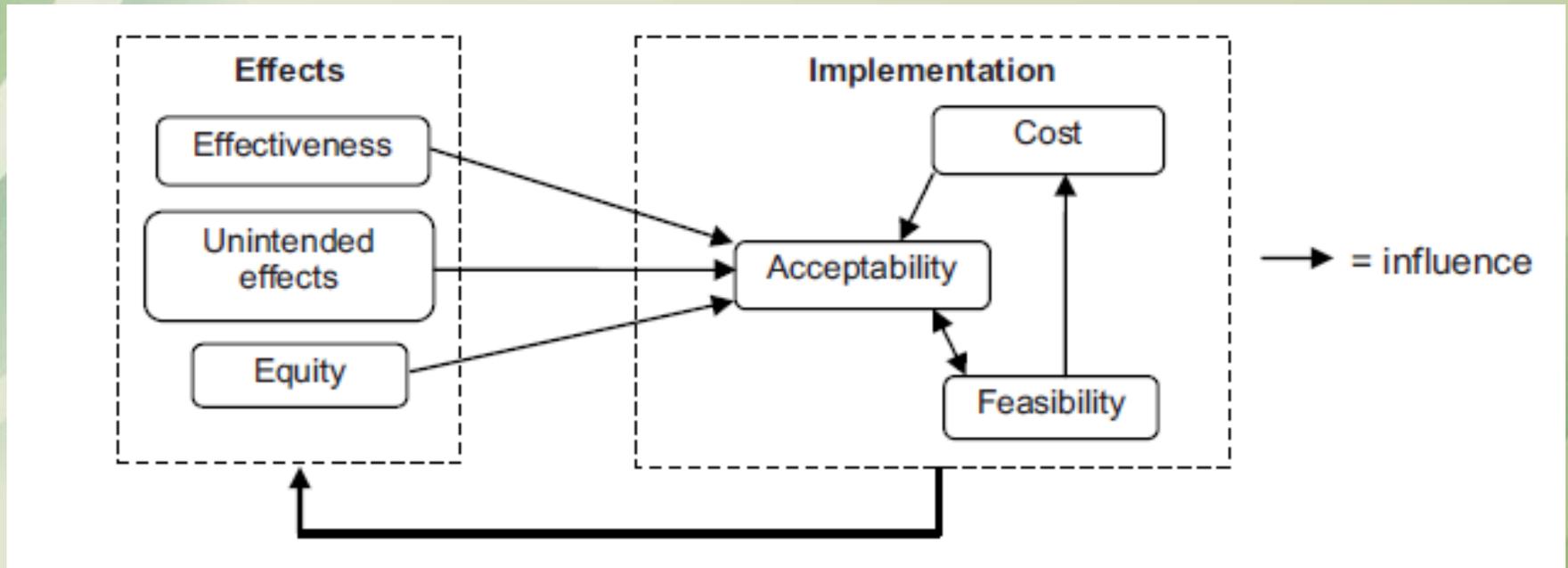
- Consultation with reference committee
 - Identifying interventions of interest
- Literature search
 - Peer reviewed & grey literature
- Evaluation of intervention effectiveness
 - Based on the NCCHPP model
- Identification of indicators
 - Food safety measures

Type of Intervention	Examples
Inspection protocol	Frequency of inspection visits, inspection methodologies
Hazard Analysis of Critical Control Points (HACCP)	Mandatory creation and tracking of food safety/HACCP plan
Risk-based inspection	Inspection frequency based on risk level of premise
Field reporting technology	Electronic hand held device for inspection reporting
Food handler training	Mandatory food handler certification for staff, certified kitchen manager training
Education during inspection visits	Serving Safe Food Alberta
Engineering and equipment use	Mandatory glove use, hand sanitization facilities
Managerial intervention	Sick leave/reporting policies, designated food handling assignments to reduce cross contamination
Disclosure program	Online database of inspection results, Grade card program, Dinesafe, Scores on the Doors
Award and recognition for hygiene compliance	Elite smiley face, Elite star award
Internal quality assurance	Quality assurance program for inspection visits
Outbreak surveillance	Reportable Disease Information System [RDIS], Integrated Public Health Information System [IPHIS]
Community partnerships	Partnership with ethnic restaurant associations

Interventions Reviewed

- 1) Inspection disclosure systems
- 2) Food safety enforcement (Routine Inspection)
- 3) Mandatory food handler training and certified kitchen manager training
- 4) Engineering and managerial interventions

Intervention Assessment Model



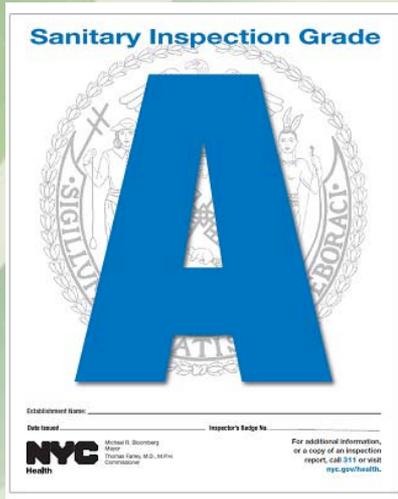
Source: Morestin F, Gauvin F-P, Hogue M-C, Benoit F. Method for Synthesizing Knowledge about Public Policies: National Collaborating Centre for Healthy Public Policy; 2010. Available from: http://www.nccchpp.ca/docs/MethodPP_EN.pdf.

Findings: Inspection Disclosure System

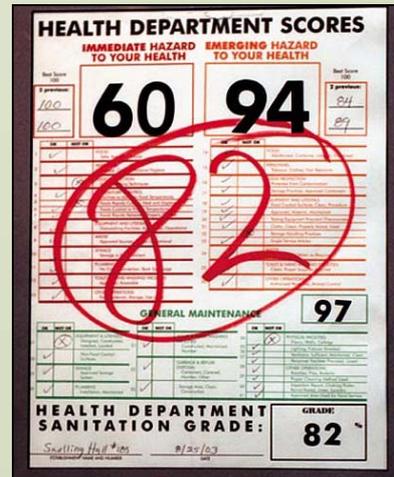
- Improvements in inspection performance
- Inconclusive evidence on food borne illness rates
- Unintended effects on inspector, operator & consumer behaviour

Examples of Different Inspection Notices (or Sign) System

Letter Grades



Numerical Scores



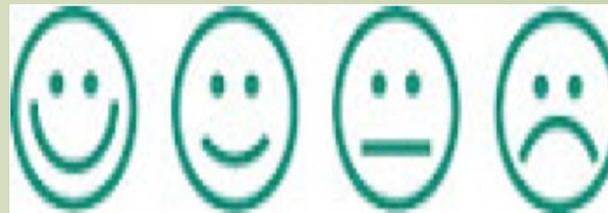
Colour Cards



Statement Cards



Symbol

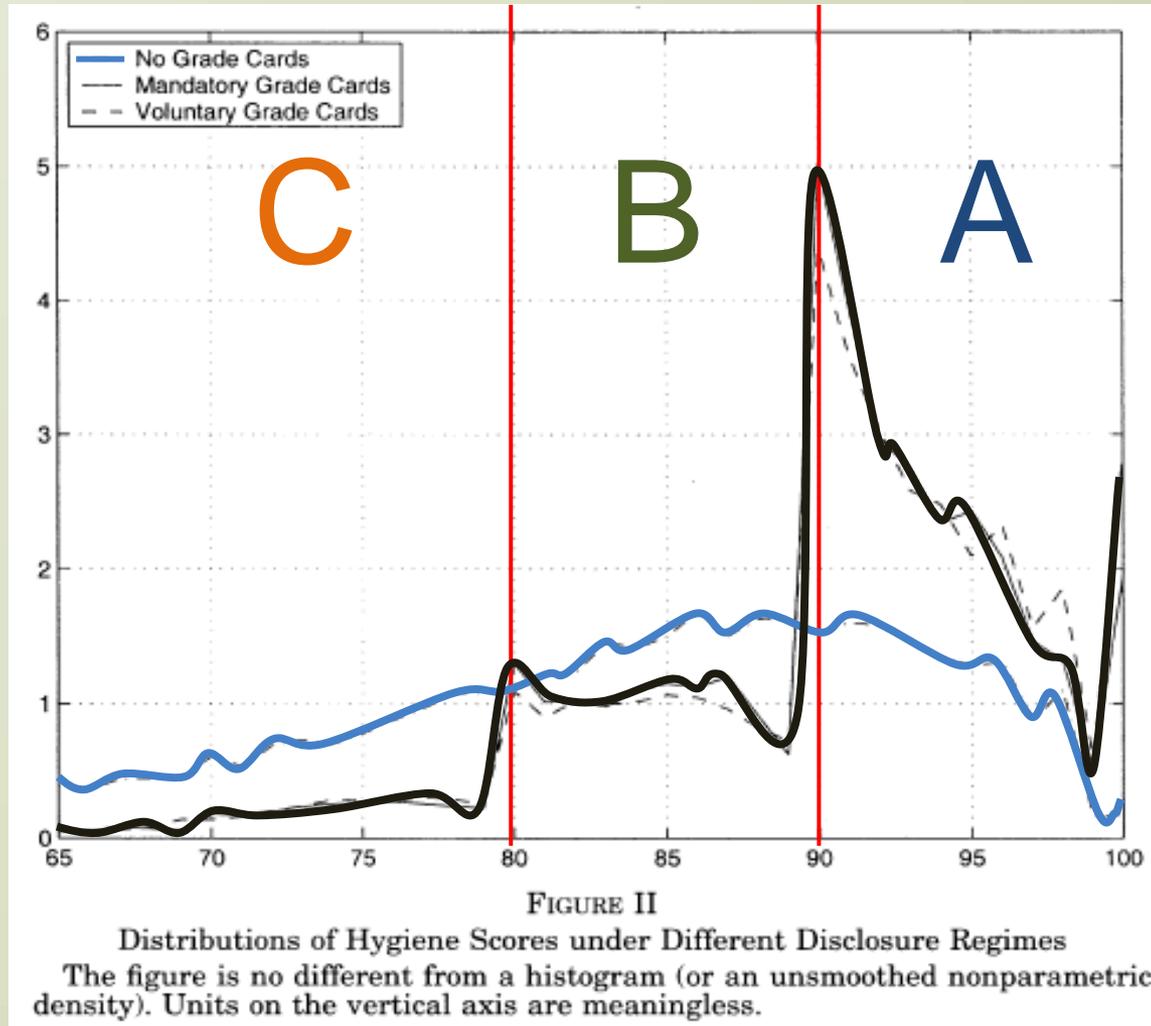


Award Schemes



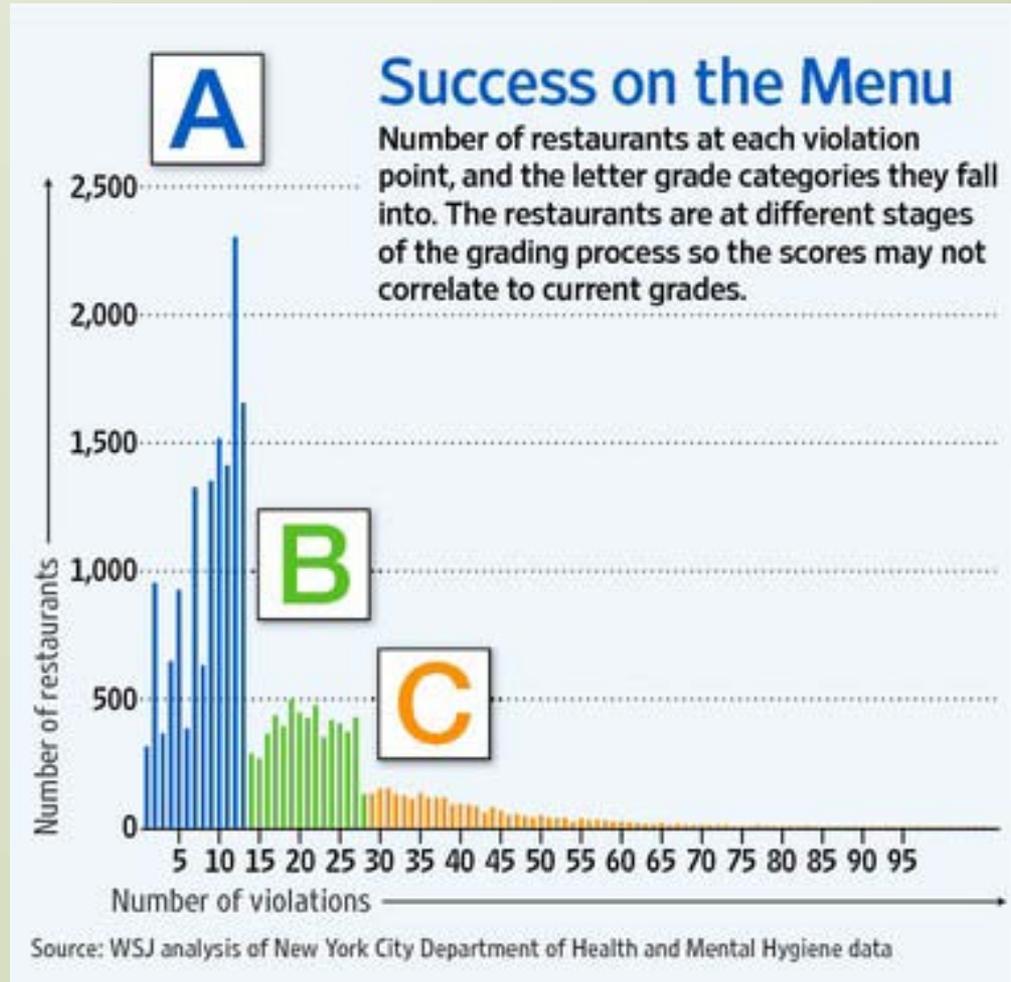
Paige Schell, Practicum Student
Ministry of Health and Long-Term Care, Ontario

Change in Score Distribution (Los Angeles)



Source: Jin GZ, Leslie P. The Effect Of Information On Product Quality: Evidence From Restaurant Hygiene Grade Cards*. *Quarterly Journal of Economics*. 2003;118(2):409-51

Change in Score Distribution (New York)



How Not to Hide Inspection Grades



Source: Johnston G. DOH Fines 804 Restaurants for Hiding Their Grades. Gothamist. 2011 June 15, 2011.

How Not to Hide Inspection Grades



Source: Marian Nestle, <http://www.foodpolitics.com>



Sneaky Restaurant FAIL

failblog.org

Source: <http://www.failblog.org>

Findings: Routine Inspection

- Stricter enforcement policies alone did not improve food safety
- Successes seen in programs where education was provided in conjunction with inspection
- Evidence on frequency of inspection was inconclusive



Findings: Food Handler Training

- Benefits for having certified kitchen/food manager
- Inconclusive evidence on mandatory food handler training
- On-site/demonstrative training showed positive benefits

Findings: Engineering & Managerial

- Glove use was efficacious in lab setting but not in practice
- Hand washing engineering
 - Water temperature did not improve food safety
 - Paper towel as a better drying agent than hand dryers
- Food safety infosheets showed improvements
- Paid sick leave may yield food safety benefits

Examples of food safety infosheet

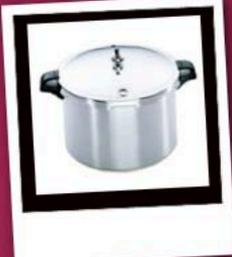
Food safety infosheet August 2, 2012
www.foodsafetyinfosheets.com

Storing low-acid foods in a jar and sealing them without either acidifying or processing using pressure creates the ideal conditions for toxin formation.

Tested recipes and directions for safe canning can be found at the National Center for Home Food Preservation: nchfp.uga.edu.

In 1977, 59 patrons of a Detroit Mexican restaurant became ill with botulism after consuming improperly canned peppers after restaurant staff put lightly-cooked peppers and water in jars and sealed them.

Home-canned beets in Oregon linked to three botulism hospitalizations




Three attendees at a private gathering in Oregon were hospitalized in July 2012 after eating foods that contained the botulism toxin. The ill individuals shared beets that had not been canned properly. The beets had been placed into jars, heated in a boiling water bath and then stored at room temperature. The lack of oxygen, low-acid environment and room temperature creates ideal conditions for *Clostridium botulinum* spores to germinate and create the toxin.

While boiling water bath temperatures will kill many foodborne pathogens, *Clostridium botulinum* spores are tough and require higher heat to be inactivated. The only way to do this in a home kitchen is through the use of a pressure canner.

- Low acid foods (pH greater than 4.6) like beets cannot be safely canned using a boiling water bath unless acidified according to a tested recipe.
- *Clostridium botulinum* occur in soil and foods that come from the soil. After heating the spores can germinate into cells create a toxin leading to botulism in oxygen-free environment (like canned foods).
- A pint of beets needs to be processed for 30 min at 11 psi if using a dial gauge (or 10 psi using a weighted gauge) pressure canner at sea level.
- Required pressure will increase at higher altitudes; time will increase for larger containers (quarts).
- Consult the National Center for Home Food Preservation, <http://www.uga.edu/nchfp/> for altitude adjustments and tested recipes.



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FOOD SAFETY INFOSHEET
May 29, 2012

CROSS-CONTAMINATION FACTOR IN OUTBREAK

88 *Salmonella* Paratyphi B illnesses linked to unpasteurized tempeh



TEMPEH IS A FERMENTED SOY PRODUCT

CROSS-CONTAMINATION

To make tempeh, soybeans are cooked and mashed. Vinegar and a fungal starter are added to the soybean paste and the fungus is allowed to grow for 2-3 days (and it consumes the vinegar). *Salmonella* and other pathogens can grow during this process. Unpasteurized tempeh should be handled like raw meat.



Food safety know-how

- Wash hands after handling any potentially contaminated food or packaging (especially those that are leaking).
- Clean and sanitize food contact surfaces after preparing any raw or potentially contaminated food.

An outbreak of *Salmonella* Paratyphi B has led to over 80 illnesses in North Carolina since March 2012. The illnesses are linked to restaurants that served tempeh, a fermented soy product. Investigators have since linked the introduction of the *Salmonella* to a starter culture used by the tempeh processor, Smiling Harah of Asheville, North Carolina.

The outbreak has resulted in recalls by Smiling Harah as well as the starter culture supplier, IndonesianFoodMart.com. While the original source of the *Salmonella* was the starter culture, health authorities pointed to cross-contamination in kitchens as a factor that led to illnesses. Food preparers reported cutting uncooked tempeh and fresh vegetables with the same knives and cutting boards. *Salmonella*-containing tempeh residue could have spread to diners through these utensils.

Unless noted on packaging, treat tempeh as a raw food; knives, cutting boards and other food contact surfaces must be cleaned and sanitized between preparation and use with ready-to-eat foods.





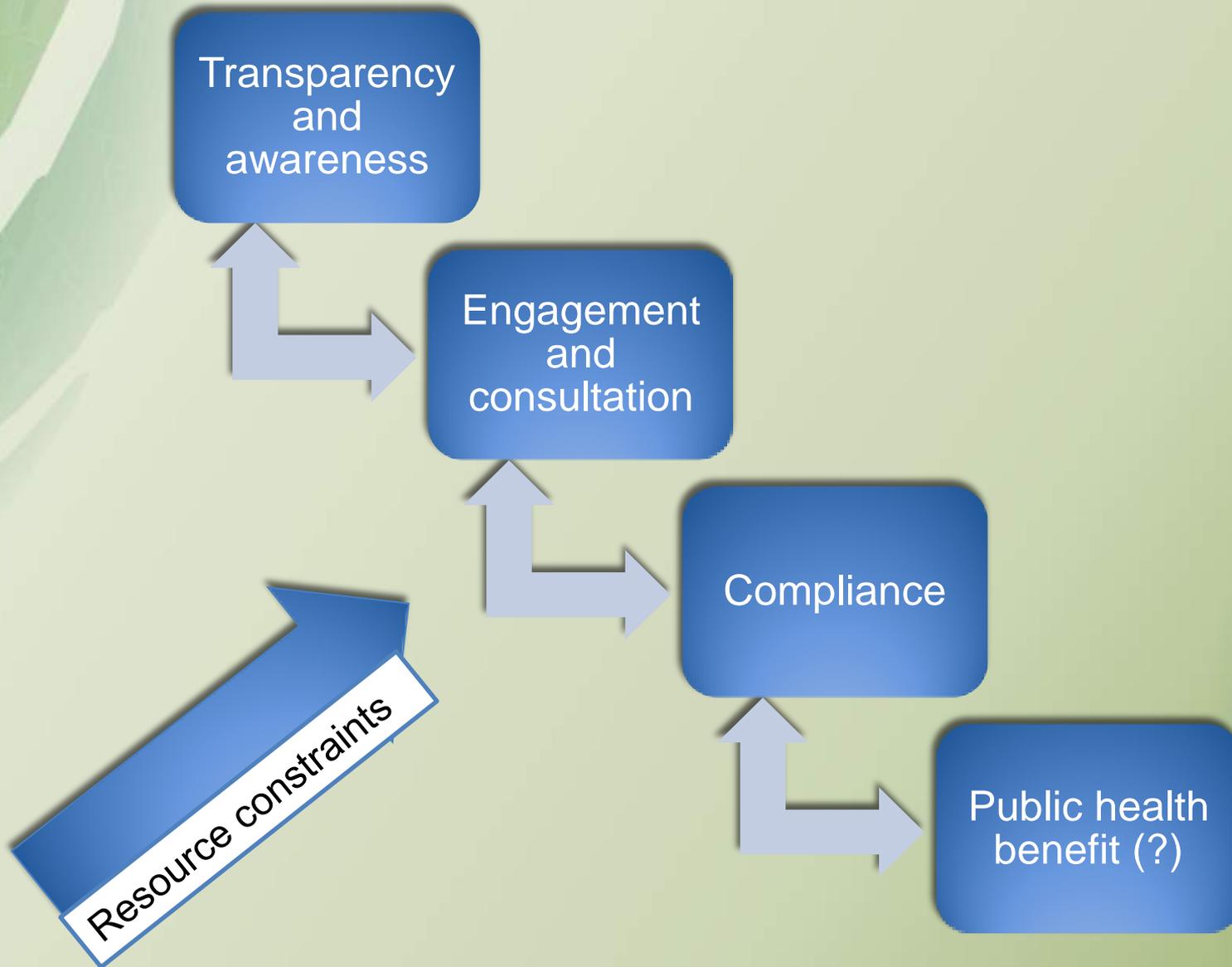
For more information contact Ben Chapman, benjamin_chapman@ncsu.edu or Doug Powell at dpowell@ksu.edu

Ben Chapman,
Kansas State University <http://foodsafetyinfosheets.wordpress.com/>

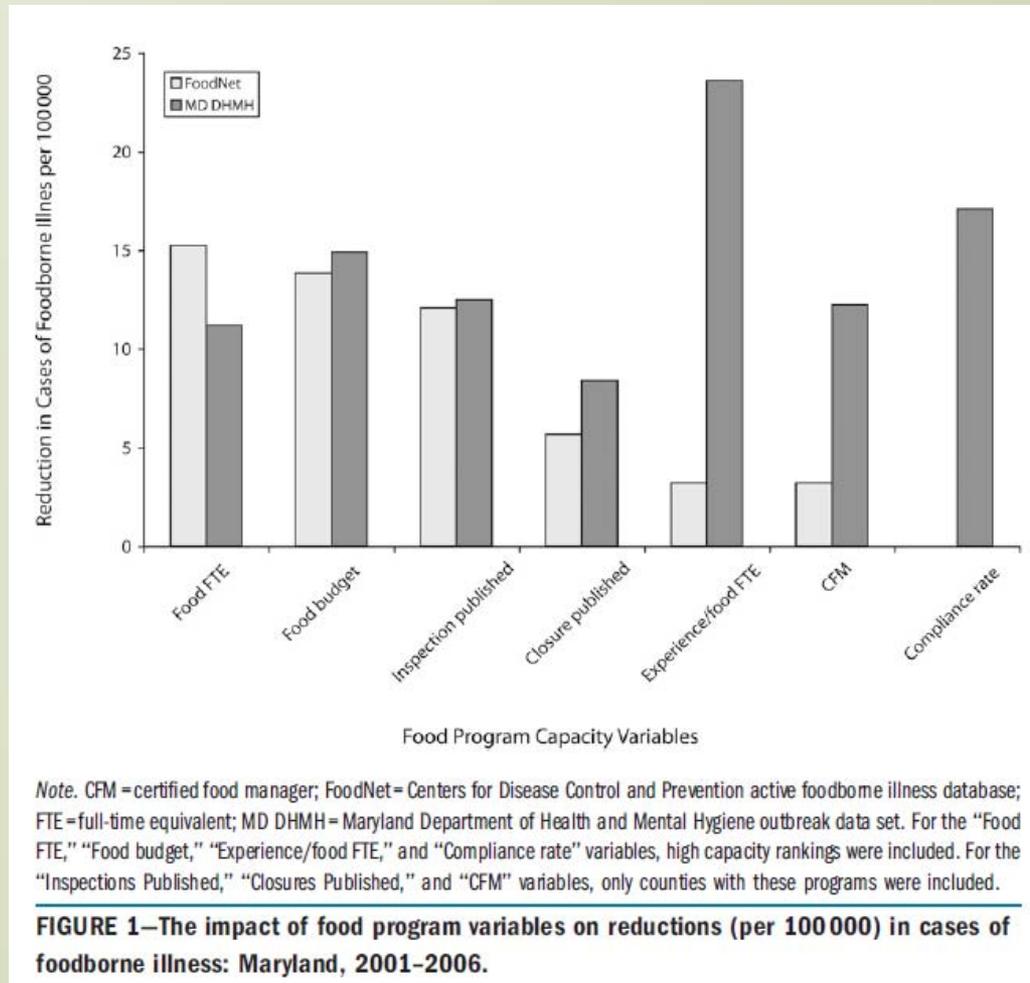
Discussion

- Study designs in peer reviewed literature: do intervention meet the needs of public health inspectors?
- Efficacy → effectiveness → practicality
- Unintended effects of interventions
- Evaluation of interventions are lacking

Discussion: Planning & Evaluation



Evaluation of Programs



Source: Kufel et al. (2010). The Impact of Local Environmental Health Capacity on Foodborne Illness Morbidity in Maryland. *American Journal of Public Health*. 101(8) 1495-1500.

Evidence Gaps & Limitations

- Studies need to account for food handler behaviour's effect on intervention
- Interventions addressing food safety culture are needed
- Evaluations of food safety program effectiveness are not readily accessible

Thank You

Questions?

Comments?

Evidence reviews (draft) available on request

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www.ncceh.ca | www.ccnse.ca

Funded by the Public Health Agency of Canada

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