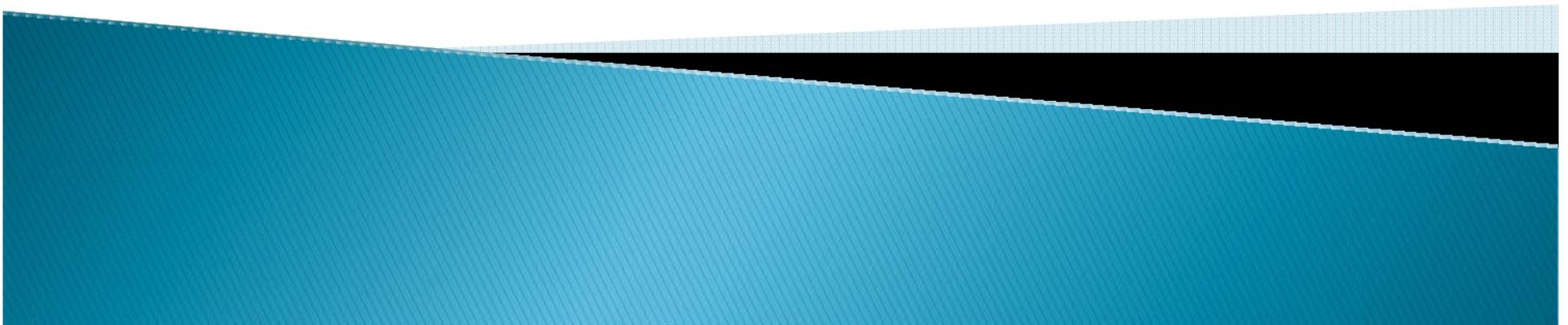


Houston Department of Health and Human Services Food Manager's Certification Program

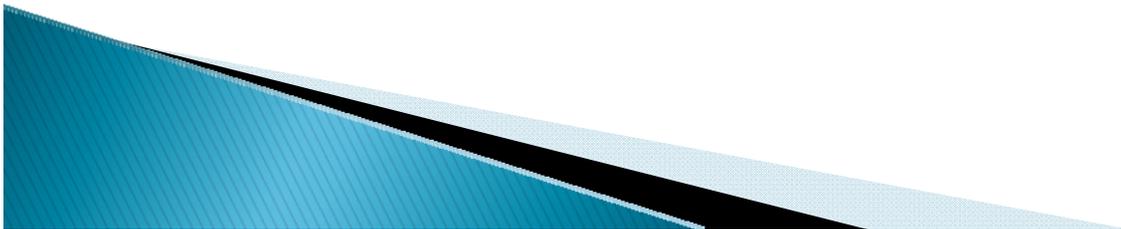
Program Evaluation

Provided by: Cary Cain, Abhinav Khanna, Aditya Lal, Michelle Marshall, Stephanie Meyer, Chad Niemeyer, and Deema Simaan,



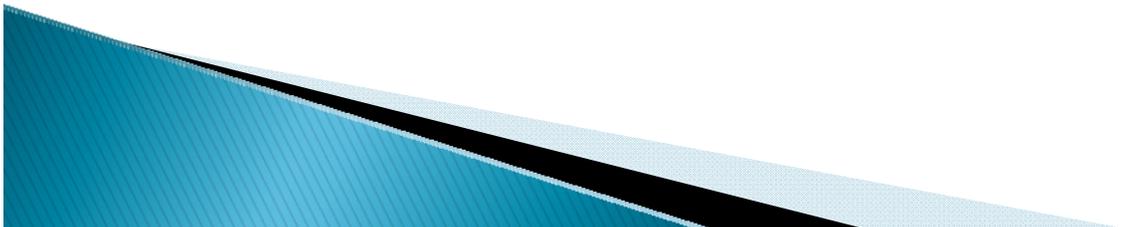
Outline

- ▶ Scope of Foodborne Illness
- ▶ History of Food Service Manager's Certification
- ▶ Overview of inspection program
- ▶ Logic Model
- ▶ Qualitative analysis
- ▶ Quantitative analysis
- ▶ Recommendations
- ▶ Conclusions



Scope of Foodborne Illness

- ▶ Preventable
- ▶ Caused by:
 - Bacteria: Salmonella, Campylobacter, E. Coli O157:H7
 - Viruses: Norovirus
 - Parasites
 - Toxins
 - Metals
 - Prions



Scope of Foodborne Illness

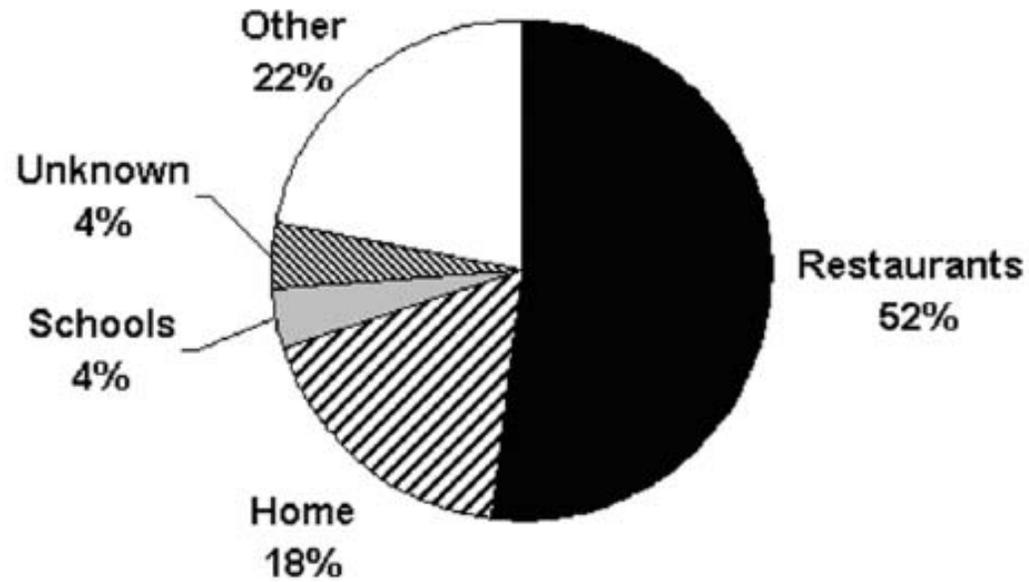


Figure 1. Sources of foodborne disease outbreaks reported to the Centers for Disease Control and Prevention during the period 1998–2004. Data are from [4]. "Restaurants" includes delicatessens, cafeterias, and hotels.

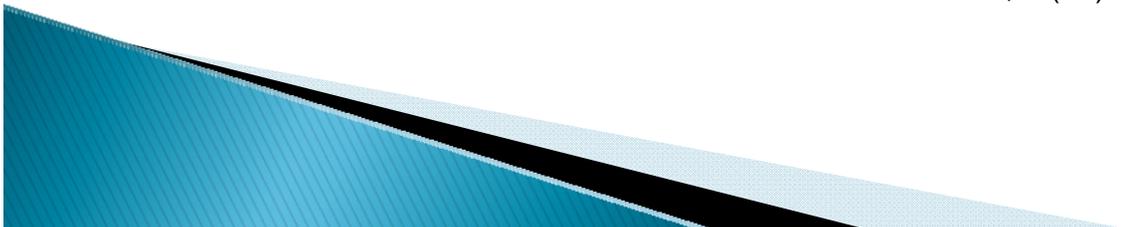
SOURCE: Jones TF, Angulo FJ. Eating in restaurants: A risk factor for foodborne illness? Food Safety CID. 2006;43:1324-1328.

Scope of Foodborne Illness

▶ 2006

- 1,270 foodborne disease outbreaks
 - 27,634 cases
 - Norovirus was the most common cause, accounting for 54% of outbreaks and 11,879 cases
 - Salmonella accounted for 18% of outbreaks and 3,252 cases
 - 11 deaths
 - six were attributed to E. Coli O157:H7

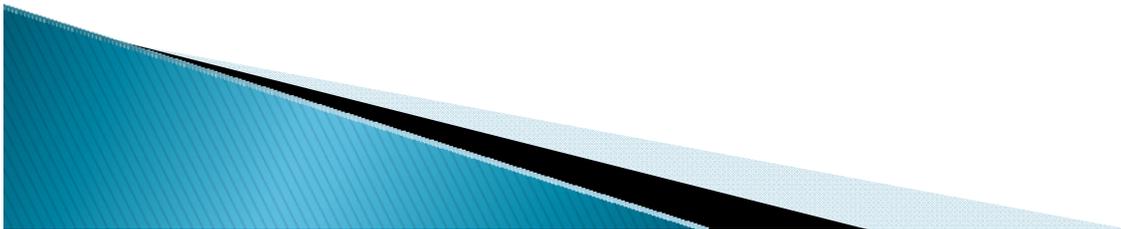
SOURCE: Centers for Disease Control and Prevention. Surveillance for foodborne disease outbreaks – United States, 2006. Centers for Disease Control and Prevention MMWR. Atlanta. 2009;58(22):609-615.



Scope of Foodborne Illness

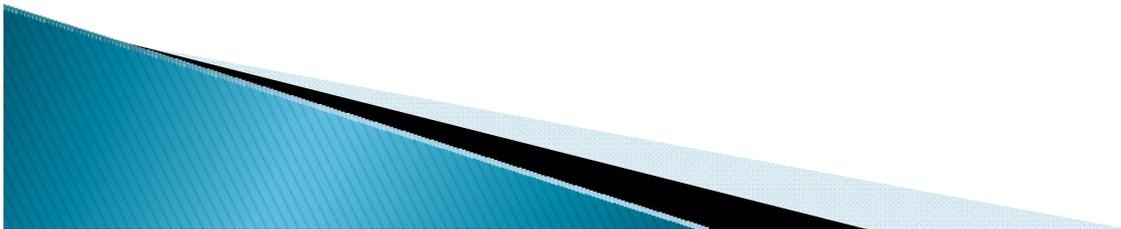
- ▶ FDA Food Code

“to safeguard public health and ensure that food is unadulterated and honestly presented when offered to the consumer.”



Scope of Foodborne Illness

- ▶ Healthy People 2010
 - Section 10, Food Safety
 - Objective 10–6
 - “Improve food employee behaviors and food preparation practices that directly relate to foodborne illnesses in retail food establishments.”



Scope of Foodborne Illness

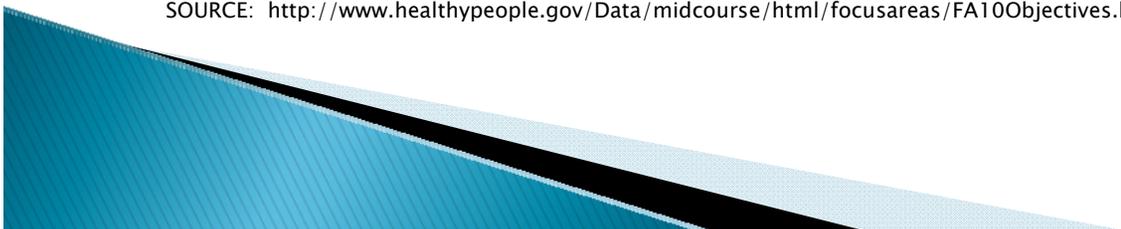
Target and baseline:

<u>Objective</u>	<u>Increase in Safe Retail Food Preparation Practices</u>	<u>1998 Baseline</u>	<u>2010 Target</u>
		<i><u>Percent</u></i>	<i><u>Percent</u></i>
<u>10-6a.</u>	<u>Hospital</u>	<u>80</u>	<u>85</u>
<u>10-6b.</u>	<u>Nursing home</u>	<u>82</u>	<u>87</u>
<u>10-6c.</u>	<u>Elementary school</u>	<u>80</u>	<u>85</u>
<u>10-6d.</u>	<u>Fast food restaurant</u>	<u>74</u>	<u>81</u>
<u>10-6e.</u>	<u>Full-service restaurant</u>	<u>60</u>	<u>70</u>
<u>10-6f.</u>	<u>Deli department</u>	<u>73</u>	<u>80</u>
<u>10-6g.</u>	<u>Meat/poultry department</u>	<u>81</u>	<u>86</u>
<u>10-6h.</u>	<u>Produce department</u>	<u>76</u>	<u>82</u>
<u>10-6i.</u>	<u>Seafood department</u>	<u>83</u>	<u>87</u>

Target setting method: 25 percent improvement of observable out-of-compliance risk factors.

Data source: Retail Food Database of Foodborne Illness Risk Factors, FDA, CFSAN.

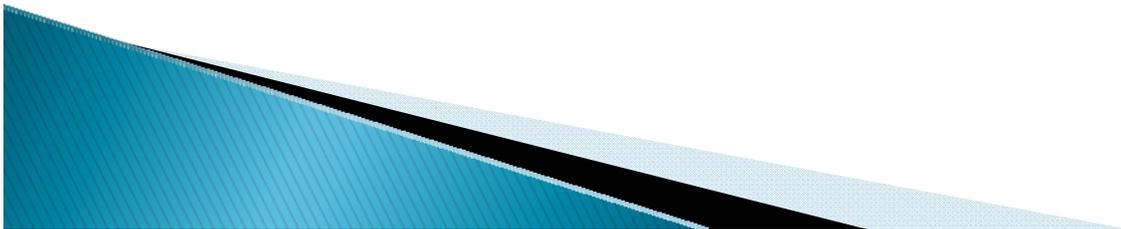
SOURCE: <http://www.healthypeople.gov/Data/midcourse/html/focusareas/FA10Objectives.htm>



Scope of Foodborne Illness

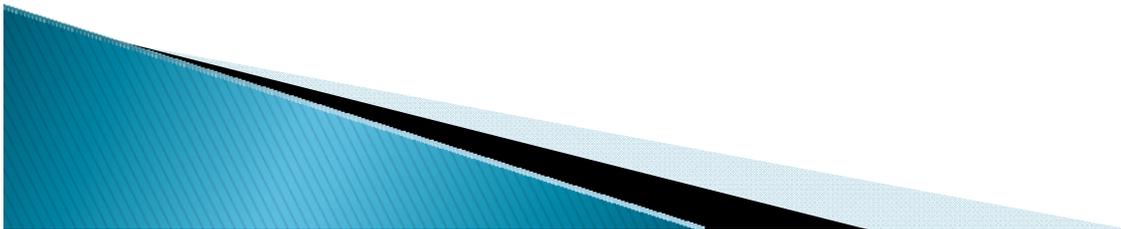
▶ Risk Factors:

- Improper holding temperatures
- Inadequate cooking
- Contaminated equipment
- Food from an unsafe source
- Poor personal hygiene



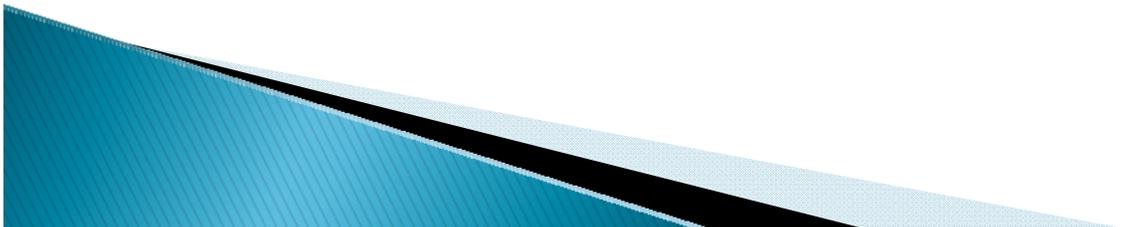
History

- ▶ Section 20–52 of Houston Food Ordinance mandates the Food Service Manager's Certification Program
- ▶ Food Ordinance established on August 21, 1985
- ▶ The latest revision is dated September 12, 2007



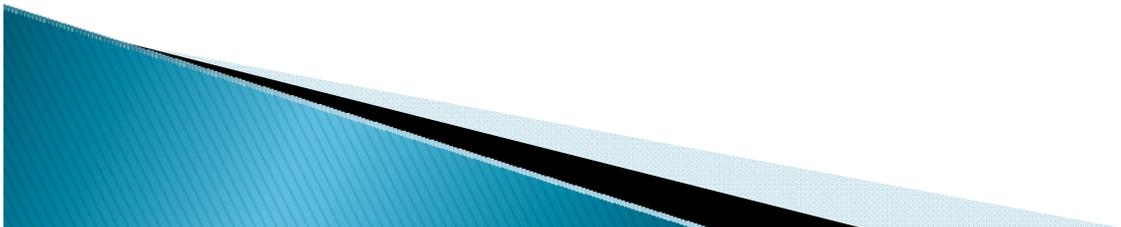
Food Establishment Inspection

- ▶ Over 12,960 restaurants
- ▶ Over 28,940 inspections annually
- ▶ Five “triggers” for an inspection:
 - Routine
 - Pre-opening
 - Re-inspection
 - Complaints
 - Change of ownership



Food Establishment Inspection

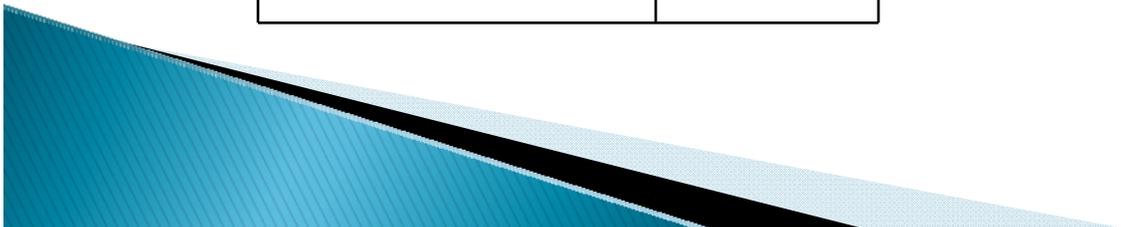
- ▶ Food Establishment risk profile
 - Low
 - Medium
 - High
- ▶ Data and observations
 - Characteristics
 - Food preparation and handling procedures
 - Environmental conditions
 - Sanitation practices
 - Permits and certifications



Food Establishment Inspection

- ▶ Violations
 - Critical
 - Non-critical
- ▶ Inspection Score

Point subtotal (sum of violation weights)	Inspection score
0-4	1
5-8	2
9-16	3
17-24	4
25+	5



Foodservice Manager Certification Program

▶ Stakeholders

- Developers of Food Service Manager's Certification Manual and Program
- Sanitarians
- Foodservice establishment owners
- Foodservice establishment patrons

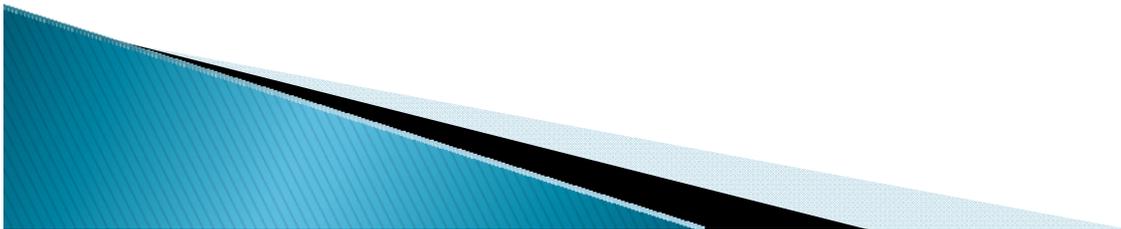
▶ Objectives

- Increase knowledge of food safety practices
- Increase number of Certified Foodservice Managers
- Certified Managers train employees
- Fewer violations during inspections



Logic Model

- ▶ A logic model provides a visual representation of a program, providing viewers a way in which to understand how the interplay between the resources available, the activities undertaken for the program, and the outputs or results of the activities affect outcomes (W.K. Kellogg Foundation, 2001).



Outcomes

Input

Houston Food Ordinance No 09-762; Chapter 20, Sections 52 and 53

Food Certification Course/Program Developers & Staff

Health Department Budget

Sanitarians who do the inspections

Digital Health Department (DHD) Software & Staff that manipulate the database to evaluate trends

Activities

Obtain current information of food safety guidelines and regulations

Development of curriculum & training materials

Inspections of Foodservice establishments to ensure implementation of safe practices

Documentation of Inspections in DHD database

Output

Food Service Managers Certification Training Course & Certification Manual

Number of establishments with violations

Short-term

FSM increase knowledge of food safety practices based on current ordinances and obtain certification

Re-inspection based on severity of violation

Intermediate

Increase number of Certified FSM who implement changes to promote food safety programs in their establishments

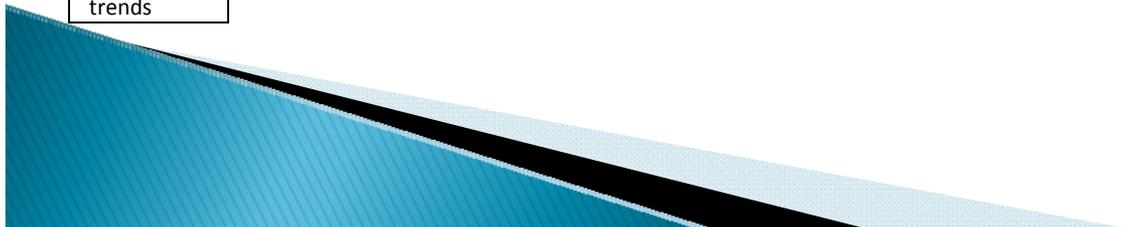
Increased number of Certified FSM who conduct on-site training to employees

Increased implementation and use of food safety practices to reduce the risk of food borne illness

Long-term Impact

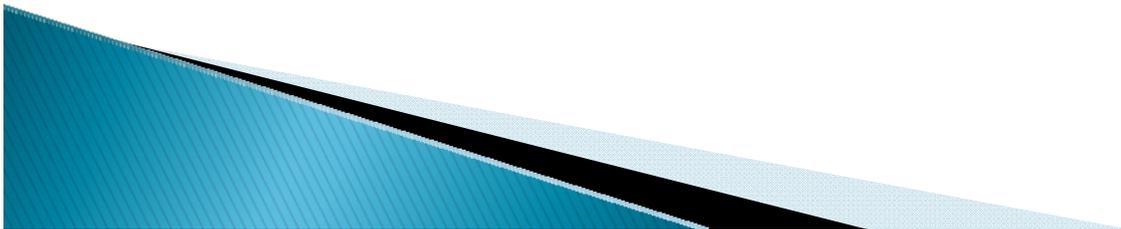
High risk foodservice establishments pass inspection/ have fewer violations

Reduced incidence of food borne illness in establishments



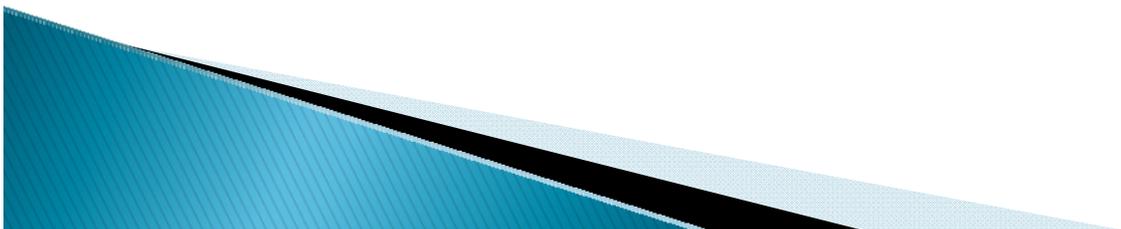
Evaluation Project Objectives

- ▶ To determine whether having a Certified Food Manager reduces the number of critical violations found during inspections of high-risk foodservice establishments
- ▶ To determine whether the overall inspection score is lower if a Certified Food Manager is present.



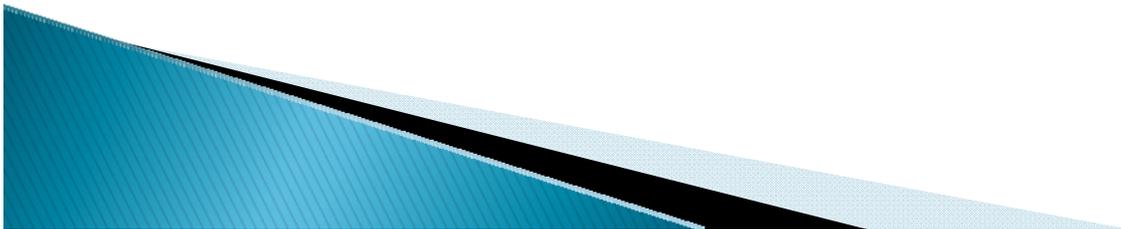
Methods

- ▶ Qualitative
 - Observation of Food Inspection
 - Observation of Food Manager Certification Course
- ▶ Quantitative
 - Data analysis using historical data from Digital Health Department



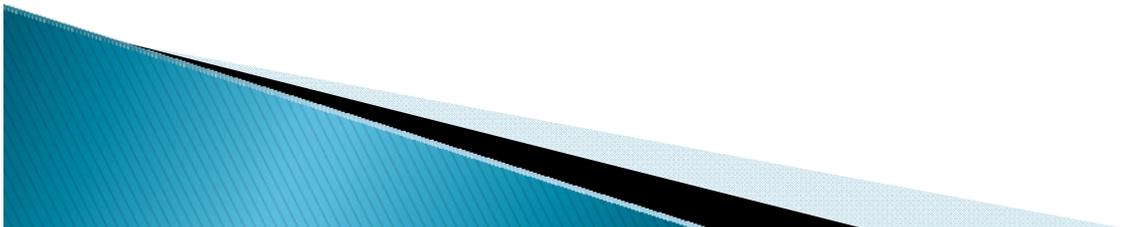
Results: Food Establishment Inspection

- ▶ Exterior premises
- ▶ Permits & Certification
- ▶ Dry Storage
- ▶ Food Preparation & Dishwashing Areas
- ▶ Food Service Areas
- ▶ Bathrooms



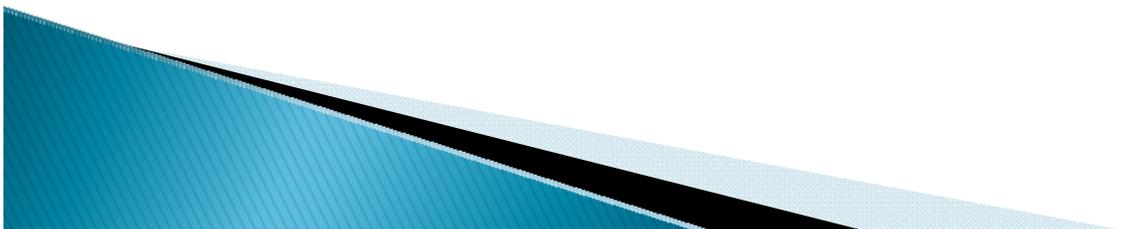
Results: Foodservice Manager's Certification Course

- ▶ Comprehensive 2-day course taught at appropriate pace
- ▶ Good teaching tactics involving
 - Repetition of key concepts
 - Anecdotes and scenarios
 - Verbal quizzes
 - Write down key points



Data Collection and Analysis

- ▶ HDHHS provided a list of all violations in establishments that had a 20–53(a) violation at any point in 2009
- ▶ 679 inspections with a 20–53(a) violation were identified
 - 3 points were removed from the inspection subtotal
 - The adjusted inspection score was recalculated
- ▶ 1474 inspections without 20–53(a) but occurring in establishments that were in violation of 20–53(a) at some other point during the year



Foodborne Illness Risk Factors and Public Health Interventions

Code	Description	Status
20-19	FOOD ESTABLISHMENT COMPLIANCE	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-20	FOOD ESTABLISHMENT INSPECTIONS	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.01	FOOD SUPPLIES	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.02	FOOD PROTECTION	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.03	FOOD STORAGE	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.04	FOOD PREPARATION	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.05	FOOD DISPLAY AND SERVICE	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.06	FOOD TRANSPORTATION	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.07	EMPLOYEE HEALTH	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.08	PERSONAL CLEANLINESS	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.09	EMPLOYEE PRACTICES	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.10	EQUIPMENT AND UTENSILS	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.11	EQUIPMENT AND UTENSILS CLEANING AND SANITATION	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.12	MANUAL CLEANING AND SANITIZING	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.13	MECHANICAL CLEANING AND SANITIZING	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.14	EQUIPMENT AND UTENSILS STORAGE	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.15	WATER SUPPLIES	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.16	SEWAGE	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.17	PLUMBING	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.18	TOILET FACILITIES	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.19	HAND WASHING FACILITIES	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.20	GARBAGE AND REFUSE	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.21	INSECT AND RODENT CONTROL	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.22	FLOORS	<input checked="" type="radio"/> :IN <input type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O
20-21.23	WALLS AND CEILINGS	<input type="radio"/> :IN <input checked="" type="radio"/> :OUT <input type="radio"/> :N/A <input type="radio"/> :N/O

No.	Status	Type	Comments
1	OUT	V	Observed fan covers in walk-in-cooler and ret...



20-21.22	FLOORS	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
20-21.23	WALLS AND CEILINGS	<input type="radio"/> :IN	<input checked="" type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
No.	Status	Type	Comments		
1	OUT	V	Observed fan covers in walk-in-cooler and ret...		<input checked="" type="radio"/> <input type="radio"/>
20-21.24	LIGHTING	<input type="radio"/> :IN	<input checked="" type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
No.	Status	Type	Comments		
1	OUT	V	Observed light fixture not working above free...		<input checked="" type="radio"/> <input type="radio"/>
20-21.25	VENTILATION	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
20-21.26	DRESSING ROOMS AND LOCKERS	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
20-21.27	POISONOUS OR TOXIC MATERIALS	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
20-21.28	PREMISES	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
20-36	FOOD DEALER'S PERMIT/TEMPORARY PERMIT	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
20-39	FROZEN DESSERT PERMIT	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
20-53	FSMC REQUIREMENTS	<input type="radio"/> :IN	<input checked="" type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
No.	Status	Type	Comments		
1	OUT	V	Observed person-in-charge(Christopher Roy)wit...		<input checked="" type="radio"/> <input type="radio"/>
21-244	SMOKING--ASHTRAYS/SIGNAGE	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
21-247	SMOKING--FAILED TO REQUEST/MAINTAIN	<input checked="" type="radio"/> :IN	<input type="radio"/> :OUT	<input type="radio"/> :N/A	<input type="radio"/> :N/O
Show All Violations		Hide Violations			

General Comments

Select a Predefined Comment

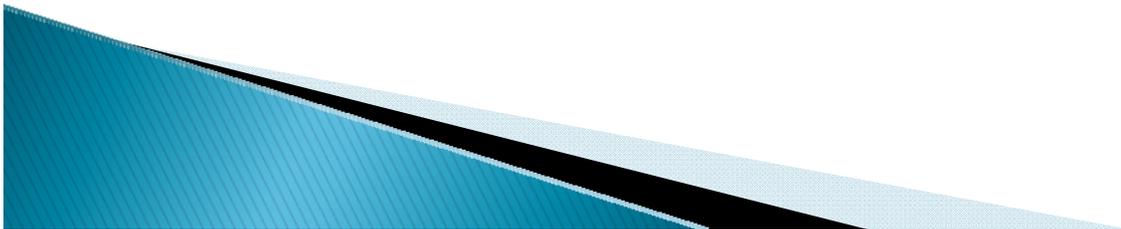


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Data Collection and Analysis

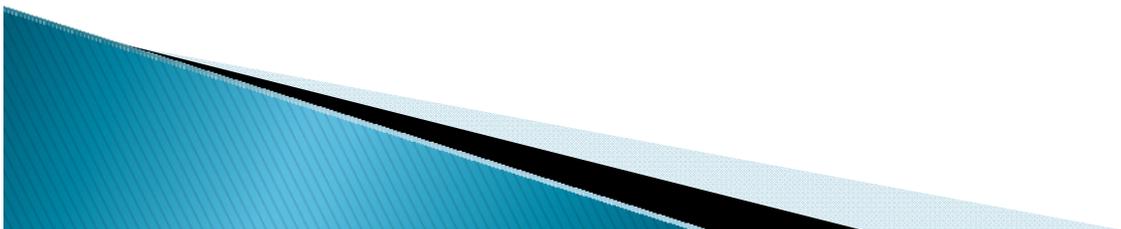
- ▶ A list of all inspections occurring in risk 3 establishments during 2009 was obtained from the Digital Health Department website
- ▶ Data cross-checked with the list of inspections in which there was a 20-53(a) violation
 - Inspections that had a 20-53(a) violation were removed
 - Yielded 14,662 inspections without a 20-53(a) violation



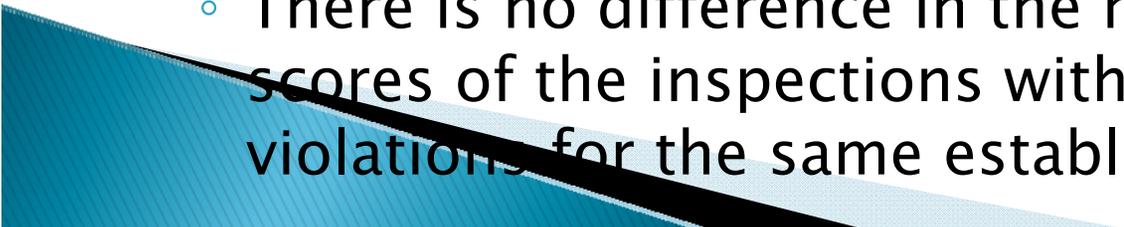
Statistical Analysis

- ▶ In this evaluation we have focused on two questions:
 - Is there a difference between the adjusted* mean inspection scores of food establishments that had 20–53(a) violations and those that did not?
 - Is there a difference between the adjusted* mean inspection scores for inspections with and without a 20–53(a) violation for the same group of establishments?

*Adjusted scores were calculated by subtracting the score due to the 20–53(a) violation from the total score earned at the inspection



Statistical Analysis continued

- ▶ SPSS version 17 was used for the statistical tests.
 - ▶ Independent t-test was used to analyze the significance of the difference of the mean scores for both of the study questions.
 - ▶ The null hypothesis for the two tests were as follows:
 - There is no difference in the mean inspection scores of the establishments with and without a 20-53(a) violation
 - There is no difference in the mean inspection scores of the inspections with and without 20-53(a) violations for the same establishments
- 

Results of Statistical Analysis

▶ Study Question 1

Groups	N	Mean Inspection Score	Std. Deviation	Std. Error Mean
Establishments with 20-53(a) Violation	679	2.4109	1.28662	.04938
Establishments without 20-53(a) violation	14462	1.5333	.89561	.00745

- ▶ Independent t-test p-value < 0.001
 - ▶ Conclusion: Those establishments that never had a violation of 20-53(a) had lower inspection scores than establishments that were in violation of 20-53(a) at any point during the year.
- 

Results of Statistical Analysis

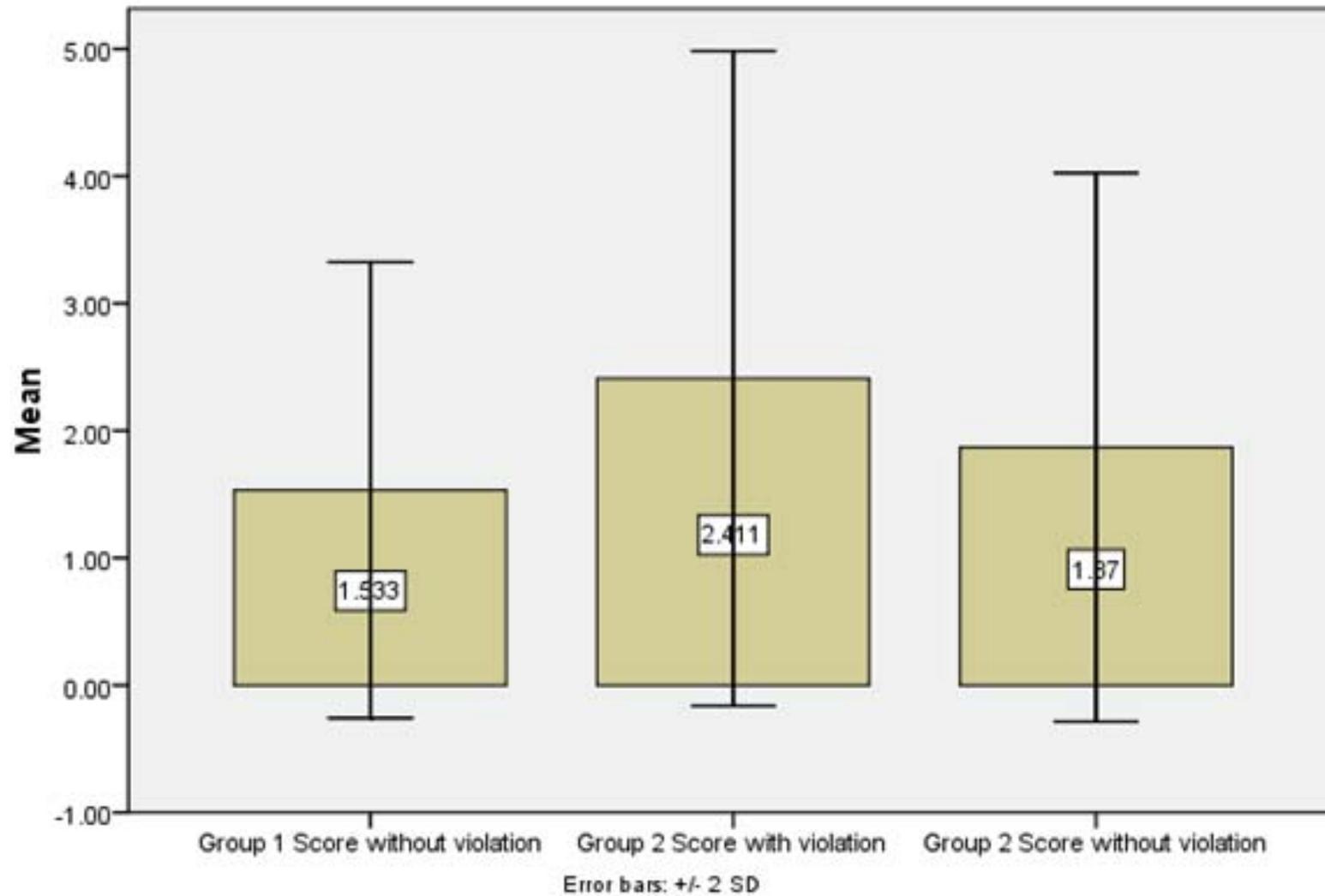
▶ Study Question 2

Groups	N	Mean Inspection Score	Std. Deviation	Std. Error Mean
Inspections with 20-53(a) Violation	679	2.4109	1.28662	.04938
Inspections without 20-53(a) violation	1474	1.8697	1.07776	.02807

- ▶ Independent t-test p-value < 0.001
- ▶ Conclusion: For establishments that were in violation of 20-53(a) at any point in 2009, the inspections in which there was no violation had lower scores than the inspections in which there was a violation.

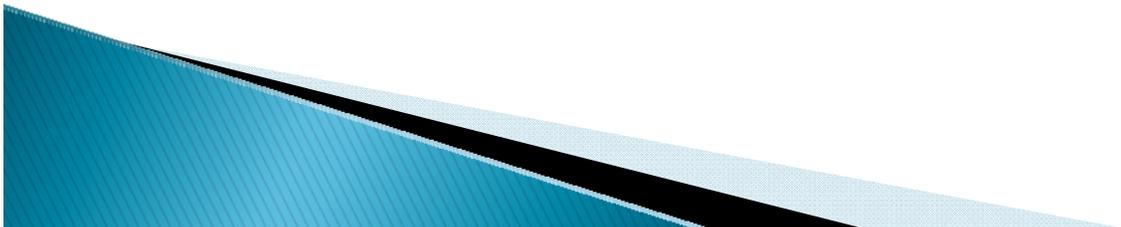


Mean scores of groups with or without violation (20-52a)



Recommendations & Suggestions

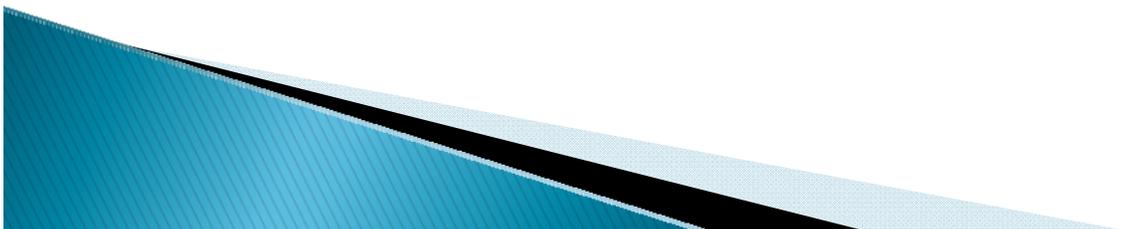
- ▶ **Foodservice Manager Certification Course:**
 - Pretest to triage which two-day class to attend
 - Evaluate whether test score correlates to improved implementation of knowledge obtained
 - Request top three at beginning of day one and before the test on day two
 - Test *all* applicants for certification
 - Add a practical component to class or demo
 - Have class members teach each other
- ▶ **Food establishment Inspection:**
 - Potential bias resulting from requesting verification of certification prior to inspection



Recommendations & Suggestions

▶ Information Systems

- Link certified food service manager to establishment
 - Allow Health Dept to track where Certified Food Service Managers practice, and how method of certification affects compliance with the Houston Food Ordinance
- Make data on critical violations available through the Digital Health Department
 - Allow for analysis of Food Service Manager program's impact on critical violations in future evaluations
 - Allow for continuing surveillance of critical violations
- Retain data on violation weight subtotals in addition to scaled overall inspection score
 - Allow for more rigorous quantitative analysis of Food Service Manager program in future evaluations
- Continued enforcement of Houston Food Ordinance



Conclusion

- ▶ The HDHHS Food Certification Program has a positive impact on compliance with the Houston Food Ordinance
- ▶ Future studies are needed to further evaluate impact of the program

