



Are we focusing on risk?

Trends and Gaps from a Multi-State Retail Data Analytics Pilot

*Note: These findings represent preliminary analyses of the available data and should not be considered final.
Results may be updated as additional review and validation activities are completed.*

Updated 12/19/2025

What Makes an Inspection “Risk-based”?

- **Focuses** on factors most likely to cause foodborne diseases
- **Supports** the systematic identification, evaluation, and control of food safety hazards
- **Promotes** preventive rather than reactive actions

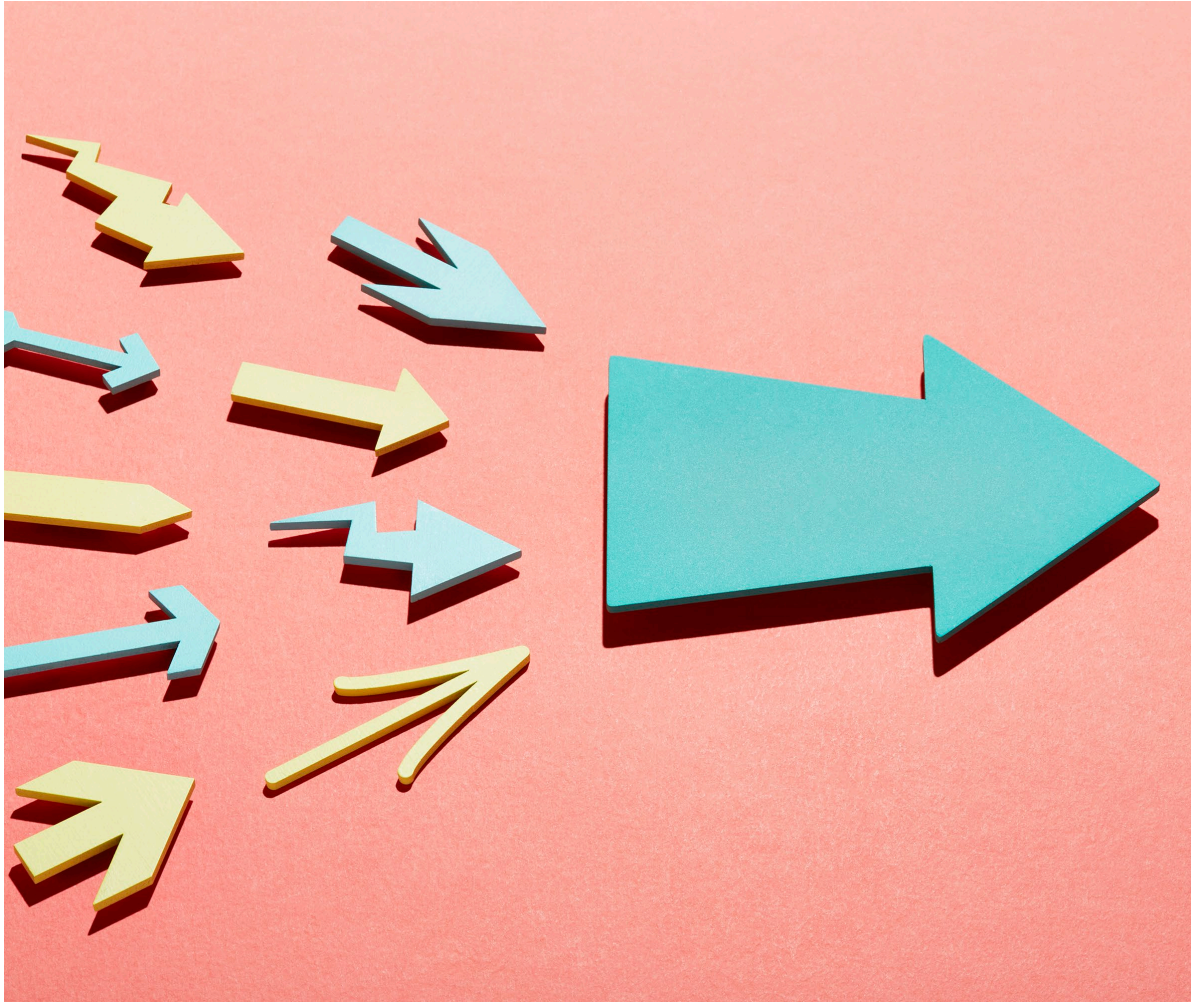


How Do We Know If We're On Target?

- Can inspection data tell us if we are conducting quality risk-based inspections?



How Do We Combine Data to Gain Insights?



Everyone is collecting data, but it is not the **same** data

- Different Food Codes
- Different forms
- Different risk categories

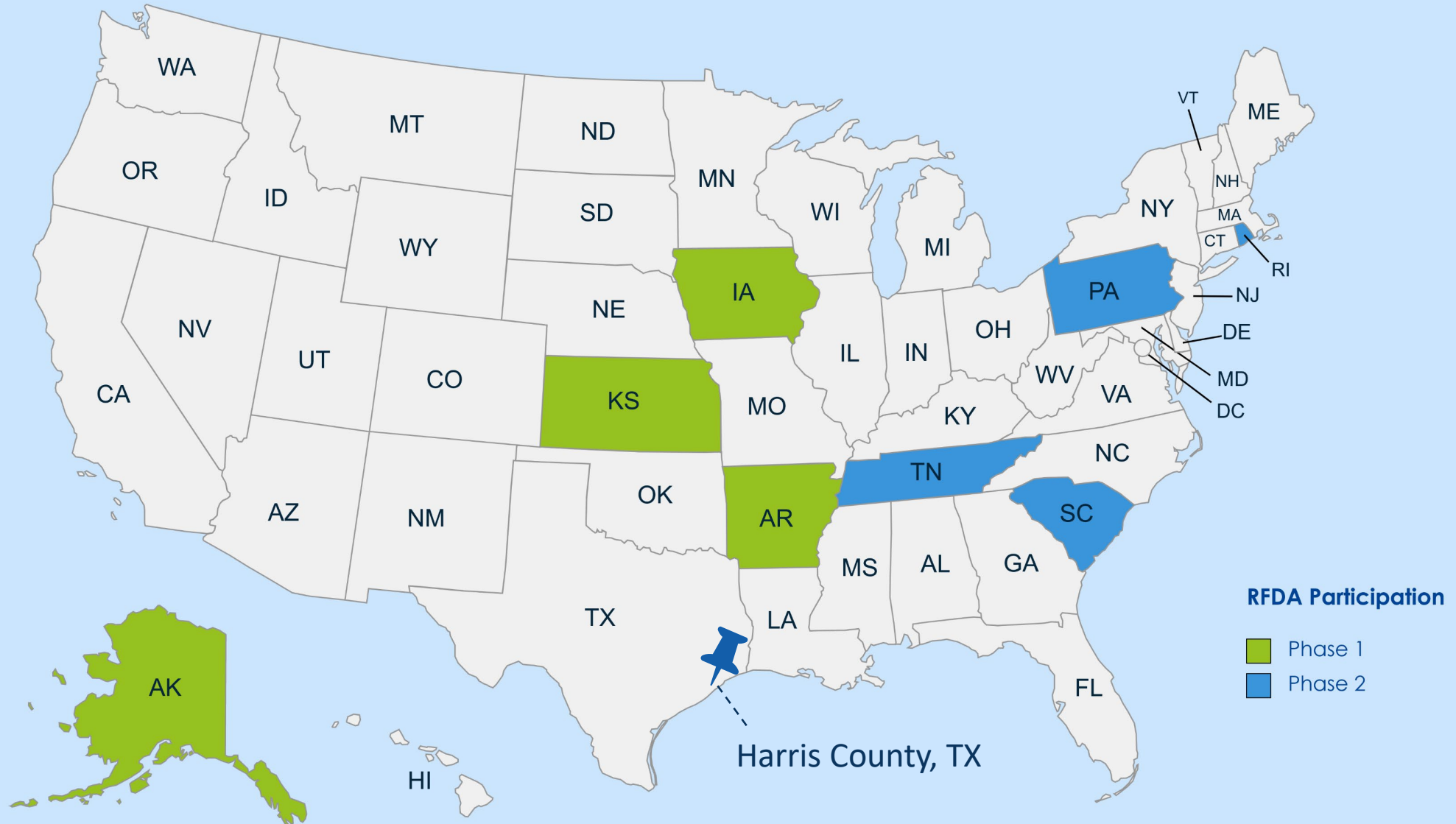
Goals of Retail Food Data Analytics Project

- 1) Methodological Goal:** Identify methods for cleaning, combining, and standardizing regulatory retail food inspection information from multiple jurisdictions
- 2) Analytical Goal:** Assess trends in and determinants of foodborne illness risk factor occurrence and inspectional characteristics
- 3) Ultimate Goal:** Identify attributes of a quality, risk-based regulatory inspection of retail food establishments and provide meaningful performance metrics for retail food programs



Methods

Participating State & Local Jurisdictions



Data Quality and Transformation Process

Steps to transform the data into a single consolidated data warehouse:

1. Review Data Elements with State/Local Jurisdiction
2. Map jurisdictional inspection report to 2017 Model FDA Food Code
3. Receive Retail Inspection Data:
 - A. Inspection Reason Type: Routine Online
 - B. Inspection Status: Approved (Final Form/Share)
 - C. Inspection Dates:
 - 1) Round 1: 01/01/2017 to 12/31/2019
 - 2) Round 2: 01/01/2020 to 12/31/2022
4. Data Quality Review
5. Data Transformation and Mapping Process

Data Standardization Challenges

- 1) Difficulty mapping different Food Code versions to a standard
 - a) One-to-many: Single state violation items that contain multiple 2017 version violations
 - b) Many-to-one: Multiple state violation items that map to the same 2017 version violations
- 2) Lack of citation-specific details & difficulty teasing out riskiest practices
- 3) Different and inconsistently applied establishment risk categories
- 4) Lack of industry segment data (restaurant/food service, grocery store, convenience store)
- 5) Different inspectional policies and procedures
 - a) When and how items are marked OUT of compliance

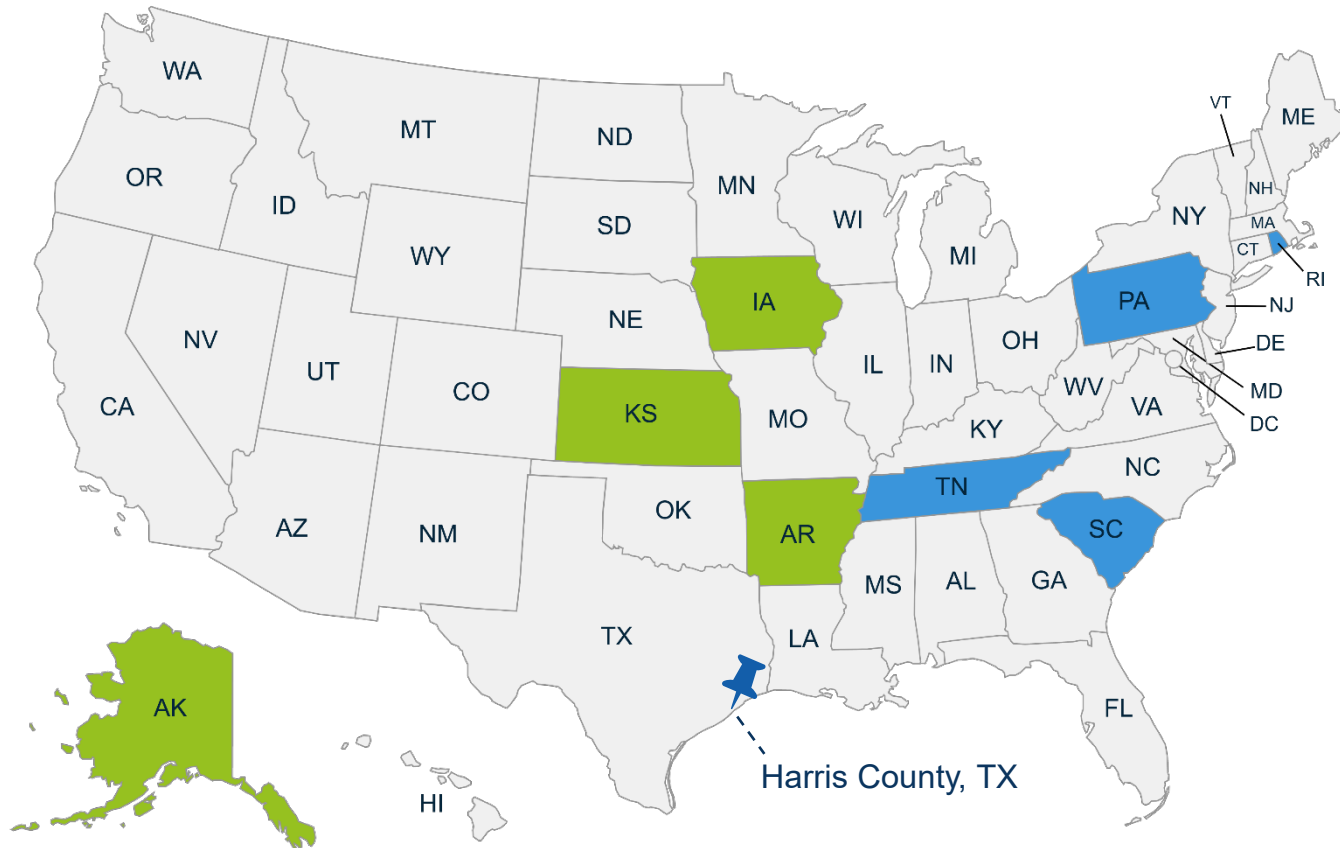
Top Brand Data Import

- Top restaurants, grocery stores, and convenience store chains by annual sales
- Matched store banner names with facility names in dataset
- Easier trending across the dataset
- Used to create **standardized risk categories** for subset of data



Results

Retail Food Inspection Data Analytics Project



Retail Data Analytics Participation

- Phase 1
- Phase 2

SUMMARY DATA

DATE RANGE:
1/1/2017 – 12/31/2022

NUMBER OF FACILITIES:
257,000

NUMBER OF INSPECTIONS:
852,000

Dataset Summary

State	Coverage Area	Population	Food Code Version(s)	Inspection System	Records Data Range	# of Facilities	# of Inspections
AK	Entire state, except city of Anchorage	443,545	2005	USAFoodSafety	1/3/2017 – 12/30/2022	3,328	6,655
AR	Entire state	3,017,804	2009, 2013	USAFoodSafety	1/2/2018 – 12/30/2022	26,048	136,897
IA	Entire state	3,155,070	2013, 2017	USAFoodSafety	1/3/2017 – 12/31/2022	21,466	56,399
KS	Entire state	2,913,314	2009 (2011 suppl.), 2017	USAFoodSafety	1/2/2018 – 12/30/2022	17,625	50,560
PA	61 of 67 counties	7,747,978	2015, 2017, 2022	USAFoodSafety	1/2/2017 – 12/31/2022	54,789	217,194
RI	Entire state	1,059,361	2017, 2019	Digital Health Department	1/3/2017 – 12/30/2022	7,817	22,445
SC	Entire state	5,148,714	2013, 2017	RizePoint	3/3/2016 – 12/30/2022	30,031	105,883
TN	Entire state – restaurants/food service only	6,829,174	2009	HealthSpace	1/3/2017 – 12/30/2022	41,715	197,657
TX	Harris County	4,713,325	2013	In-house system	1/3/2017 – 12/30/2022	9,832	28,502
Total		35,028,285				212,651	822,192

Top Risk Factors OUT OF COMPLIANCE

(n = 852,092)

(16) Food contact surfaces cleaned & sanitized

110,597

(10) Adequate handwashing sinks

103,692

(22) Proper cold holding

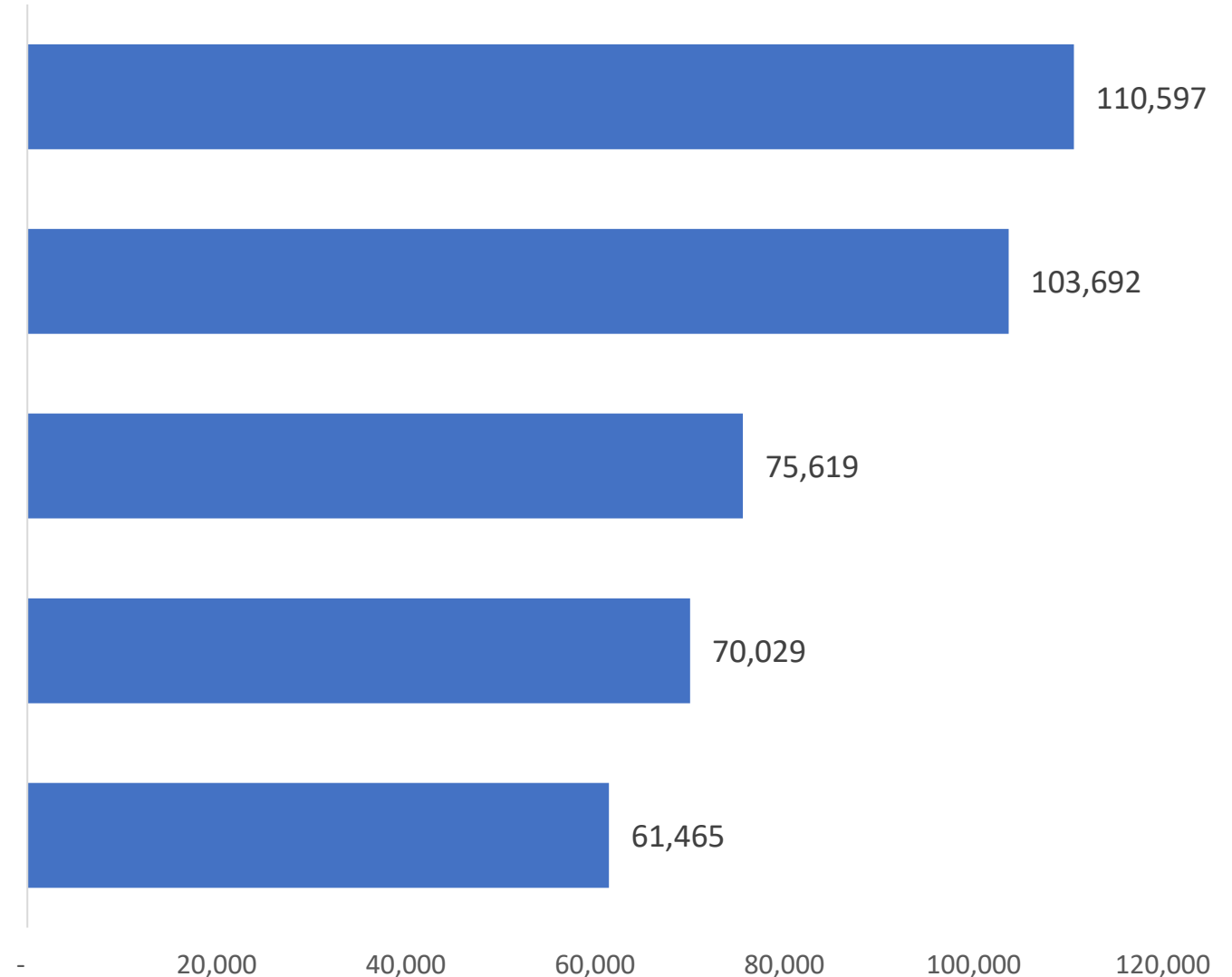
75,619

(23) Date marking & disposition

70,029

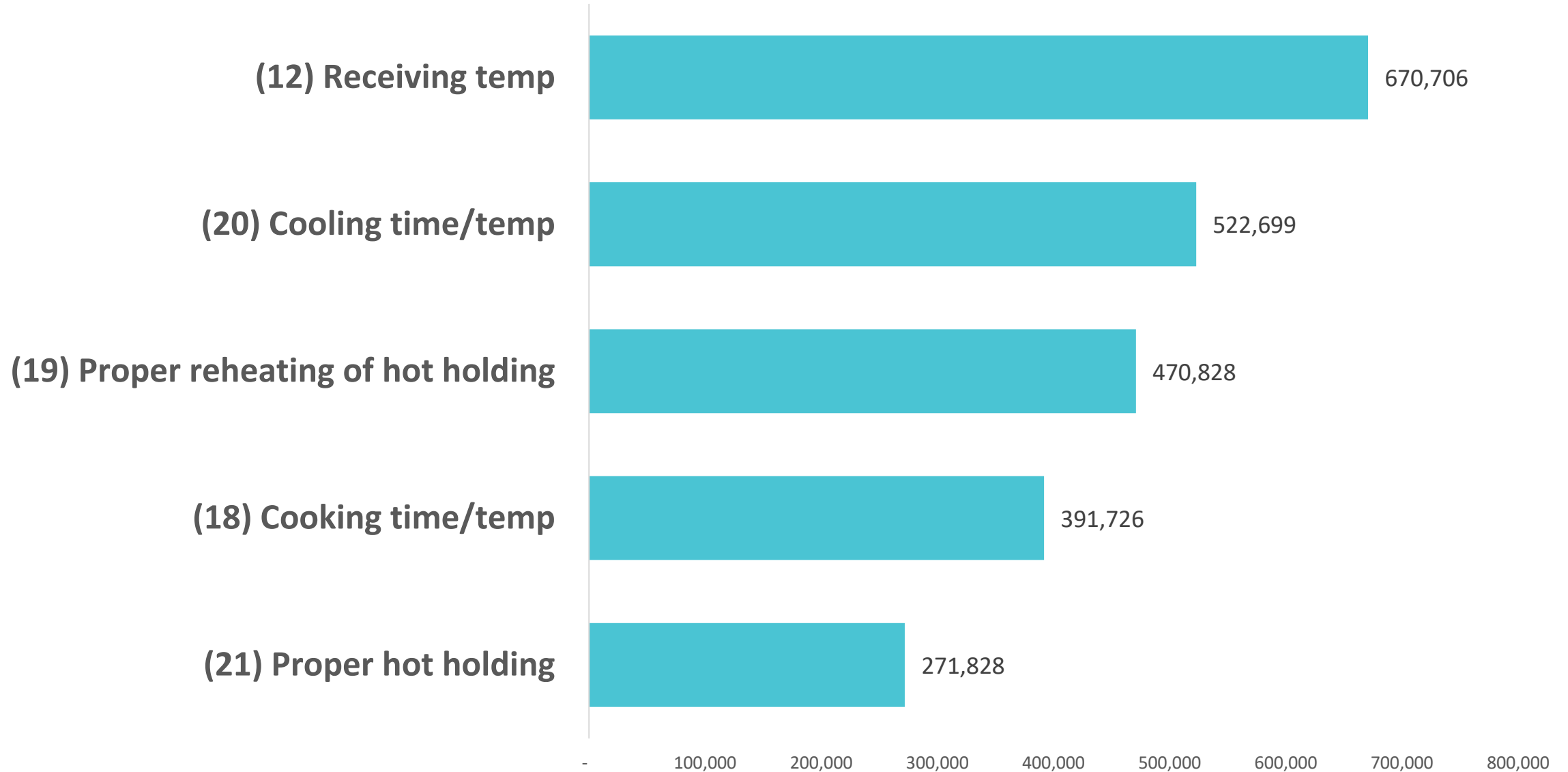
(28) Toxic substance properly identified

61,465



Top Risk Factors NOT OBSERVED

(n = 852,092)

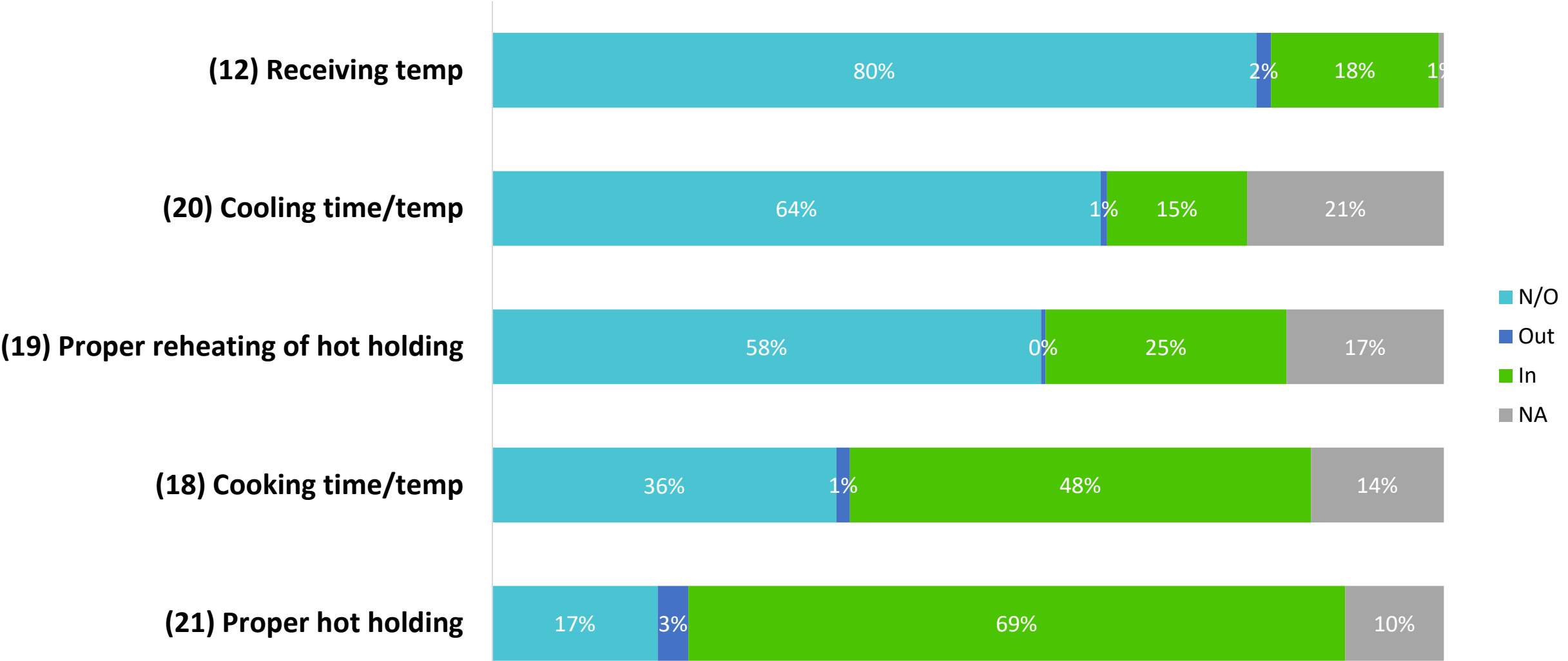


Number of Retail Facilities and Inspections Analyzed by Risk Category*

Risk Category	Number of Facilities (%)	Number of Inspections (%)
High	6,915 (19%)	30,744 (20%)
Medium	21,280 (58%)	92,859 (60%)
Low	8,694 (23%)	31,653 (20%)
TOTAL	36,889	155,256

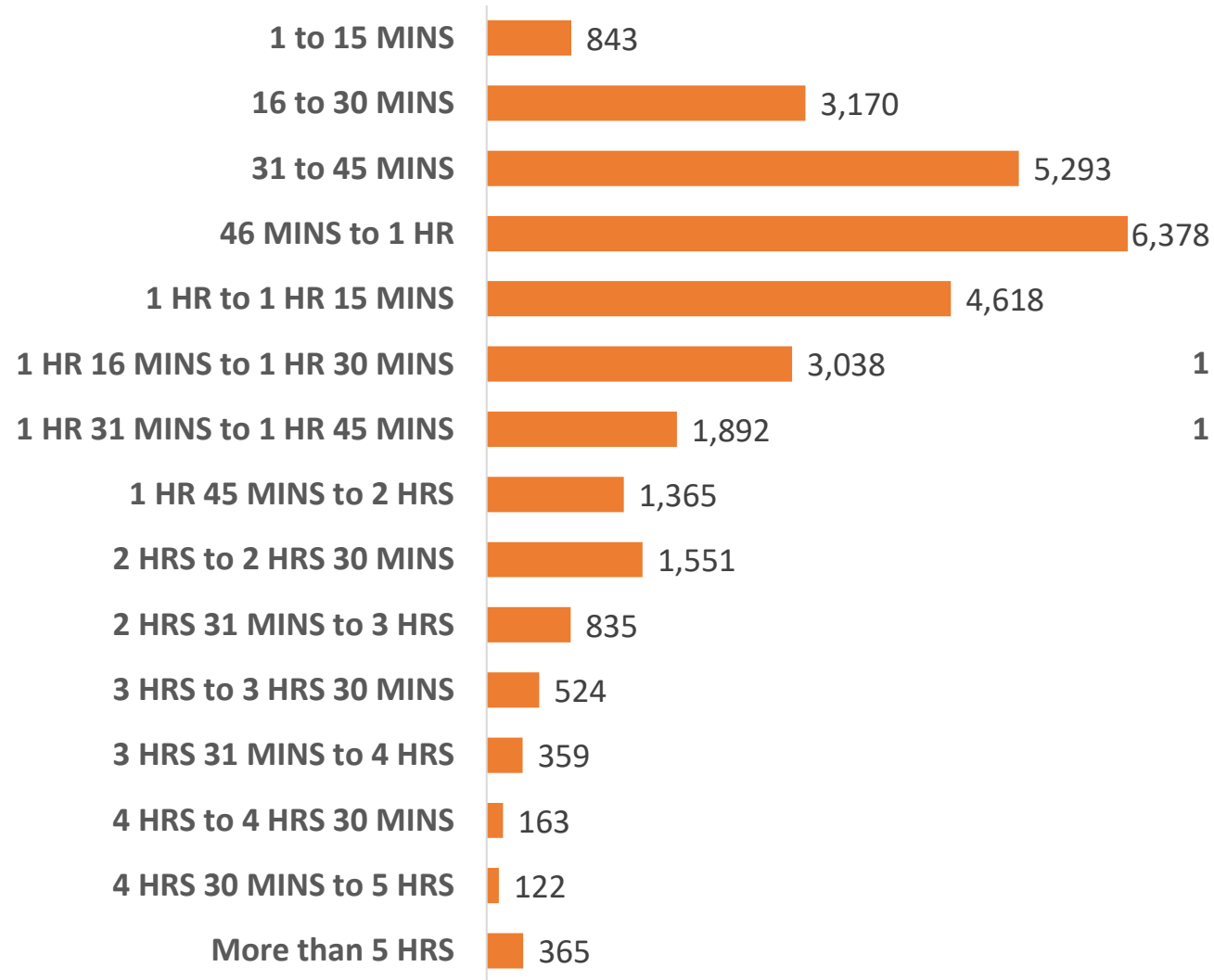
* This represents the top retailer brands for which we have risk categorization, which is ~18% of the full inspection data set.

Key Foodborne Illness Risk Factor Compliance Status, High or Medium Risk Retailers

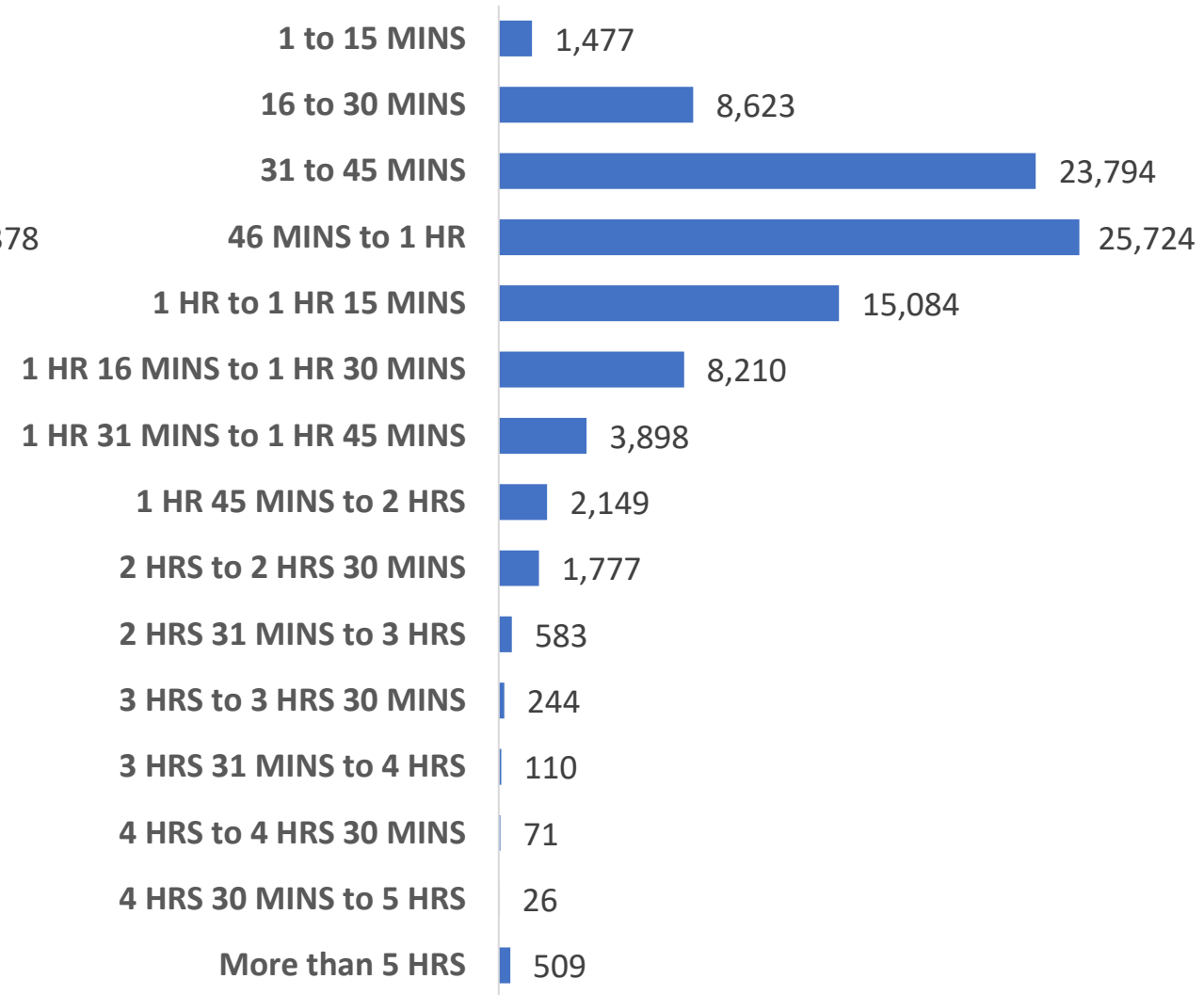


Routine Inspection Duration – High and Medium Risk Facilities

High Risk (n = 30,516)

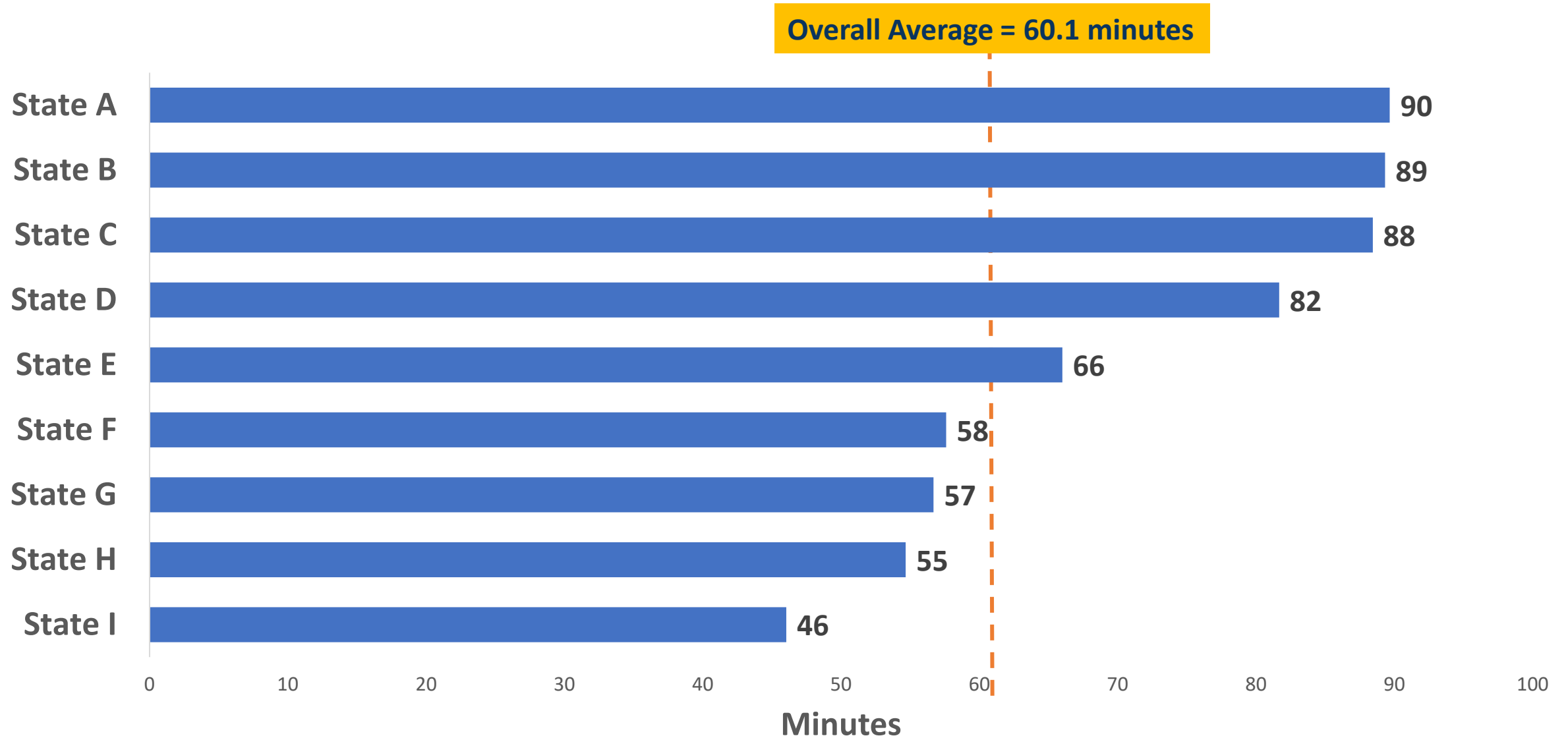


Medium Risk (n = 92,279)

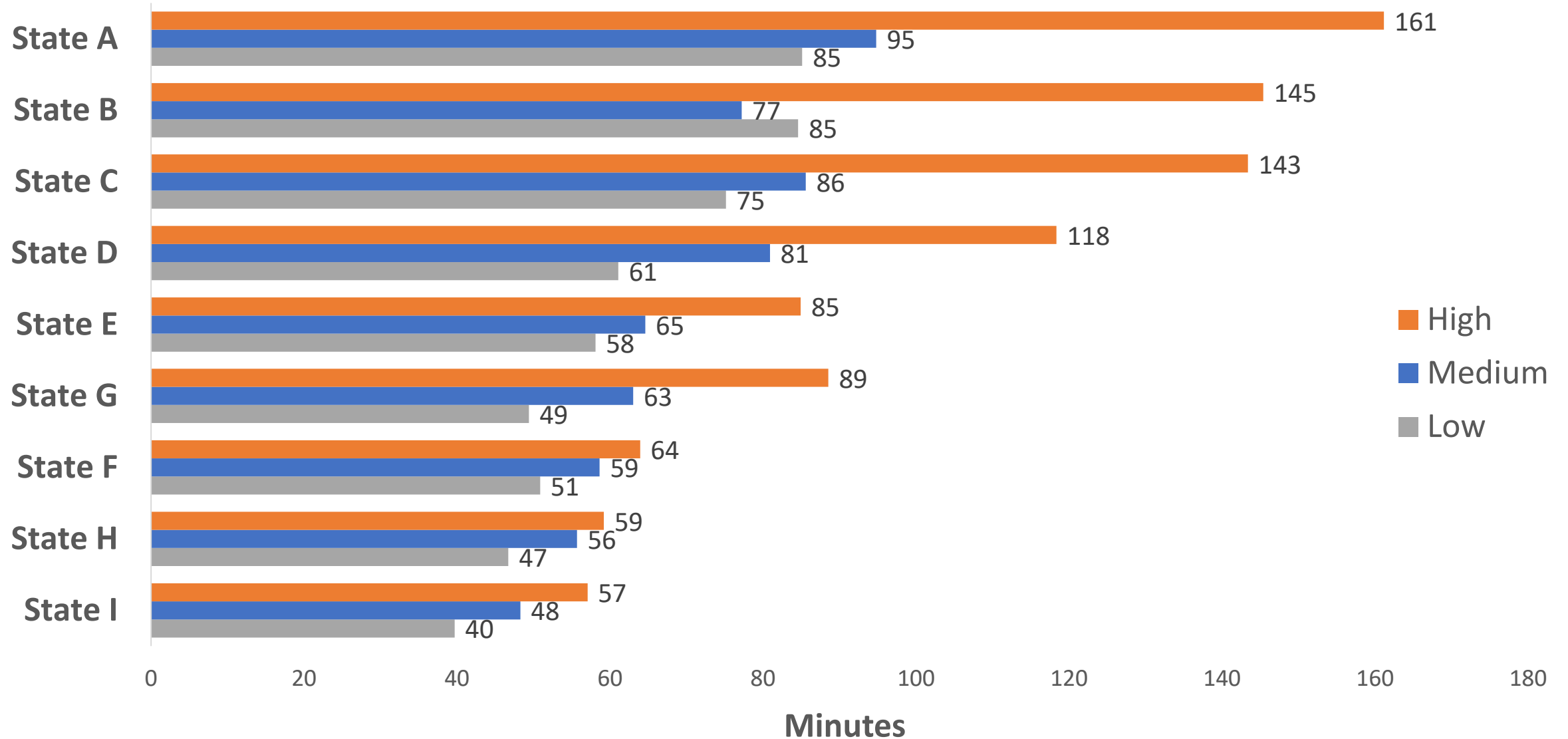


Routine Inspection Duration by State

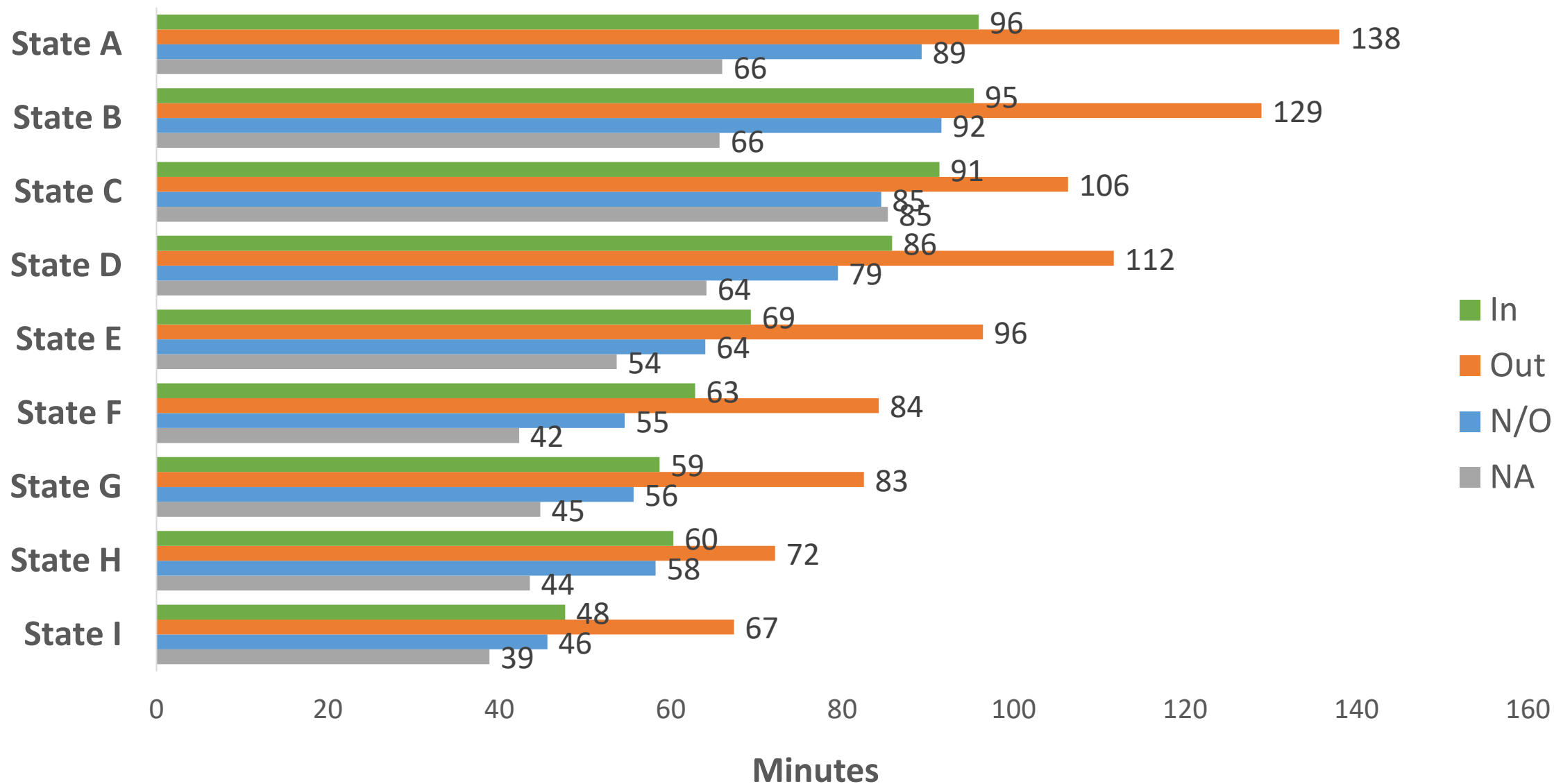
(n = 846,946)



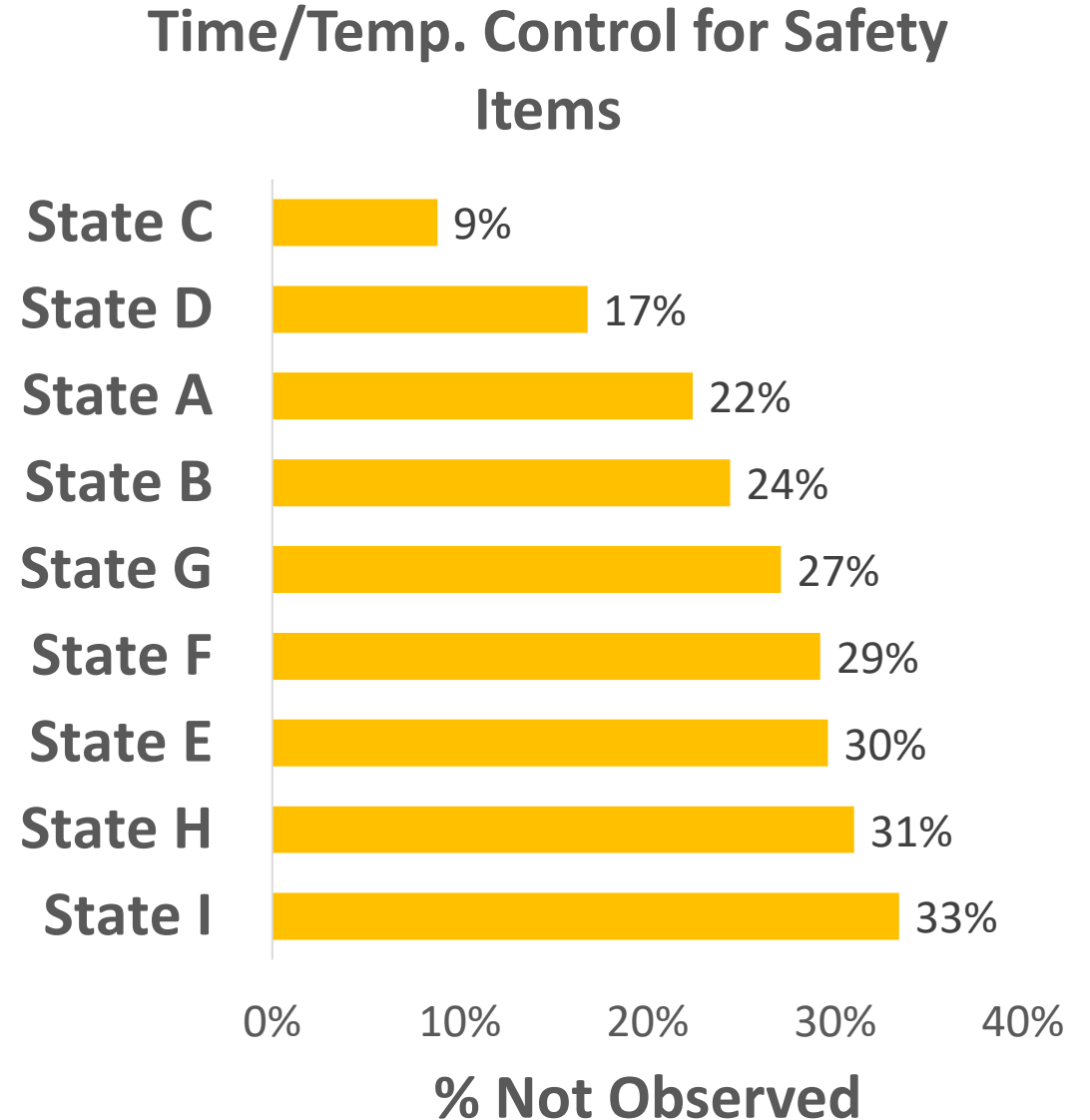
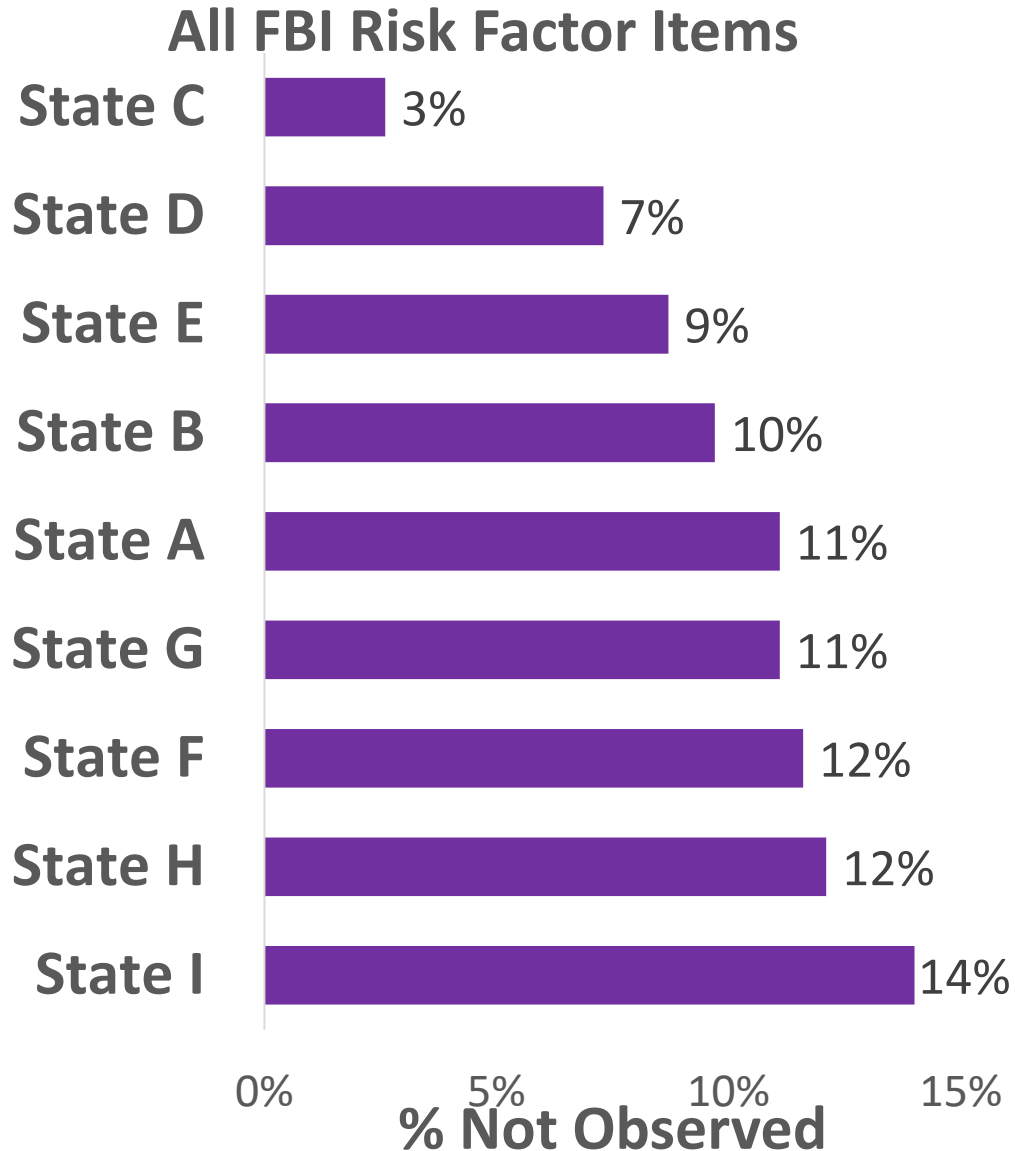
Routine Inspection Duration by State and Risk Level



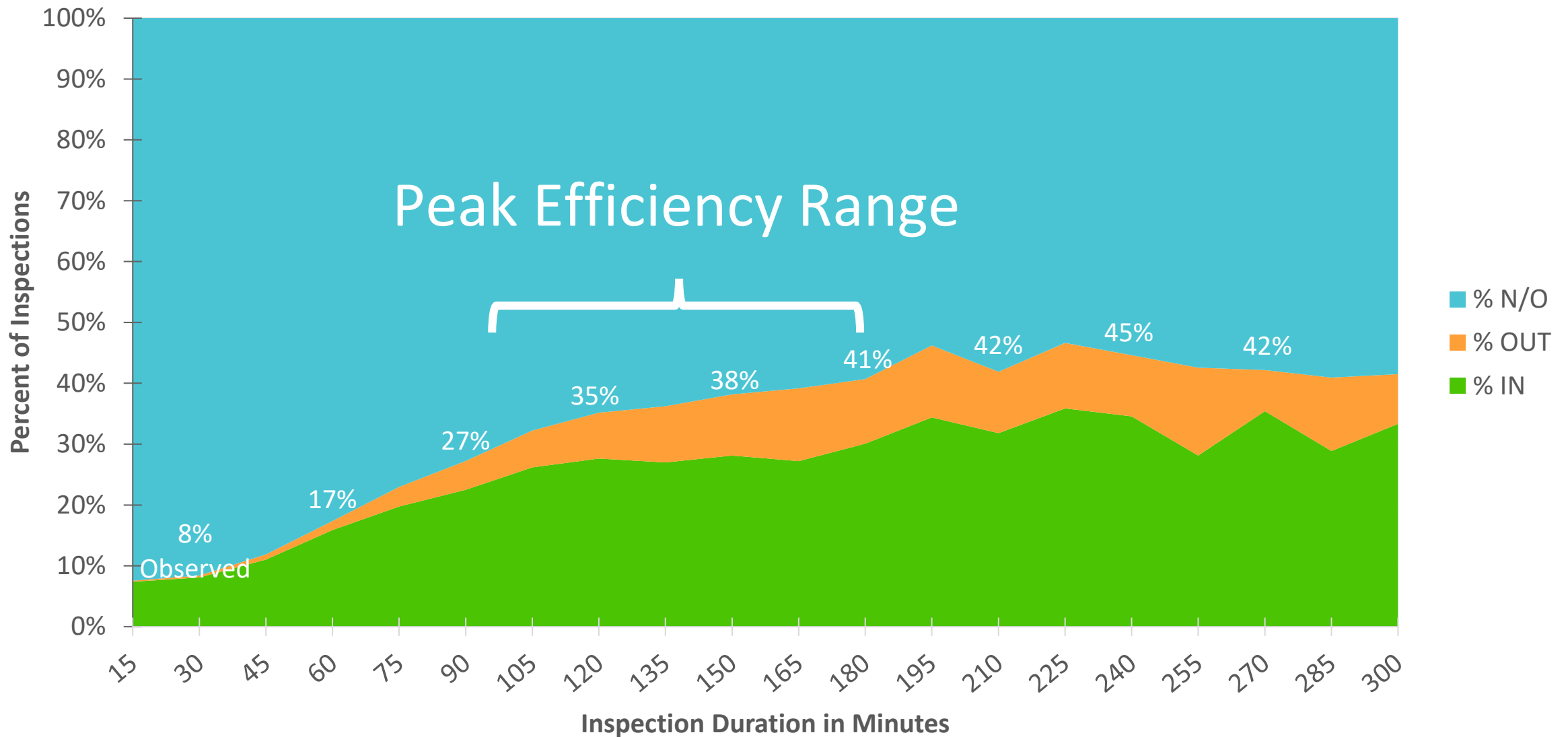
Average Duration of Inspections for the Compliance Status of Five Key Foodborne Illness Risk Factors, by State



% Inspection Items NOT OBSERVED during High and Medium Risk Inspections



Proper Cooling Time and Temperature Compliance Status by Inspection Duration



Inspection Peak Efficiency Range

Similar analysis of key Foodborne Illness Risk Factor items suggests an inspection length **peak efficiency range** of

75 – 180 minutes

Key Foodborne Illness Risk Factor Items	Peak Efficiency Inspection Length
Proper Cooling Time and Temp	120 - 180 minutes
Proper Reheating of Hot Holding	105 - 180 minutes
Proper Cooking Time and Temp	105 - 165 minutes
No Bare Hand Contact with RTE Food	75 - 120 minutes
Hands Cleaned and Properly Washed	75 - 120 minutes
PIC Present, Knowledgeable, Performs Duties	120 - 180 minutes



Discussion

Are we
focused
on the
right
things?



Questions future data analysis can help answer



Are we observing the right things and inspecting at the right time?



Are we looking for and finding the root cause of risk factor violations?



Is compliance for the moment or permanent?



Are our actions having a positive public health impact?

The path ahead

- It is clear that some retail food regulatory programs are further ahead in conducting risk-based inspections than others.
- We know that number of inspections per year is a poor measure of a quality inspection program. But programs are not going to quit using this metric until we give them a better metric to move to.
- We'd like to create a maturity matrix with key, measurable characteristics of quality risk-based inspections. This would be a roadmap for retail regulatory programs to move towards more risk-based inspection approach that complements the current Retail Food Regulatory Program Standards.

Retail Food Safety Regulatory Association Collaborative Cooperative Agreement



Retail Food Data Analytics is one of the key projects for meeting the Collaborative's CAP objectives.

This project was supported by the Food and Drug Administration (FDA) of the U.S. Department of Health and Human Services (HHS) as part of a financial assistance award U18FD007051 with 100 percent funded by FDA/HHS. The contents are those of the author(s) and do not necessarily represent the official views of, nor an endorsement, by FDA/HHS, or the U.S. Government.



Thank you!

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