

Improving Public Food Safety: Using Big Data and AI to Connect Restaurant Operators with Health Departments

May 8, 2019

What we will cover today

Hazel Analytics introduction

How food service and retail brands use Hazel insights

- Operations
- Strategy

Health department insights

Hazel roadmap

Questions

Hazel Analytics Introduction

Company Background

Based in Seattle, WA

Founded in 2014 based on 10+ years of research from Stanford, UCLA, and Univ of Maryland

101 global and national chains use the Food Safety Insights (FSI) platform to manage food safety risk and regulatory compliance, including nearly half of the largest 100 chains.



Mission

Improving public health by
connecting regulators, food service operators, and industry providers
via data-driven technology solutions.

Why we created FSI

1 High fragmentation of jurisdictions and data => collecting inspection reports is hard

- Thousands of health departments
- No single database where inspection reports are aggregated
- Unfriendly websites

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- Each jurisdiction has own scoring system and inspection behavior
- What gets published and how it's published differs greatly across jurisdictions

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3 Volume and quality of data => analysis and insights are challenging to extract

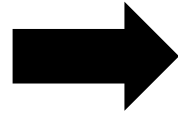
- Factors above make meaningful analysis challenging, if not impossible
- For larger chains, volume of data further inhibits timely and regular analysis

What we do

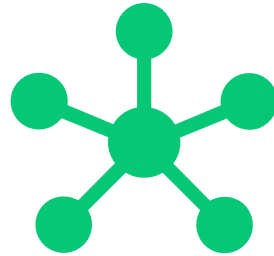
COLLECTION



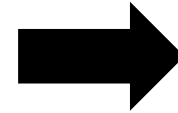
1,000+ Health Depts
47 U.S. States & Canada
1.7M Facilities



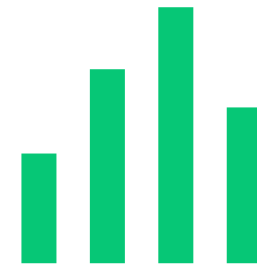
STANDARDIZATION



Hazel
Score



ANALYTICS



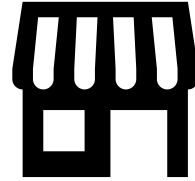
Food Safety Insights
(FSI)

2018 Hazel data collection summary



2,143,585

Inspections



1,165,060

Facilities



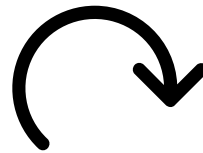
5,818,378

Violations



706,855

Inspections w/ 1+ Critical



278,212

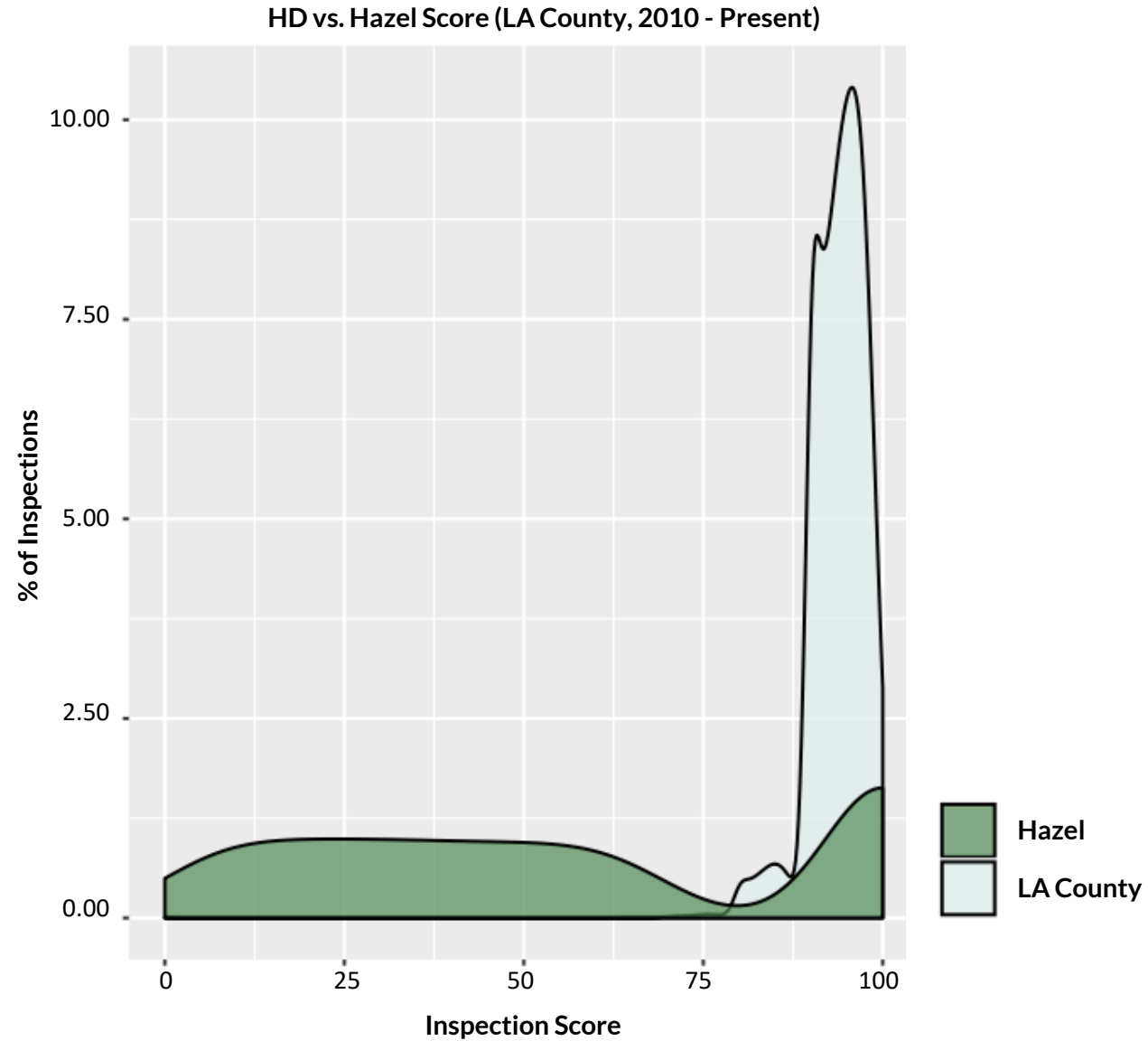
Re-inspections



45,147

Consumer Complaints

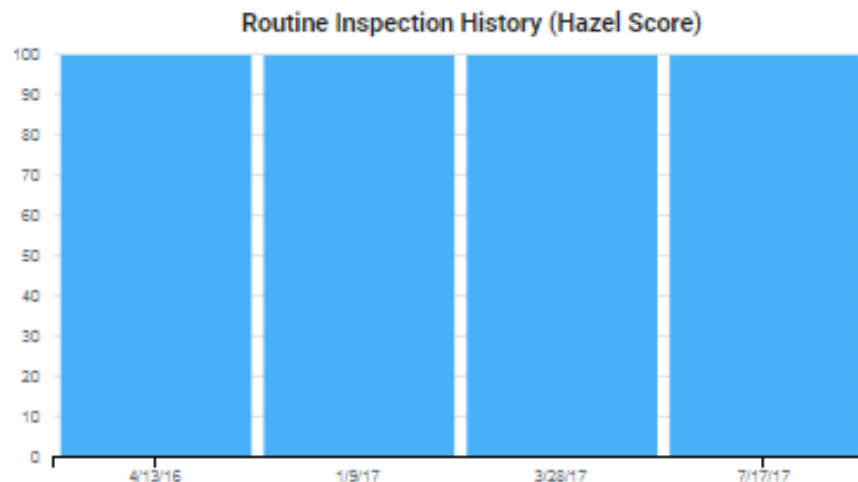
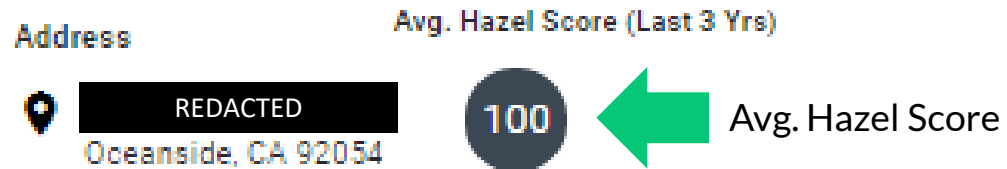
Standardization: creating separation in performance



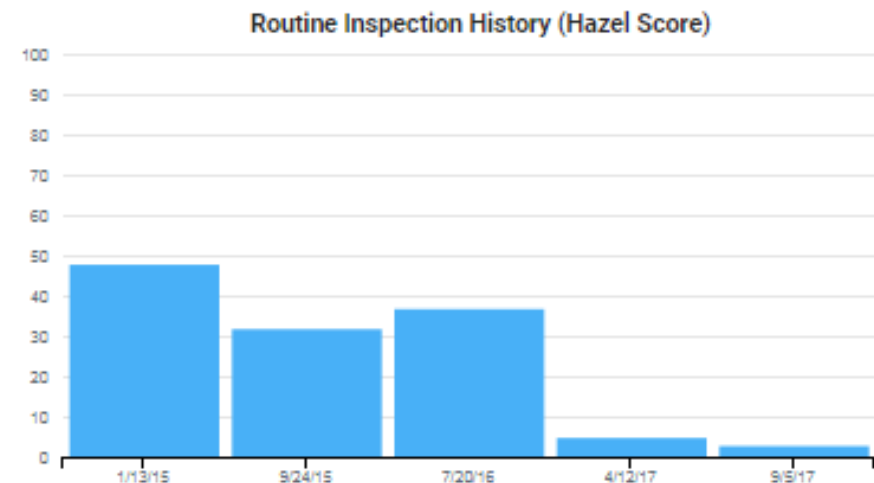
Standardization: facility level case study

Shown below are the Hazel Score histories for two stores (A and B) that are operated by the same brand/chain, and which are located in the same health department jurisdiction (San Diego County).

STORE A



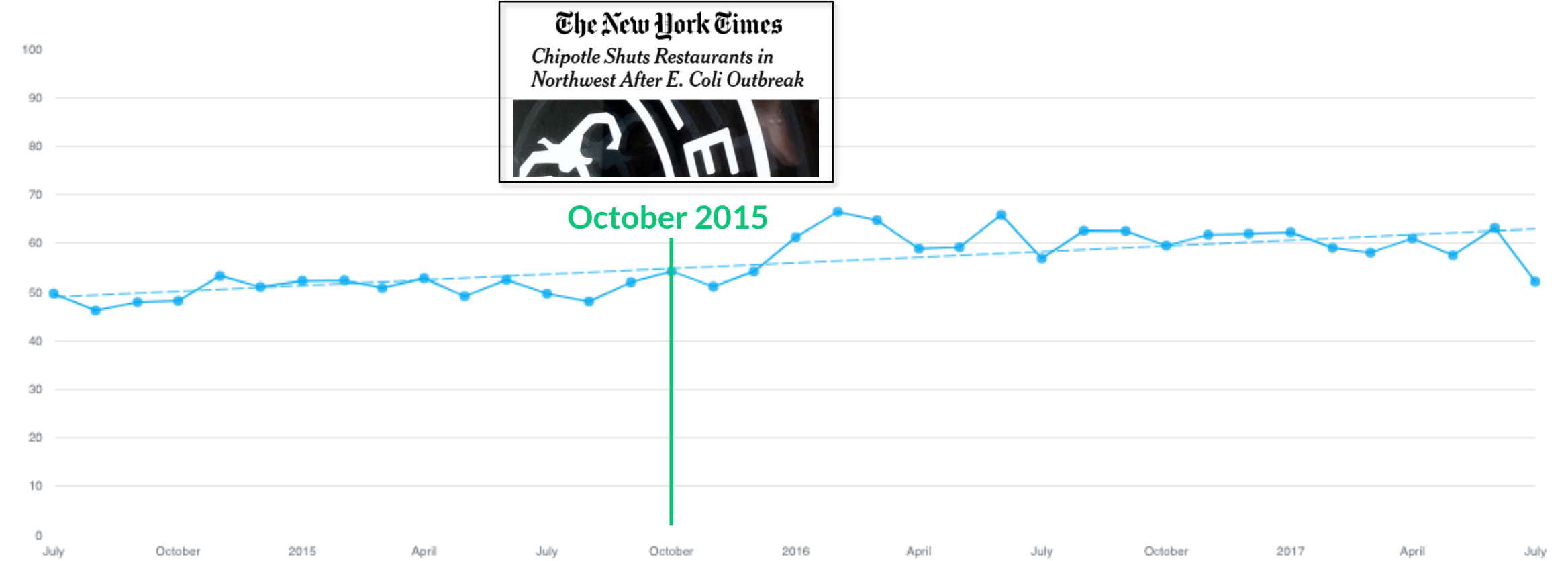
STORE B



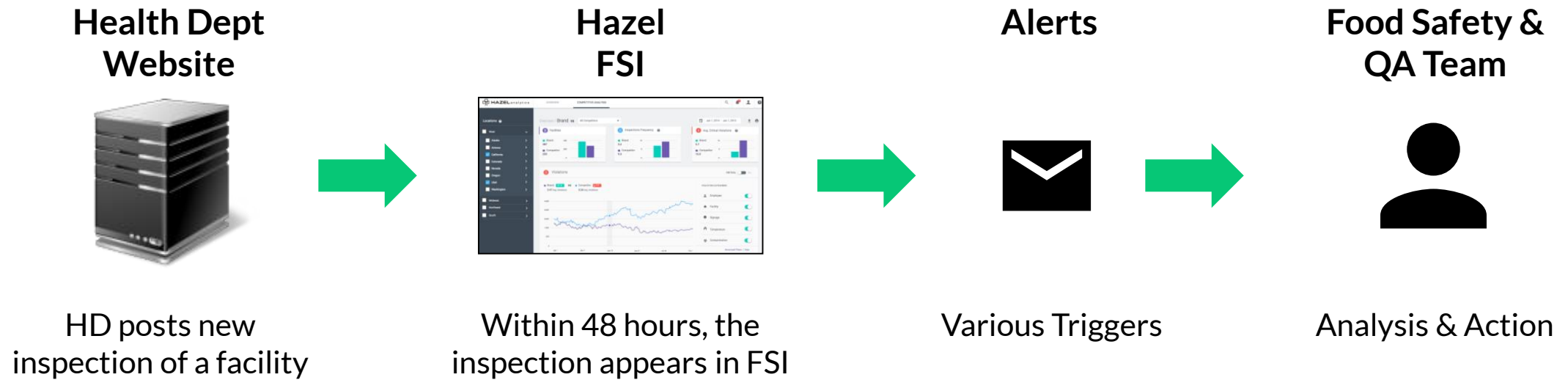
Standardization: brand level case study

★ Hazel Score - Overall

Trend Line Hazel Score



Analytics: Food Safety Insights (FSI)



Winner of 2019 Food Safety Innovation Award by Food Marketing Institute
Nominated for the 2019 IAFP Food Safety Innovation Award by Target
Winner of 2016 Food Safety Innovation Award by Jack in the Box

Analytics: why food service and retail chains use FSI



Communication

Our stores do not report inspections to HQ,
especially poor results



High-Risk Facilities

The health department will shut down a store and
we find out about it too late or not at all



Visibility

We do not have holistic visibility into our
inspection performance, trends, and
benchmarks

Operational Insights



Too much data a good thing?

3,441

of brand's inspections collected in last 3 months alone

or

1 inspection every ~37 minutes

Using FSI we can start to narrow things down

283

Inspections w/
Hazel Scores below



39

Reinspections w/
1+ criticals



11

Consumer complaints
w/ 1+ violation



7


Closures




This starts to become manageable => less than 4 inspections per day

How about being proactive? Alerts can help

High Frequency Inspections Alerts FSI Emails x

 Hazel Analytics <no-reply@hazelanalytics.com>
to me ▾

 HAZELanalytics

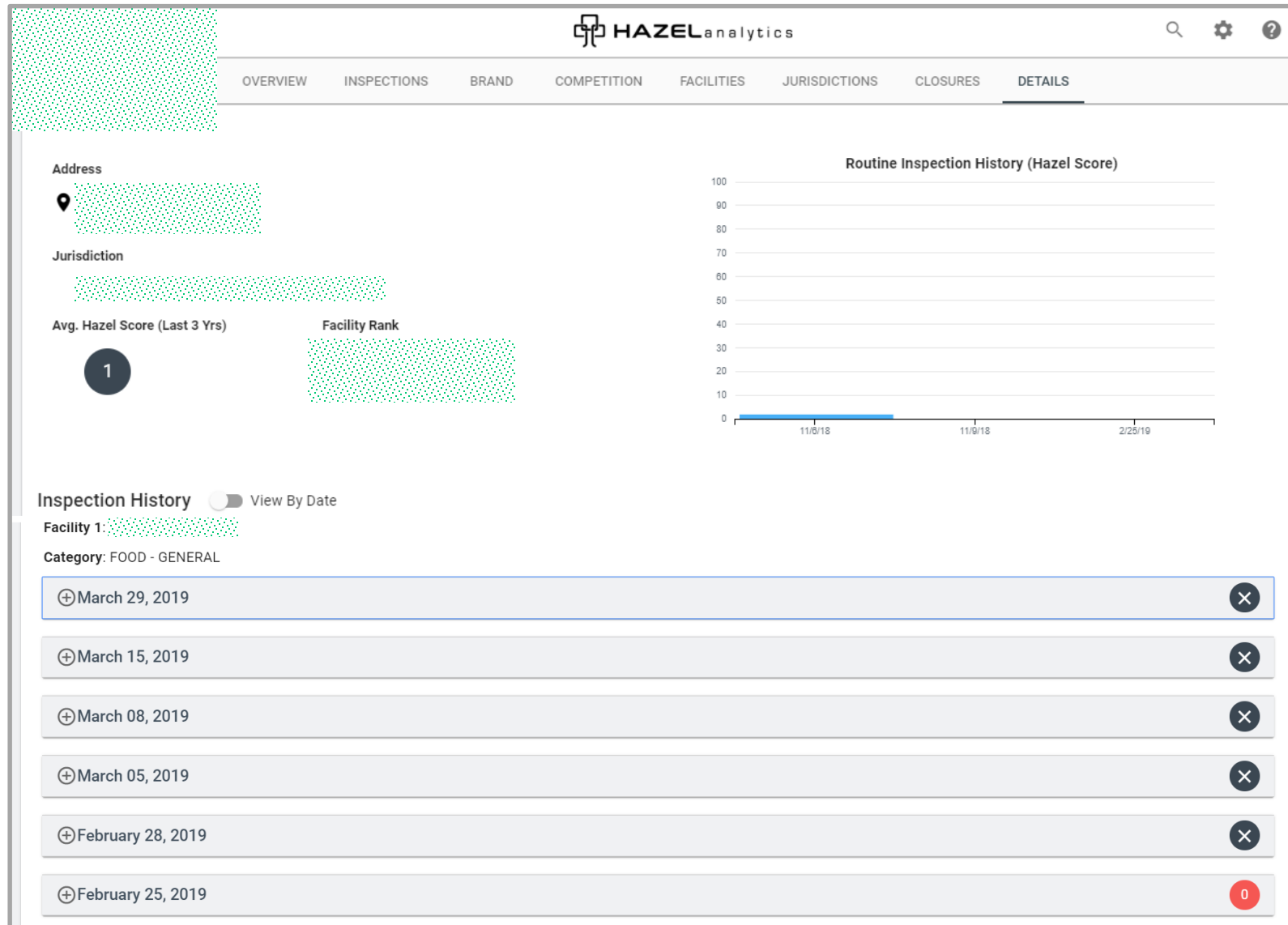
Facilities with multiple inspections within a 90 day period

Facility	Inspections
REDACTED	<ul style="list-style-type: none">Dec 28, 2018Feb 04, 2019Mar 05, 2019
REDACTED	<ul style="list-style-type: none">Feb 25, 2019Feb 28, 2019Mar 05, 2019

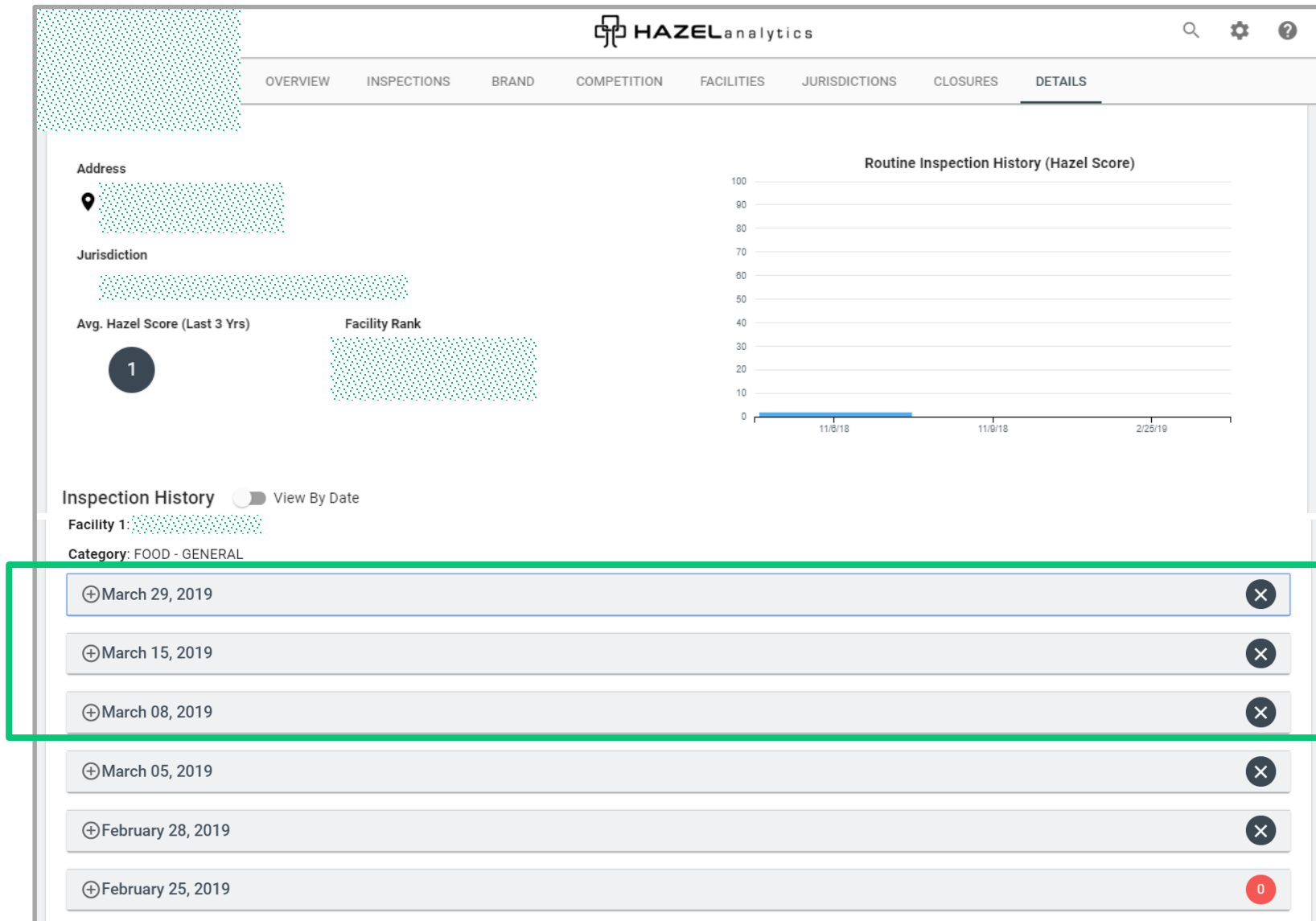


**Alert sent
on 3/6/19**

Potential opportunity to get ahead of issues before they recur



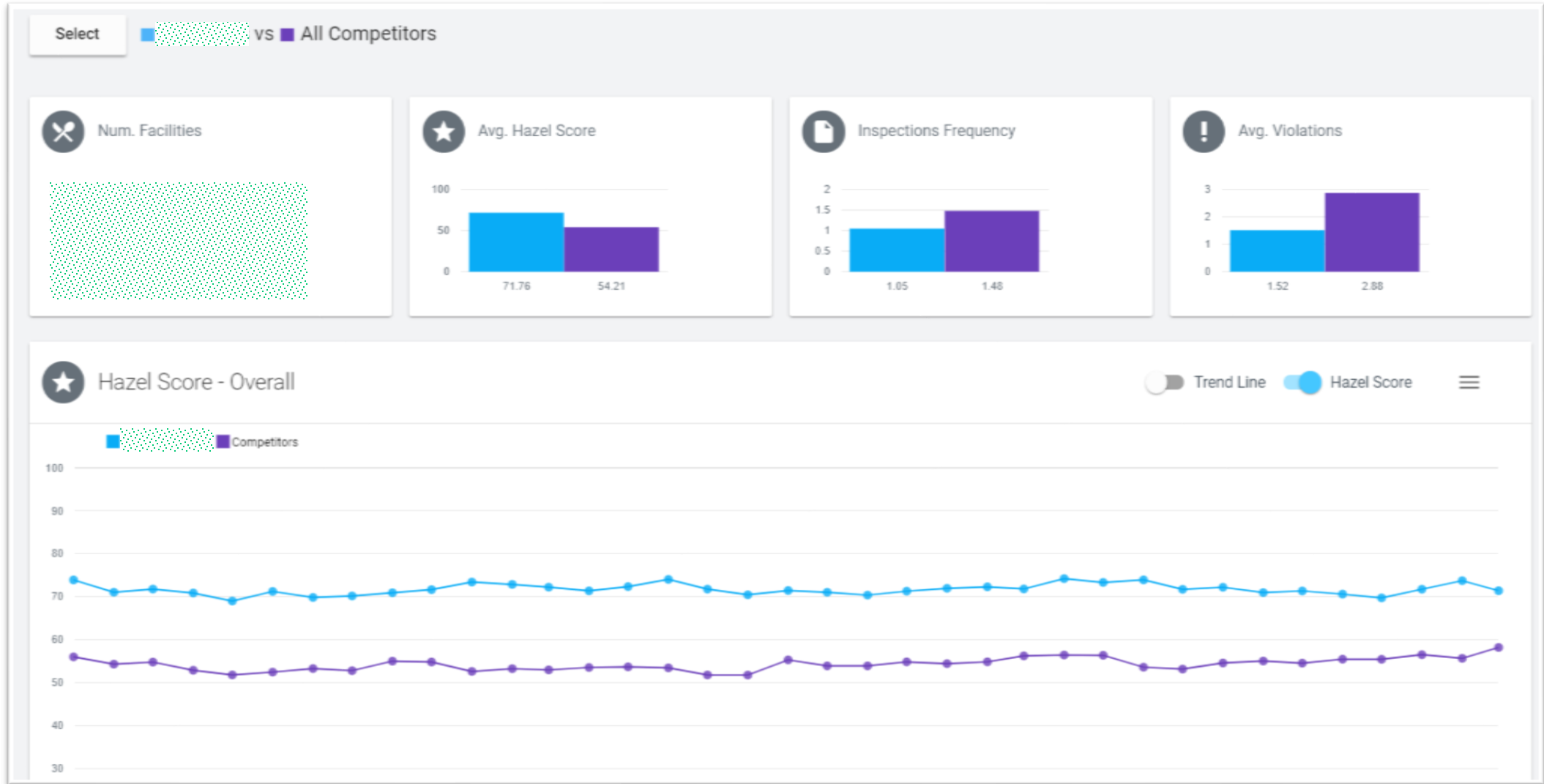
Potential opportunity to get ahead of issues before they recur



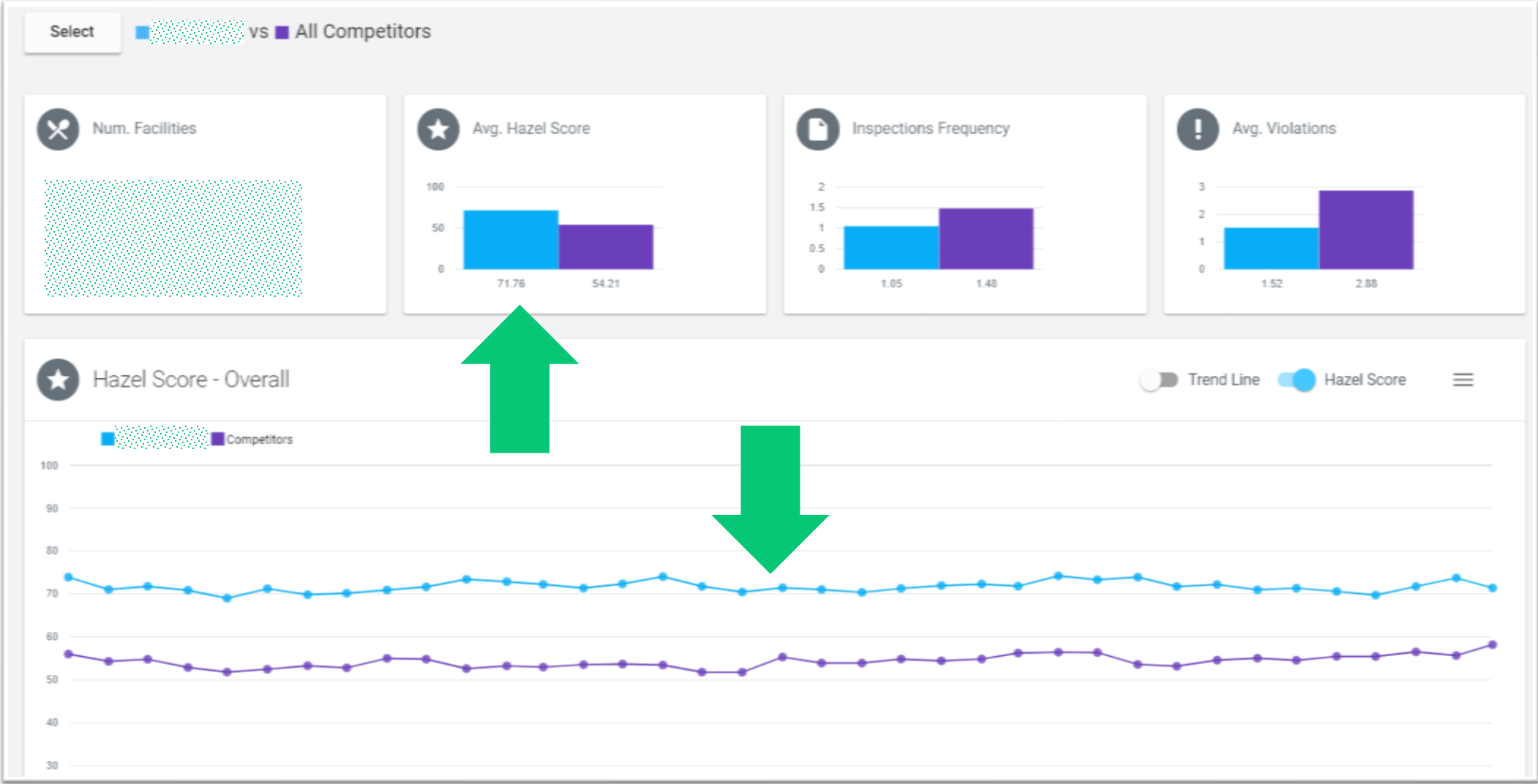
Strategic Insights



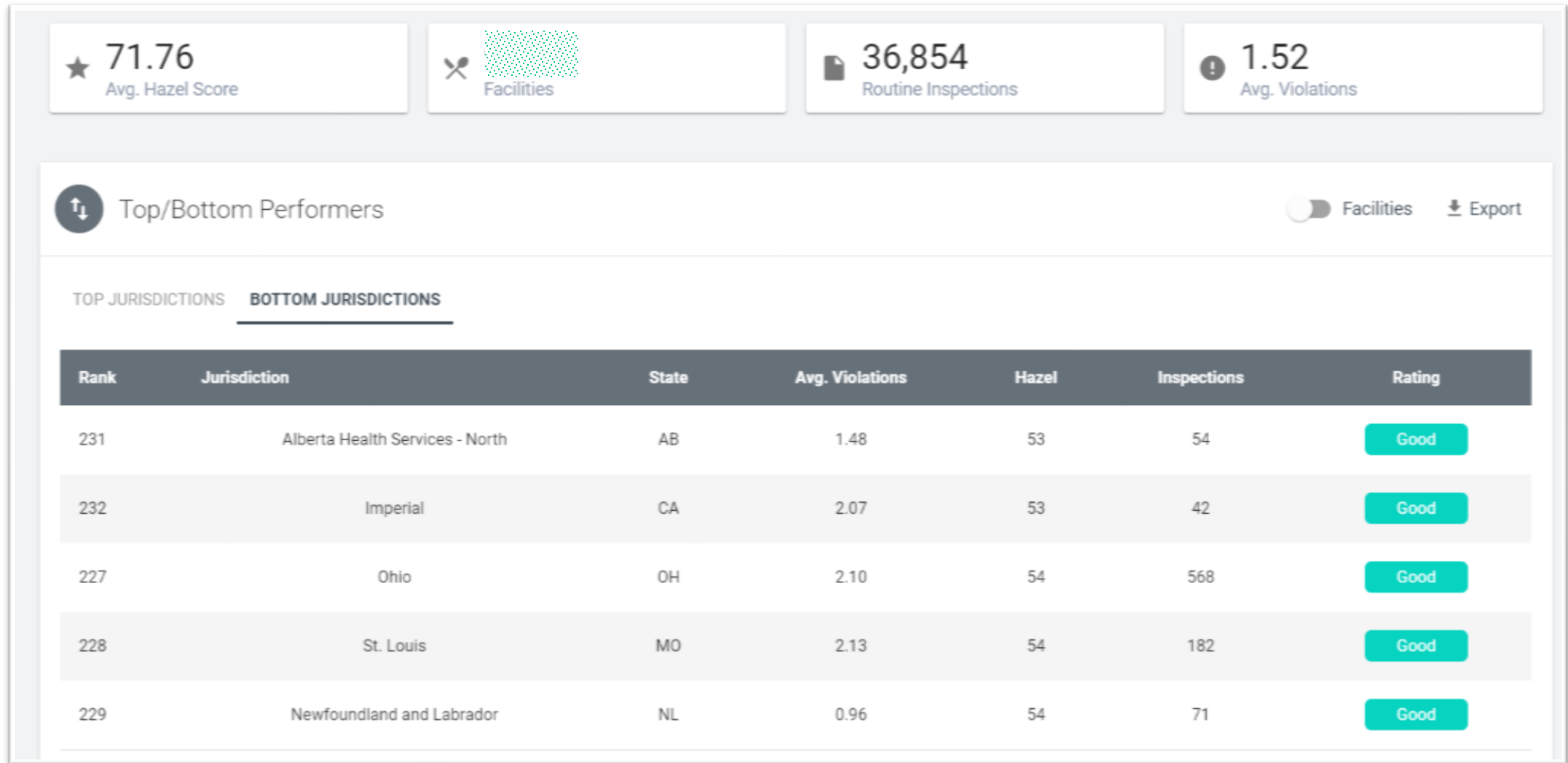
This brand outperforms its peers nationally



This brand outperforms its peers nationally



But are there any regions where this brand falls behind the curve?



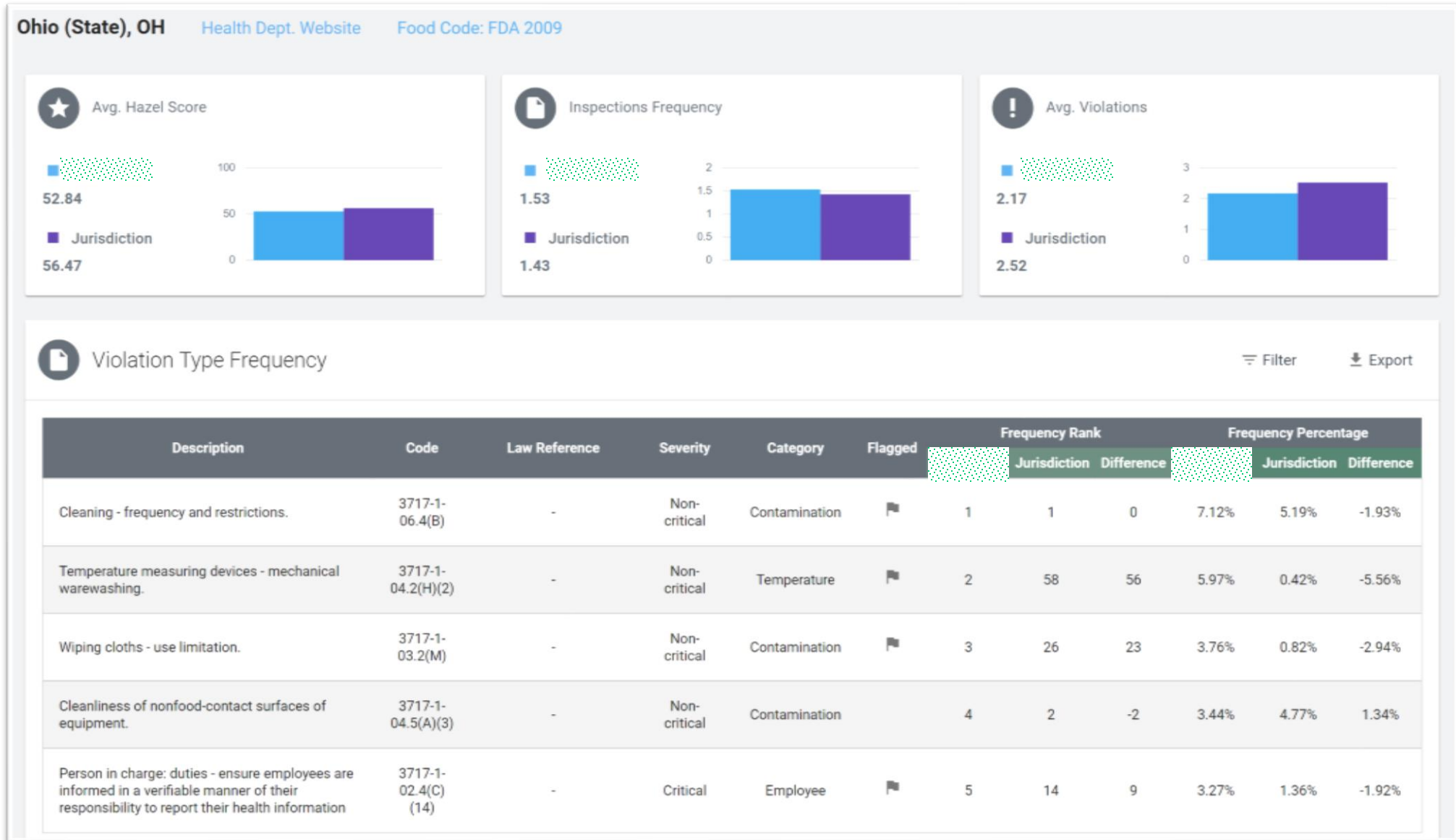
Wait, but which Ohio health department?

Name	Level	State ^	Facilities	Case	!	☹	Avg. Violations	Violations: Types	Violations: Flagged	Last Inspection	Run Time (hrs)
Cuyahoga	County	OH	31	III	✓	✓	1.87	699	7	11-Mar-2019	19
Columbus	City	OH	36	III	✓	-	0.97	487	2	15-Mar-2019	28
Butler	County	OH	9	I	✓	-	3.26	73	1	27-Nov-2018	15
Montgomery	County	OH	6	I	✓	✓	1.05	353	0	14-Mar-2019	17
Stark	County	OH	7	III	✓	✓	1.54	485	0	14-Mar-2019	12
Cincinnati	City	OH	12	I	-	✓	3.85	836	1	25-Feb-2019	17
Greene	County	OH	4	I	✓	-	5.82	207	0	15-Nov-2018	13
Ohio	State	OH	116	III	✓	✓	2.52	1532	17	21-Mar-2019	34

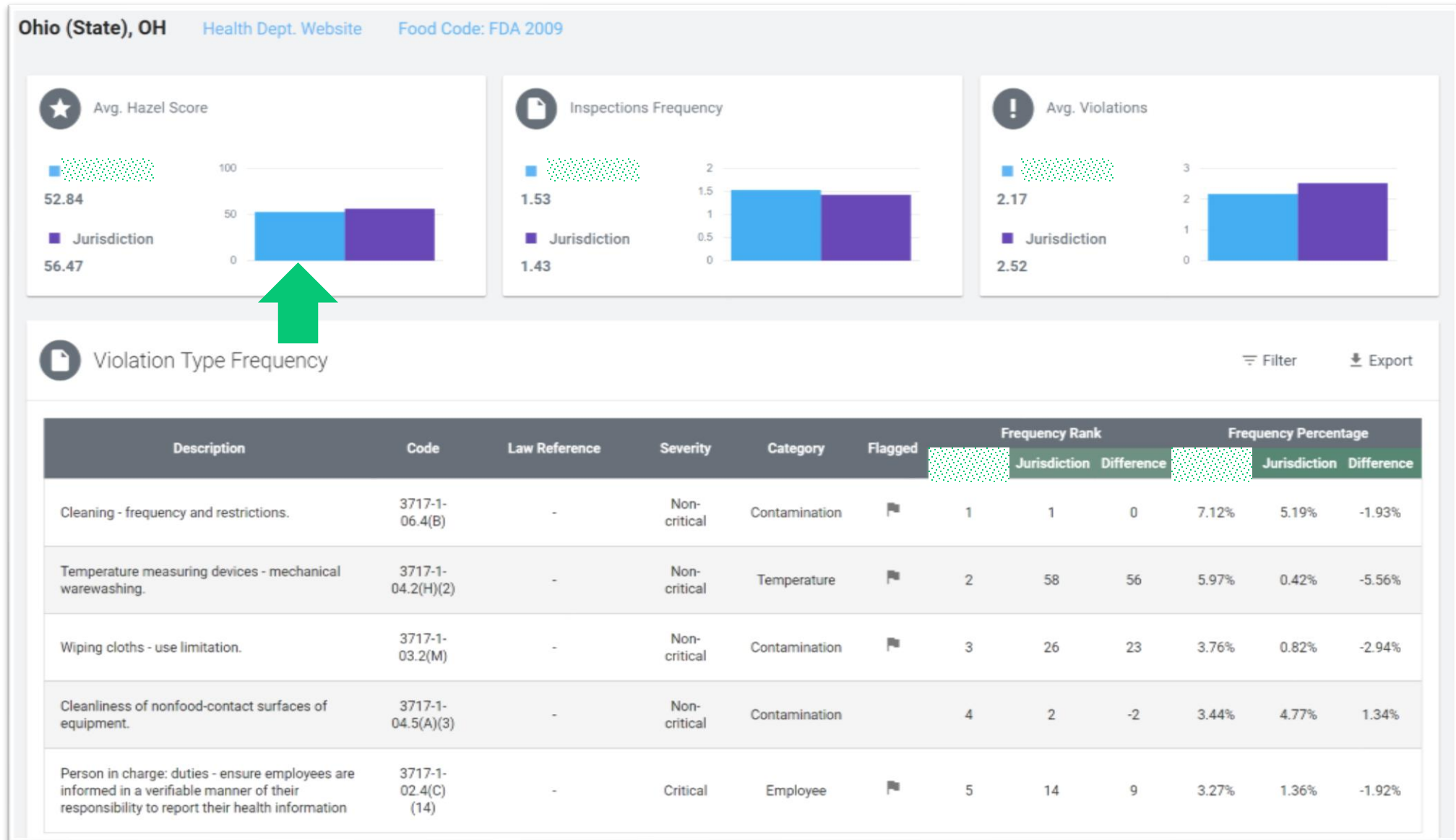
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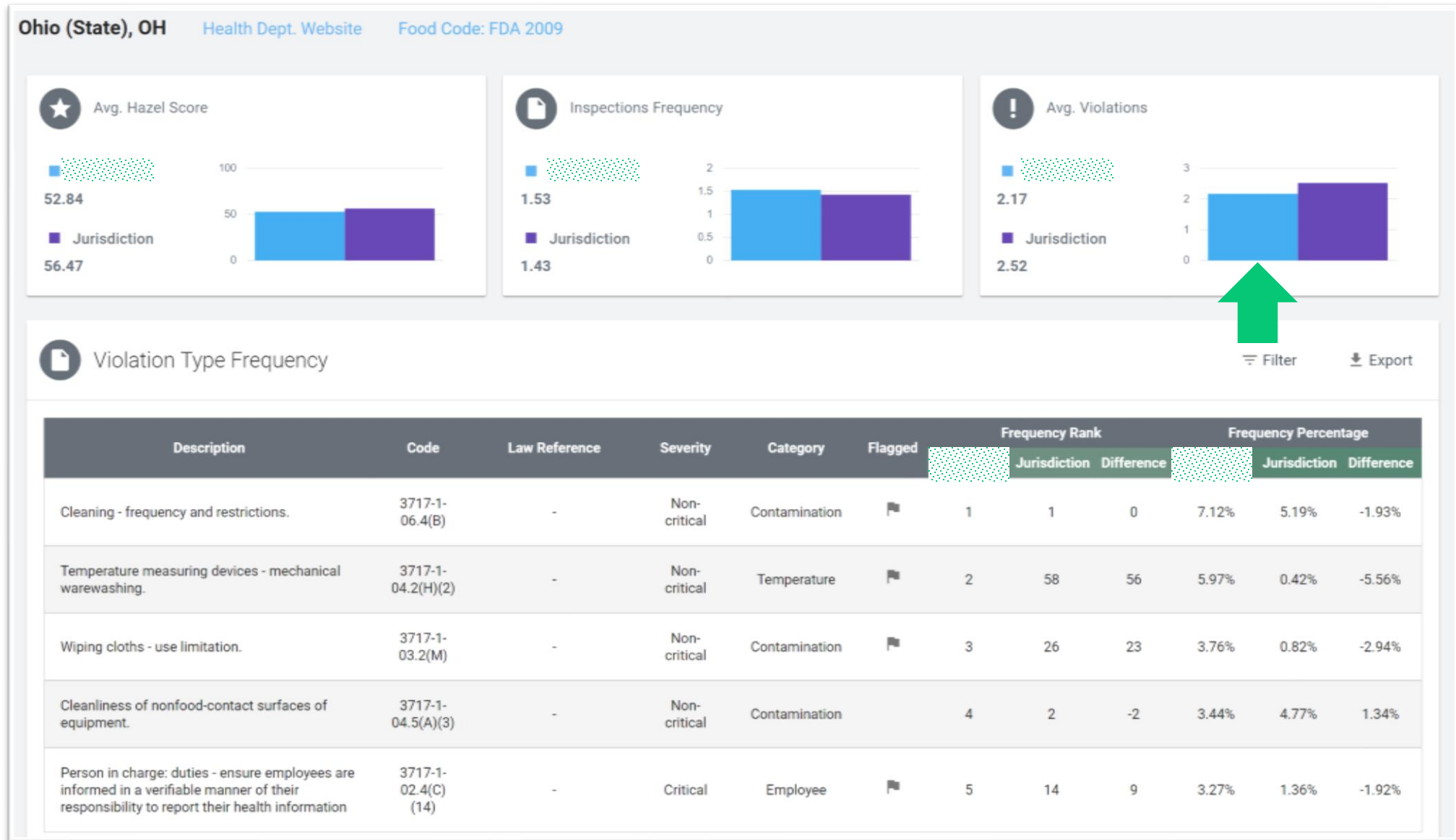
What can we learn about what's happening in this jurisdiction?



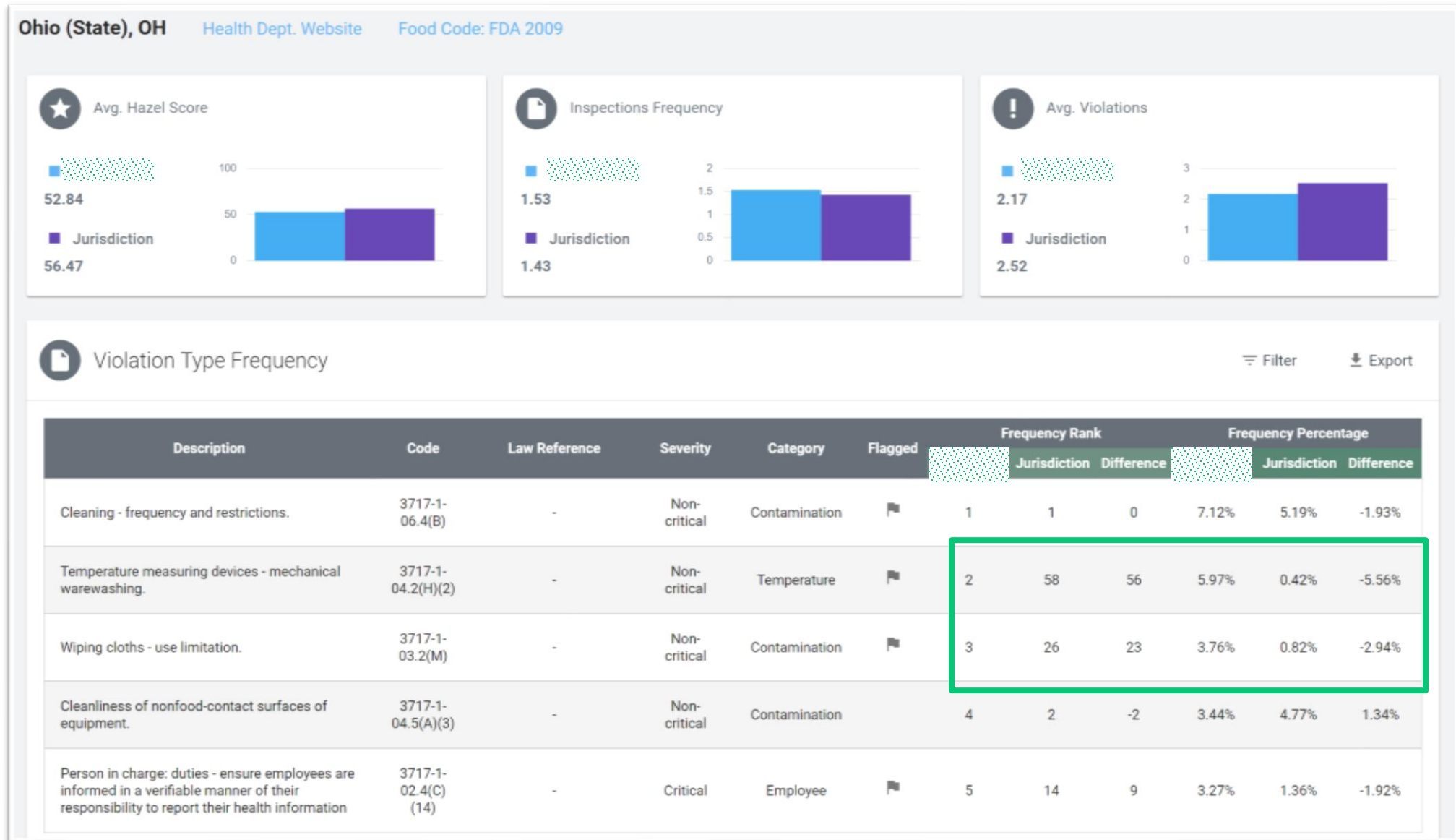
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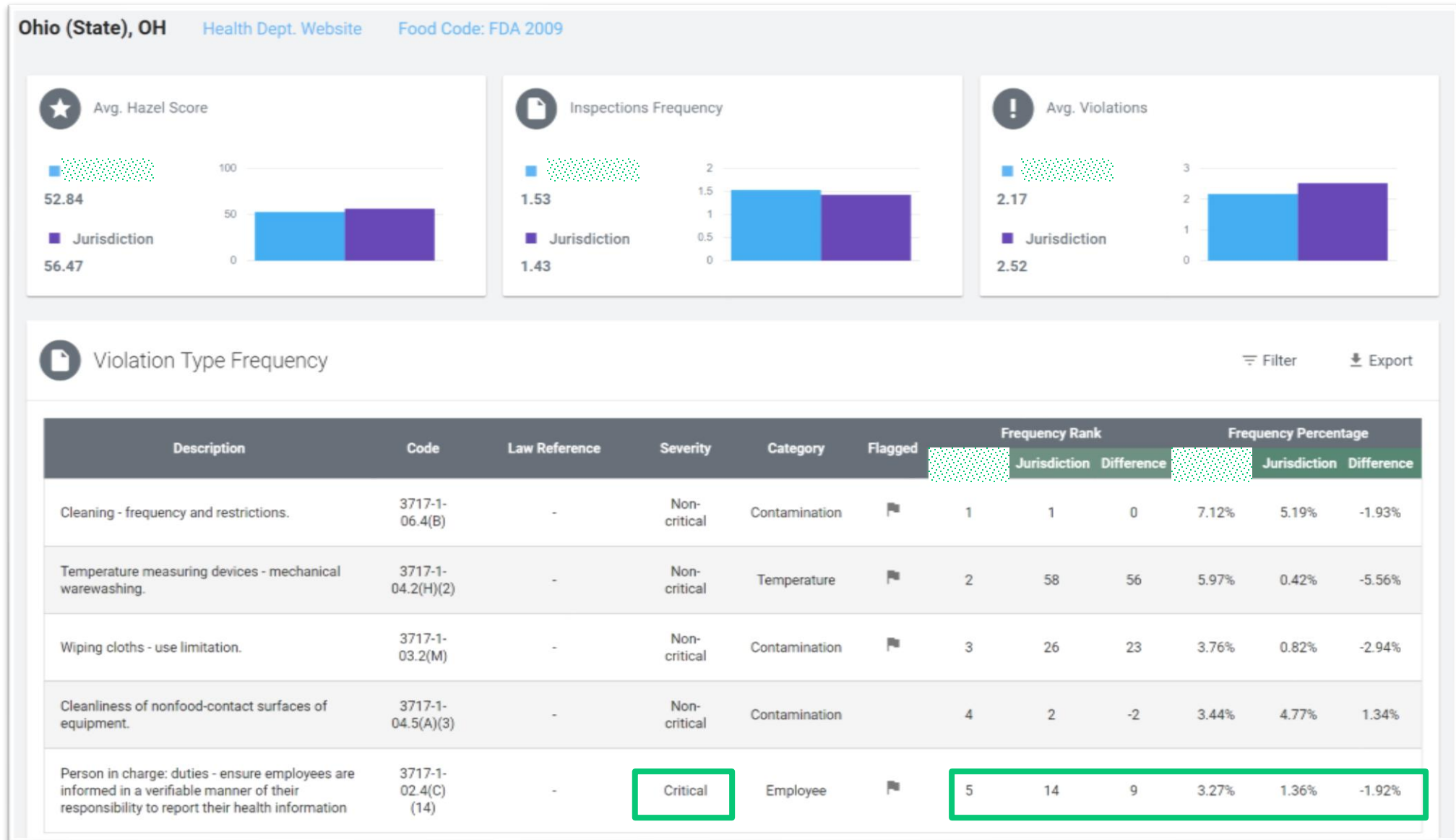
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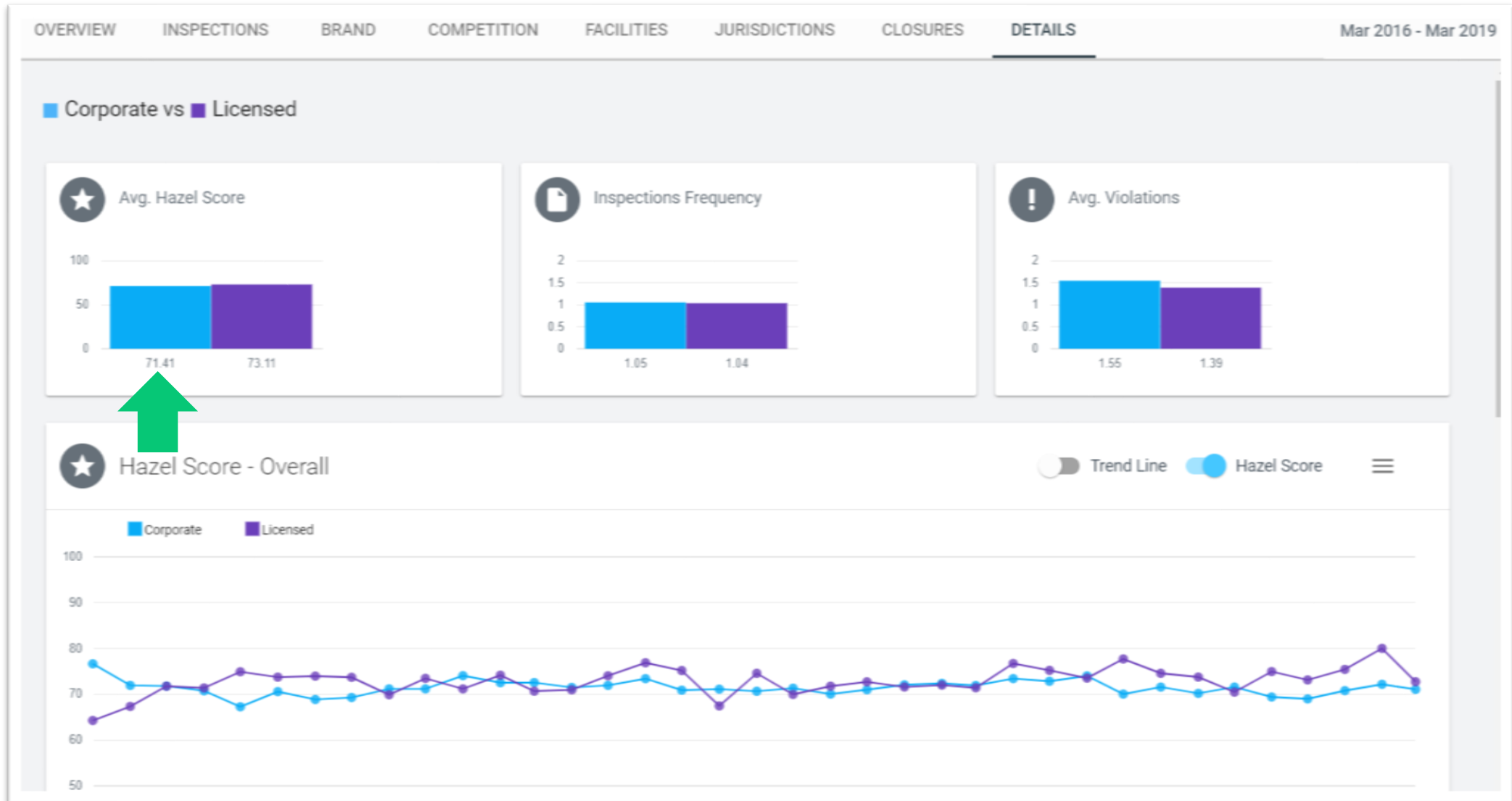


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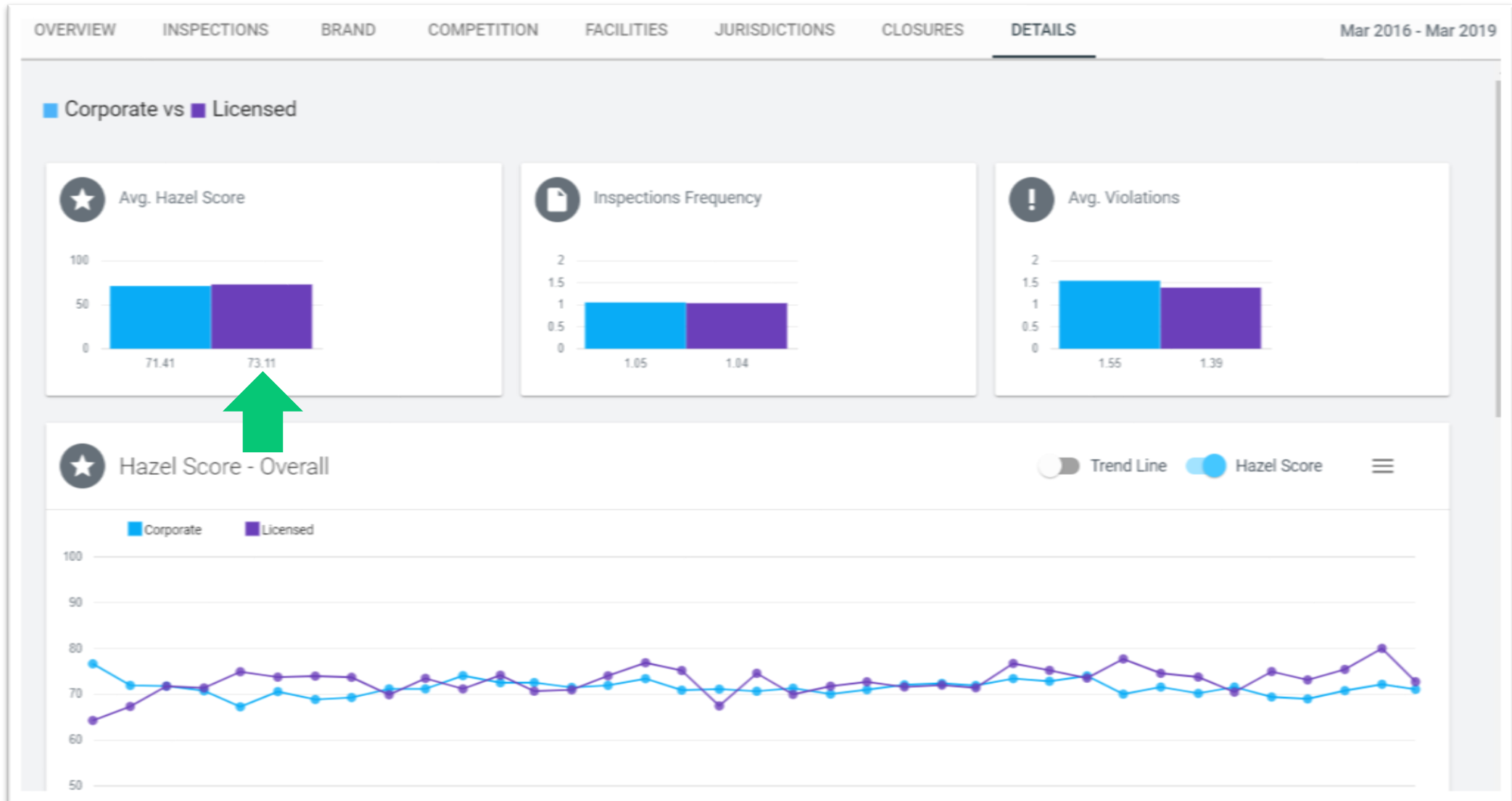


**Corporate vs. licensed locations:
which have the better scores?**

Corporate (71.41)

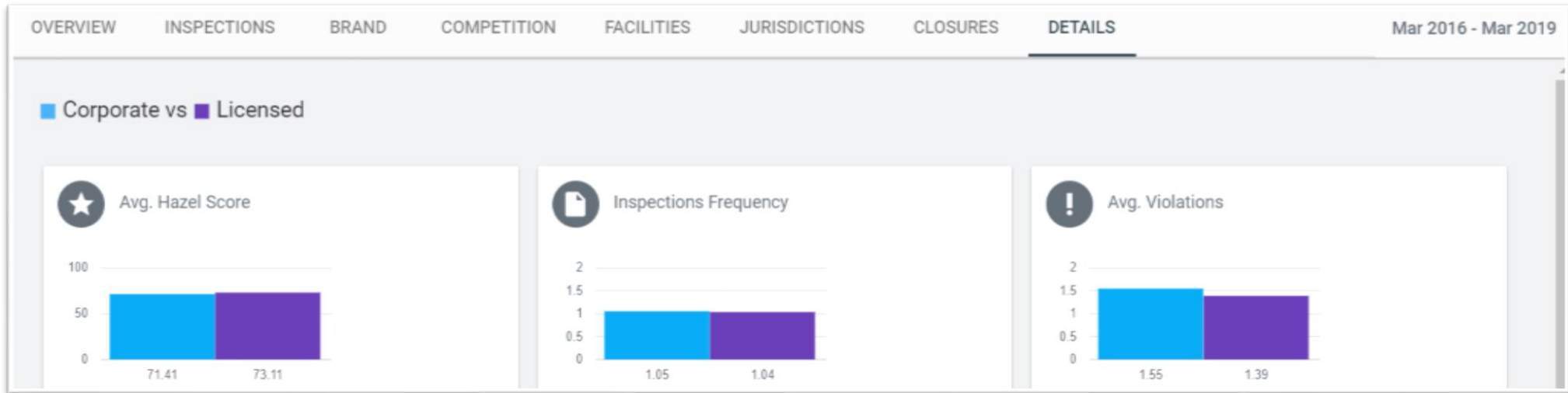


Corporate (71.41) < Licensed (73.11)

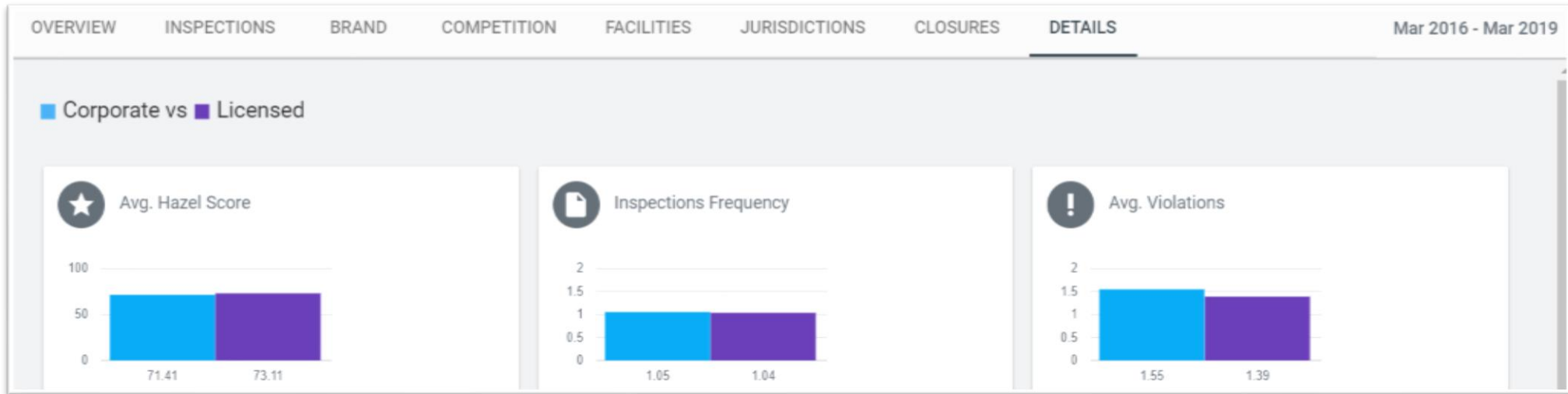


**Comparing the last 3 years vs. last 1 year,
has the performance gap between
corporate and licensed locations grown or shrunk?**

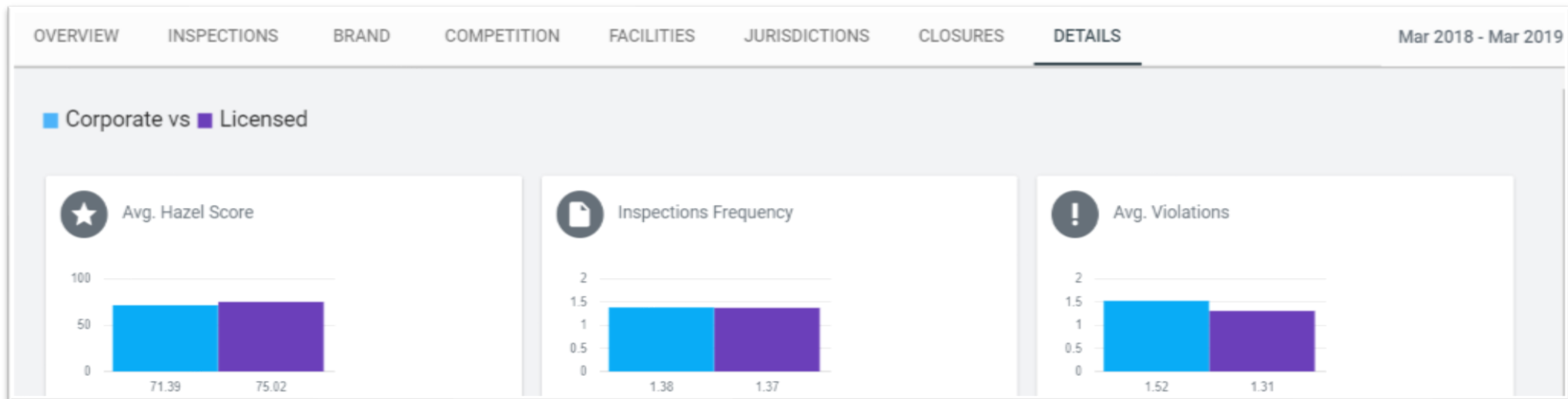
3-Year Difference: 1.70 (73.11 - 71.41)



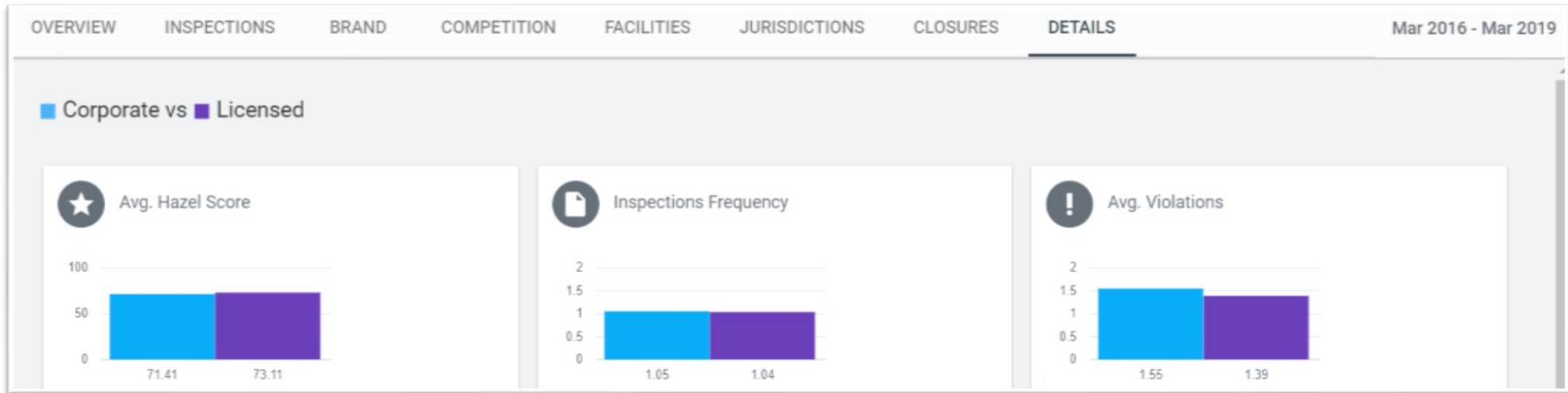
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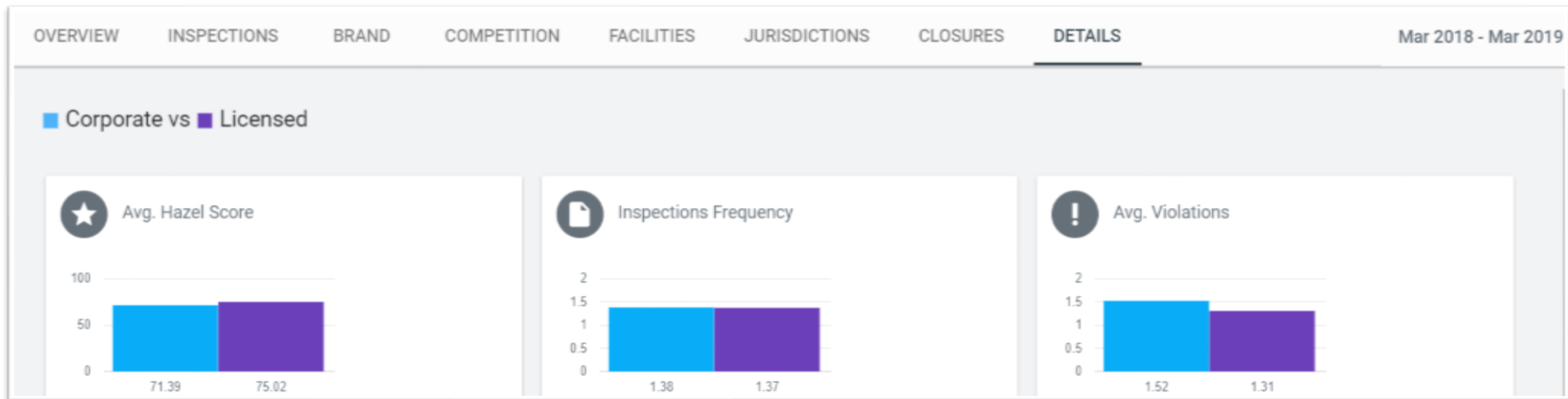
1-Year Difference: 3.63 (75.02 - 71.39)



3-Year Difference: 1.70 (73.11 - 71.41)





1-Year Difference: 3.63 (75.02 - 71.39) ↑



Insights for Health Departments

Canadian nice in food retail inspection results?

		
Avg. # of violations per inspection	3.16	1.16
Avg. # of criticals per inspection	0.79	0.45

US State Level Analysis

Violations

Top 5

State	Average
FL	5.91
CT	5.90
UT	5.53
NE	5.45
DC	5.35

Washington

WA	1.19
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Bottom 5

AZ	0.96
ID	0.78
NH	0.58
ND	0.25
MS	0.24

US State Level Analysis

Violations

Criticals

Top 5

State	Average
FL	5.91
CT	5.90
UT	5.53
NE	5.45
DC	5.35

State	Average
CT	2.38
DC	2.24
CO	1.86
UT	1.80
KS	1.65

Washington

WA	1.19
----	------

WA	0.72
----	------

Bottom 5

AZ	0.96
ID	0.78
NH	0.58
ND	0.25
MS	0.24

MD	0.36
CA	0.35
NV	0.34
OK	0.33
AL	0.33

US State Level Analysis

% Perfect Inspections

Top 5

State	Average
MS	87%
ND	85%
NH	68%
ID	64%
AZ	57%

Washington

WA	45.81%
----	--------

Bottom 5

FL	15%
DC	12%
NC	9%
NE	7%
CT	4%

US State Level Analysis

% Perfect Inspections

Inspection Frequency

Top 5

State	Average
MS	87%
ND	85%
NH	68%
ID	64%
AZ	57%

State	Average
CT	2.32
IN	2.06
SC	2.04
MA	2.03
AZ	1.83

Washington

WA	45.81%
----	--------

WA	1.30
----	------

Bottom 5

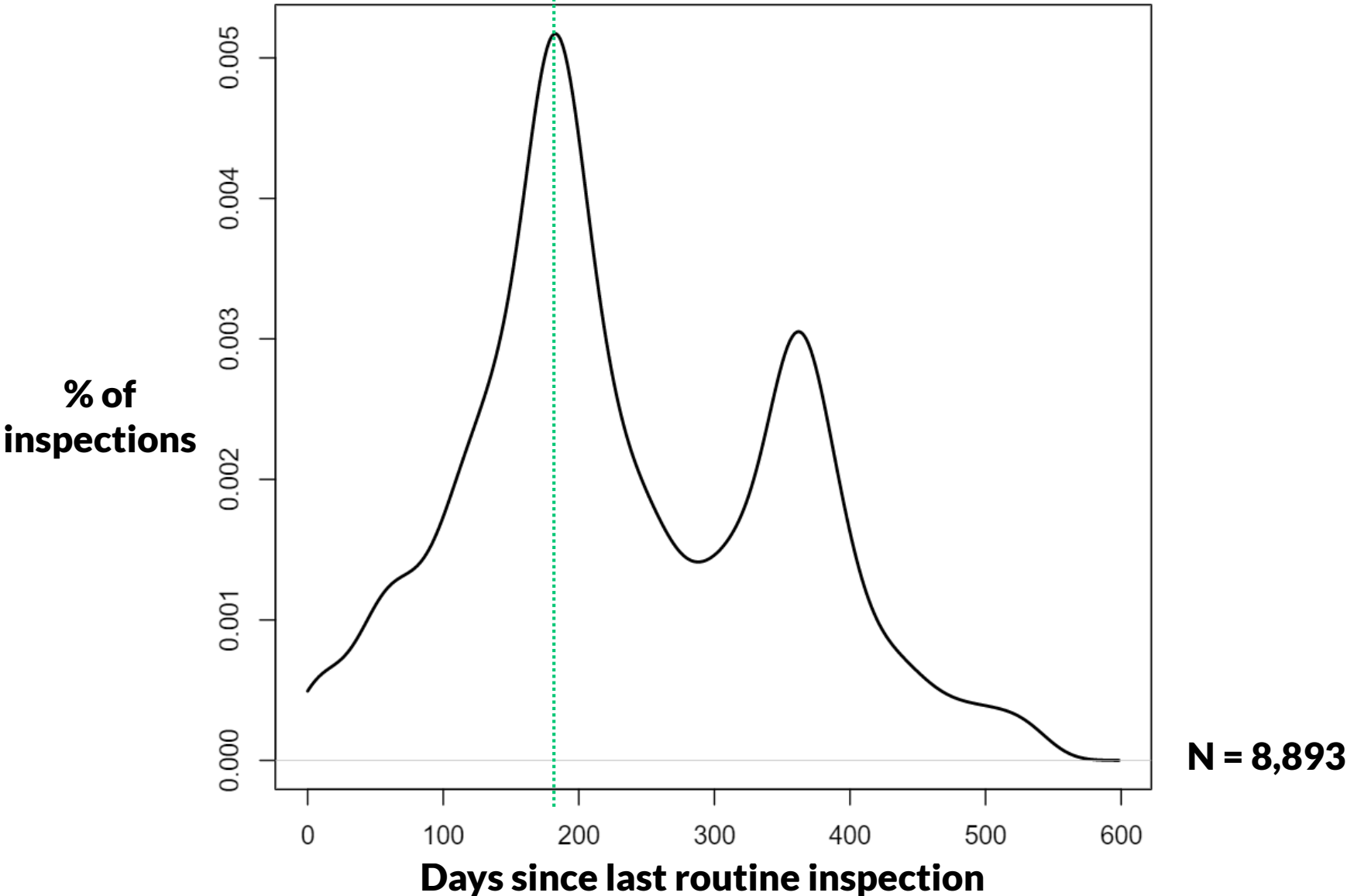
FL	15%
DC	12%
NC	9%
NE	7%
CT	4%

NE	0.71
SD	0.67
NH	0.67
ME	0.66
AK	0.54

Staying on schedule:
**How closely do health departments follow
their scheduled inspection frequencies?**

Risk category: 1

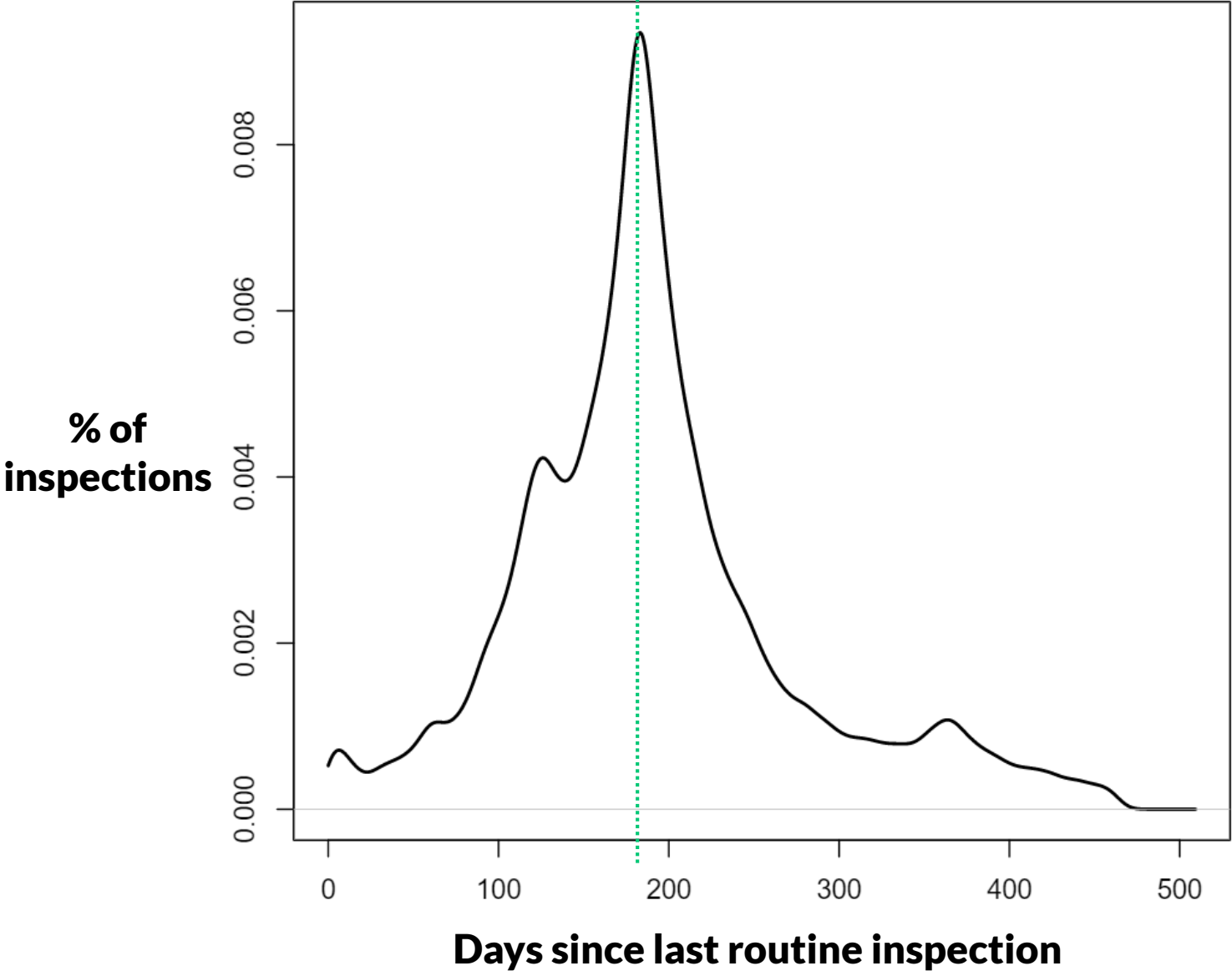
Scheduled frequency: once every 360 days



N = 8,893

Risk category: 2

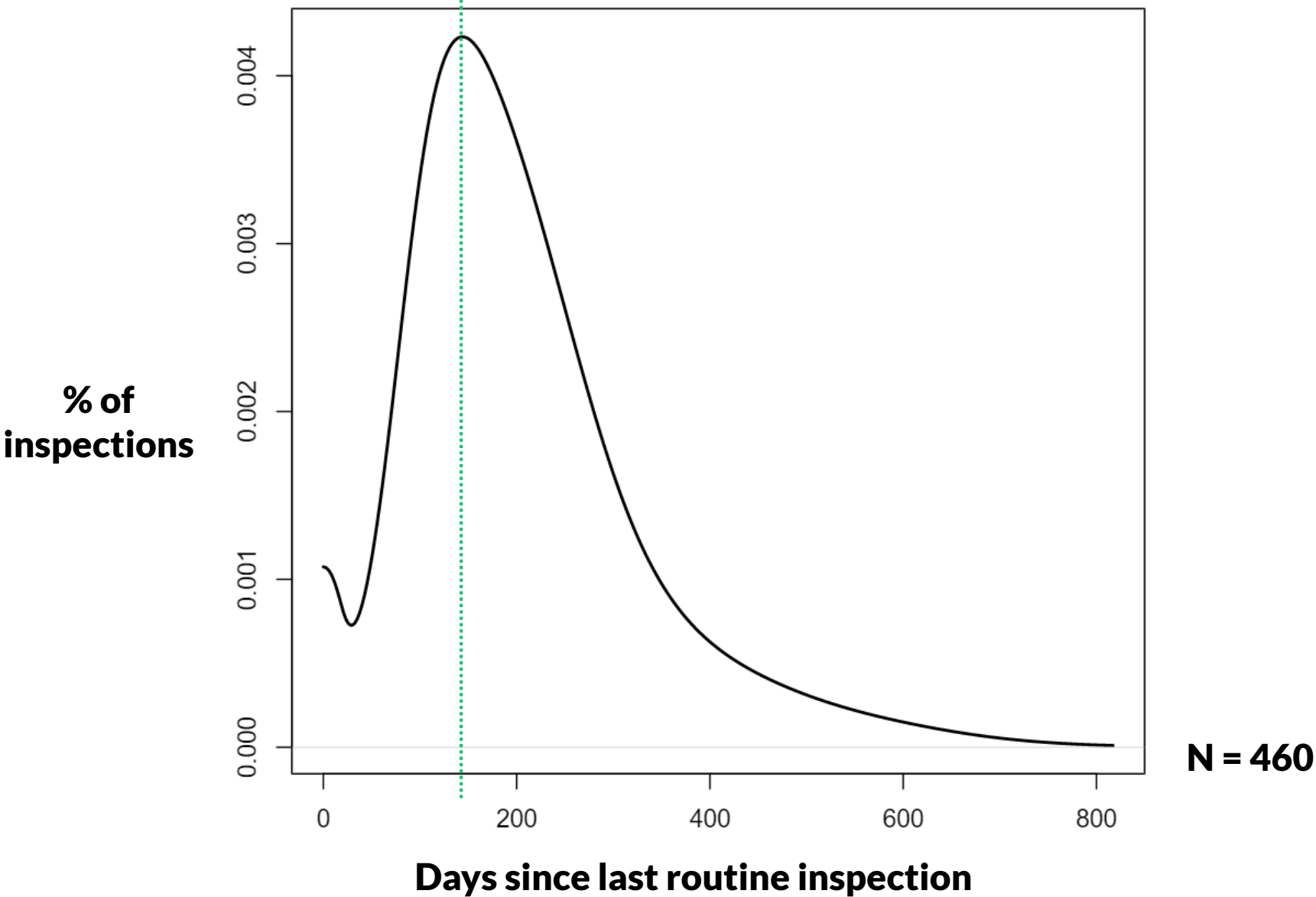
Scheduled frequency: once every 180 days



N = 84,503

Risk category: 3

Scheduled frequency: once every 120 days



WA City Level Analysis

City	Violations		Criticals	
	Rank	Average	Rank	Average
RICHLAND	1	2.13		
KENNEWICK	2	2.08		
PASCO	3	1.94		
BELLINGHAM	4	1.67		
KENMORE	5	1.64		
MONROE	6	1.58		
VANCOUVER	7	1.57		
WALLA WALLA	8	1.53		
ISSAQUAH	9	1.52		
REDMOND	10	1.49		

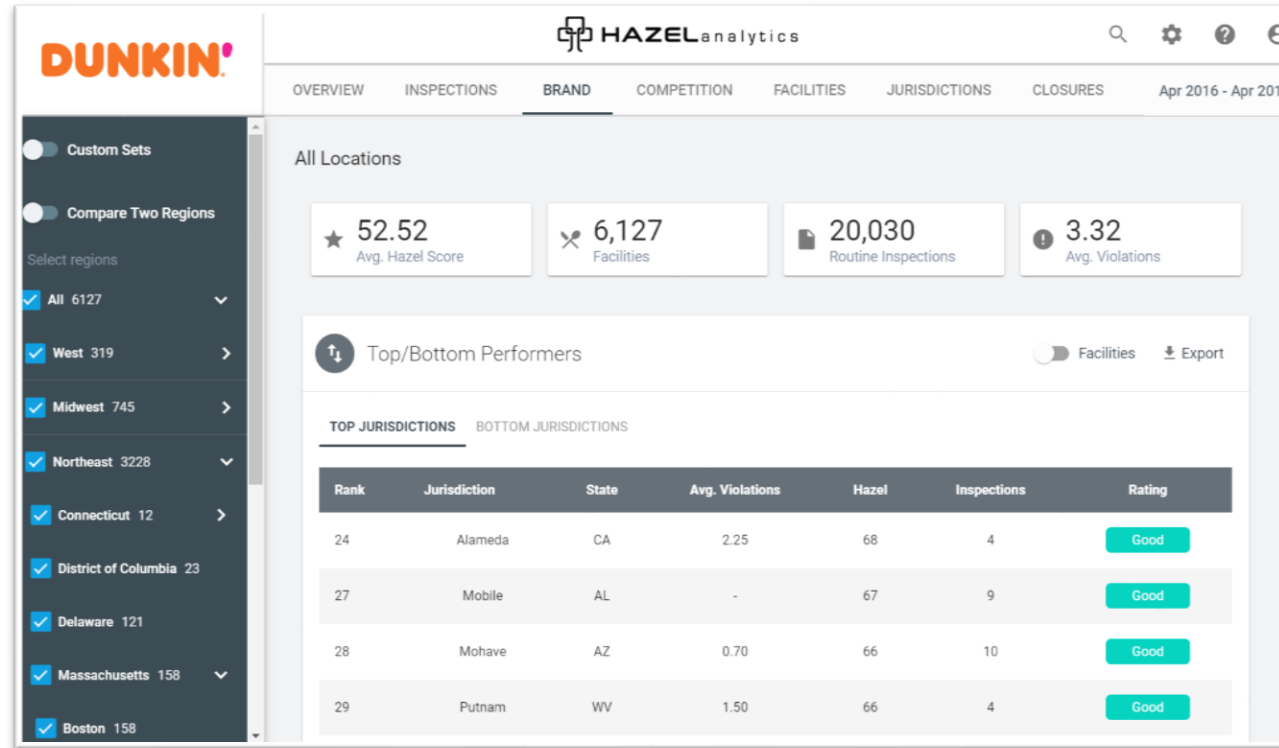
WA City Level Analysis

City	Violations		Criticals	
	Rank	Average	Rank	Average
RICHLAND	1	2.13	1	1.56
KENNEWICK	2	2.08	2	1.55
PASCO	3	1.94	3	1.54
BELLINGHAM	4	1.67	6	1.08
KENMORE	5	1.64	15	0.92
MONROE	6	1.58	4	1.17
VANCOUVER	7	1.57	37	0.59
WALLA WALLA	8	1.53	7	1.07
ISSAQUAH	9	1.52	20	0.81
REDMOND	10	1.49	21	0.76

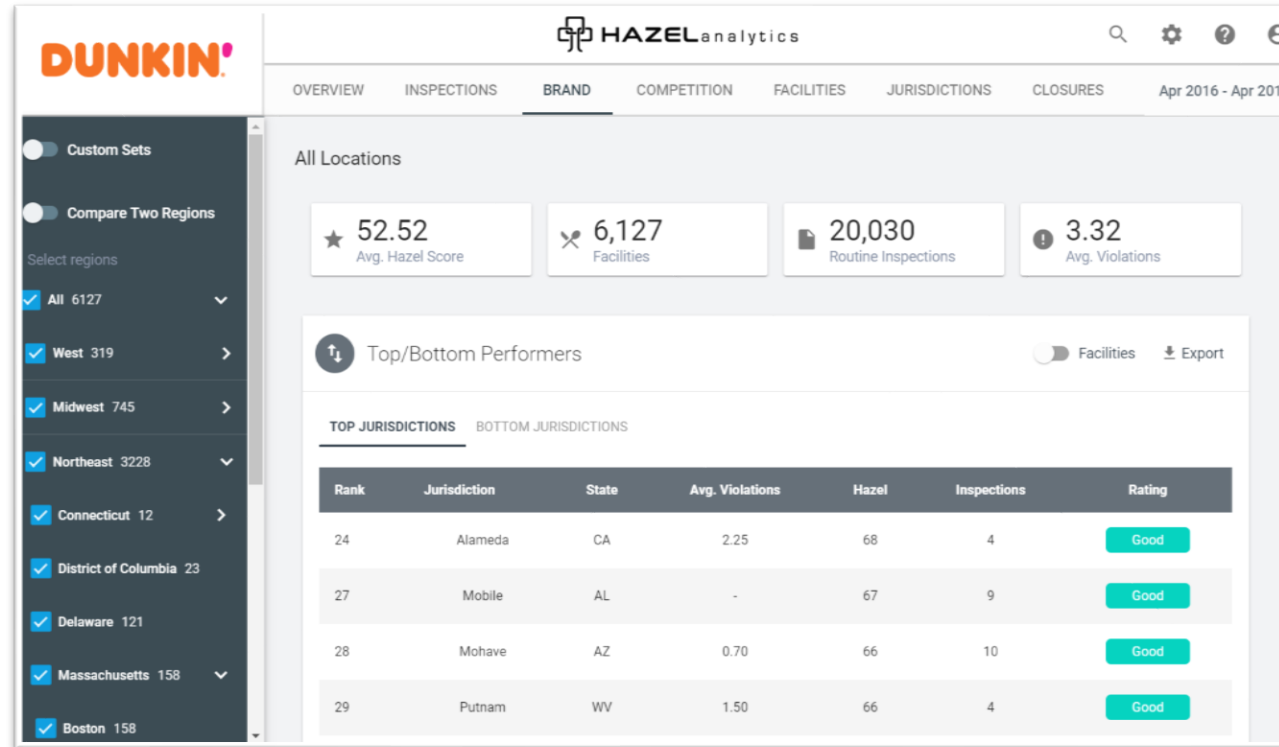
Does “home court advantage” matter? Can inspectors be partial to local brands?



Dunkin Donuts Case Study



Dunkin Donuts Case Study

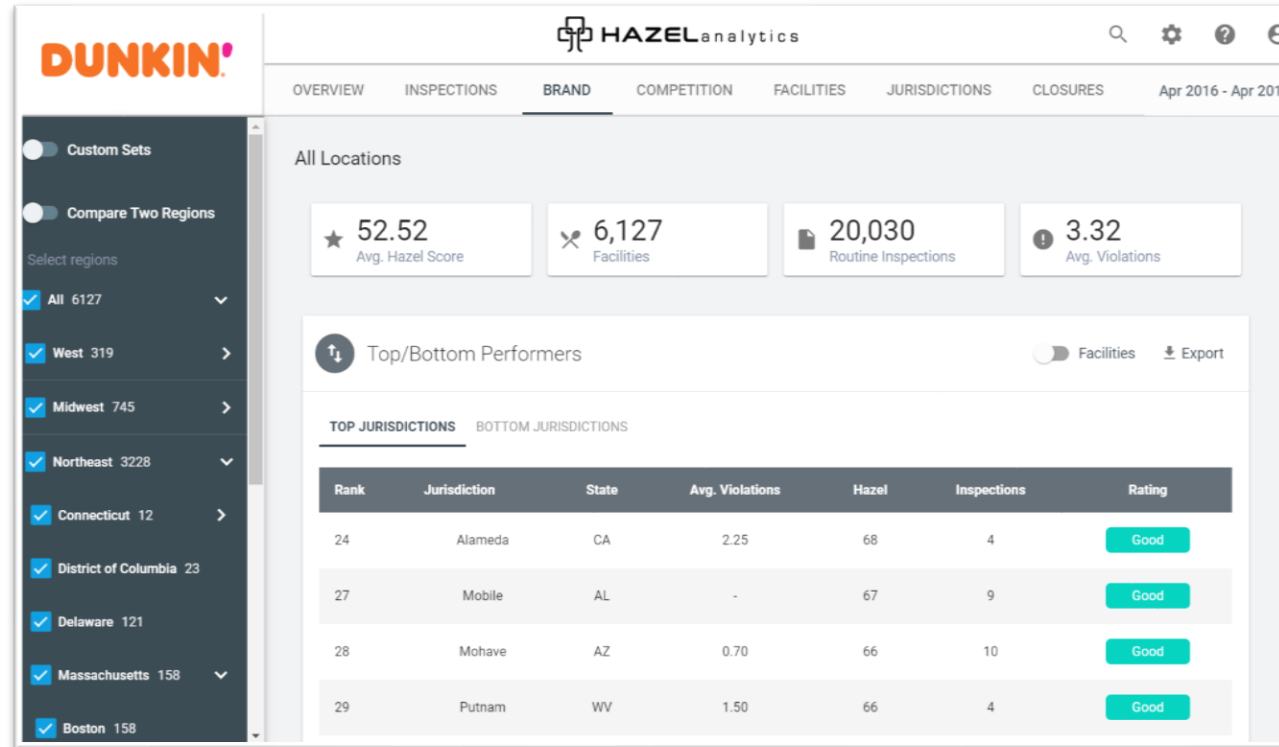


Hazel Score
Performance

National



Dunkin Donuts Case Study



**Hazel Score
Performance**

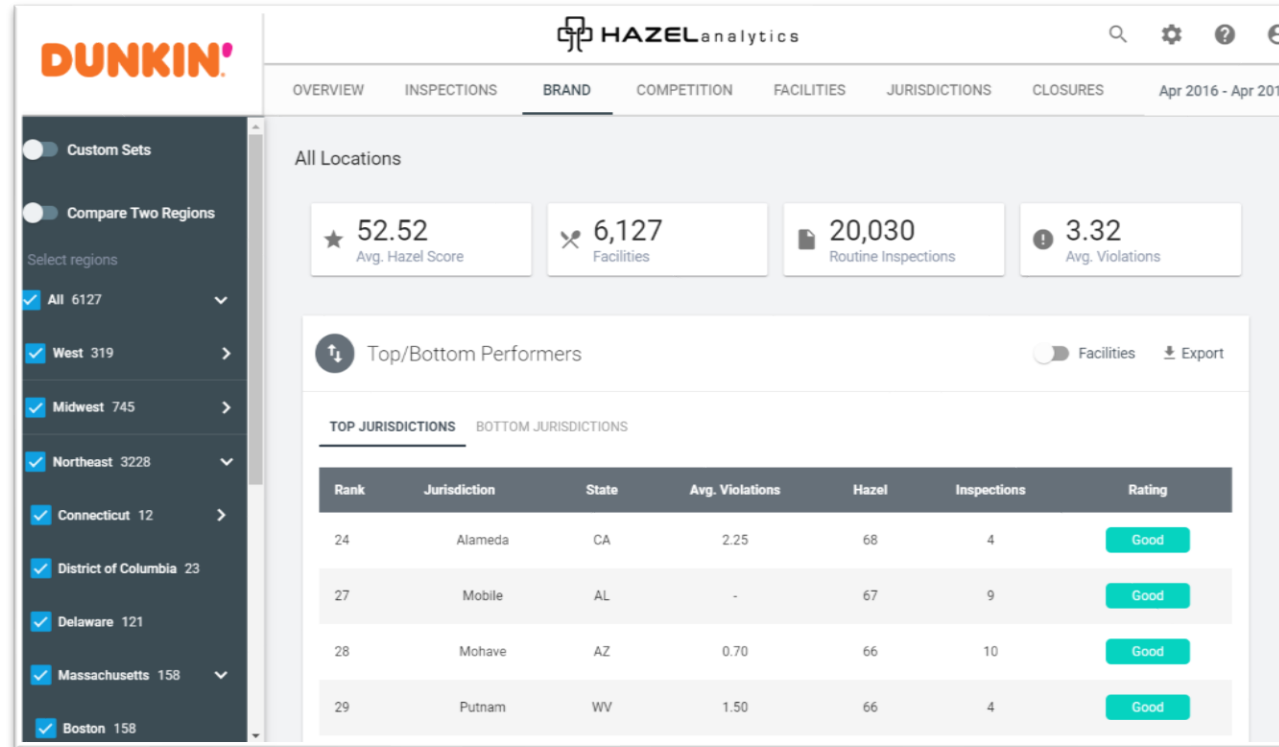
National



Northeast



Dunkin Donuts Case Study



**Hazel Score
Performance**

National



Northeast



Boston



WA – Top Violations by FDA Food Code

Jurisdiction	Clark	Walla Walla	King	Benton-Franklin	Whatcom	Pierce	Snohomish	Thurston	Kitsap	Spokane
1st	1	1	48	1	33	22	22	33	33	55
2nd	22	24	33	25	1	10	10	41	1	33
3rd	49	41	22	21	55	24	15	1	21	10
4th	55	39	41	10	10	21	1	48	55	41
5th	48	36	10	55	56	15	24	10	10	1
6th	39	21	55	39	48	33	33	55	24	45
7th	10	49	56	24	41	16	21	36	36	15
8th	33	10	1	36	24	41	55	56	8	56
9th	37	55	15	41	36	55	29	8	48	16
10th	18	33	24	48	45	1	36	21	41	43

Where Hazel is headed next

Questions

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