
BIG DATA AND RISK – “LOOKING FOR FOOD SAFETY IN ALL THE RIGHT PLACES”

TOM FORD

VICE PRESIDENT FOOD SAFETY

April 16, 2018

Big Data: Big Risk or Big Opportunity?

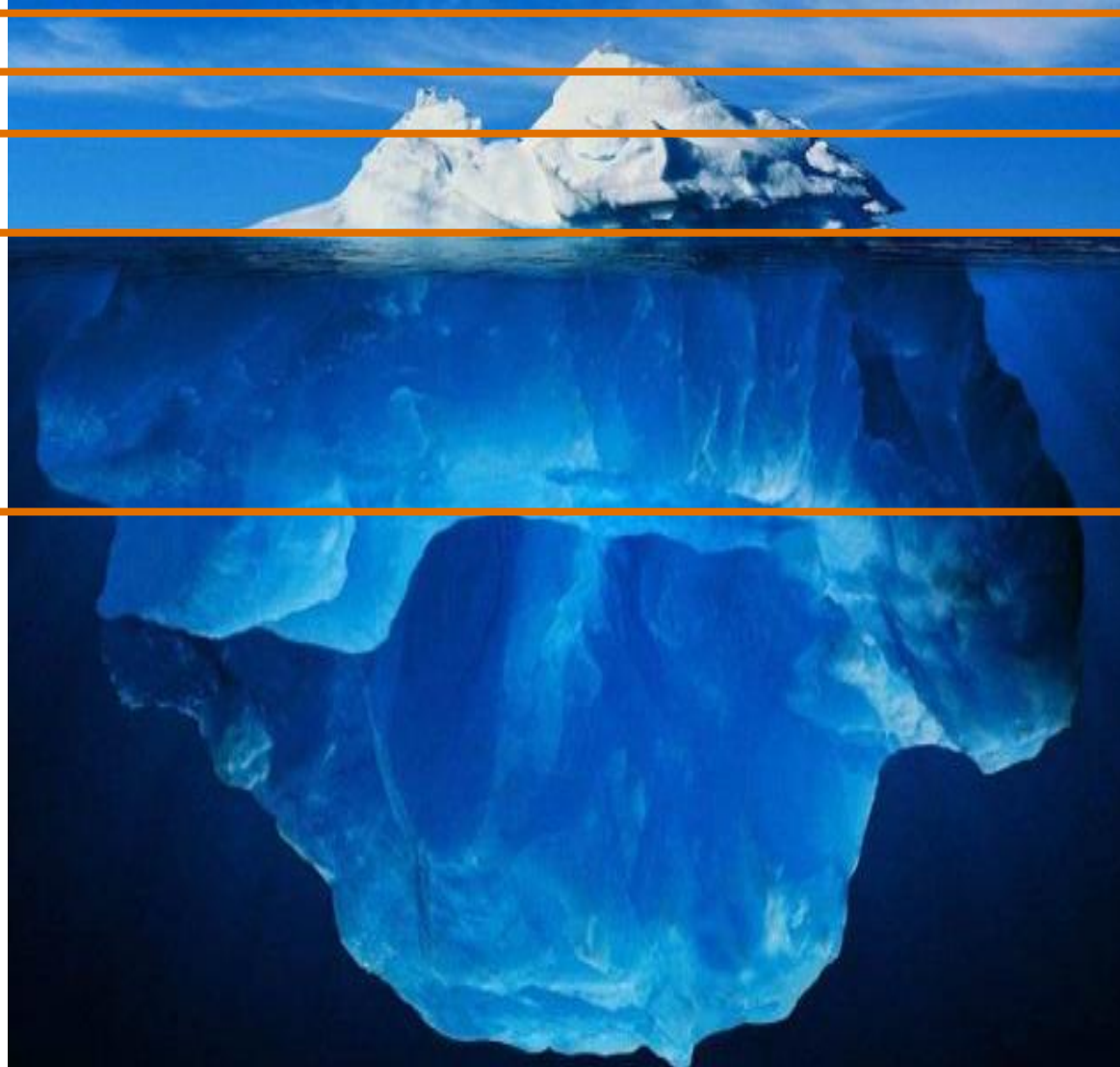
Pest: 96,000

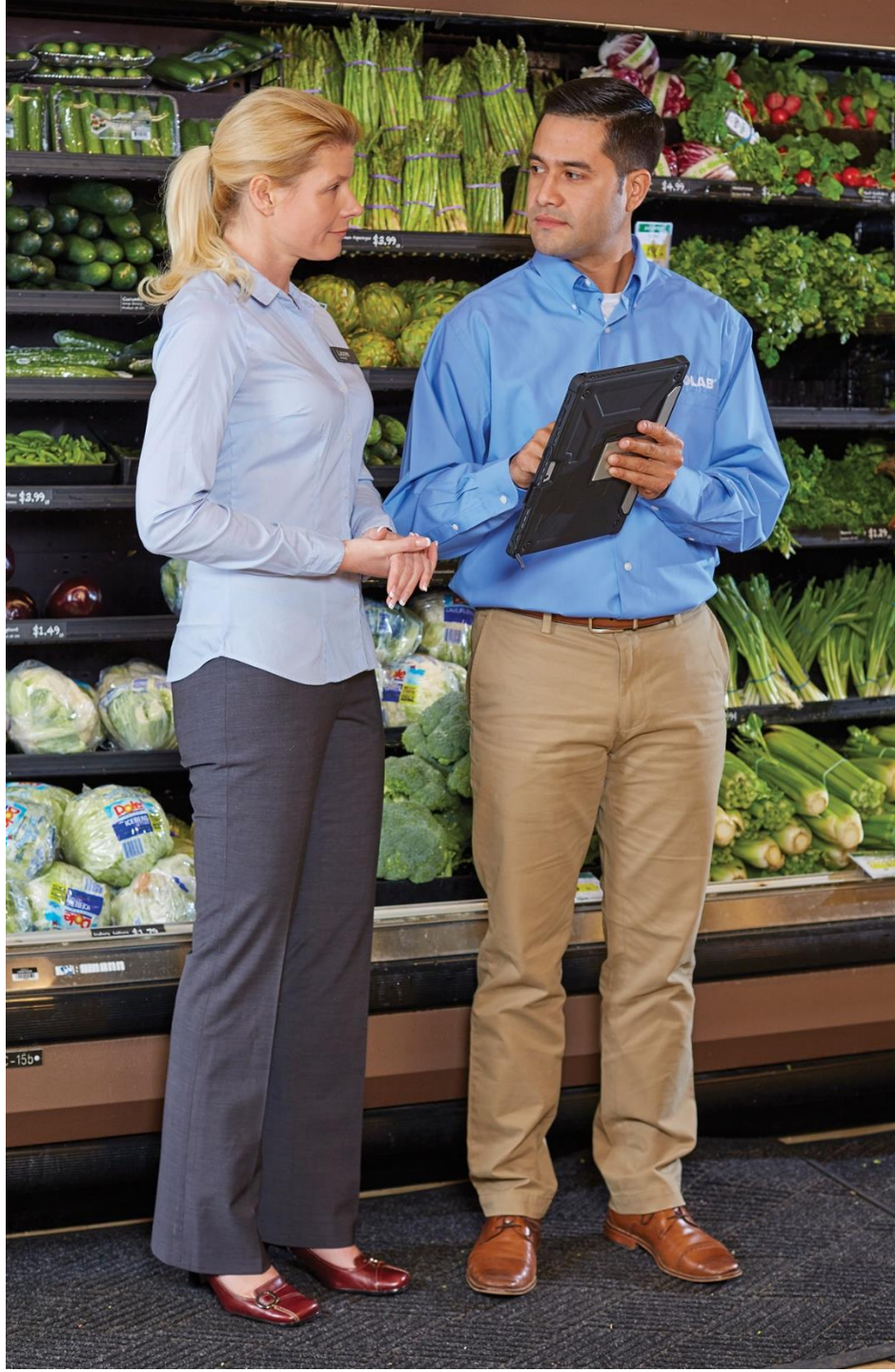
HDI/Regulatory: 108,000

Food Safety Audit: 690,000

Self checks:
16,425,000

Sanitation
Compliance:
44,530,000









Food Facility Inspection Report

Philadelphia Dept of Health/Office of Food Protection 111 W. Hunting Park Ave, www.phila.gov/health/environment/foodprotection.html		No. of Risk Factor/Intervention Violations	3	Date	06/30/2016
		No. of Repeat Risk Factor/Intervention Violations	0	Time In	10:50 AM
		Number of Corrections	2	Time Out	02:15 PM
Food Facility	Address	Telephone	Establishment Type Food Store: Retail Food	District 10	Sub 7
Licensee	Corporate Officer		Purpose of Inspection Inspection	Inspection Type Inspection	

FOODBORNE ILLNESS RISK FACTORS AND PUBLIC HEALTH INTERVENTIONS

IN=in compliance OUT=not in compliance N/O=not observed N/A=not applicable COS=corrected on-site during inspection R=repeat violation

Compliance Status		COS	R	Compliance Status		COS	R
Demonstration of Knowledge							
1	IN			16	IN		
Certification by accredited program, compliance with Code, or correct responses				Proper cooking time & temperature			
Employee Health							
2	IN			17	IN		
Management awareness; policy present				Proper reheating procedures for hot holding			
3	IN			18	IN		
Proper use of reporting: restriction & exclusion				Proper cooling time & temperature			
Good Hygienic Practices							
4	IN			19	IN		
Proper eating, tasting, drinking, or tobacco use				Proper hot holding temperature			
5	IN			20	IN		
No discharge from eyes, nose, and mouth				Proper cold holding temperature			
Preventing Contamination by Hazards							
6	IN			21	IN		
Hands clean & properly washed				Proper date marking & disposition			
7	IN			22	IN		
No bare hand contact with RTE foods or approved alternate method properly followed				Time as a public health control; procedures & record			
8	OUT		X	Consumer Advisory			
Adequate handwashing facilities supplied & accessible				Consumer advisory provided for raw or undercooked foods			
Approved Source							
9	IN			Highly Susceptible Population			
Food obtained from approved source				Pasteurized foods used; prohibited foods not offered			
10	IN			Chemical			
Food received at proper temperature				Food additives: approved & properly used			
11	IN			Toxic substances properly identified, stored & used			
Food in good condition, safe, & unadulterated				Conformance with Approved Procedure			
12	IN			Compliance with variance, specialized process, & HACCP plan			
Required records available: shellstock tags, parasite destruction							
Protection From Contamination							
13	IN			Risk factors are improper practices or procedures identified as the most prevalent contributing factors of foodborne illness or injury. Public Health Interventions are control measures to prevent foodborne illness or injury.			
14	IN						
15	IN						
Food separated & protected							
Food-contact surfaces: cleaned & sanitized							
Proper disposition of returned, previously served, reconditioned, & unsafe food							

GOOD RETAIL PRACTICES

Good Retail Practices are preventative measures to control the addition of pathogens, chemicals, and physical objects into foods.

Compliance Status		COS	R	Compliance Status		COS	R
Safe Food and Water							
28	IN			Proper Use of Utensils			
Pasteurized eggs used where required				Utensils, equipment & linens: properly stored, dried & handled			
29	IN			42	IN		
Water & ice from approved source				Single-use & single-service articles: properly stored & used			
30	IN			43	IN		
Variance obtained for specialized processing methods				Gloves used properly			
Food Temperature Control							
31	IN			Utensils, Equipment and Vending			
Proper cooling methods used; adequate equipment for temperature control				Food & non-food contact surfaces cleanable, properly designed, constructed, & used			
32	IN			45	OUT		
Plant food properly cooked for hot holding				Warewashing facilities: installed, maintained, & used; test strips			
33	IN			46	IN		
Approved thawing methods used				Non-food contact surfaces clean			
34	OUT			Physical Facilities			
Thermometer provided & accurate				Hot & cold water available; adequate pressure			
Food Identification							
35	IN			Plumbing installed; proper backflow devices			
Food properly labeled; original container				Sewage & waste water properly disposed			
Prevention of Food Contamination							
36	OUT		X	Toilet facilities: properly constructed, supplied, & cleaned			
Insects, rodents & animals not present; no unauthorized persons				Garbage & refuse properly disposed; facilities maintained			
37	OUT			Physical facilities installed, maintained, & clean			
Contamination prevented during food preparation, storage & display				Adequate ventilation & lighting; designated areas used			
38	IN			Philadelphia Ordinances			
Personal cleanliness				Person in Control of premises has not posted "No Smoking" signs			
39	IN			Philadelphia Ordinances			
Wiping cloths: properly used & stored							
40	IN						
Washing fruit & vegetables							
Proper Use of Utensils							
41	IN						
In-use utensils: properly stored							







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Food Facility	Address	Telephone	Establishment Type	District	Sub
Licensee	Corporate Officer		Purpose of Inspection	Inspection Type	
FOODBORNE ILLNESS RISK FACTORS AND PUBLIC HEALTH INTERVENTIONS					
(N=In compliance OUT=Out of compliance NI=Not observed NI/Not applicable COS=Corrected on-site during inspection R=Repeat violation					
Compliance Status			Compliance Status		
COSI R			COSI R		
Demonstration of Knowledge			Potentially Hazardous Food Time/Temperature		
1	IN	Certification by accredited program, compliance with Code, or correct responses	18	IN	Proper cooking time & temperature
Employee Health			17	IN	Proper reheating procedures for hot holding
2	IN	Management awareness, policy present	19	IN	Proper cooling time & temperature
3	IN	Proper use of reporting, restriction & exclusion	20	IN	Proper hot holding temperature
Good Hygienic Practices			21	IN	Proper cold holding temperature
4	IN	Proper eating, tasting, drinking, or tobacco use	22	IN	Proper date marking & disposition
5	IN	No discharge from eyes, nose, and mouth	23	IN	Time as a public health control: procedures & record
Preventing Contamination by Hazards			Consumer Advisory		
6	IN	Hands clean & properly washed	24	IN	Consumer advisory provided for raw or undercooked foods
7	IN	No bare hand contact with RTE foods or approved alternate method properly followed	Highly Susceptible Population		
8	OUT	Adequate handwashing facilities supplied & accessible	25	IN	Pasteurized foods used, prohibited foods not offered
Approved Source			Chemical		
9	IN	Food obtained from approved source	26	IN	Food additives, approved & properly used
10	IN	Food received at proper temperature	27	IN	Toxic substances properly identified, stored & used
11	IN	Food in good condition, safe & undamaged	Conformance with Approved Procedure		
12	IN	Required records available: shellstock logs, parasite destruction	27	IN	Compliance with variance, specialized process, & HACCP plan
Protection From Contamination			Risk factors are improper practices or procedures identified as the most prevalent contributing factors of foodborne illness or injury. Public Health Interventions are control measures to prevent foodborne illness or injury.		
13	IN	Food separated & protected			
14	IN	Food-contact surfaces, cleaned & sanitized			
15	IN	Proper disposition of returned, previously served, reconditioned, & unsafe food			





What if you could...



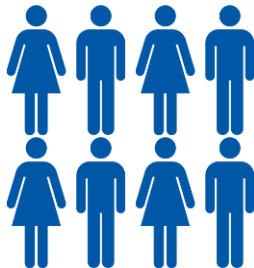
Better Understand
YOUR FOOD SAFETY AND
COMPLIANCE **RISKS**



See **HOW**
different data streams
predict
success



IMPROVE
SPECIFIC regions
or stores



IMPLEMENT
through a **FIELD TEAM**
to drive outcomes

MARKETGUARD™ 365

MARKETGUARD APP

Task management app
replaces paper logs and
sign offs



MARKETGUARD PORTAL

Dynamic dashboards
and alerts of critical
food safety metrics



IN-STORE SERVICE

SANITATION COMPLIANCE



Remote monitoring of SSOPs
and operational compliance

ActiveView HDI



Standardized
health department
inspections

Benefits of MARKETGUARD 365

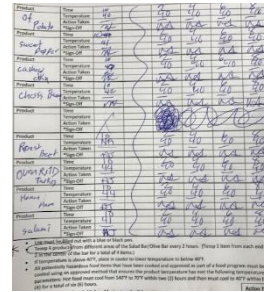
Accessible and
defendable data



Time savings
from electronic
audits



Decrease in dry
labbing



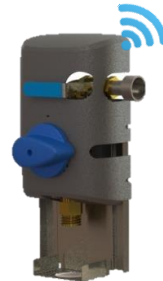
Verification of the
checklists



Insights into dept.
operations



SSOP compliance



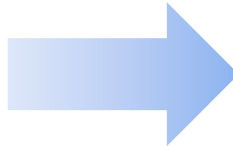
Tracking of recall
notifications



Real world examples



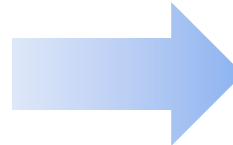
Accessible and
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85% of store associates acknowledge
checklists don't get completed correctly



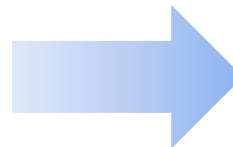
Time savings from
electronic audits



75% reduction in the number of
checklists with digital collections
2 hours per week spent printing,
storing and replacing paper logs



Cost savings
from paper
checklists



\$10 per store per month paper,
pen, clip board savings

Temperature of hot holding too low

Situation

- ▲ Ecolab set up the MARKETGUARD™ 365 App
- ▲ Associates were taking temperatures in the hot holding case

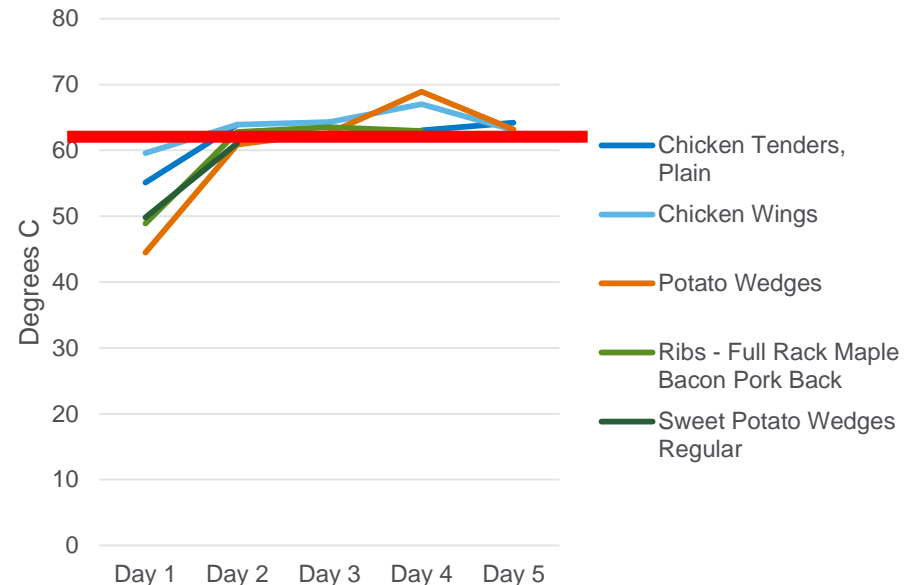
Findings

- ▲ Using the Bluetooth thermometer and app the store began to see that the case was not holding food at the right temperature
- ▲ Store claimed “This has never happened before”
- ▲ Corrective action taken to increase temperature

Results

- ▲ With visibility to the true temperatures and a corresponding corrective actions in place the safety of the food was enhanced

Hot Holding Food Temperatures



FOOD SAFETY



Improved safety of food with the correct holding temperature

Rolling up data on bad product

Situation

- ▲ Store weighs rotisserie chickens after cooking to see if they passed the quality standards
- ▲ Underweight chickens are tracked and rolled up to corporate
- ▲ Roll up was done weekly by department managers manually by reviewing the weekly logs and reporting it to corporate.

Finding

- ▲ Using the MARKETGUARD™ 365 App and Portal the customer was able to quickly roll this information up from corporate

Results

- ▲ Department managers saved **30 minutes per week** reporting the results from paper logs
- ▲ Corporate saves time and countless emails consolidating results.



30 min/week, or
\$450 / year / store
30 min/week, or
\$450 / year / store

Food being overcooked

Situation

- Store started to use the MARKETGUARD™ 365 app to take cooking temperatures

Finding

- Fried chicken wings were being overcooked resulting in poor quality food and increased energy usage

Results

- Store worked with fryer manufacturer to reset the timer for chicken wings
- Resulting in better quality food and energy savings

Temperature of Fried Chicken



The Future? Almost now.



- ▲ Using AI to get predictive
- ▲ Behavioral Science interfacing with Food Science
- ▲ Long term meaningful behavior change in food safety practices
- ▲ Stay Tuned!

Looking for food safety data in all the right places: using big data and other sources for decision making

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NC State University

www.barfblog.com

www.foodsafetytalk.com

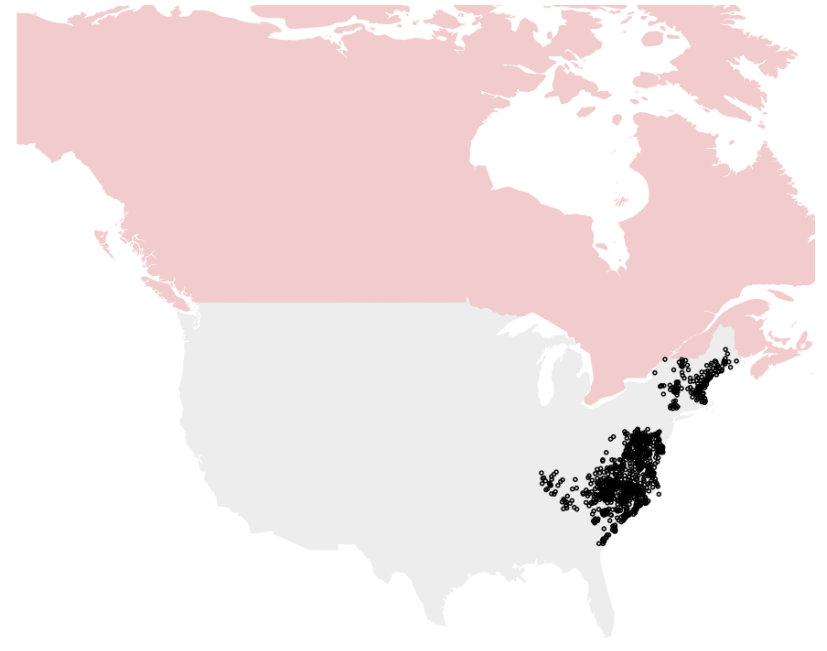
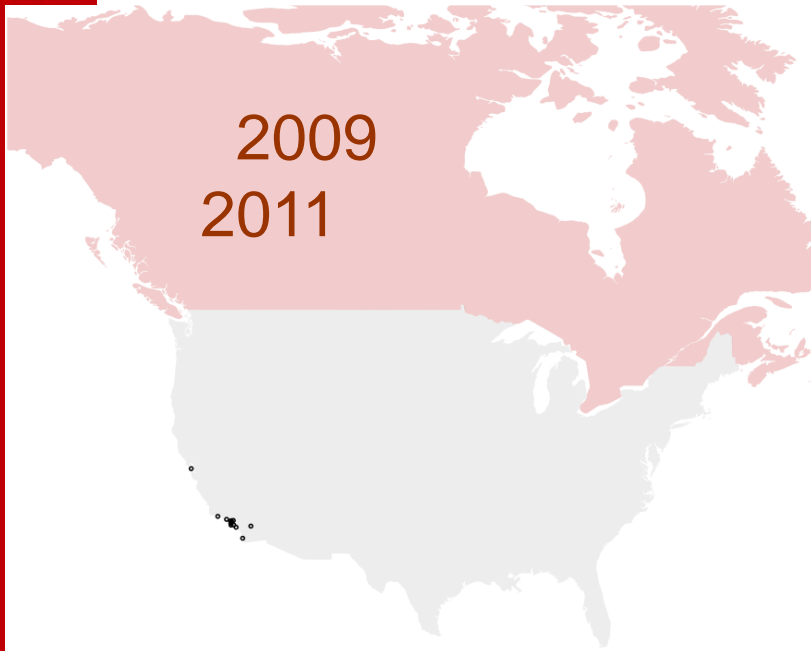
@benjaminchapman

Third-Party Audit Data

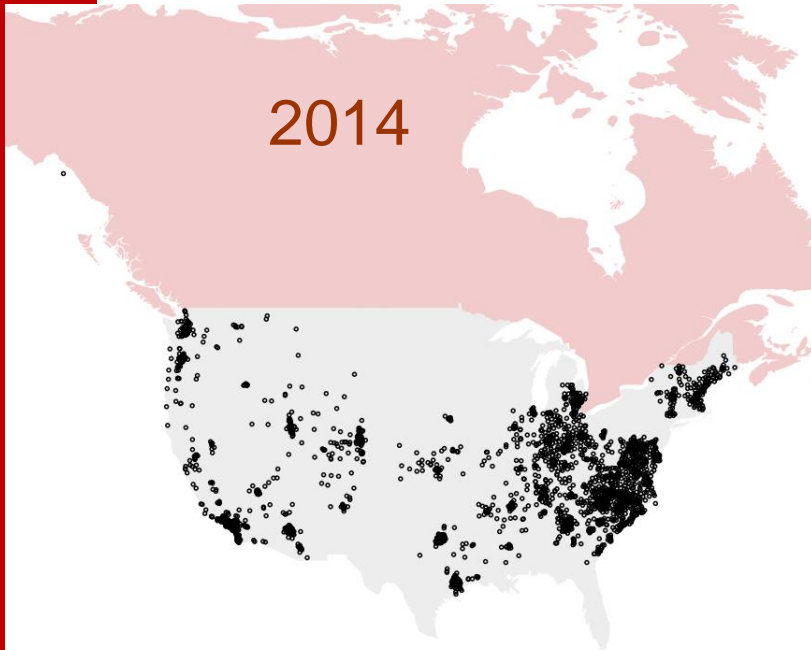
- Eight grocery store companies
- Continental United States and Canada
- Data spans 2009-2015
- 72,278 unique store visits
- 11,148,295 data points/observations



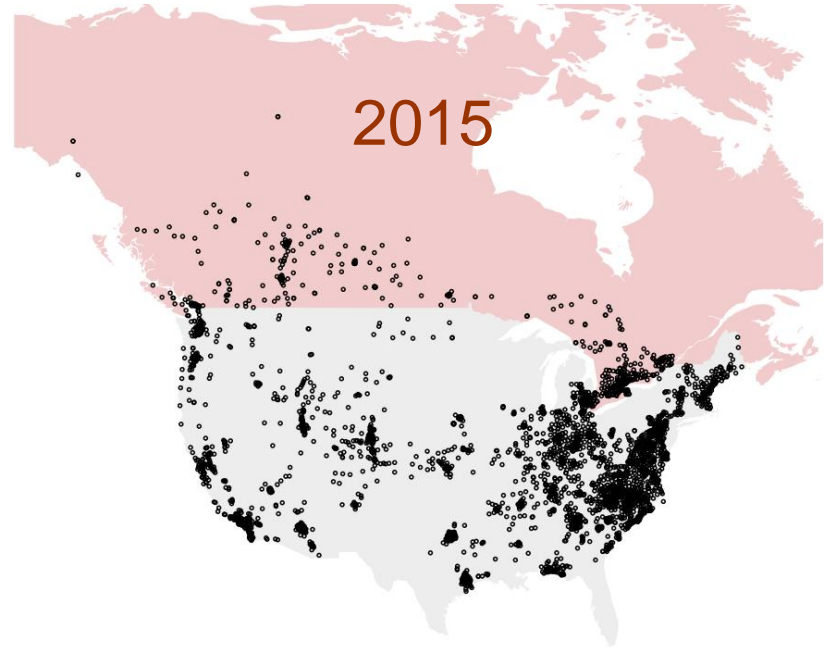
2009
2011



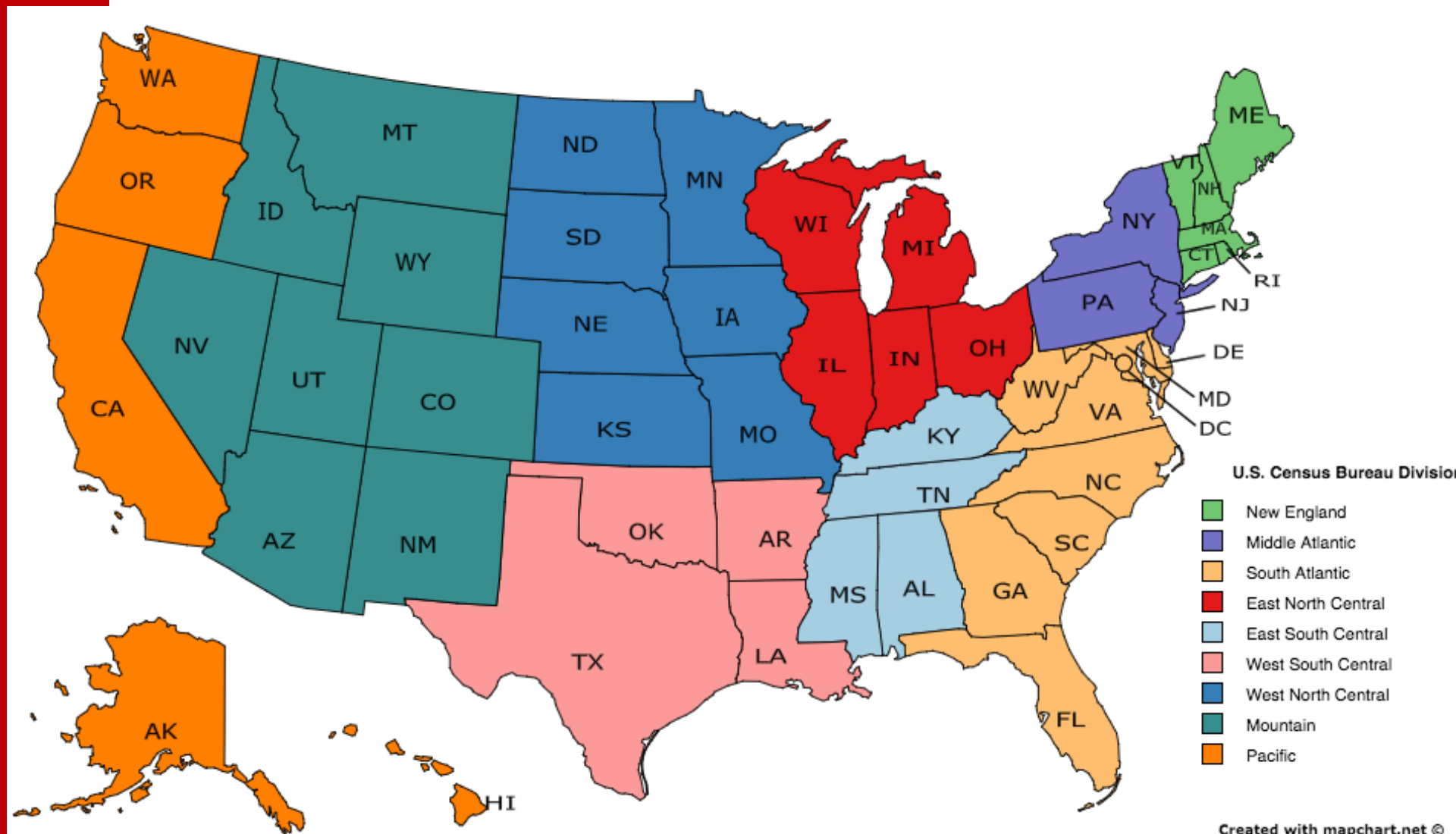
2014



2015



U.S. Census Bureau Divisions



Handwashing violations by department

Dept	Bakery	Deli	General	Meat	Produce	Seafood	Other
Pass	55908	58824	55567	77696	96830	41839	19456
Violation	1997	3693	177	2545	3984	1435	457
Prop. of violation	0.034	0.059	0.003	0.032	0.040	0.033	0.023

$p = 0$

Handwashing violations by day of week

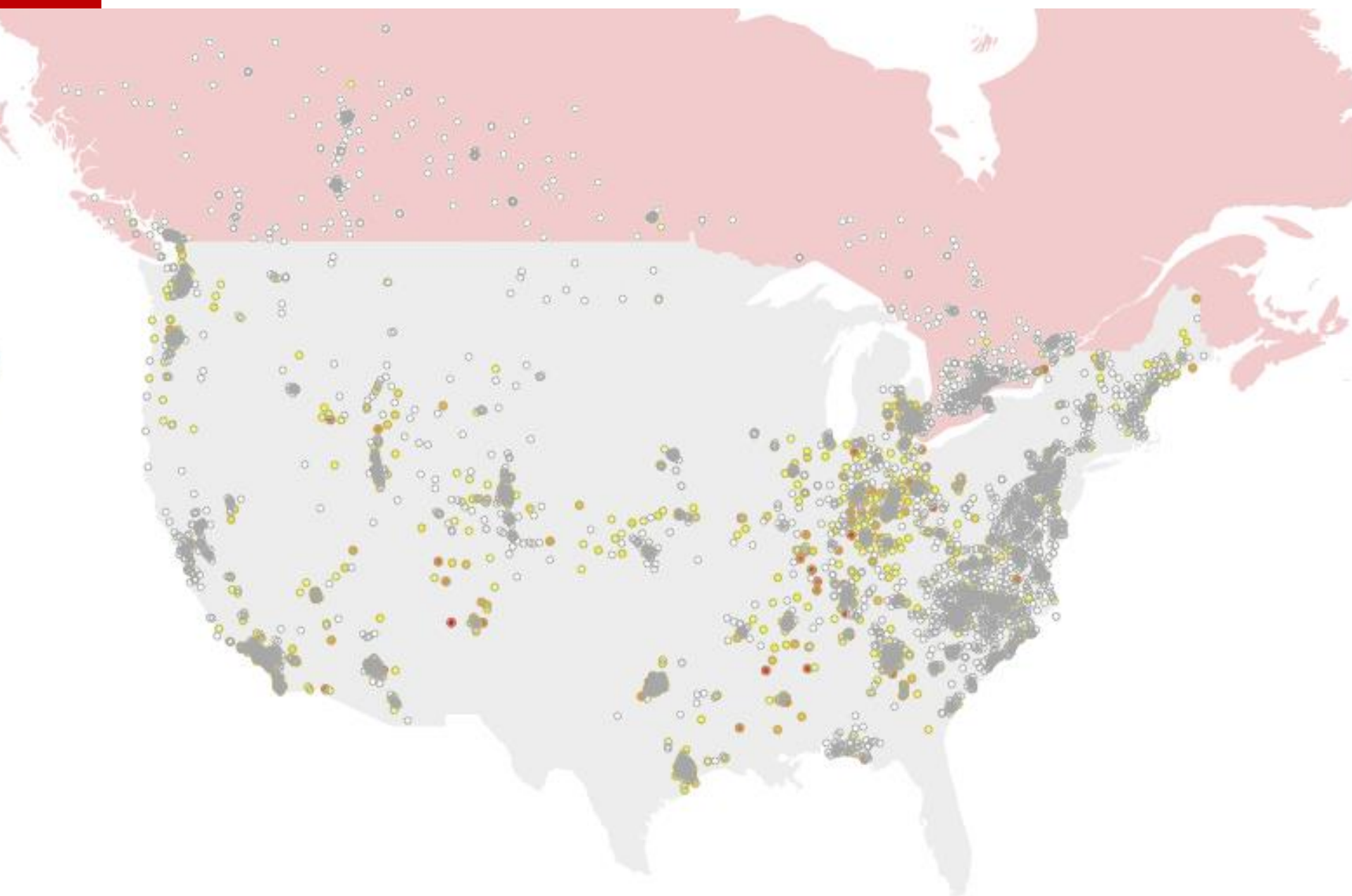
Day	Mon	Tues	Wed	Thurs	Fri	Sat	Sun
Pass	94353	103084	104775	100935	76878	908	435
Violation	3358	3770	3618	3594	2626	17	13
Prop. of violation	0.034	0.035	0.033	0.034	0.033	0.018	0.029

$p = 0.01$

Handwashing violations by geographic location

Division	E. N. Cent.	W. N. Cent.	Mid- Atlan.	N. Eng	E. S. Cent.	S. Atlan.	W. S. Cent.	Mtn.	Pacif.
Pass	47750	9841	7486	10132	27739	115337	19216	48014	63793
Violation	2973	377	78	282	1079	2596	765	1653	2056
Prop.	0.062	0.038	0.010	0.028	0.039	0.023	0.040	0.034	0.032

$$p = 1e^{-16}$$



Temperature violations by department

Dept	Bakery	Deli	General	Meat	Produce	Seafood	Other
Pass	17627	152831	68418	62665	133830	56095	18320
Violation	47	9473	1482	1255	5613	1018	463
Prop. of violation	0.003	0.058	0.021	0.020	0.040	0.023	0.025

$$p = 0$$

Temperature violations by month

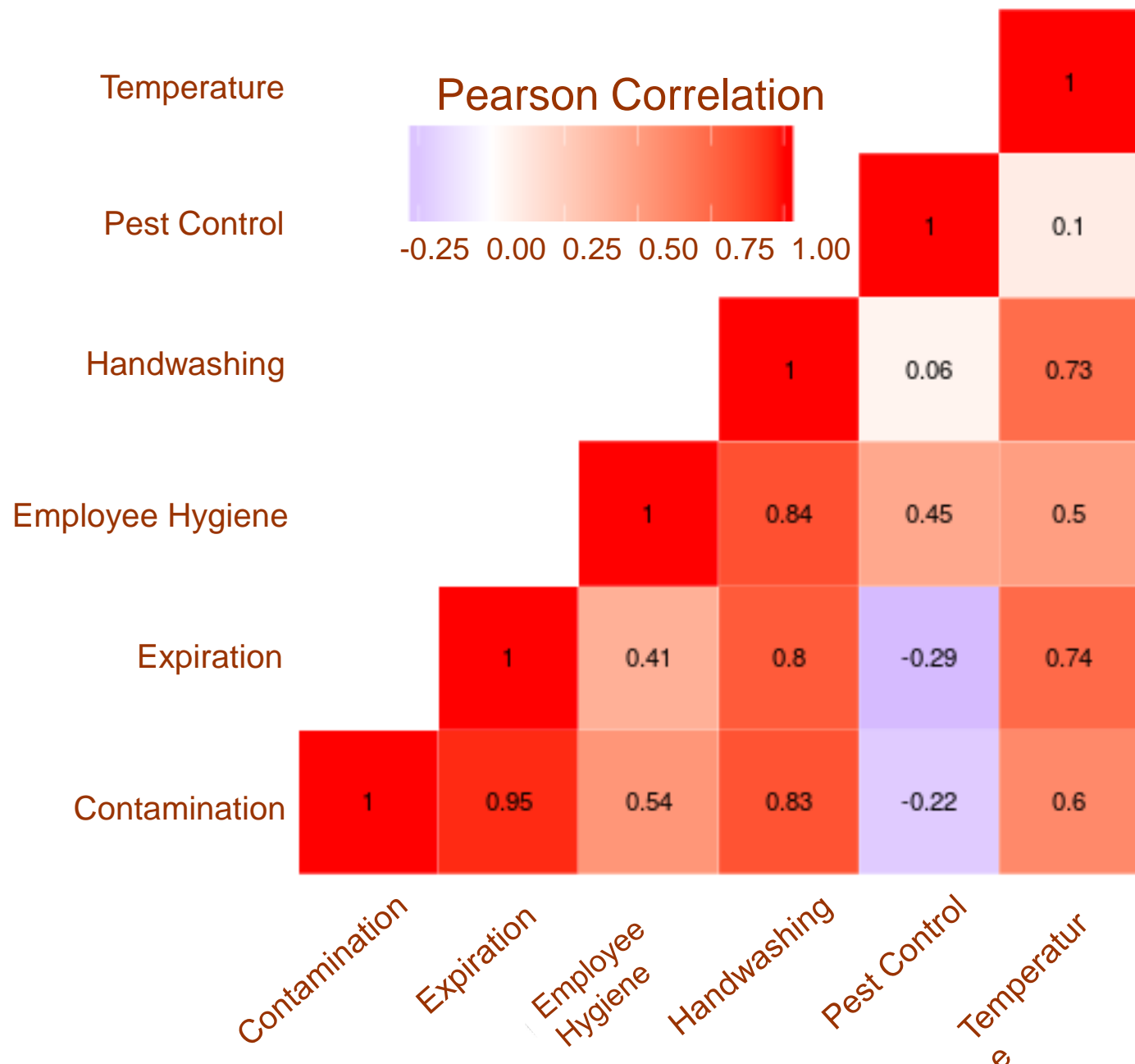
Dept	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Pass	38152	47417	52574	46100	46216	50177	58169	61534	70058	75332	65422	44417
Violation	1631	2078	2249	2015	1966	2279	2295	2316	2363	2539	2193	1277
Prop. of violation	0.041	0.042	0.041	0.042	0.041	0.043	0.038	0.036	0.033	0.033	0.032	0.028

$$p = 8.56e^{-83}$$

Temperature violations by time of day

Dept	Morning	Afternoon	Evening
Pass	366092	275237	14239
Violation	13905	10950	346
Prop. of violation	0.037	0.038	0.024

$$p = 1.52e^{-19}$$



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The End