Dinesafe Toronto: An Evaluation of the Placard System

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Abstract

Background: The purpose of this research study was to analyse the success of Toronto's placard system (Dinesafe) in reducing the number of violations in food service establishments. The placard system is designed to inform the public about restaurant inspection results and to boost operator compliance. Inspections are a point-in-time check of the facility's ability to manage the risk it poses to public health. It is accepted that if best practices are implemented as designed by an establishment's food safety and sanitation plan, the risk of a foodborne illness/outbreak can be minimized.

Methods: From the Dinesafe program, the number of violations cited at each inspection from all relevant food service establishments receiving a conditional pass from two time periods, 2004-2006 (Before) and 2012-2014 (After), were compared to see if there was a decrease in violations. The reports, completed by Public Health Inspectors (PHI), were retrieved from a publicly available website. Data were analysed using a two-sample T-test.

Results: The anticipated decrease in violations in the second time frame was not significant [$p = 0.85$] nor strong ($\alpha = 0.001$). The means were similar (3.83 Before and 3.71 After), with standard deviations of 1.91 and 1.79 respectively. A greater number of restaurants were cited in the After analysis (3169 compared to 572). Inspections from 2004-2006 had fewer violations (12 or less) than 2012-1014 (14 or less). The majority of violations (71% Before and 73% After) were between 2 and 4. Reoffenders comprised of 16.3% of total violations in 2004-2006 and 17.5% in 2012-2014.

Conclusion: There is no evidence that the placard system has decreased violations or that counting the number of violations a good measure for compliance. Pushback among operators could explain the increase in the number of establishments cited. The increase in maximum citation could be due to an increase in citations available from 2012-2014. The number of establishments that received a conditional pass twice in a time frame increased from 59% to 68%. The maximum number of times an establishment received a conditional pass dropped from 10 to 8. It is recommended that Health Units use plain language narrative on the website rather than violations as a measure to communicate findings to the public. The placard significance should be better communicated to the public.

Key words: placard, restaurant, inspection, Toronto, conditional pass, Dinesafe, foodborne illness

Introduction

Factors that increase the likelihood of a pathogen to be introduced and multiply on food in a food service establishment include temperature abuse, personal hygiene, sanitation, pest control and cross-contamination (Bartleson, Lee, Guzewhich, Nazarowec-White, Tan and Todd, 2011). Inspections, which are science based, identify violations related to the identified factors. Severe violations can warrant actions that discourage certain practices within an establishment to decrease the probability of a foodborne illness (FBI) from occurring.

In Toronto, Dinesafe was implemented in 2001 and utilises three placards: green for pass, yellow for conditional pass and red for closed. In accordance with the Ontario Food Premises Regulation 562/90 as amended (Health Protection and Promotion Act/Loi sur la protection et la promotion de la santé, 2014), Toronto has identified that significant violations within a food service establishment must be corrected within 24-48 hours or be subject to closure whereas crucial violations must be dealt with immediately. For more information about how critical violations are communicated to the public, visit the city of Toronto's website at http://www. toronto. ca/health/dinesafe/system.htm (City of Toronto: Public Health Home, 2014).

It has been identified that inspections alone do not reduce critical violation citations in high and medium risk establishments and that 44% of violations are recurrent (Basara, Boatright, Elledge, Lynch, and Phillips, 2006). Therefore, implementing the placard system is a valuable adjunct to food inspections in informing the public and gaining operator compliance (Basara et al., 2006; Aguirre, Fielding and Palaiologos, 2001; Jin & Leslie, 2005). There are no long-term studies to confirm consistent operator compliance. This study proposed to fill that gap by assessing the number of critical and significant violations in Toronto restaurants over two time periods, 2004 to 2006 "Before" and 2012 to 2014 "After", to see if there is an overall decrease.

Literature review

A study found the majority of outbreaks in restaurants are attributed to norovirus (72%); in 65% of these cases, by an infected food handler (EHS Net Working Group, Hedberg, Jones, Kirkland, Radke, Selman and Smith, 2006). A Canadian study found that food handlers are less likely to exclude themselves from work when sick, and are therefore more of a concern than health workers with respect to disease transmission (Henderson, Kosatsky, McIntyre, Vallaster and Wilcott, 2013). In 2004, it was estimated that there were 20,150 cases of FBI per 100,000 people in British Columbia (BC) (Henderson et. al., 2013). Studies have also shown that a trained kitchen worker presence can affect handwashing practices among the staff (Burke, Dworkin, Liu and Manes, nd).

In response, Health Units in Ontario require that at least one person on site at all times has a food handlers training certificate. Studies have demonstrated that a certified kitchen manager and food handlers with many years of experience can enforce proper food handling practices (Almanza, Binkley, Frash and Nelson, 2005 and Cates, Harrison, Karns, Muth, Penne, Radke and Stone, 2009); however, Henderson et. al (2013) found that 55% of people who have a food handlers training certificate in BC are managers who do not work in the kitchen and so cannot enforce proper food handling practices successfully.

Some barriers identified by kitchen staff include: lack of understanding because of a knowledge or language gap, lack of appropriate tools to carry out tasks (such as a thermometer), inconvenience, inadequate supplies (such as soap and paper towels), lack of desire to perform the duties and lack of enforcement among managers (Brandon, Barrett, Howells, Pilling, Roberts and Shanklin, 2008 and Kwon, Liu, Roberts, Shanklin and Yen, 2010).

However, contradictory studies state that even though having a certified kitchen manager present is associated with 71% of non-outbreak and 31% of outbreak restaurants (EHS-net working group et al, 2006), it does not affect exclusion of a sick worker (Almanza and Choi, 2012).

The placard is designed to influence behaviour of operators and staff in a food establishment. By allowing the public to see the inspection results and to make an informed choice whether or not to eat there encourages operators and staff to make food safety a priority.

There are many methods of implementing a placard system. Studies that have analysed the point system have demonstrated that there is no incentive to adopt good sanitary practices when owners only avoid code violations serious enough to cause a closure (Aguirre, et al., 2001). It is uncertain what effects the placards have on chain restaurants versus independent restaurants, as well as tourist versus non-tourist locations (Aguirre et al., 2001 and DiPietro, Kock, Li and Murphy, 2010). Inspectors were noted to bump up borderline scores and they were offered a bribe more often when inspections results were not favourable (Aguirre et al., 2001 and Jin and Leslie, 2005). Further studies have found that critical violations did not predict when and where an outbreak will occur, and visual inspections did not concur with microbiological testing regarding sanitation (Almanza and Choi, 2012).

However, when the percentage of A's increased in letter grade systems, a 20% decrease was observed in food related illnesses (utilising data from hospital records), and an increase in revenue was observed (Jin and Leslie, 2005). These results suggest that the placard does influence the population's decision on where to eat. It does not mean that the public understands what the placard is aiming to communicate. Firstly, the public prefers a narrative because it increases their food safety awareness and willingness to protect themselves; however, the use of industry jargon is confusing to the public. Secondly, the public prefers a letter grade but they do not comprehend what the letter means (Almanza, Choi, Miao and Nelson, 2013 and Almanza and Choi, 2012). In Toronto, the inspection results are available online. By using an interactive map and clicking on the coloured dot representing the placard colour assigned, members of the public can read the infraction details that focus on violations and severity. Details such as "Operator fail to use proper procedure(s) to ensure food safety" (City of Toronto website, 2014) does not lead to public understanding.

Members of the public also overestimate the strictness of inspectors. For example, many people believe that an employee should be fined or fired if they fail to wash their hands after they have been contaminated. In addition, the public perceptions of restaurant closure as a result of critical violations are actually fewer. (Grimm and Jones, 2008 and Carr, Henson, Jones, Knowles, Majowicz, Masakure and Sockett, 2006). With respect to public behaviour, most people incorrectly believe that an FBI occurs within a couple of hours after a meal, in reality, an FBI can occur from 30 minutes; in the case of neurotoxins from shellfish poisoning to months; such as those caused by the bacteria *Listeria monocytogenes* (Foodsafe, n.d.). In addition, many people do not see a family doctor nor report their illness to the Health Unit (Carr et al., 2006). Members of the public also believe that extreme cases of FBI should make the news and problematic cases should be identified with the placard (Carr et al., 2006).

If patrons frequent a restaurant and see a yellow placard, in many instances, they will continue to eat there (Carr et al., 2006). A study of a green and red placard system used in Hamilton, Ontario, identified that the public used cleanliness as the primary measure of determining whether a restaurant is safe, while inspection notices were ranked third (Carr et al., 2006). In a separate study, cleanliness was also

cited as the number one indicator (Knight, Todd and Worosz, 2007). Cleanliness in the dining room is not a good reflection of a food safety risk assessment because it is not where food is prepared or handled. This demonstrates another gap in public knowledge about food safety.

Given this background, the Health Unit must accurately make an assessment independent of the public and take the responsibility for ensuring compliance. As such, violations have been the measure used to assess food safety and the placard has been the method to communicate it to the public. It stands to reason that a decrease in violations cited would correlate with a decrease in risk. This study evaluated the riskiest establishments (yellow placard) to see if compliance is increasing over time.

Internal and External Validity

After arranging the data, there were 15,048 data points for analysis from over 16,000 establishments operating in Toronto. There were 3,169 date-related violations that fit the criteria of being a food establishment and had significant and critical violations from 2012 to 2014 and 572 from 2004 to 2006. A large sample size was chosen instead of looking at individual restaurants because there was a greater probability that many of the restaurants under evaluation from 2004 to 2006 may not have been in operation from 2012 to 2014. Inspection occurrence varied between 2 to 4 times each year, therefore a two-year timeframe was used to capture a more accurate representation of the restaurant's activities and increased the reliability of the study. The variation between inspectors and the violations they chose to cite posed a significant threat to internal validity. Analysis of the raw data demonstrated that over the two-year data collection period, each facility was not inspected by the same inspector each time. A single inspector would be more consistent at inspecting and re-inspecting the same facility over two years. However, depending on the relationship between the inspector and the operator, s/he may be more rigorous or lenient during an inspection which could then influence the number of violations cited. Having a different inspector inspect the same facility could decrease this error; however, this would likely not increase compliance due to the lack of an inspector-operator relationship. The author was unaware of Toronto's policy regarding this matter; however, the large number of data points evaluated should have reduced beta errors associated with data included from a few inspectors who were more or less lenient.

Methods and Materials

There was no standard method available for conducting this study therefore the methods and materials were designed by the author. To eliminate bias and ensure anonymity, the restaurant's unique ID number was the only information used to identify a restaurant and its subsequent inspection results.

The information utilised in the study is secondary data that is publicly available from the City of Toronto's website (City of Toronto, 2014). The data from October 2004 until October 2006 was provided by Information Management Services Toronto Public Health as it was archived. The data from October 2012 to November 2014 was downloaded from the Toronto Dinesafe open database for inspection reports. The data is both nominal and numerical.

Inclusion / Exclusion

In the data set, only the following columns contained the necessary information to conduct the study: "establishment ID", "establishment type", "status", "infraction details"," inspection date" and "severity". A food establishment was defined as a place, open to all members of the public where the primary function was to cook food for immediate consumption for fee, excluding bakeries, bowling alleys, butcher shops, lodging facilities, daycares, community living facilities, banquet halls, food service establishments in educational institutions, soup kitchens, catered facilities, chartered cruise

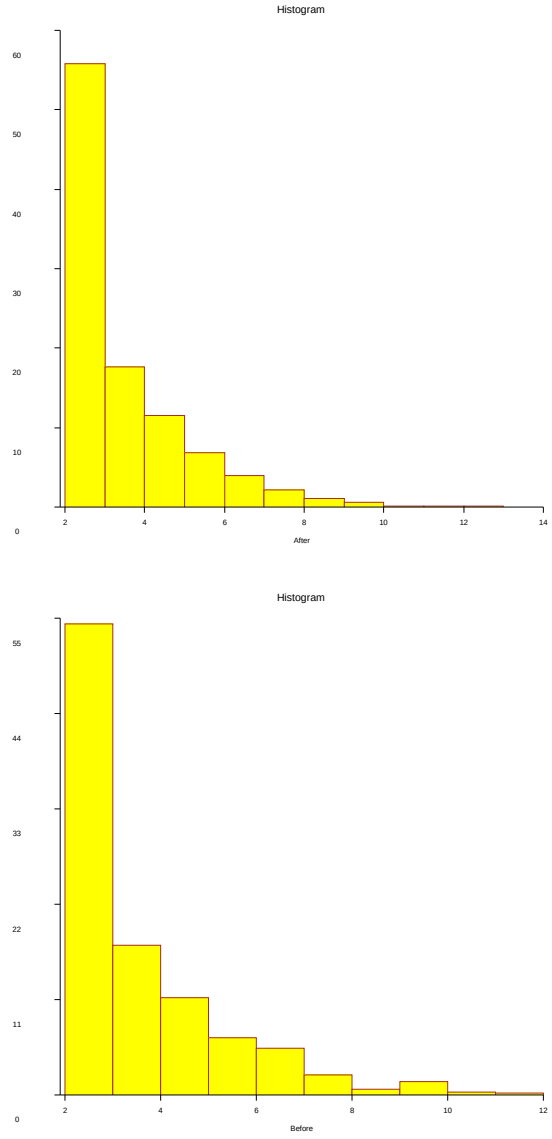
boats, food processing plants, facilities that provided community kitchen meal programs, convenience stores, hospital and healthcare facilities and supermarkets. Food carts were included in the 2012 – 2014 but not a category in 2004 – 2006. Tracy Dal Bianco, manager at Toronto Public Health, felt that this category was captured under mobile food preparation or hot dog cart. (Personal communication, Dec 12, 2014)

All passes and closures were removed since a pass means operations pose no significant risk to human health while a closure means they do. "Minor" infractions were removed as were infractions unrelated to FBI prevention such as producing reports, displaying a valid permit(s), failing to display the placard in a visible location and failing to produce a photo ID found in the "non-applicable's" section. Failure of the facility to produce a current or valid food handler certificate was kept because it was related to FBI prevention as cited by Henderson et al's study (2013). This information in the 2004-2006 data was not recorded. Data from both time periods was uploaded into Access 2010. Using the query wizard, all records from "establishment ID" and "inspection date" was searched for duplicate records and counted.

The number of violations for each time period was copied into a new Excel spreadsheet for further analysis. The author uploaded the information from the Access queries into NCSS9 where a two-sample T-test was performed.

Results

Expected H_o was $\mu_{1\ (before)} - \mu_{2\ (after)} > 0$. Using the Mann-Whitney with correction, $p = 0.85$ indicated that the difference in the number of violations between the two time periods was not significant and the null hypothesis was not rejected. The means were similar (3.83 prior to Dinesafe and 3.71 after), with standard deviations of 1.91 and 1.79 respectively. The majority of violations (71% before and 73% after Dinesafe) were between 2 and 4.

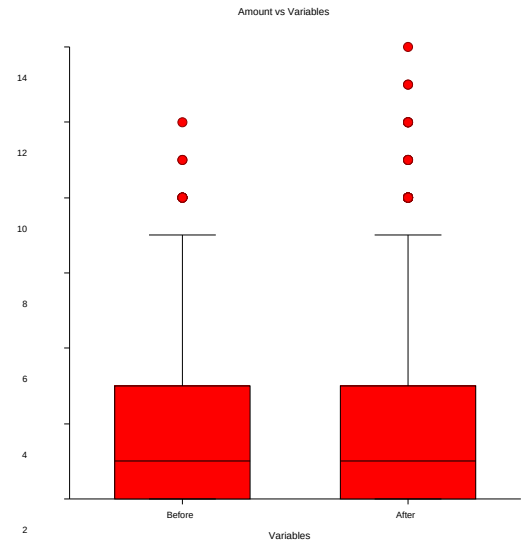


Discussion & Recommendations

Contrary to what was expected, the number of violations did not decrease over time but remained closely the same. The time period classified as "Before" for the purpose of this study was three years after Dinesafe was implemented. It is possible that the Toronto Health Unit rectified issues surrounding compliance by 2004, the start of the "Before" study data collection period.

Figures 1: Before &2: After: Violations by percent

Figure 3: Number of Violations

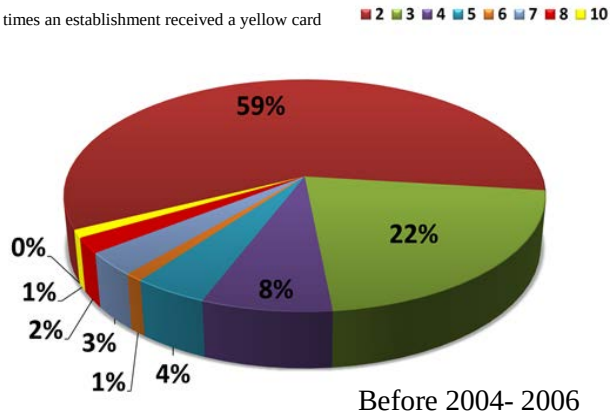


The maximum number of violations cited increased from 12 to 14. This result could be explained by the increased number of violations to choose from for inspectors in the later time frame. Therefore, there was no trend indicating that restaurants have become more non-compliant since the implementation of the placard system. For example, the earlier time frame did not have any assigned violation codes pertaining to a food handlers training certificate, whereas in the "After" time frame, there were three options available.

When the results were analysed to see how many establishments continued to be assigned a yellow card year after year, 16.3% were identified from 2004 to 2006 and 17.5% from 2012 to 2014. This result suggested that the placard had little effect on chronic offenders.

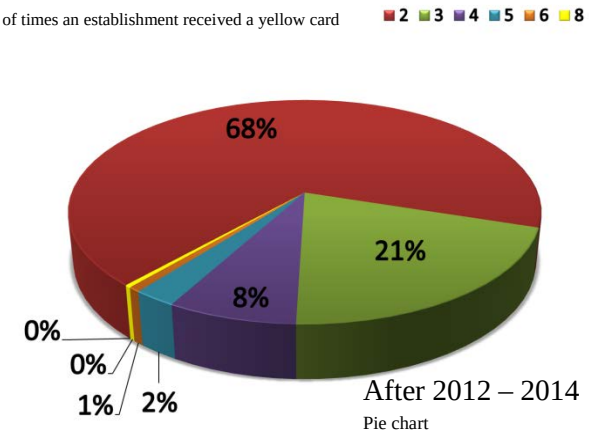
Other strategies may need to be developed to change the behaviour of this demographic, such as displaying the placard for a longer time frame or including the last three inspections on one card. This would be in accordance with the results from the Hamilton, Ontario study indicating that the public prefers that chronic violators be identified by the placard (Carr et al, 2006). Another option would be to adopt policies similar to those in Los Angeles, where any facility scoring below a certain point more than twice in a year are subject to a 14 day closure order and the operators are required to pay for their re-inspection (Aguirre et al., 2001). This method encourages operators to be more consistent with managing their own sanitation and food safety plans rather than depending on the inspector to provide directives. The author did not compare establishment IDs to see if the same food service establishments were included in each of the two time frames of study.

Figures 4 and 5:



Before 2004- 2006
Pie chart

Number of times an establishment received a yellow card



After 2012 – 2014
Pie chart

Many individual restaurants repeatedly received a yellow placard but there was evidence that this is decreasing. From 2004 to 2006, only 59% of individual establishments received a yellow placard twice in a time period, whereas from 2012 to 2014, that number increased to 68%. This evidence demonstrated that more establishments are moving towards compliance.

Also, the maximum number of times an individual restaurant received a yellow placard decreased from 10 to 8.

The number of facilities utilised in the study was also revealing. The growth of the city of Toronto between 2006 and 2012 does not explain that 572 establishments were cited in the "Before" criteria and 3169 in the "After". One possible aftereffect of the placard implementation was the pushback observed from operators. Co-regulation gives the PHI an opportunity to educate the owner/manager and foster trust, whereas being prescriptive can be belittling and minimize compliance (Caswell, Henson, Fearne and Martinez 2007). Other Health Units that do not utilise the placard system operate under the condition that if a food services establishment is open, then this indicates that they are comfortable allowing operators to manage their food safety issues (Personal Communication, Sarah Ryding, November 26, 2014).

A study to corroborate these findings compared an unannounced inspection followed by an announced inspection (Group B) and an announced inspection followed by an unannounced inspection (Group C). This study found that Group C had a decrease in critical violations when compared to Group B, and managers from Group C also expressed a more favourable attitude in 59% of the cases (Fernandez, Hedberg, Jenkins, Reske 2007). The reason for this, as cited by managers, was the improved relationship with the inspector which gave managers a better understanding of food safety and a willingness to comply.

Further Recommendations

One of the biggest barriers identified in the literature review was how the culture of the establishment affected implementation of safe food handling practices. Toronto By-Laws requires that one person on site must hold a food handlers certificate, renewable every five years. Knowledge and practices wain as time goes on. It is said that 40% of what is learned after training is implemented and that only 15% is implemented over the course of a year. This is affected by the workplace environment and knowledge of the subject (as cited by Almanza et al., 2005). To improve culture and practice, every person that handles food should be required to have a food handler's certificate renewed every two years. Florida Law requires that all food handlers have food safety training. Results from studies conducted in that area found that food safety training did improve inspection result outcomes by 14.7% in comparison to 7.5% in areas where Food safety training was voluntary (DiPietro et al. 2010).

The study also identified the need of managers to address specific barriers within their facility and to be an overall better role model to improve poor attitudes about food safety within their facility. It was suggested that managers should give verbal reminders often and educate the workers about the consequences of improper food handling practices (Brandon et al., 2008).

Regarding informing the public, it is recommended that a plain language narration summary of the inspection focusing on why operators received the assigned card be published rather than publishing a violation citations summary. The public lacks an understanding of the inspection process and the ability to interpret the online reports and subsequently, the card. For example, in recent history, CBC News Toronto has run a story criticizing Dinesafe citing that chronic offenders are not dealt with, and the number of violations were too high to warrant certain establishments to remain open (CBC News, 2014). Utilising the same database the author used and doing their own statistical analysis, CBC came to the conclusion that compliance was not increasing when evaluating violations, refusing to accept Joe Mihevc's, chair of Toronto Public Health, assurance that Dinesafe has increased compliance from 50% prior to 2000 to 90% since that time (CBC News, 2014).

Limitations

Given that Toronto is a multicultural city, the results of this study may not be applicable to smaller city centres or to centres that consist predominantly of one culture. The study was conducted utilising food service establishments that were available to all members of the public and so the information cannot be extrapolated to institutions such as school or long term care facilities. Food establishments analysed in this study were also privately run by individuals for financial gain and so results would not reflect practices seen in other types of facilities.

Future Research

Due to the amount of data collected, a number of future studies could be conducted. Researchers could determine what violations are cited most often, in both the significant and crucial categories, and communicate that information to PHIs. This information could also be used by Health Units to better allocate resources.

Infractions related to the type and style of cooking could be analysed to determine what food safety violations are most common. This information could be communicated directly to operators or be incorporated into food handler's training. For example, there could be enough evidence that food preparation specific training, which is not currently available, is needed in restaurant that use sous vide cooking.

Research could be conducted to see if geography influences inspection results. Specifically, evaluating compliance in tourist versus suburb areas, or chain versus independent food service establishments.

Conclusion

On the surface, it appears as though Dinesafe is not very effective given that the number of violations and the percentage of chronic reoffenders cited per inspection have not changed significantly between the two time frames. However, there are an increasing number of establishments that reoffended only twice in a time frame and the total number of times establishments reoffended in the time period is also decreasing. This suggests that using the number of violations cited as a tool to judge compliance may be ineffective and should be avoided as a means to communicate food safety to the public.

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