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Examining Restaurant Sanitation Scores Across Cuisines

Andrew Choothakan

Fieldwork Summary Report

University of San Francisco

August 2015
ABSTRACT

Working and completing over 300 hours at the Asian Health Institute (AHI) allowed me the bridge the gap between AHI and the San Francisco Department of Public Health (SFDPH) to address restaurant sanitation to the Asian community to prove whether past research and perceptions are correct that Asian restaurants are the least clean out of other restaurants cuisines.

This paper uses data collected from SFDPH as a means to investigate possible correlations such as location and price of the restaurants in relation to the health score. Additionally, subgroups of Asian cuisine are examined and ranked according to average health score. The use of the survey examines customer’s perception of cleanliness among different cuisines. Although selection bias and limited number of respondents made it difficult to obtain results, the survey as well as the data obtained from SFDPH revealed that Asian restaurants in general have lower sanitation score than other cuisines.
Section I. Introduction

Progress has been made in reducing food safety risks and restaurant sanitation in the U.S. by addressing the safety concerns crucial to public health such as on time-temperature abuse, inadequate hand washing, cross-contamination, lack of food safety knowledge by food handlers and food premise operators, and lack of food safety information and knowledge about specialty foods. However, foodborne illness cases remain high among ethnic restaurant services. Additionally, customers do not think of food safety when choosing a place to eat, but rather consider the aesthetics restaurants to reflect cleanliness (Lee et al., 2012).

The first few sections of the paper surmise the public health problem as it relates to sanitation of both ethnic and non-ethnic restaurants and towards customers’ behaviors. Following section provides brief description of the Asian Health Institute (AHI). The purpose of this paper is to understand consumer perception of restaurant sanitation and compare with the actual data obtained from SFDPH, and understanding other possible factors like price and location to help the public become more aware of food safety and about Environmental Health in a broader context.

Section II. Background and Description of Public Health Problem

Food related diseases is a preventable and underreported public health problem that is costing the U.S. economy $10-$83 billion a year and results in 48 million illnesses cases, 128,000 hospitalizations, and 3,000 deaths annually (Yeager et al., 2012). Associated effects caused by ingesting food containing harmful bacteria, parasites, virus or chemicals includes vomiting, kidney failure, brain and nerve damage and even death
(Ungku et al., 2010). The chances of an outbreak are more prevalent in restaurants than in homes because the former serves food to many customers.

The Center for Disease Control (CDC) reported that restaurant operations cause between 52% and 59% of food borne illness outbreaks in the United States with full-service restaurants having a 60% non-compliance rate for food safety and fast food restaurants having a 26% non-compliance rate for food safety. It is an alarming statistic considering 96% of consumers viewing restaurants as being the most responsible for food safety, food safety being an increasingly important factor in consumer purchase decision-making and the frequency at which Americans are dining out. A 2006 article reports shows that approximately 50% of funds budgeted for food by Americans is being spent on restaurants with 44% of American adults saying restaurants are an essential part of their lifestyle (Jones & Angulo, 2010). Additionally, 53% of consumers eat outside at least once per week, 17% dine outside the home five or more times per week and 4% eat out seven or more times any given week.

Stark contrasts in food cleanliness have been documented between ethnic and non-ethnic restaurants. The CDC reported that foodborne outbreaks associated with ethnic foods increased from 3% in 1990 to 11% to 2000 (Liu & Kwon, 2013). Ethnic restaurants tend to score lower during inspections, are cited for more Food Code violations, and are more likely to be associated with foodborne outbreak than non-ethnic restaurants. Additionally, there are different perceptions on food safety between ethnic cuisines. For example, Asians and Mexicans own 15% and 8% of restaurants respectively, but Asian restaurants, more specifically, Chinese restaurants are perceived as being the least clean
among Asian cuisines despite 90% of Americans having tried Chinese food and 63% eating Chinese food at least once a month.

**Section III. Description of Agency**

The Asian Health Institute (AHI) operates under University of California San Francisco Medical Center at Mount Zion campus. The Institute serves the Asian population residing in the Bay Area by tailoring medical care and health education to encompass a diverse group of both immigrants and American-born Asians from different Asian countries with over 100 different Asian languages or dialects. Under the guidance of Director Diana Lau, AHI strives to constantly improve medical access, services, and quality of care delivered to Asian patients especially those with limited English proficiency by extending UCSF’s services of primary care and preventative care to treatment and follow-up and rehabilitation in a culturally sensitive and respective environment.

Interns are tasked with updating the website on a weekly basis with information concerning upcoming events, which includes community outreach events, blood and bone marrow drive, and community health and professional health education. At times, during CME accreditation, interns are asked to compile research on information related to the Asian population. Every two weeks, interns and volunteers participate in a health symposium by handing out flyers, collecting surveys and sign-in sheets. Additionally, contact information and e-mail address are updated daily to allow subscribers to receive information on any upcoming events through Dr. Lau’s account.
The AHI website consists of information databases pertaining to cancer, diabetes, heart disease, high blood pressure and stroke, but no information on foodborne illness and food safety. Being an institution that promotes health and well being for Asians in the Bay Area, it is alarming that food safety is not included in the education plan because foodborne illness continues to be a public health burden while some pathogens transmitted through food affects Asians at a higher rate than other ethnic groups (Lee et al., 2010).

Section IV. Overall Project Plan and Learning Objectives

The first objective was to create a community map that will benefit the Asian community living in San Francisco in terms of promoting awareness for food safety. The initial plan developed with Dr. Lau was to develop a study that examines Asian restaurants in San Francisco and comparing the health sanitation scores to within the subgroup. The idea expanded to include restaurants of other ethnicities with the purpose of investigating whether Asian cuisine have lower sanitation scores than other cuisines based on other past literary reviews, research and common perceptions as previously stated. Other factors that may affect sanitation score that needs to be taken into consideration are the price of the food, how many restaurant sanitation scores improved, decreased or stayed the same, and location of the restaurant. Since AHI does not have the necessary data, the second objective was to establish contact with the San Francisco Department of Public Health (SFDPH) Food Safety Program to obtain access their database.

Section V. IMPLEMENTATION OF THE PROJECTS/METHODS USED
In the Environmental Sector of SFDPH, the food safety program monitors compliance of restaurants, markets, and all other retail food operations in San Francisco. Since there are many inspectors overseeing different districts of the city, the third objective was reaching out and obtaining data of all restaurants from the head of the department. Since there are more than 7,000 restaurants in the Bay Area, food establishments are divided into three categories in accordance with SFDPH:

- Category 1- two routines are required per year for inspection score of 81% or above or three routines inspections per year for inspection score of 80% or below
- Category 2- one routine inspection required per year
- Category 3- routine inspections are not required

The majority of the data collected from the database at SFDPH concerns primarily Category 1 restaurants, which are further broken down into price, type of cuisine, and location. The fourth objective of the fieldwork required further data scrubbing to eliminate restaurants that incorporate fusion cuisines, majority of café and bakeries, restaurants that have opened the past year with one or no sanitation score, and restaurants that have closed during the past year. Other issues associated with the data collection included the food safety database being offline for weekly updates and eliminating restaurants that have not been inspected for more than a year. The final dataset included restaurant mappings categorized into restaurant type, latest health scores posted by SFDPH in 2013 and in 2015, its location and price.

An attached calculation chart completed in Excel highlights restaurants scores and averages. The chart highlights in yellow, restaurants with a score of 85 and below and green detailing improvement with a score above 85 the following inspection. In
accordance to SFDPH, a score of 71-85 categorizes the operating condition of restaurants as “needing improvement” while a score of less than or equal to 70 categorizes the restaurant as “poor.”

**Mapping:** Color and shape was designated to each ethnic cuisine and price range respectively as shown in Appendix A. All mapping was done by the Google Map application. Within the map, a circle symbol represents the price range of under $10, a square symbol represents price range of $11-$30, a triangle symbol represents price range of $31-$60, and a star symbol represents price range $61 and above.

**Survey:** The fifth objective was to develop a survey questionnaire to gather customer perceptions about restaurant sanitation. A survey was administered via SurveyMonkey.com and is open to anyone ages 18 and older. A ranking scale was used for question 1, asking participants to rank restaurants based on cleanliness with 1 being the least clean and 12 being the cleanest. Question 2 is broken down into 10 questions each with participant rating the importance of restaurant cleanliness and food safety score, and expectations of high and low budget restaurants in a 5-point Likert scale of Strongly Agree, Agree, Neutral, Disagree, and Strongly Disagree.

**Section VI. Results and Findings**

*Characteristics of Survey Respondents:* Approximately 85% of survey respondents self-identified as Asian or Pacific Islander, 0.90% as Black or African American, 1.8% as Hispanic or Latino, 5.4% as White/Caucasian while 9% preferred not to answer. When asked the age, 37% of the respondents are 18 to 24, 16% ages 25-34, 13% ages 35-44, 23% ages 45-54, 7% ages 55-64, and 1% ages 75 or older. In the open-ended question,
majority of respondents either wrote Yelp or the restaurant themselves as a major source of food safety inspections scores.

When asked about restaurant cleanliness, 66% of respondents strongly agreed that restaurant cleanliness is important and 68% strongly agreed that high-budget restaurants should have a high standard of cleanliness. Additionally, half of the respondents either strongly agreed or agreed that restaurant scores should be made easily accessible to the public.

*Data analysis obtained through SFDPH:* Results displayed in Appendix B shows the mean percentage between health scores of different ethnic restaurants. The first graph shows two bars, the blue being the average health score from 2012-2013 and the red bar being the average health score from 2014-2015. To put it in a ranking perspective, data does confirm that Chinese restaurants are on average, the most unclean, but from the data, Irish has the best sanitation school out of all the cuisine.

When asked about improvements, results are as follows:

- American restaurants improved with 17 restaurants in 2015 having a sanitation score of <85, from 25 in 2013 but out of those restaurants, 16 improved
- Chinese restaurants saw an improvement with 42 restaurants in 2015 having a sanitation score of <85, from 45 in 2013, but out of those restaurants, 14 improved and 13 new restaurants were added to the list
- Japanese restaurants did not see an improvement with 16 restaurants in 2015 having a sanitation score of <85, from 17 in 2013 and out of those restaurants, 6 improved and 5 new restaurants were added to the list
• Korean restaurants did not see an improvement with 11 restaurants in 2015 having a sanitation score of <85, from 6 in 2013 and out of those restaurants, none improved

• Thai restaurants did not see an improvement with 22 restaurants in 2015 having a sanitation score of <85, from 19 in 2013 and out of those restaurants, only 3 improved, but 7 new restaurants were added to the list

• French restaurants did not see an improvement with 8 restaurants in 2015 having a sanitation score of <85, from 5 in 2013 and out of those restaurants, only 2 improved, but 5 new restaurants were added to the list

• Vietnamese restaurants did not see an improvement with 20 restaurants in 2015 having a sanitation score of <85, from 15 in 2013 and out of those restaurants, only 3 improved, but 2 new restaurants were added to the list

• Mexican restaurants saw an improvement with 11 restaurants in 2015 having a sanitation score of <85, from 17 in 2013 and out of those restaurants, 11 improved with 5 new restaurants were added to the list

• Irish restaurants did not see an improvement with 4 restaurants in 2015 having a sanitation score of <85, from 2 in 2013 and out of those restaurants, only 1 improved, but 3 new restaurants were added to the list

• Italian restaurants remained the same

• Indian restaurants did not see an improvement with 11 restaurants in 2015 having a sanitation score of <85, from 8 in 2013 and out of those restaurants, only 1 improved, but 5 new restaurants were added to the list
• Greek/Mediterranean restaurants saw an improvement with 6 restaurants in 2015 having a sanitation score of <85, from 8 in 2013 and out of those restaurants, 3 improved, and 1 new restaurants were added to the list

From the data collected, it seems that location also plays a role in restaurant sanitation scores. From the district map and the map of Chinese restaurants as an example with scores <85 in Appendix D, a cluster can be found near Chinatown district. Now median household income is only $17,630 and 31% of individuals live in poverty.

Section VII. Discussion

Results from this study, which utilized publicly available data from SFDPH, indicates that ethnic cuisines, especially Asian restaurants are lagging behind other cuisines in terms of sanitation score. The survey findings are heavily biased towards Asian Americans so the results are not representative towards other ethnic backgrounds. However, data may be used for the Asian Health Institution for future references with the Asian community, but the survey requires more participants. Another limitation of the study is that the results are the calculated from the average mean of the restaurants and the underrepresentation of some cuisine. Restaurants that are pricier as stated above usually have higher scores, it can bump up the average score and since there are only 12 Irish restaurants collected in the study, the average increases.

Section VIII. Application of Results and Public Health Significance

Cleanliness is important in the survival of any restaurant, ethnic or non-ethnic. Unfortunately, as the results show, Asian cuisine still lags behind other cuisines in terms of sanitation score. The study may be useful to share with the Asian Health Institute
because consumer perceptions from the survey, past research and literary reviews have supported this claim.

One of the recommendations aside from providing classes on food safety and increasing the frequency of inspection that needs further evaluation is restaurant classification. Category 1 restaurants whether a higher price restaurant or a food truck and bakery, are subjected to the same testing. By getting restaurants broken down into different categories, and ethnic cuisine, grading may be easier. Another recommendation would be to conduct uniform training for all health inspectors employed in San Francisco, but it will seem like a far reach due to the department being severely understaffed. Another gradual solution is to develop culture sensitive scoring guidelines tailored towards particular ethnic cuisines.

**Section IX: Conclusion**

The opportunity to intern at the Asian Health Institution and to be allowed to continue until the end of the year has been nothing short of a blessing. I feel very grateful to be under the tutelage of Dr. Diana Lau, who is kind, compassionate and cares for her interns. During my tenure at AHI, I was able to learn about subjects ranging from E-cigarettes to population research ophthalmology. I learned many lessons in AHI like gathering the right data to use for a project. Additionally, I was able to attend seminars and meet with previous interns who shared past experiences with me.

As a public health professional, I was able to utilize my skills to write proposals for funding and expanded my USF MPH Competencies in Appendix F. Both AHI and SFDPH are incredible organization that puts the health of the public first. The
lessons I can take away from this experience are to be patient, calm and collected, in order words, be professional.

References:


Niode, O., Bruhn, C., & Simonne, A. H. (2011). Insight into Asian and hispanic
restaurant manager needs for safe food handling. Food Control, 22(1), 34-42. doi:10.1016/j.foodcont.2010.06.006


APPENDIX A Mapping of Restaurants in San Francisco
Map 1: RESTAURANT MAP n=589
Map 2: RESTAURANT MAP CONTINUE n=598

Map 3: American restaurants n=98
Map 4 Chinese restaurants n=87
Map 5 Japanese Restaurants n=65

Map 6 Korean Restaurant n=26
Restaurant Sanitation Study

Map 7: Thai Restaurant n=51

Map 8: French Restaurant n=32
Map 9: Vietnamese Restaurant n=43

Map 10: Mexican Restaurant n=52
Map 11: Irish Restaurant n=12

Map 12: Italian Restaurant n=74
Appendix B: Mean Safety Scores Via Health Scores of SFDPH
Mean Safety Scores

Restaurant Type

Mean Health Score Chart 1

Restaurant Type
Appendix C: Survey Results

Appendix D: Restaurant Cleanliness in relation to Location
Appendix E: Student Preceptor Agreement and Learning Contract

**Student**: Andrew Choothakan

**Agency and Department/Division/Program**: University of California San Francisco Asian Health Institution

**Preceptor**: Diana Lau, Director

**Dates of Placement**: May 21\(^{st}\) – December 31\(^{st}\)

| GOAL 1: Increase knowledge of SF bay area Asian Health community |
|---|---|---|---|---|
| **Objective(s)** | **Activities** | **Start/End Date** | **Who is Responsible?** | **Tracking Measures** |
| Understand opportunities, strengths and vision of organization | Attend weekly meetings and monthly annual seminars | May 21\(^{st}\) – December 31\(^{st}\) | Andrew Choothakan, Diana Lau | Weekly projects assigned by director |
| Develop ideas for community mapping project | Accessing SFPD database | June 6-August 25th | Andrew Choothakan | Final project deliverables: • Graphs • Charts |
| Develop plan through December | Discussions, continued meetings, | May 21\(^{st}\) – December 31\(^{st}\) | Andrew Choothakan, Diana Lau | Notes from email communication |
### Goal 2: Create network database group

<table>
<thead>
<tr>
<th>Objective(s)</th>
<th>Activities</th>
<th>Start/End Date</th>
<th>Who is Responsible?</th>
<th>Tracking measures</th>
</tr>
</thead>
</table>
| Establish communication with different television, radio, and newspaper networks | Background check, website research, phone-phone interview | June 10-August 25th | Andrew Choothakan | Excel deliverable  
• Averages  
• Trend Map |
| Communicate via email to discuss issues or deliverables | | June 15th-August 25th | Andrew Choothakan, Diana Lau | |
| Communicate with director for feedback about program | Weekly meetings and email | | Andrew Choothakan, Diana Lau | |

### Goal 3: Establish contact with San Francisco Department of Public Health (SFDPH)

<table>
<thead>
<tr>
<th>Objective(s)</th>
<th>Activities</th>
<th>Start/End Date</th>
<th>Who is Responsible?</th>
<th>Tracking measures</th>
</tr>
</thead>
</table>
| E-mail and phone SFDPH for interview and possible access to database | Access SFDPH database  
Interview with head of SFDPH | June 11-August 25th | Andrew Choothakan | Reflection, Project deliverable |
| Develop plan for study in collaboration with SFDPH | Research organization that meets with the preliminary requirements for research | June 20th-August 25th | Andrew Choothakan | Final Project deliverable, weekly schedule meetings |

### Goal 4: Develop protocol for data collection and data entry

<table>
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<th>Objective(s)</th>
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<th>Who is Responsible?</th>
<th>Tracking measures</th>
</tr>
</thead>
</table>
| Data Scrubbing of information | Health apps  
Health entry | June 30st-August 25th | Andrew Choothakan | • Excel Sheet of categorized |
Restaurant Sanitation Study

<table>
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<th>obtained from SFDPH</th>
<th>Research methodologies best suited for the study</th>
<th>Brainstorming</th>
<th>June 30st-August 25th</th>
<th>Andrew Chootherakan</th>
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<tbody>
<tr>
<td>Generate list of common methods used for conducting study</td>
<td></td>
<td>June 30st-August 25th</td>
<td>Andrew Chootherakan</td>
<td>List of literatures read</td>
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</table>

Goal 5: Increase Knowledge of Community-based Research

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<th>Objective(s)</th>
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<th>Who is Responsible?</th>
<th>Tracking measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Develop survey questionnaire</td>
<td>Research questions that aid in research</td>
<td>June 20th-August 25th</td>
<td>Andrew Chootherakan</td>
<td>Number of respondents</td>
</tr>
<tr>
<td>Gather respondents to do the survey</td>
<td>Phone, in person, paper handout, Facebook</td>
<td>June 30st-August 25th</td>
<td>Andrew Chootherakan</td>
<td>Surveymonkey</td>
</tr>
</tbody>
</table>

Goal 6: Develop protocol for data collection and data entry

<table>
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<th>Objective(s)</th>
<th>Activities</th>
<th>Start/End Date</th>
<th>Who is Responsible?</th>
<th>Tracking measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>Understand strength and weaknesses of methodology</td>
<td>Meet with Dr. Lau through phone or in person</td>
<td>June 30th-August 26th</td>
<td>Andrew Chootherakan</td>
<td>Summary of research and relevant literature</td>
</tr>
</tbody>
</table>

Appendix F: Competencies Addressed

Learning Objectives
1. Fulfilled gathering health safety scores of over 500 restaurants within the Bay Area for research in collaboration with SFDPH
2. Used method of data scrubbing to narrow over 7,000 restaurants down to 600 restaurants
3. Created a survey to determine perceptions of customers who dine out at restaurants
4. Analyze survey findings and report findings of research

USF MPH Competencies
• Communicate public health messages to a variety of audience from professionals to the general public
• Identify and prioritize key dimensions of a public health problem by assessing public health literature utilizing both quantitative and qualitative sources
• Advance the mission and core values of the University of San Francisco

Data scrubbing and creating a survey that tailors to the study requires a lot of research and patience. Doing so requires proper tools to assess community needs. Associated activities done in conjunction to fieldwork project is correlating and planning documents of cancer to prepare for the seminar. Another activity that shows communicating of public health through a variety of audience is making an excel spreadsheet summary of media from different languages to broaden the UCSF database collection.

CEPH Core Knowledge Areas includes

*Environmental Health:* collaborated with SFDPH with analyzing, categorizing and interpreting data for the restaurant food project
*Professionalism:* Always arrive to internship on time. Speak when you are spoken to and listen carefully when seeking advice from a medical professional
*Diversity and Culture:* Obtained data on different ethnic and non-ethnic restaurants in San Francisco.
*Leadership:* Took the leap to translate entire 46 slides of UCSF Asian Health Institute from English to Thai

### Appendix G: Restaurant Food Safety Survey

1. Please rank from 1 to 12 (1 being the least clean to 12 being the most clean) of restaurant cleanliness

   Japanese ____
   Korean _____
   Chinese ____
   Irish ______
   American ______
   Italian _____
   Greek/Mediterranean ______
   Indian ______
   Mexican ______
   Vietnamese ____
   Thai _____
   French _____

   Strongly Disagree, Disagree, Neutral, Agree, Strongly Agree

1. Restaurant cleanliness is important to me
2. Restaurant cleanliness is important to me when evaluating overall restaurant quality
3. Restaurant cleanliness is important to me when I decide whether I will return to a restaurant or not
4. The food safety score is important to me when I decide whether I will return to a restaurant or not
5. Food safety score is important to me when evaluating overall restaurant quality
6. I have expectations of cleanliness for high-budget restaurants
7. I have low expectations of cleanliness for low-budget restaurants
8. A clean restaurant will increase my overall level of satisfaction
9. A dirty restaurant will decrease my overall level of satisfaction
10. Restaurant scores should be made easily accessible to the public

11. Where to do obtain information about food safety inspection scores of restaurants

12. What is your gender? ___ Male ___ Female
13. What is your age? ________
14. What is your most preferred cuisine when dining out?
15. How often do you dine out per week?
   a. Once a week
   b. Twice a week
   c. Three times a week
   d. Four times a week
   e. Greater than five times a week
16. What is your ethnic group?
   ___ Caucasian
   ___ Asian
   ___ African-American
   ___ Hispanic
   ___ Other (please specify)______________