



# Evidence-Informed Policy to Reduce Fast Food Consumption – An Empirical Study

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**Abstract.** This paper describes an experiment examining the effectiveness of evidence-informed policy to regulate fast food consumption. We reviewed existing literature on public health policies that target unhealthy products, mainly focusing on evidence-based policies. During a 6-month field experiment, health risks associated with fast food consumption will be represented to the treatment group but not to the control group. Data on fast food consumption frequency and demographic information will be collected from both groups, and the effectiveness of the policy will be evaluated by comparing the data. If the policy is effective, we expect a statistically reduced fast food consumption in the treatment group; however, if we fail to observe the declining data, it may suggest that such policies are not strong enough regulations for the fast food market. Nonetheless, external factors such as contaminated samples or incorrect placement of health information could also contribute to this outcome.

**Keywords:** health policy · fast food consumption · evidence-informed policy · health risk

## 1 Introduction

Nowadays, a growing number of people are worried about the catastrophic effects of fast food's popularity. According to research, fast food is popular for a variety of reasons. Surveys show that most young adults (aged 16 to 24) who visit fast food restaurants believe that fast food is relatively affordable and conveniently purchased. A small percentage of consumers believe it is a way to socialize with family and friends [1]. According to the 2022 survey of UK food and drink brands, Greggs had the greatest rating from the British public in a 2022 poll of UK food and beverage brands, with 74% of respondents having a favorable relationship with the company. Pizza Express, KFC, Pizza Hut, and Costa Coffee were listed in the top five. Many businesses may close due to the pandemic;

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however, the UK takeaway and fast food restaurant market are still set to reach 22 billion in 2023, representing 3.1% of the UK market growth. The global fast food market is projected to grow from USD 972.74 billion in 2021 to USD 1,467.04 billion by 2028 at a CAGR of 6.05% during the 2021–2028 period [2]. However, plenty of well-researched evidence demonstrated various adverse health effects of the such epidemic. Existing literature suggests that eating processed and fast foods may cause more premature deaths than smoking each year [3].

According to a 2015 study, fast food is high in sugar, salt, saturated fat, trans fatty acids, processed ingredients, and calories. Antioxidants, fiber, and other nutrients are low, increasing the risk of obesity, insulin resistance, type 2 diabetes, and various cardiovascular diseases. The lower fiber content also leads to constipation and reduced healthy gut bacteria. Poor immunity, inflammation, memory loss, asthma, rhinoconjunctivitis.

Moreover, eczema have been shown to be inextricably linked to fast food consumption [4]. Therefore, it is essential to solve and address the urgency of this issue. Few policies can regulate fast food consumption; however, limited studies can be found that support the legitimacy of evidence-informed policy on fast food consumption. As a result, an experiment will be designed in this study to test the effectiveness of such a policy. We created an observational experiment in which advertisements about the health risky fact of consuming fast food were placed in the lift lobbies of office buildings. Two online questionnaires (pre- and post-experiment questionnaires) will be given to participants to gather information on their demographics and fast food consumption. The effectiveness of evidence-informed policy can be assessed by comparing the pre- and post-experiment questionnaires.

## 2 Literature Review

First, research has shown that financial incentive schemes like cash and vouchers successfully target unhealthy behavior and result in healthier consumption; besides, the importance of designs when considering financial incentives to educate is emphasized [5]. However, possible moral problems and expenses related to using financial rewards should raise concerns [6]. Second, imposing health taxes on products hurts health (sugar, alcohol, etc.) and reduces consumption. Existing findings have indicated that implementing higher taxes and changing the relative price to other goods and sugary drinks are expected to improve health behaviors and outcomes [7]. However, the tax could be a burden to distort consumer and producer surplus; even worse, if the product is relatively price inelastic, producers can easily transfer the tax burden to consumers and create deadweight loss leading to reducing in social welfare. Finally, the evidence-informed healthy eating policy is increasingly considered a less intrusive vehicle to reduce risky behaviors.

Since the increased trend of eating out raised concerns about the impact on nutrients, research investigating that away-from-home food has slight nutritional improvement; however, raising the calories and fat intake [8]. Consequently, nutrition labeling and promotional strategies are required to remind consumers of the influence of food consumed, which help potential consumers to cultivate favorable attitudes towards healthier choices when eating out.

In 2008, caloric information was forced to show on the menus of chain restaurants in New York City. According to research, this change caused a 1.5% reduction in body mass index (BMI) and a 12% drop in the probability of obesity. Besides, the finding shows that calorie labeling had a more significant effect on low-income groups, especially low-income minorities, through heterogeneous analysis [9]. In contrast, the influence of evidence-informed based policy is questioned by some parties as a recent study illustrates a mixed picture of such policy's effectiveness.

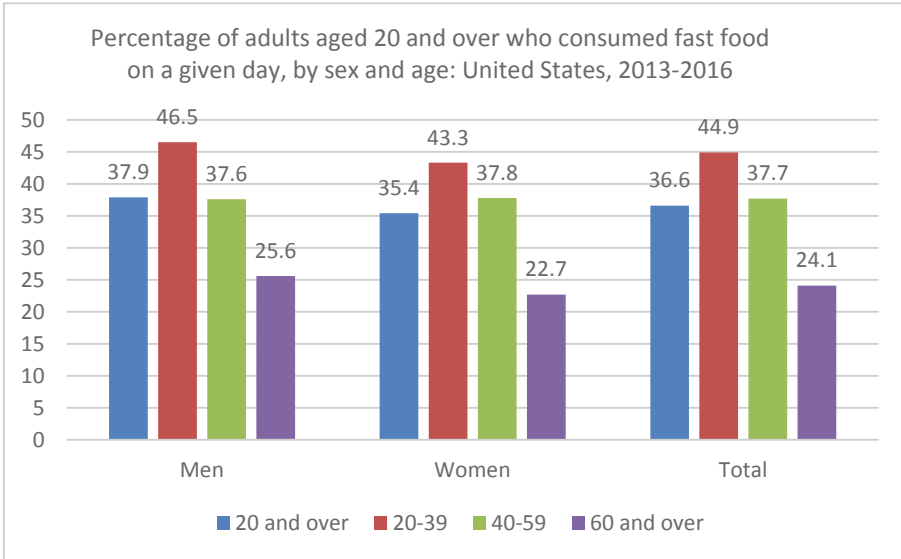
A natural experiment published in the *International Journal of Obesity* indicates no statistically significant difference in calories purchased before and after providing the nutrient label; about 9% of adolescents consider the information though many of them (57%) noticed [10]. However, a field experiment in a full-service restaurant found that calorie labeling has the maximum influence on the least-conscious consumers while doing little for people with nutrient knowledge. In other words, the effect of the evidence-informed policy depends on consumers' awareness of healthy eating, and such a policy is more likely to change people with the little nutritional message [11]. Therefore, this paper aims to create a study that can fill the information gap on the health hazards associated with fast food consumption and educate individuals who may need to be more familiar with the negative consequences of this unhealthy habit.

A randomized clinical trial in 2021 was performed to assess the impact of graphic warning labels on cigarette packages. The research found that participants given cigarette packs with graphic warning labels experienced a significant increase in their health concerns and reported a higher frequency of abstaining from smoking each week than the control group [12]. We aim to develop dietary guidelines that raise awareness about the potential health risks associated with fast food consumption, similar to the health warnings on cigarette packages. The effectiveness of this policy will be tested by sharing the guidelines with the treatment group through advertisements while withholding the information from the control group.

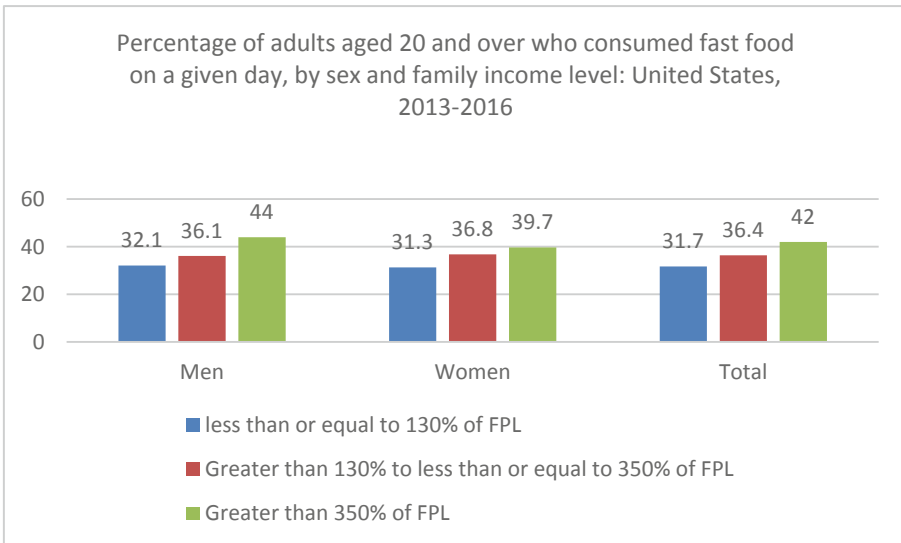
From a survey conducted by National Centre for Health Statistics based in the United States, the data demonstrate that fast food consumption amongst adults reduced with age. As illustrated in Fig. 1, among all the responses obtained, adults aged 20–39 have the highest fast-food consumption on a given day than any other age group. The difference in consumption between men and women is minimal, with the consumption of men being slightly higher in three age groups (20 and over, 20–39, 60 and over) and the consumption of women being higher in one age group (40–59).

Furthermore, the survey also drew attention to the effect of family income level on fast-food consumption. As shown in Fig. 2, regardless of sex, fast-food consumption of all the respondents increased with income, measured by FPL (federal poverty level), indicating a positive correlation.

In our study, we have selected middle incomers aged 20–39 as our target population. As illustrated in Fig. 1, respondents aged 20–39 have the highest fast-food consumption rate among all age groups. Therefore, the effectiveness of evidence-informed policy should be most observable within this age group, enabling the establishment of a causal relationship. Middle incomers are chosen since this income group would have relatively unlimited food choices, which may not apply to lower incomers. Thus, eliminating this extraneous variable could establish a cause-and-effect relationship with higher certainty.



**Fig. 1.** Percentage of adults aged 20 and over who consumed fast food on a given day, by sex and age: United States, 2013–2016 [Owner-draw]



**Fig. 2.** Percentage of adults aged 20 and over who consumed fast food on a given day, by sex and family income level: United States, 2013–2016 [Owner-draw]

Twenty office buildings in this major city will be selected randomly and divided into two groups, one being a treatment group where dietary guidelines are provided and the other one being a control group where no information is provided. The experiment will last for six months to ensure the complete delivery of the dietary information to the treatment groups. Although past experiments have tested the effectiveness of food-related health policies, there needed to be more evidence to support their usefulness. Therefore, our study will examine the effectiveness of evidence-informed policies in reducing fast food consumption.

### 3 Methodology

In this paper, we intend to design a field experiment to test the effectiveness of evidence-informed policy on fast food consumption to ensure the high ecological validity of our results. Field experiments would also allow the results to reflect behaviours in day-to-day situations with sufficient accuracy. In the study, 20 office buildings in a given city will be randomly chosen at the start. This will be carried out by using a computer generator in which the names of all the qualified office buildings in a city are entered and 20 of those will be randomly selected into our sample. The selection of office buildings will be based on the criteria as follows: the office buildings need to be more than 10 floors to ensure the diversity of occupations; the office buildings should have a minimum of 200 workers in order for sufficient data to be obtained; the gender made-up of all office-buildings should be similar, aiming for a relatively equal ratio of males and females. When a sample of 20 is obtained, they are randomly assigned to either treatment group or control group using the same computer generator. Since the study is investigating the effectiveness of evidence-informed policy to reduce fast food consumption, for the treatment-group buildings, dietary guidelines (the potential risks to health conditions of overconsumption of fast food) will be displayed in conspicuous locations such as in the lift lobbies, while the control group will not. The experiment will last for 6 months in order to observe the effect of dietary guidelines on fast food consumption behaviours. At the start and the end of the experiment, surveys regarding individual fast-food consumption will be distributed via emails to all members of the 20 office buildings, the only difference is that information regarding the age, income, gender and ethnicity of the participants is collected at the first survey, as these variables are considered to have an impact on fast-food consumption. The data from the two surveys before and after the experiment will be compared. We chose to carry out the experiment in office buildings to minimise the effect of extraneous variables, as our target participants will be middle-class workers aged between 20 and 39 years old. The distribution of the surveys will be at the same time of the day before and after the experiment, e.g. at 9 am, to ensure the demographics are more similar.

Below shows the first survey.

1. What is your ethnicity?

- American Indian or Alaskan Native
- Asian / Pacific Islander
- Black or African American
- Hispanic
- White / Caucasian
- Multiple ethnicity / other (please specify)

2. What is your age?

- 18-24
- 25-34
- 35-44
- 45-54
- 55-64
- 65 and over

3. What is your gender?

- Male (including transgender men)
- Female (including transgender women)
- Prefer to self describe as\_ (non-binary, gender-fluid, agender, please specify)
- Prefer not to say

4. What is your income?

- \$0 to \$19,999
- \$20,000-\$49,999
- \$50,000-89,999
- \$90,000-\$129,999
- \$130,000-\$149,000
- \$150,000+

5. How often do you consume fast food last month on a weekly basis?

- 1-2 times
- 3-4 times
- 5-6 times
- 7 times or more
- N/A

At the end of the 6-month experiment, a survey will be distributed to the participants again. This second survey will consist of three self-reporting questions; firstly, the participants are required to report their average weekly fast-food consumption in the past month; secondly, questions related to the participants' opinions regarding the effectiveness of the fast-food risky facts advertisement, and how to improve the experiment will be asked. To ensure sufficient data is obtained from the questionnaire, a \$5 Amazon voucher will be offered to the survey participants as an incentive to attract as many respondents as possible.

6. How often do you consume fast food last month on a weekly basis?

- 1-2 times
- 3-4 times
- 5-6 times
- 7 times or more
- N/A

7. Do you think the fast-food risky facts advertisement is effective? Rate on a scale from 1 to 5. 5 being very effective, 1 being not effective at all.

- |                       |                       |                       |                       |                       |
|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| 1                     | 2                     | 3                     | 4                     | 5                     |
| <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

How do you think our experiment on reducing fast-food consumption can be improved?

Short-answer text

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## 4 Potential Results

After six months of controlled experiments on twenty randomly selected office buildings, the following results are expected: If providing fast food dietary guidelines acted as an effective reminder and successfully raised health concerns, it might be reasonable to expect a decreasing trend in consumption.

As predicted in the survey results, the frequency of fast food consumption per week might drop. By comparing the density before and after six months, performed statistical inference, the estimated outcome may indicate a significant drop in the frequency of fast food in the treatment group, while in the control group, it may fail to obtain any difference. Besides, knowing how the results vary among several demographic groups could be necessary to further evaluate the policy implication, like income level, gender, age, and ethnicity.

The survey result may illustrate the percentage of adults who frequently consumed fast food was insignificantly related to salary. In addition, within each income level, there was no noticeable variation in the average frequency between men and women. However, men were more likely than women to eat fast food at lunch, but women were more likely to report eating fast food as a snack. For all samples, a greater percentage of men than women consumed fast foods. Such experimental findings may come from the different dietary preferences of men and women, which were not discussed in this paper [13].

Since the experiment sample contained diversified ethnicities, it may also be one of the potential influencing factors. Different cultural backgrounds might shape various dietary structures, affecting fast food choice and consumption: It could be black adults consumed fast food with a higher density than non-Hispanic white, non-Hispanic Asian, and Hispanic adults. Finally, among categorized age groups, it seems to show a decrease in the chance of consuming fast food as aging [13]. This could be explained by individuals gradually realizing the importance of healthy living, therefore, consciously avoiding processed food choices. On the other hand, the experiment data may not support the effectiveness of providing the guideline: there was no statistical difference in the frequency of having fast food in the treatment and control groups. One possible reason could be the demand for fast food dominated consumer choices, although they have been informed that it could lead to health concerns. Consequently, the survey findings demonstrated subtle differences between the two groups.

If the above rationales were valid, the following question was why people do not change such unhealthy habits knowing the disadvantages of eating fast food. The subtle change of fast food consumption results from some essential properties of convenience food and consumers' attitudes towards high-sugar and cholesterol food.

Time-saving could be the most important driving factor for that fast food to be the most popular work-day lunch choice. Simultaneously, it was worth mentioning that almost all office buildings were surrounded by chain fast food restaurants.

One concerning issue of today's processed food is that consuming such food produces subnormal rewards the brain may receive from the original food. This means that eating a banana or having a steak caused a moderate dopamine release, while having a deep-fried chicken led to a much greater amount of 'happiness' [14]. This phenomenon could result in people becoming addicted to such foods, thus disturbing the survey data.

In addition to those external causes that may affect the outcome, there is no guarantee that the errors in the experiment design have not led to the imprecision of the results. Though it is unknown whether individuals received the information provided in the experiment group, poor design of information-based dietary guidelines could undermine the influence. For instance, people might not notice an “advertisement” that is not attractive enough. The lack of creativity and visualization might fail to raise health concerns; to simplify that, the problem is ensuring people have seen the guidelines rather than scrolling their phones in the lift.

Second, non-representative experimental data could lead to a biased estimation of the population parameter, in other words, the statistical inference based on insufficient survey results might be misleading. If only minority employees in the buildings attended the survey, the finding not only can be anticipated to be non-reflective with the true population but, even worse, deviated from the realization on account of selection bias, as participants may have common characteristics.

Despite the research performed in the randomized control trial to dominate the factors that are not directly under experimental control, the unpredictable external impacts could have interfered: for example, the explosion of a scandal at a well-known fast food supplier would frighten people from consuming fast food, caused a descending trend in frequency in both groups.

## 5 Conclusion

Given the predicted results of the experiment, if the evidence-informed policy reduces the frequency of people going to eat fast food in the treatment group, we may safely draw the conclusion that proper publicity of health risky facts can inspire people to avoid behaviour that is detrimental to them. Therefore, in order to reduce the consumption of fast food and to ensure the physical and mental health of residents, the government should adopt evidence-informed policy on unhealthy products. On the other hand, if the frequency of eating fast food is unaffected by the policy, other factors may be to blame, such as a contaminated sample size or a lack of available meal options. Furthermore, advertisement placement and design may also affect the result. For instance, the poster’s design may not be as effective at drawing in customers as we had hoped. Another possibility is that that people do not translate readily available information into the knowledge that helps them make the best decisions [15]. Other ways to reduce fast food consumption, such as increasing taxes on fast food and increasing the price of fast food, one of its greatest advantages, affordability, will disappear. This could lead to greater social impact and unrest, such as increased short-term mortality, marches and strikes, etc. Another method was to offer customers a small discount on reduced portion sizes, which resulted in 14–33% of customers accepting the offer. This resulted in a reduction in total calorie consumption and did not affect the amount of food left uneaten [16]. This suggests that offering smaller portions may be more effective in reducing calorie consumption if offered.

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