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Could higher junk food taxes reduce obesity?

Authors:
Ole Boysen, Kirsten Boysen-Urban, Harvey Bradford and Jean Balié
Associate Editors:
Elitsa Panayotova and Lisa Woodruff

Abstract

Do you like eating junk food? While it might taste great, it's highly processed food which can lead to obesity. Obesity is a problem not only in richer countries, where people have higher incomes but also in poorer countries, where at the same time many people are underweight. We wanted to see if a tax on highly processed foods could have an effect on obesity rates. To evaluate that we used import tariffs as a measurement tool and created a statistical model. We found out that increasing the price difference between healthier foods and highly processed foods could be a useful step toward reducing obesity in some countries, but could also worsen the issue with underweight, sometimes even within the same country.

Introduction

Obesity has become a big problem worldwide, as it poses many health risks. You might think that this problem is more prominent in developed (rich) countries, where people have higher incomes and consume more energy than they can burn. But actually, developing (poorer) countries, where many people suffer from undernutrition, show high rates of obesity as well. In fact, developing countries account for 60% of obesity **prevalence** worldwide!

A lot of research shows that one of the main reasons for obesity overall is the consumption of **highly processed foods**, which provide a lot of energy but few nutrients. These products are very popular among consumers, as they are very tasty due to their high content of sugar, fat, and salt; usually take less time to prepare; cost less; and have longer expiration dates. Such popularity makes it a very profitable market. Nevertheless, in rich countries this market is **saturated** – the sales can't grow any further. That's why food companies try to sell highly processed foods in developing countries, such as countries in sub-Saharan Africa. However, undernutrition is still very widespread there and undernutrition during childhood makes it easier to become overweight later in life. This could make the obesity problem in sub-Saharan Africa even worse.

So what can governments do to reduce obesity? Both developed and developing countries have tried different measures, such as educating the population and promoting healthy foods through **price incentives**. We wanted to see the impact of higher taxes on highly processed foods: would the taxes decrease obesity prevalence?

Group 1: Unprocessed food

Group 2: Processed culinary ingredients

Group 3: Processed foods

Group 4: Highly-processed foods

Methods

To find the answer to our question:

- We classified food products into four groups according to the level of processing. Group 1 is unprocessed food and Group 4 is highly processed food (Table 1).
- We used their **import tariffs** (available from a trading database) to evaluate the price difference between two categories of foods: highly processed (Group 4) and less processed food products (Groups 1 to 3).
- We categorized nearly 900 food items from this database into the four groups.

Our main hypothesis is that the difference in prices between highly processed and healthier products changes people's food choices. This then affects the prevalence of obesity and **underweight**. To better define the effect of tariffs on obesity prevalence we accounted for several other factors including:

- **Income per capita** (with lower income, people buy less and cheaper products)
- Percentage of population living in urban areas (people living in cities have better access to group 4 foods)
- Percentage of women working outside the home (this often results in less time for preparing meals, since in many cultures men don't participate in meal preparation)
- Percentage of people aged 65 and above (their physical activity is less)

We were able to gather data for 101 countries and categorized them by income (Table 2). In our analysis, we also checked if their location (e.g. being in Sub-Saharan Africa) mattered for the results.

Table 1:
Classification of food according to processing levels.

Food category	Definition
Group 1	**unprocessed or minimally processed foods** – edible parts of plants, such as fresh or frozen fruits and vegetables, or of animals (eggs, meat, milk), cereal flour
Group 2	**processed culinary ingredients** – Group 1 foods undergo physical or chemical processing (pressing, drying, etc). *Examples: honey, sugar extracted from cane, salt, oil*
Group 3	**processed foods** – one or very few Group 2 ingredients (e.g. salt) are added to a group 1 product (e.g. nuts). *Examples: salted nuts, cheese, fresh bread, canned vegetables*
Group 4	**highly processed foods** – many ingredients; usually contain added sugar, salt, additives, colors; often is pre-prepared or ready-to-eat. *Examples: soft drinks, instant noodles, chips, pre-prepared dishes, sausages, breakfast "cereals," "fruit" yogurt*

Table 2:
Countries included in our analysis, by income group.

Income group	Countries
Low income	Benin, Burkina Faso, Burundi, Central African Republic, Gambia, Guinea-Bissau, Haiti, Madagascar, Mali, Niger, Nepal, Senegal, Togo, Uganda, Tanzania
Lower middle income	Armenia, Bangladesh, Bolivia, Cabo Verde, Cameroon, Cote d'Ivoire, Egypt, El Salvador, Georgia, Guatemala, Honduras, India, Indonesia, Jordan, Kenya, Kyrgyzstan, Nicaragua, Pakistan, Philippines, Moldova, Ukraine, Zambia
Upper middle income	Albania, Argentina, Belize, Bosnia and Herzegovina, Botswana, Brazil, Bulgaria, Colombia, Costa Rica, Croatia, Cuba, Fiji, Gabon, Guyana, Malaysia, Mauritius, Mexico, Namibia, Panama, Paraguay, Russia, North Macedonia, South Africa, Venezuela
High income	Australia, Austria, Bahrain, Belgium, Canada, Chile, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Kuwait, Latvia, Lithuania, Luxembourg, Malta, Netherlands, New Zealand, Norway, Poland, Portugal, Qatar, Republic of Korea, Singapore, Slovakia, Slovenia, Spain, Sweden, Switzerland, United Kingdom, United States of America, Uruguay

Results

1. Which factors affect obesity prevalence? Our results show that obesity rates are higher when:

- Income per capita is higher. But once people are wealthy enough, additional income decreases obesity rates.
- The percentage of people living in urban areas is high.
- The percentage of women working outside the home is high.
- The percentage of people aged 65 and above is high.

2. Does the price difference between healthier and highly processed foods have an impact on obesity as well?

The results depend on the countries' state of development (as shown in Table 2):

- For most non-sub-Saharan African countries we couldn't determine a consistent effect of additional taxes on highly processed foods on obesity prevalence apart from in lower-middle-income countries.
- In upper-middle-income sub-Saharan African countries the higher the taxes on highly processed foods are, the lower the obesity prevalence.
- In low-income sub-Saharan African countries, an increased price difference would reduce obesity rates.

3. What about underweight?

- In poorer countries, an increase in income reduces underweight prevalence.
- So does a higher percentage of people living in urban areas.
- Also, a higher percentage of elderly people is associated with a higher prevalence of underweight.

4. Would an increase in the price difference between healthier and highly processed foods have an impact on underweight rates?

- It would decrease underweight prevalence in low-income non-sub-Saharan African countries.
- By contrast, in sub-Saharan Africa, it would increase underweight prevalence in lower-middle-income countries and upper-middle-income countries.

Discussion

Our results indicate that an increase in taxes on highly processed foods, and thus the price difference between healthier and highly processed foods, could be an effective method to reduce obesity. In upper-middle-income sub-Saharan African countries if this price difference increases by just one percentage point, the obesity rates would reduce by 0.2 percentage points. For example, if South Africa introduces a new tax of 10% on highly processed foods, the number of obese people would reduce by 7% – almost a million people!

Nevertheless, our study also shows that while increasing taxes on highly processed foods decreases obesity in sub-Saharan African countries, at the same time it can increase the prevalence of underweight in the same country. So a more mixed approach, using various measures to reduce obesity, could be a better solution in these areas. For instance, the government could spend the additional money it receives from the tax to support underweight people.

Conclusion

More and more people around the world are obese. But what can we do? We were able to show that obesity is linked to highly processed foods and that increasing prices of highly processed foods decreases obesity prevalence. Therefore, governments can influence people's food choices to reduce obesity through careful use of taxes on highly processed foods.

To make healthy choices yourself, awareness about highly processed foods and nutrition is important. While highly processed foods tend to be unhealthy, it is actually the food's ingredients and how it is processed that determines if it is unhealthy. And though highly processed food is handy and can sometimes taste better, always remember that the closer the food is to its natural form, the better it is for your health. You can see some examples of healthy foods in the references.

Glossary of Key Terms

Highly processed foods – food that manufacturers have significantly changed in many processing steps, often adding sugar, salts, additives, colors, etc., and that often is pre-prepared or ready-to-eat. Some examples are candy, soft drinks, chips, and frozen pizza.

Import tariffs – a tax on goods that come from abroad. The main purpose is to protect local industries. Import tariffs differentiate almost 900 food products by various criteria, including the level of processing.

Income per capita – average income earned per person in a country (country's total income divided by the country's population).

Obesity – according to the World Health Organization, obesity is an abnormal or excessive fat accumulation that presents a risk to health, e.g., risk of heart disease, cancer, and diabetes.

Prevalence – the number of cases of a disease (e.g. obese people) in a particular population (e.g. country) at a given time.

Price incentive – when the price of a product is increased or decreased, it changes a consumer's willingness to buy it. An example is a tax on a product's sales price. The tax increases the consumer's price and when faced with a higher price, people tend to consume less of this product.

Saturation (market) – the market (e.g. soft drinks) can't grow any further – there are no more possible customers.

Underweight – often a sign of undernutrition, i.e. an insufficient intake of energy and important minerals and vitamins from food. For children, undernutrition can result, for example, in stunting (low height for age), wasting (low weight for height), or underweight (low weight for age).

Check your understanding

1. Looking at the table categorizing foods by the level of processing, how would you categorize these products: frozen pizza, apples, canned apples in syrup, and apple vinegar?
2. Why are both overweight and underweight problems occurring at the same time in poorer countries?
3. Why can increasing taxes on highly processed foods lead to higher underweight rates in some cases?
4. Is your country listed in Table 2? If so, based on our analysis, what impact would a tax on highly processed foods have there?
5. Plan a healthy meal that your family could share one evening. Be sure to include some vegetables and a source of protein. Consider your family's schedule. How much time will you have to prepare the meal? What ingredients will your family need to buy? What tasks can each person do in order to help with the meal preparation?

REFERENCES

Ole Boysen, Kirsten Boysen-Urban, Harvey Bradford, Jean Balié (2019). *Taxing highly processed foods: What would be the impacts on obesity and underweight in sub-Saharan Africa*? World Development.
https://www.sciencedirect.com/science/article/pii/S0305750X19300506

Carlos Augusto Monteiro, Geoffrey Cannon, Mark Lawrence, Maria Laura da Costa Louzada, and Priscila Pereira Machado (2019) *Ultra-processed foods, diet quality, and health using the NOVA classification system*. Food and Agriculture Organization of the United Nations.
http://www.fao.org/publications/card/en/c/CA5644EN/

WHO: Obesity and Overweight Fact Sheets
https://www.who.int/en/news-room/fact-sheets/detail/obesity-and-overweight

BBC: Healthy Food for Kids
https://www.bbcgoodfood.com/howto/guide/healthy-food-kids-will-love