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The Pan American Health Organization (PAHO) assessed the impact that eliminating industrially produced trans-fatty acids (TFAs) could have on productivity and mortality in Barbados. The study is the first of its kind in the Caribbean and contributes to the evidence base for the Region of the Americas.

In Barbados the Government has made a policy commitment, and policies to remove industrially produced TFAs from local foods are being developed (1, 2). This study examined the policy action with the greatest potential impact: banning partially hydrogenated oils (PHOs) from the food supply.

The study compared the current consumption of PHOs in Barbados with a counterfactual scenario in which PHOs were completely eliminated from the food supply chain in Barbados.

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**Abbreviations and acronyms**

- **CVD**: cardiovascular disease
- **PAHO**: Pan American Health Organization
- **PHO**: partially hydrogenated oil
- **TFA**: trans-fatty acid
- **TFAMM**: Trans-Fatty Acid Macrosimulation Model
- **UI**: uncertainty interval
- **VSL**: value of a statistical life
This paper considers the economic impact of a ban on the production and use of PHOs as an ingredient in all foods in Barbados (both imported and local). The economic impact considered productivity gains associated with the deaths averted or postponed, as well as other savings from mortality reduction occurring outside the labour force.

The health impact of a national ban on the production or use of PHOs as an ingredient in all foods was calculated using the Trans-Fatty Acid Macrosimulation Model (TFAMM), which was developed and applied to estimate the impact of different TFA elimination policies in Brazil (3). The TFAMM uses a comparative risk assessment framework, whereby it provides estimates of the potential reduction in cardiovascular disease (CVD)-related mortality (coronary heart disease and stroke) if TFA intake in the diet is reduced. The methodological aspects of the TFAMM are described in Nilson et al. (3).

Only one scenario was examined in this study: the elimination of PHOs from the food supply chain by a national ban on the production or use of PHOs as an ingredient in all foods (3). This was done to model the effect of legislation banning the consumption of PHOs, since PHOs and partially hydrogenated fats are generally considered the primary source of industrially produced TFAs in the diet (4). Two assumptions were made: (1) PHOs will be replaced with monounsaturated and polyunsaturated fats, and (2) PHOs are consumed in foods prepared in the household, in packaged food products and in food from establishments outside the home (3, 5). The latter assumption is based in part on the increased consumption of ultra-processed food in Barbados and the more frequent consumption of food away from the home (5).

Population data for 2019 were obtained from the Barbados Statistical Service. The average energy content of the population's diet and coronary heart disease-related mortality in the adult population were obtained from the Global Burden of Disease study 2019 (6, 7).

The human capital approach was used to determine the potential productivity losses that the economy could have averted. The analysis focused on those in formal employment, i.e., in the labour force and aged 15–64. To obtain a measure of worker productivity, the economic output (gross domestic product) of each full-time worker in the formal economy in Barbados was used.

To address the broader economic impact beyond productivity losses, the value of a statistical life (VSL) was used. VSL puts a value on mortality and captures the total welfare loss resulting from premature mortality, beyond labour force and productivity losses. The VSL is usually calculated from empirical research on revealed preferences derived from labour market and product market studies and stated preference studies (8). In this analysis, as in Viscusi and Masterman (9), an elasticity value of 1 was used and this yielded a VSL of USD 2 567 587.03 for Barbados in 2019.
Results

There were approximately nine CVD-related deaths (8.92; 95% uncertainty interval [UI] 7.02–10.77) associated with the absence of a policy banning PHOs from the food supply, and the estimated productivity losses incurred for 2019 were USD 43 042.05 (95% UI USD 33 620.89–52 204.28). Even with this modest reduction in mortality, a national ban on the production or use of PHOs as an ingredient in all foods in 2019 would have prevented USD 546 246.13 (95% UI USD 426 590.38–663 675.22) in future productivity losses (Table 1).

Table 1. Present value of productivity losses associated with the absence of a mandatory national policy banning partially hydrogenated oils (PHOs) from the food supply

<table>
<thead>
<tr>
<th>Age group</th>
<th>Productivity losses due to cardiovascular disease (USD)</th>
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<tbody>
<tr>
<td></td>
<td>Mean (95% UI)</td>
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<tr>
<td>25–29</td>
<td>14 702.90 (11 530.17–17 870.63)</td>
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<tr>
<td>30–34</td>
<td>28 491.93 (22 268.22–34 523.18)</td>
</tr>
<tr>
<td>35–39</td>
<td>40 580.77 (32 108.27–49 088.97)</td>
</tr>
<tr>
<td>40–44</td>
<td>66 407.21 (52 213.88–80 327.33)</td>
</tr>
<tr>
<td>45–49</td>
<td>101 479.50 (78 970.90–123 755.90)</td>
</tr>
<tr>
<td>50–54</td>
<td>118 788.95 (92 273.90–145 056.01)</td>
</tr>
<tr>
<td>55–59</td>
<td>106 340.81 (83 018.44–128 888.46)</td>
</tr>
<tr>
<td>60–64</td>
<td>69 454.06 (54 206.61–84 164.73)</td>
</tr>
<tr>
<td>Total for ages 25–64</td>
<td>546 246.13 (426 590.38–663 675.22)</td>
</tr>
</tbody>
</table>

Considering all deaths, beyond those at labour age, using the VSL for Barbados, the monetized mortality loss is USD 22 898 651.27 (95% UI USD 18 033 115.17–27 651 232.87) in 2019, which is equivalent to 0.4% of the country’s gross domestic product for that year.
Conclusions

This is the first study to conduct an economic evaluation of the implementation of best practice policies for the elimination of industrially produced TFAs in the Caribbean. Although an underestimation of the likely effects, this study’s usefulness lies in providing an indication of the minimum cost savings that could be gained from this policy action to improve the populations’ health.

In the context of the rising tide of noncommunicable diseases in Barbados and the accompanying morbidity and mortality, this study’s results, taken in tandem with the rising costs of treatment and care, indicate that the economic costs of noncommunicable diseases are too high and are unsustainable. Policy action must be taken to protect public health and the country’s development.
References


