Linking obesity and the Sustainable Development Goals: A new model for projecting BMI-related premature mortality from non-communicable diseases

Teddy Sun[1], Thomas Hilberg Rahbek[1], Ole Kjerkegaard Nielsen[1], Mette Bøgelund[2], Laurie Twells[3], Altynai Satylganova[1], Niels Lund[1], Stephen Charles Gough[1]

1 Novo Nordisk A/S, Denmark
2 Incentive, Denmark
3 Memorial University of Newfoundland, Canada

PO2.054

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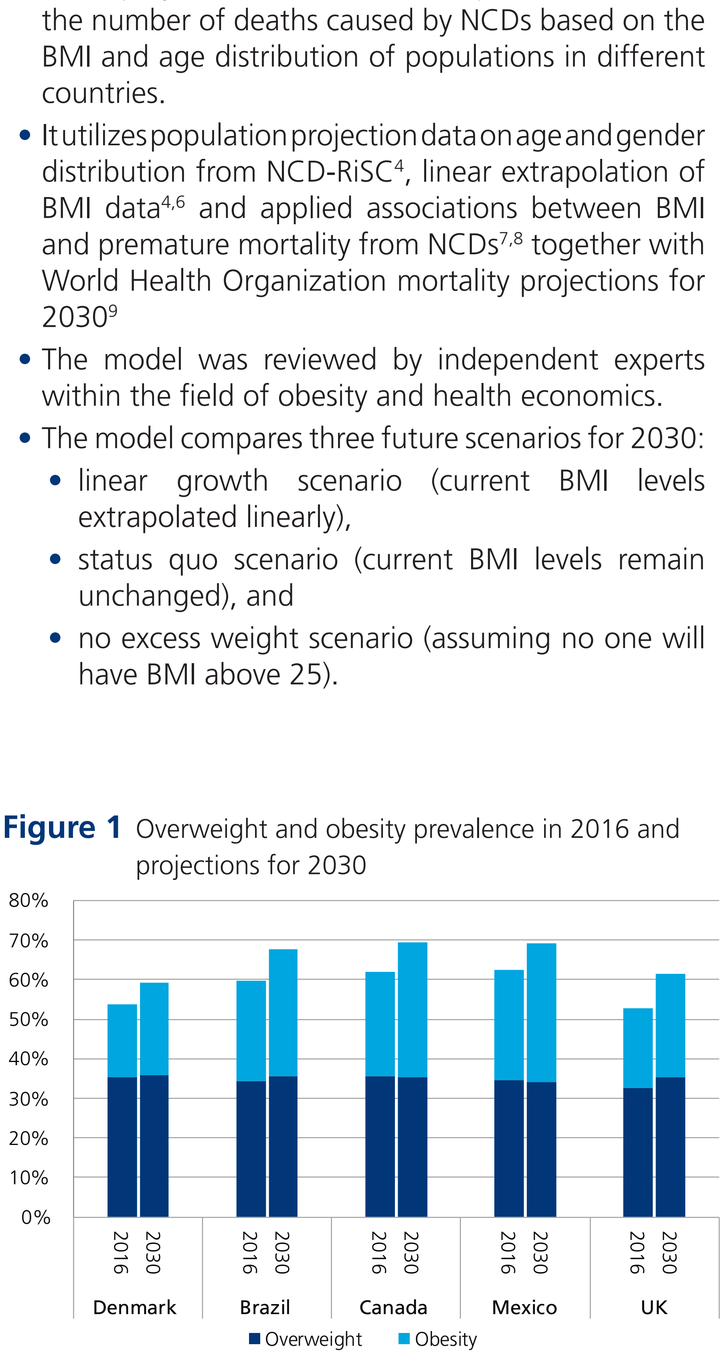
Introduction

- Obesity is a major contributor to premature mortality from the four major noncommunicable diseases (NCDs), namely cardiovascular disease, cancer, chronic respiratory disease, and diabetes.[1]
- Globally, NCDs account for 41 million deaths annually and 15 million of these are premature (between 30-70 years).[2] Furthermore, according to data from the Global Burden of Disease study, high BMI directly accounted for 4 million deaths in 2015.[1]
- In addition, NCDs pose substantial risk to the sustainability of economies, societies and human health.
- Increasing rates of obesity is a threat to the achievement of the UN Global Goals.
- The achievement of the 'Sustainable Development Goal (SDG) Target 3.4' of reducing premature mortality from NCDs by one third by 2030 requires intensified reduction in rates of obesity.[3]
- The aim of this study was to illustrate the projected impact of high BMI on NCD-related premature mortality in 2030 in five high-income and upper-middle-income countries.

Methods

- A BMI projection model was developed that estimates the number of deaths caused by NCDs based on the BMI and age distribution of populations in different countries.
- It utilizes population projection data on age and gender distribution from NCD-RiSC[4], linear extrapolation of BMI data[4,6] and applied associations between BMI and premature mortality from NCDs[7,8] together with World Health Organization mortality projections for 2030[9]
- The model was reviewed by independent experts within the field of obesity and health economics.
- The model compares three future scenarios for 2030:
  - linear growth scenario (current BMI levels extrapolated linearly),
  - status quo scenario (current BMI levels remain unchanged), and
  - no excess weight scenario (assuming no one will have BMI above 25).

Figure 1 Overweight and obesity prevalence in 2016 and projections for 2030



Displays the development between 2016-2030 for overweight and obesity for the five selected countries based on a linear projection.

Results

- The linear projection shows how a continuation of past trends would lead to an increasing number of people living with higher BMI in all five countries (figure 1).
- The key results show the difference in premature mortality based on the three BMI scenarios for 2030. The two reduction scenarios showed a substantial decrease in premature mortality by NCD.
- Keeping BMI levels at current levels compared to a linear projection would give an estimated decrease between 5-7% of premature mortality.
- The scenario in which no one will have overweight or obesity would result in between 25-31% reduction in mortality (figure 2).
- Compared to the linear growth scenario, application of the status quo scenario resulted in the following decrease in premature NCD-related deaths by 2030: 5% decrease in Brazil, Denmark, and Mexico, 6% in Canada, and 7% in United Kingdom (figure 2).

Table 1 Premature mortality in 2030 for all scenarios

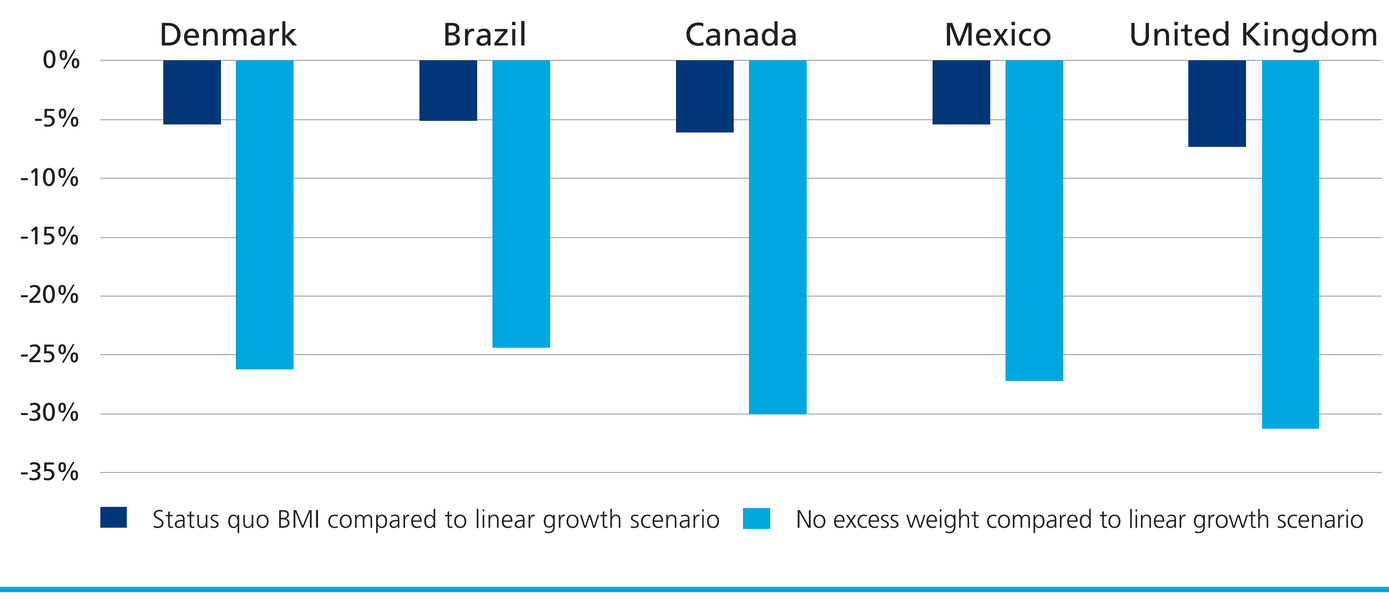
	Denmark	Brazil	Canada	Mexico	UK
Linear growth	11,220	347,316	67,760	205,256	127,645
Status Quo	10,609	329,267	63,617	194,100	118,234
No Excess	8,259	261,294	47,214	156,096	87,552

Number of estimated premature deaths from NCDs in the three scenarios for all five countries.

- In contrast, if there is no overweight or obesity by 2030 (no excess weight scenario) premature mortality will decrease by 25% in Brazil, 26% in Denmark, 28% in Mexico, 30% in Canada, and 31% in United Kingdom (figure 2).
- The number of deaths that could be avoided if there is no overweight or obesity is between 2.691 - 86.022 in the lowest and highest estimates for the five countries (table 1).

Key results

Figure 2 Estimated reduction in premature NCD-related deaths by 2030 depending on BMI scenario



- Excess weight related premature mortality from NCDs are a substantial challenge threatening the achievement of SDG target 3.4 of a third reduction with two countries having over 30% deaths related to overweight and obesity.

Discussion

- Addressing obesity holds great potential for tackling pre-mature mortality as per SDG target 3.4. The estimated reductions in five selected countries show that even keeping BMI at a steady state will result in fewer deaths compared to a continuation of past trends.
- The results show the magnitude of obesity's impact on population health. The consequences of not taking actions are not sustainable with implications for both human, social and economic costs.

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Conclusion

- This study provides important evidence on the extent to which excess BMI impacts the premature mortality from NCDs in selected countries.
- Addressing the growing burden of obesity is critical to achievement of the SDG 3.4 and requires timely and evidence-based measures to halt the growing rates among the population and treatment of those living with obesity.

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