

INVESTIGATING THE HEALTH RISK-BENEFIT BALANCE OF TRANSITIONING TO A SUSTAINABLE DIETS IN THE DANISH ADULT POPULATION

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INTRODUCTION

Countries are updating dietary guidelines to include sustainable food patterns. Few studies provide evidence on the health impact of a population's change from current to sustainable dietary patterns. In addition, the food safety implications of such a transition have yet to be investigated. The aim of our study was to evaluate the risk-benefit balance in terms of DALY of transition to a sustainable diet in Denmark, taking dietary factors and exposure to chemical contaminants into account in the estimation.

METHODOLOGY

We assessed published studies to identify intakes of food complying with various sustainability indicators. For identified food groups, we selected the health effects with at least a probable association between food and disease. We identified chemical contaminants relevant for each food group and their associated adverse effects. Contaminants were selected if a change in exposure from the current to the sustainable intake was expected. For dietary factors, a comparative risk assessment approach was applied for estimating the changes in incidences due to changes in intake from the current to the sustainable food, by combining relative risk functions with population intake assessment. For the chemical contaminants, quantitative chemical risk assessments were applied, combining dose response relations with exposure assessments to generate disease incidences at current and sustainable intake levels. Changes in DALYs due to the transition were derived by means of the total DALY for included health effects from the Global Burden of Disease project. Intake data was obtained from The Danish National Survey on Diet and Physical Activity and Danish concentration data on contaminants.

RESULTS

As a sustainable diet scenario for the Danish population, we selected a model based on the EAT Lancet Planetary health diet, but adjusted for current Danish dietary patterns. We

included nine food groups and, based on grading of evidence, we included the following diseases across food groups: type II diabetes, coronary heart disease, colorectal cancer, stroke and hypertension. We accounted for the exposure to inorganic arsenic, methyl mercury, lead, cadmium, aflatoxin and lectins across the food groups, and the associated health effects: lung, bladder, skin and liver cancer, chronic kidney disease, coronary heart disease and neurodevelopmental toxicity (loss of IQ). For the Danish population, we estimated a mean change in intake from the current to the sustainable diet scenario of 100 %, 36 %, 58 %, -26 %, -70 %, 32 %, 3900 %, 667 % and -55 % for cereals, vegetables, fruits, dairy, red meat, fish, pulses, nuts and added sugar, respectively. Final estimates are currently being prepared on the change in chemical exposures and the overall DALY difference between current and sustainable diets accounting for all included health effects.

DISCUSSION

To our knowledge, this is the first study to quantitatively assess the risk-benefit balance of a transition from current diets to a sustainable diet, covering both the nutritional and sustainability aspects as well as food safety. As a sustainable diet, we defined a scenario based on the EAT Lancet diet but adjusted to current Danish dietary patterns. A sustainable diet can be formulated in various other ways, taking into account different indicators or reflecting different dietary patterns. However, the models developed in the project can be adapted to any definition of sustainable diets applied in other national or regional settings. We argue that the quantitative evidence generated from our study provides decision-makers with information on the trade-offs involved in the transition to a sustainably healthy diet. The quantitative assessment of the health impact provides the basis for including other indicators of public health burdens, e.g. cost of illness estimates, thus enabling the development of guidelines and interventions based on holistic scientific evidence.