Dietary quality, undernutrition and disease: global patterns and trends over three decades

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Introduction

Agricultural production, commodity marketing and food consumption patterns have changed significantly over the past 30 years the world over, as have national epidemiological profiles. Many countries are now experiencing epidemics of non-communicable diseases (NCDs), while some simultaneously still have large burdens of childhood undernutrition.

Recent studies[1] have found evidence of an increasing polarisation between healthy and unhealthy diets, with many high income countries having diets that are becoming more healthy, while in lower income countries diets are becoming more unhealthy. However, little is known about how the changing availability of different kinds of foods at a national level may be related to both undernutrition and NCDs.

Methods

Combining data for 124 countries over the period 1980-2009, we explored relationships between national-level food availability and nutrition and health outcomes. Child stunting and mortality from ischaemic heart disease (IHD) were the primary health and nutrition outcomes. Relationships were modelled using random effects models, adjusting for time and measures of development.

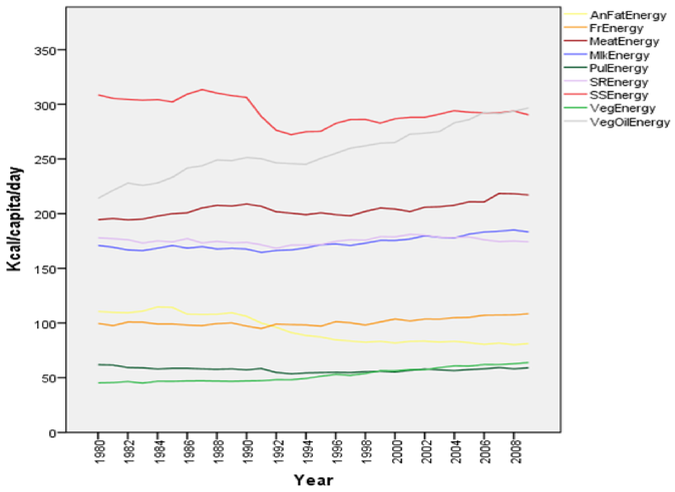

Fig. 1 Changing food availability 1980-2009 (non-staples)

Results

Over the 30 years studied, availability of most food groups increased (Fig1), particularly vegetables, vegetable oils and meat. Availability of animal fats and sugar reduced.

An increase in total dietary energy availability over the study period of 100kcal was associated with a 0.15% reduction in child stunting (Fig 2). However, the same increase in energy availability was associated with an increase in IHD mortality of 0.05 deaths per 1000 population (Fig 3).

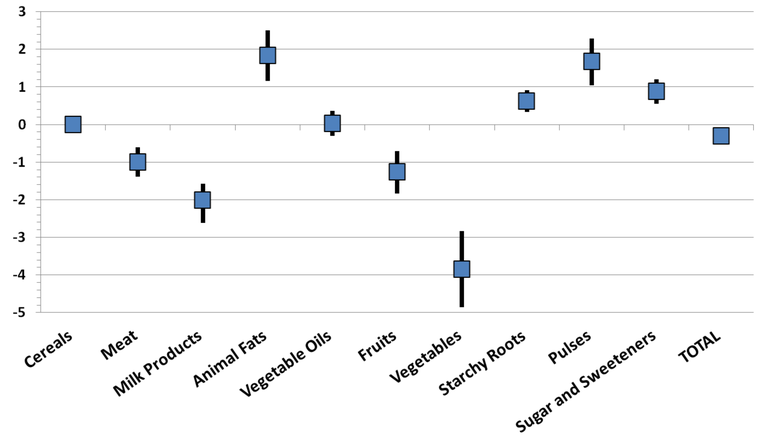

Fig. 2 Dietary quality (100kcal increase) and change in % children stunted

The proportion of total dietary energy provided by different food groups was also important. Increased energy availability from fruit, vegetables, meat and milk products was associated with a lower prevalence of child stunting (Fig 2), such that a 100kcal increase in vegetable availability was associated with a 4% reduction in stunting.

Increased availability of energy from fruit was also related to lower mortality from IHD (Fig 3) – a 100kcal increase in fruit availability was associated with a reduction in mortality of 0.4 deaths per 1000 population, or roughly 28,000 deaths averted per year in a country with a population the size of the UK. By contrast, the availability of energy from meat, dairy products and vegetable oils was associated with higher levels of mortality from IHD.

We also found that some measures of development were associated with the health outcomes: increased national income was related to a decrease in both stunting and IHD mortality, while urbanisation was associated with a reduction in stunting but an increase in IHD mortality.

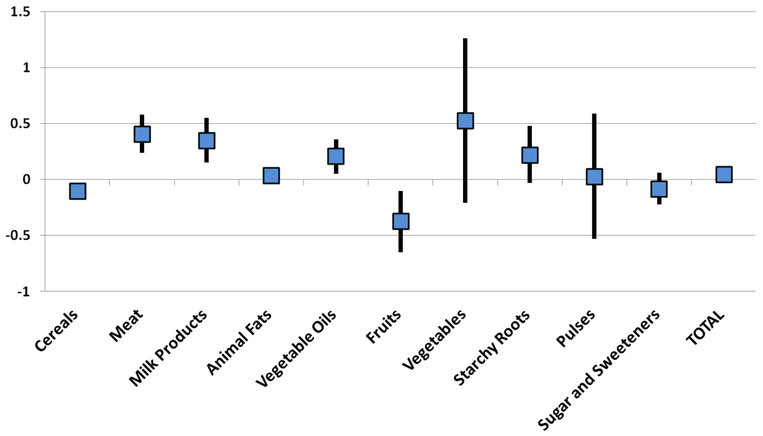

Fig. 3 Dietary quality (100kcal increase) and change in IHD mortality rate

Conclusions

- Not just the quantity but also the quality of diets is essential in tackling both undernutrition and NCDs.
- Availability of some foods (fruits in particular) is associated with reductions in both undernutrition and chronic disease. However, increased diversity in the diet can be associated with more IHD as well as reduced stunting.
- 'Diversity' as a measure of diet quality may be too simplistic – diets should contain nutrient-rich foods as well as staples but not too much of certain foods (meat, milk products, oils)
- This study is the first to bring together all these datasets to look at diet, measures of development and health outcomes, but still it is only an ecological picture.

References

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