



Food and Agriculture  
Organization of the  
United Nations



**cirad**  
AGRICULTURAL RESEARCH  
FOR DEVELOPMENT

# FOOD SYSTEMS AT RISK

## NEW TRENDS AND CHALLENGES





# FOOD SYSTEMS AT RISK

## NEW TRENDS AND CHALLENGES

Sandrine Dury,  
Pauline Bendjebbar,  
Étienne Hainzelin,  
Thierry Giordano  
and Nicolas Bricas (Eds)

Published by  
the Food and Agriculture Organization of the United Nations  
and  
Le Centre de Coopération Internationale en Recherche Agronomique pour le Développement  
and  
the European Commission  
Rome, 2019

Citation:

Dury, S., Bendjebbar, P., Hainzelin, E., Giordano, T. and Bricas, N., eds. 2019. *Food Systems at risk: new trends and challenges*. Rome, Montpellier, Brussels, FAO, CIRAD and European Commission. DOI: 10.19182/agritrop/00080

The designations employed and the presentation of material in this information product do not imply the expression of any opinion whatsoever on the part of the Food and Agriculture Organization of the United Nations (FAO), the Centre de coopération internationale en recherche agronomique pour le développement (CIRAD) or the European Commission (EC) concerning the legal or development status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries. The mention of specific companies or products of manufacturers, whether or not these have been patented, does not imply that these have been endorsed or recommended by CIRAD, FAO or EC in preference to others of a similar nature that are not mentioned.

The views expressed in this information product are those of the author(s) and do not necessarily reflect the views or policies of CIRAD, FAO or EC.

ISBN 978-2-87614-751-5 (CIRAD)

ISBN 978-92-5-131732-7 (FAO)

© FAO, 2019



Some rights reserved. This work is made available under the Creative Commons Attribution-NonCommercial-ShareAlike 3.0 IGO licence (CC BY-NC-SA 3.0 IGO; <https://creativecommons.org/licenses/by-nc-sa/3.0/igo/legalcode>).

Under the terms of this licence, this work may be copied, redistributed and adapted for non-commercial purposes, provided that the work is appropriately cited. In any use of this work, there should be no suggestion that FAO endorses any specific organisation, products or services. The use of the FAO logo is not permitted. If the work is adapted, then it must be licensed under the same or equivalent Creative Commons licence. If a translation of this work is created, it must include the following disclaimer along with the required citation: "This translation was not created by the Food and Agriculture Organization of the United Nations (FAO). FAO is not responsible for the content or accuracy of this translation. The original English edition shall be the authoritative edition."

Disputes arising under the licence that cannot be settled amicably will be resolved by mediation and arbitration as described in Article 8 of the licence except as otherwise provided herein. The applicable mediation rules will be the mediation rules of the World Intellectual Property Organization <http://www.wipo.int/amc/en/mediation/rules> and any arbitration will be in accordance with the Arbitration Rules of the United Nations Commission on International Trade Law (UNCITRAL).

Third-party materials. Users wishing to reuse material from this work that is attributed to a third party, such as tables, figures or images, are responsible for determining whether permission is needed for that reuse and for obtaining permission from the copyright holder. The risk of claims resulting from infringement of any third party-owned component in the work rests solely with the user.

Sales, rights and licensing. FAO information products are available on the FAO website ([www.fao.org/publications](http://www.fao.org/publications)) and can be purchased through [publications-sales@fao.org](mailto:publications-sales@fao.org). Requests for commercial use should be submitted via: [www.fao.org/contact-us/licence-request](http://www.fao.org/contact-us/licence-request). Queries regarding rights and licensing should be submitted to: [copyright@fao.org](mailto:copyright@fao.org)

## CHAPTER 5.4

## NUTRITIONAL RISKS OF UNHEALTHY DIETS

Sandrine Dury<sup>1</sup> and Yves Martin-Prével<sup>2</sup>

## SUMMARY

Currently, one in three people in the world is affected by at least one type of malnutrition and, if no action is rapidly taken, this could become one in two by 2025. Different types of malnutrition coexist in almost every country, causing severe consequences in terms of human health and economic losses: 45 percent of the mortality in under-five children is linked to undernutrition and globally malnutrition in all its forms costs US\$ 3.5 trillion per year. Inadequate diets are a major cause of malnutrition and access to healthy diets for all would save 11 million lives per year.

**Malnutrition in all its forms: current situation is alarming**

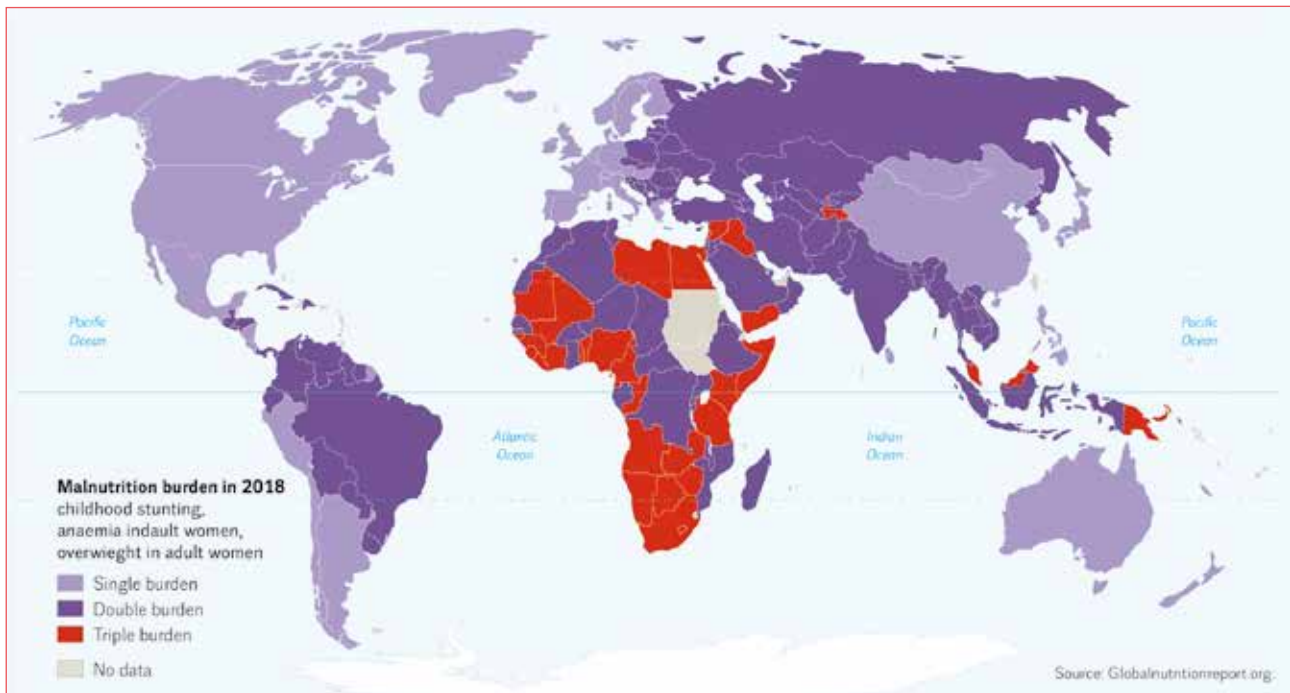
Currently, one in three people in the world is affected by at least one type of malnutrition and, if no action is rapidly taken, this could become one in two by 2025 (Glopan, 2016). Malnutrition is a multifaceted, truly universal problem. The number of undernourished people has again been growing since 2015 and has now reached 820 million people (FAO *et al.*, 2018). There are also 151 million under-five children whose stunted growth compromises the achievement of their full physical, intellectual and health potential and 51 million whose life is threatened by wasting. Anaemia in women is on the increase at the global scale (FAO *et al.*, 2018); more than 500 million women of reproductive age suffered with anaemia in 2011 (Stevens *et al.*, 2013). In addition, around 2 billion people suffer from micronutrient deficiencies. Simultaneously, around 2 billion adults are overweight, among which 670 million are obese. The world obesity epidemic continues to grow and to date no country has reversed this trend (Roberto *et al.*, 2015). Overweight even starts at a young age as 38 million under-five children are overweight. This category of malnutrition contributes to the rise in non-communicable diseases (NCD) such as type 2 diabetes, hypertension, heart disease, strokes and some cancers.

While every country in the world faces at least one serious form of malnutrition, most countries face several nutritional challenges. The coexistence of persisting undernutrition and growing obesity and diet-related chronic diseases is a consequence of a rapid nutrition transition occurring in Low-Income (LI) and Lower Middle-Income (LMI) countries, leading to a double burden that is a complex issue to tackle for under-equipped national health systems. There is even a triple burden in many countries, with deficiencies in some essential micronutrients added to the mix (*cf.* Map 11). Of the 141 countries with consistent data on three forms of malnutrition - childhood stunting, anaemia in women of reproductive age and overweight among women - 88 percent experience a high level of at least two types of malnutrition, with 29 percent experiencing high levels of all three. Most of these countries are in Africa. Coexisting burdens bear down on millions of children, with 16 million children affected by both wasting and stunting, which increases the risk of child mortality, and 8 million children are affected by stunting and overweight (Development Initiatives, 2018).

There has been some progress in reducing malnutrition, but it has been too slow and not spread across all its forms meaning that projections for the next 20 years are threatening. The prevalence of overweight, obesity and diet-related NCD such as diabetes are increasing in all regions and most rapidly in LI and

1. CIRAD, UMR MOISA, F-34398 Montpellier, France; University of Montpellier, F-34090 Montpellier, France.

2. IRD, UMR Nutripass, F-34394 Montpellier, France; University of Montpellier, F-34090 Montpellier, France.



**Map 11:** Malnutrition burden across countries.  
Data source: Development Initiative, 2018 Globalnutritionreport.org.

LMI countries. For example, for sub-Saharan African men, the growth rate of overweight and obesity now exceeds that for underweight and projections of these indicators suggest the situation is going to get much worse by 2030 (NCD-RisC, 2016). In 2017, there were 425 million adults with diabetes in the world, four in five living in LI and LMI countries. The projection is that 630 million adults in the world will be affected by diabetes by 2045 (IDF, 2017). Obesity contributes to an increase in chronic NCD, including diabetes and hypertension, which is why the World Health Organization is calling on countries to phase out artificial trans fats by 2023<sup>3</sup>.

### Consequences of malnutrition are huge

The consequences of undernutrition are severe as it is linked to 45 percent of the mortality in children under the age of five (Black *et al.*, 2013). In addition to affecting survival, undernutrition in childhood affects growth, development, health and educational and economic outcomes. It has lasting effects on following generations, hampering the human capital of countries and is a risk factor for overweight and NCD in later life (Branca *et al.*, 2019).

NCD were responsible for 41 million deaths (71 percent of all deaths) in 2016 (Branca *et al.*, 2019). Approximately 4 million people aged between 20 and

79 died from diabetes in 2017. Diabetes accounted for 11 percent of the global all-cause mortality among people in this age group. This is higher than the combined number of deaths from infectious diseases. In Africa, 77 percent of all deaths due to diabetes occurred before the age of 60 (IDF, 2017).

The economic consequences of undernutrition represent losses in gross domestic product (GDP) ranging from 3 percent to 16 percent in various African countries. Conversely, investment in stunting reduction would generate a benefit-cost ratio of 16:1 across 40 LI and LMI countries (Hoddinott, 2016). Estimates of the economic consequences of nutrition-related NCD are also large. Globally, in 2014 the total economic impact of obesity was about US \$2 trillion (Dobbs *et al.*, 2014).

### Inadequate diets are the major drivers of all forms of malnutrition

All forms of malnutrition have several drivers, including non-food related causes, but inadequate diets are common to all of them. The last global study estimated that a change towards healthy diets would save 11 million deaths per year (Willett *et al.*, 2019).

Food production has benefitted from massive progress and change over the past century. Hunger (insufficient caloric intake) and undernutrition are no

3. *The New York Times*. Page A20 of the New York edition with the headline: Making Trans Fats History. May 14, 2014



longer a problem of supply but a question of uneven distribution at the global or local levels. The average global food supply reached 2,904 kcal/cap/day in 2015-17, compared to 2,196 kcal/cap/day in 1961. Despite this steady rise, progress in universal access to food is still too low: today there are still 820 million people who lack access to the minimum caloric intake needed to maintain a productive life. Most people suffering from undernourishment are the rural poor and live in South-East Asia, although the prevalence of undernourishment remains highest in sub-Saharan Africa.

Simultaneous to progress in food production, LI and LMI countries have witnessed an unprecedented demographic transition, which was at the origin of the speedy nutritional transition in the global South (Popkin, 2006). Economic development, globalisation of trade and urbanisation, along with a decrease in the relative price of many foods, first helped improve access to higher quantities and diversity of food. However, today increased production of processed food, aggressive marketing and changing lifestyles have led to a shift in dietary patterns.

With urbanisation and economic development, demand is growing for more processed and convenient food, street food and fast food. Many people in LI and LMI countries have access to cheap and empty calories, particularly in the form of ultra-processed food, while the availability and affordability of nutrient-rich food is too low. Many processed products contain high levels of added sugar, salt, fat

and other additives that could lead to NCD and death if consumed in large quantities. Taken together, the consumption of both healthy and unhealthy food items increased between 1990 and 2010, but the latter outpaced the former in most regions (Imamura *et al.*, 2015).

Beyond this threatening global picture, local diets and trends vary considerably across countries. For example, the consumption of sugar-sweetened beverages exceeds 400 g/cap/day in Latin America, followed closely by North America. This is in contrast to East Asia, where intakes are ten-fold lower (~40 g/cap/day). In America and Europe, consumption of red meat is excessive in terms of both the health and environmental impact. It is associated with increased risk of type 2 diabetes and coronary heart diseases. At the same time, sub-Saharan African consumers do not eat enough animal-sourced foods (Willett *et al.*, 2019).

These contrasting dietary and malnutrition patterns make it complicated to design simple and universal policies, especially when considering countries that have recently struggled to combat hunger and undernutrition and whose food systems are transitioning. However, there is a renewed and solid consensus for promoting multi-sectoral integrated approaches for transforming food systems, targeting the promotion of healthy food environments, including physical and economic access to healthy food items. ●

## References

- Black, R.E., Victora, C.G., Walker, S.P., Bhutta, Z.A., Christian, P., De Onis, M., Ezzati, M., *et al.* 2013. Maternal and child undernutrition and overweight in low-income and middle-income countries. *The Lancet*, 382(9890): 427–451.
- Branca, F., Lartey, A., Oenema, S., Aguayo, V., Stordalen, G.A., Richardson, R., Arvelo, M & Afshin, A. 2019. Transforming the food system to fight non-communicable diseases. *British Medical Journal*, 364: l296.
- Development Initiatives. 2018. 2018 *Global nutrition report: shining a light to spur action on nutrition*. Bristol, UK, Development Initiatives.
- Dobbs, R., Sawers, C., Thompson, F., Manyika, J., Woetzel, J., Child, P., McKenna, S. & Spatharou, A. 2014. *Overcoming obesity: an initial economic analysis*. Discussion paper. McKinsey Global Institute.
- FAO & WHO. 2018. *The nutrition challenge. Food systems solutions*. Rome, FAO. 12 pp.
- FAO, IFAD, UNICEF, WFP & WHO. 2018. *The State of Food Security and Nutrition in the World 2018: building climate resilience for food security and nutrition*. Rome, FAO. 184 pp.
- Global Panel on Agriculture and Food Systems for Nutrition (Glopan). 2016. *Food systems and diets: facing the challenges of the 21<sup>st</sup> century*. London, UK, Glopan.
- Hoddinott, J. 2016. *The economics of reducing malnutrition in Sub-Saharan Africa*. Global Panel working paper. London, Global Panel on Agriculture and Food Systems for Nutrition.
- International Diabetes Federation (IDF). 2017. *IDF Diabetes Atlas, 8th edition*. Brussels, IDF. (also available at <http://diabetesatlas.org/component/attachments/?task=download&id=254>).
- Imamura, F., Micha, R., Khatibzadeh, S., Fahimi, S., Shi, P., Powles, J., Mozaffarian, D. & Global Burden of Diseases Nutrition and Chronic Diseases Expert Group (NutriCoDE). 2015. Dietary quality among men and women in 187 countries in 1990 and 2010: a systematic assessment. *The Lancet Global Health*, 3(3): e132–e142.
- NCD Risk Factor Collaboration (NCD-RisC). 2016. Trends in adult body-mass index in 200 countries from 1975 to 2014: a pooled analysis of 1698 population-based measurement studies with 19.2 million participants. *The Lancet*, 387(10026): 1377–1396.
- Popkin, B.M. 2006. Global nutrition dynamics: the world is shifting rapidly toward a diet linked with non-communicable diseases. *American Journal of Clinical Nutrition*, 84(2): 289–298.
- Roberto, C.A., Swinburn, B., Hawkes, C., Huang, T.T.K., Costa, S.A., Ashe, M., Zwickler, L., *et al.* 2015. Patchy progress on obesity prevention: emerging examples, entrenched barriers, and new thinking. *The Lancet*, 385(9985): 2400–2409.

Stevens, G.A., Finucane, M.M., De-Regil, L.M., Paciorek, C.J., Flaxman, S.R., Branca, F., Peña-Rosas, J.P., *et al.* 2013. Global, regional, and national trends in haemoglobin concentration and prevalence of total and severe anaemia in children and pregnant and non-pregnant women for 1995-2011: a systematic analysis of population-representative data. *The Lancet Global Health*, 1(1): e16–e25.

Willett, W., Rockström, J., Loken, B., Springmann, M., Lang, T., Vermeulen, S., Garnett, T., *et al.* 2019. Food in the Anthropocene: the EAT–Lancet Commission on healthy diets from sustainable food systems. *The Lancet*, 393(10170): 447–492.