

**‘Addressing the symptoms *and* the cause: Exploring how food systems impact human health and our understandings of those impacts’  
(WORKING TITLE)**

Synthesis of upcoming report from IPES-Food, commissioned by the  
Global Alliance for the Future of Food

Introduction and scope

This report asks the following questions:

- How do food systems impact human health?
- How much do we know about these impacts and how well are these food-health linkages understood?
- What challenges do we face in terms of building a comprehensive understanding of these impacts?
- What are the key leverage points for consolidating the knowledge base on food-health linkages, improving our understanding of the risks generated by food systems, and building healthier food systems?

The report is primarily concerned with the *political economy of evidence*, where food systems intersect with health. It looks at how underlying dynamics and power relations shape the health impacts of those systems, and shape our understandings of those impacts. The report also takes a *public health* perspective to the analysis of food systems, which entails a focus on primary disease prevention, management of chronic conditions, and the general promotion of health. In this context, the report aims to identify how the root causes of harm could be addressed. It therefore emphasizes the need for detecting social, structural, and environmental determinants of health associated with food systems, and interventions that can potentially benefit many people at a time, ensuring and enhancing conditions for population health. . Furthermore, it is hoped that this report can contribute towards a better valuation of the health impacts of food systems and their consideration in policy making. The Economics of Ecosystems and Biodiversity for Agriculture and Food (TEEBAgriFood) project has proposed a valuation framework to estimate the visible and invisible flows of food systems; among the invisible negative flows, health impacts have been recognized as the most difficult to measure.

### Grouping the evidence: 5 key channels of impact

Given its complexity, it is impossible, at any one time, to fully describe the global food system so as to identify all the causal pathways that have negative consequences for health – not least because many of the pathways are indirect, with factors outside the food system also playing an important part (see below - ‘compounding factors’). In this report, the discussion of health impacts in food systems is grouped into five ‘channels of impact’. The chosen categories are mutually exclusive, and framed widely enough to allow all health impacts potentially arising from food systems to fit under one of these categories. However, the analysis in the report is not exhaustive, and is focused on health impacts which: a) appear to be most serious (‘per head’); b) have an impact on large numbers of people; and c) have the strongest associations with the food system.

The goal of this discussion is to allow patterns to emerge in terms of how well food-related health impacts have been documented, studied and understood, with a view to drawing general insights about the food-health nexus, in terms of what underlying factors are shaping the negative health impacts - and our understandings of them. This entails a critical approach to the available evidence, allowing assumptions (e.g. about which impacts are the most serious, about what types of food system practices are likely to generate the greatest health impacts) to be revisited on the basis of the cross-cutting challenges that emerge from the analysis. The five channels of impact are the following:

- a) **Occupational hazards:** Health impacts suffered by farmers, agricultural laborers and other food chain workers as a result of direct exposure to health risks in the field/factory/place of work. *People get sick because they work under unhealthy conditions.*
- b) **Environmental contamination:** Health impacts arising via the exposure of whole populations to contaminated environments ‘downstream’ of food production, including the pollution of soil, air and water resources. *People get sick because of contaminants in the water, soil, or air.*
- c) **Contaminated foods:** Illnesses arising from the ingestion of contaminated foods. *People get sick because they eat certain (contaminated) foods.*
- d) **Unhealthy dietary patterns:** Impacts occurring through consumption of specific foods or groups of foods with problematic health profiles. These impacts affect people directly

through their dietary habits, as shaped by the food environment. *People get sick because they have unhealthy diets.*

e) **Insufficient diets:** Impacts occurring through insufficient access to healthy and culturally acceptable foods and diets. *People get sick because they can't access enough nutritious foods.* The evidence review undertaken on this basis suggests that **food systems contribute significantly to a range of severe health impacts occurring in each of these channels.** The evidence base is generally strong in terms of data availability and the reliability of findings, with food systems practices clearly contributing to and multiplying health risks on multiple fronts. Moreover, many of these impacts across the five channels can be traced back to the same underlying practices and dynamics in industrial food and farming systems (e.g. intensive livestock production, chemical-intensive mono-cropping, heavy processing and the general downward cost pressures of commodity supply chains). Other significant impacts accrue where dangerous practices have been allowed to persist in parts of the world, with countries yet to level up to the standards imposed elsewhere.

Nonetheless, some important evidence and data gaps remain. For example, the evidence base on **occupational hazards** is weakened by under-reporting among relevant populations (e.g. supply chain injuries suffered by migrant workers) and a lack of documentation of mental health impacts (e.g. anxiety and depression among farmers and food workers). When it comes to capturing the impacts of **contaminated foods**, reporting systems often do not differentiate between zoonotic and non-zoonotic origins; detection measures for pathogens vary in their sophistication, and food-borne viruses frequently escape food inspections, making the attribution of the proportion of viral illness to food-borne sources highly complex. Meanwhile, when it comes to health impacts transiting via **environmental contamination**, the knowledge base remains incomplete as a result of highly-specific risk profiles (e.g. for individual chemicals), and fundamental methodological limitations/contestation (e.g. differential toxicity thresholds for air pollution; reliance on animal trials and the lack of a human control population evidence for measuring endocrine disruptor chemicals – EDC - exposure risks).

The review also sheds light on three more fundamental challenges regarding our knowledge and understanding of how food systems generate negative health impacts.

i) Populations without power, problems without visibility: systematic blind spots in the evidence base

Firstly, **what we know about food systems impacts tends to reflect the relative power and visibility of those affected.** For example, some of the reporting disparities on occupational hazards described above may reflect the fact that workers whose status is insecure - a widespread reality in the agriculture and food sectors - are less likely to report abuses or injuries. For all channels of impact, data availability is highly variable across different world regions, with information tending to be less complete for countries in the global South. Many of the most severe impacts, and particularly those leading most often to fatality (e.g. insufficient diets, pesticide poisoning), affect the global South disproportionately. Evidence gaps are particularly large for occupational hazards in developing countries, where, for example, records on pesticide use are incomplete. This undermines the evidence base, given how many of the world's farmers, farm labourers, and food workers are in the global South. Even within wealthy countries, a vicious cycle can be witnessed whereby health conditions accruing to marginalized populations are often poorly documented, researched, and addressed, reinforcing social-health inequalities between groups (e.g. between indigenous and non-indigenous populations). Meanwhile, some knowledge gaps are exacerbated by data withholding by the dominant firms in increasingly consolidated agri-input, machinery processing and food retail sectors. Data gaps lead to evidence problems and political prioritization problems, with the two reinforcing one another. Systematic inequities in food systems translate into systematic blind spots in the evidence base, preventing a full picture of food-health impacts from emerging.

ii) Setting the terms of debate: the ability of powerful actors to shape the evidence and frame the discussion

Secondly, the **general framing of the scientific debate on food-health linkages reflects the differential power of actors to set the terms of discussion.** Like the tobacco and pharmaceutical sectors, the food industry has been found to engage in a range of practices aimed at securing favourable research findings, e.g. sponsoring industry-leaning research projects and studies; employing individual researchers as consultants or inviting them to sit on industry boards in order to signal objectivity and legitimacy; funding professional and academic associations; publically critiquing established evidence and sowing doubt in its validity, often through the use of front groups; and using corporate social responsibility programs as marketing campaigns to shift the focus away from obesogenic diets and onto the importance of active lifestyles (e.g. by sponsoring sporting events). In times of shrinking public research budgets, it has become commonplace for research groups to fall back on private sponsorship to finance their work. Industry-funded research has in a variety of

contexts been found to disproportionately favor outcomes aligned with industry. General industry funding to professional associations has also been alleged to undermine the credibility of the findings published in major journals. Most crucially, interventions by powerful actors help to establish key narratives in food systems (e.g. ‘to tackle hunger we need to increase global food production’), shaping general understandings and setting the frames within which food-related health impacts are understood.

### iii) Contending with complexity: interconnected and mutually-reinforcing problems

Thirdly, **the health impacts in food systems tend to be highly interconnected and mutually-reinforcing**. For the majority of health impacts, including some of the most widespread and most damaging, there are strong associations with food systems practices, but the inter-connectedness of these impacts makes it difficult to isolate specific causal channels or the specific contribution of food systems. For example, antimicrobial resistance is perpetuated by a complex interplay of ecological and genetic factors, spreading through multiple channels (animal handling, water pollution, dust, foods), multiplying the risks through contact between bacteria (forming ‘multidrug resistant bacteria), and accruing through the combined animal and human uses of the same antibiotics. Meanwhile, all diet-related conditions are complex and multifactorial, with the incidence of non-communicable diseases (NCDs) highly contingent on a person’s general health status, and obesity acting as a gateway to a variety of health conditions.

Furthermore, **food systems and their health impacts cannot be looked at in isolation from the other systems in which they are embedded** and with which they overlap. We identify a series of **compounding factors**, which shape and are shaped by food systems, forming vicious cycles that lock negative health outcomes in place. While the question of how precisely food systems interact with these compounding factors is often contested, there is no doubt that these factors are an important piece of the puzzle in terms of how food systems impact health, adding a further challenge/complexity in terms of understanding how and where food-related health impacts originate. Three key compounding factors can be identified:

- **Climate change and environmental degradation.** A whole range of food-related health impacts are transmitted to human populations via environmental contamination (e.g. water and air pollution), or arise at the intersection of industrial-based and agriculture-based environmental contamination (e.g. mercury in fish, endocrine disruptor chemicals in foods or food packages); or stand to be aggravated

by climate change directly (e.g. crop losses, shifting zoonotic risks) or indirectly by affecting land and resource availability (e.g. reduced availability of fertile land driving agriculture into closer proximity to urban developments with contaminated water sources). While climate change is expected to impact food systems with consequent health effects, food systems are also driving climate change through significant contributions to greenhouse-gas (GHG) emissions, e.g. via synthetic fertilizers, livestock raising, deforestation, and trucking and shipping of foods in long supply chains.

- **Public health and sanitation.** Poor underlying hygiene and sanitation conditions tend to facilitate or exacerbate multiple health risks from food systems, such as the spread of food-borne disease throughout the chain and in the home, or pesticide poisoning on-farm. Meanwhile, food systems activities tend to exacerbate the underlying unsanitary conditions, e.g. contamination of water bodies via agricultural run-off, creating powerful feedback loops.
- **Poverty and inequality.** Poverty is a major determinant of health. It is also universally recognized as a key factor in food insecurity, and is generally seen as a crucial contributing factor to poor dietary health, obesity and the associated risks of non-communicable diseases (NCDs). Food systems have perpetuated poverty conditions through precarious employment and low monetary compensation for most of their workers. The vast majority of poor people in the world, anywhere, are engaged in agriculture and other food production and distribution activities.

The negative health impacts of food systems reviewed in the report are multifactorial and at the population level. They are caused by many agents, and often reinforce each other through various mechanisms, transiting through factors like environmental degradation, unsanitary conditions and poverty - which are themselves shaped by food systems activities and impacts. It is thus inappropriate to look for a solitary, unique, and definite cause for these conditions, or to extrapolate that the lack of proof on a causal chain between exposure and disease onset at the individual level negates an established risk factor (“cause”) for the condition at the population level. For disease prevention, we need to identify and determine the importance of specific risk factors (not *the* cause) by the accumulation of evidence from many different studies (epidemiological, animal, in vitro, and others). It is the collective strength, consistency, plausibility, and coherence of these studies that establishes a given agent as a major risk factor in a disease.

In this light, there can be no “scientifically incontestable evidence” in the same way that single-cause diseases can achieve. What we have is the probability of an agent affecting the incidence of a disease in a population. The *precautionary principle* in guiding policy was developed exactly for situations such as these. It requires policy makers to weigh the collective evidence on risk factors for a disease and act, since lack of full scientific certainty cannot be used as an excuse for inaction. However, the inherent uncertainties around food-health impacts open the door for contestation and interpretations of evidence. This means that power can be brought to bear in shaping the evidence base in terms of whether it is perceived to be sufficient for (precautionary) action, and in terms of what problems and what types of solutions are seen to require the most urgent political consideration (see Challenges i and ii).

### Systemic leverage points for change

Evidence has a pivotal role to play in terms of conveying the importance and urgency of critical health problems in food systems, paving the way for issues to move up the political agenda and shaping what solutions (policies and programs) are proposed, adopted, and implemented. However, as the analysis in this report suggests, the way that evidence is currently generated, understood and communicated is failing to spark commensurate policy action. In other words, the collective unhealthiness of food systems is not being sufficiently addressed. However, the solution is not only, or not primarily, about closing specific evidence gaps or regulatory gaps. In light of the challenges identified above, stand-alone piecemeal measures are likely to be ineffective. Rather, solutions for addressing health impacts in food systems must be systemic enough to address not only the question of inter-connected and self-reinforcing impacts in and around food systems, but also the self-reinforcing power relations and systematic disparities in how impacts accrue and are reported. The following are suggested as key leverage points for building increased understandings of the health impacts of food systems, and ultimately for building healthier food systems:

**1. Scientific integrity.** Limiting and countering the ability of vested interests to shape understandings of specific impacts and of food systems more broadly could be a major leverage point for change. This could be achieved through measures to publically fund and mandate independent scientific research and independent journalism on food systems/health, stricter rules on industry-sponsored science, and restrictions on the ability of industry to influence public-priority-setting (e.g. when it comes to developing dietary guidelines).



**2. Scientific literacy and food systems thinking.** Building general scientific literacy around uncertainty, systemic risk and complex (food) systems may be more important than improving understandings of specific types of health impacts. Deeper understanding of sustainability (particularly the inextricability of social and environmental sustainability) could also help to create the conditions for addressing health problems (both through personal actions and by building a supportive base for comprehensive policy actions). It is also crucial to break down the ‘cordon sanitaire’ that keeps specific populations at specific nodes of food systems - and specific health risks accruing to them - out of sight of most consumers. In particular, the systematic recourse to insecure labour at the base of global commodity chains must be brought to light as a basic pillar of our current food systems - and the price to pay for the food we eat. Creating this literacy, awareness and mode of thinking could take the shape of measures to support alliance-building between public health and environmental interest groups/NGOs, new educational approaches in schools and universities, schemes to bridge the gap between producers and consumers, supply chain transparency initiatives, and further efforts to empower people to become agents of personal and planetary health.

**3. Fleshing out the alternatives.** The evidence base on negative health impacts confronts several challenges and complexities, but these impacts have generally been well documented, studied and valued (in terms of human and economic cost). Less is known about the positive health impacts and positive externalities arising from alternative food and farming systems (e.g. organic or agroecological systems). More information in this regard could reinforce the case for a major shift away from current systems with their huge social and environmental fallout. It is not only the health impacts of alternative systems that need to be brought to light, but also their implications in terms of productivity. Building and communicating this knowledge is crucial in order to spell out the implications for health (i.e. via food security/insecurity) and to confront the general narratives about ‘feeding the world’ which tend to ward off genuine consideration of alternatives.