

COMMENTARY ON COVID-19 AND THE FOOD SYSTEM

A global food systems framework for pandemic prevention, response, and recovery

**JAFSCD
Responds to
the COVID-19
Pandemic**



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Abstract

COVID-19 has highlighted the dynamic relationship between pandemic threats and global food systems. Despite important connections, research and policy-making on food systems and pandemics largely operate in silos. We propose a framework that integrates food systems and pandemic planning and response, exploring the role of the food system in shaping pandemics and, consequently, the role of

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pandemics in disrupting a now global food system. This framework highlights important connections between food production, distribution, and consumption at each stage of the pandemic cycle: prevention, response, and recovery. We use recent experiences with COVID-19 to illustrate vulnerabilities in systems interaction during the prevention and response phases. Over the long term, in the recovery phase, food systems must transform, adopting an enhanced level of functioning to improve resilience. To reduce population health risks and promote sustainable food systems, we call for implementation of surveillance systems for both emerging infections and food systems functioning in order to strengthen global food supply chains, create stakeholder resource coordination mechanisms, and address underlying socioeconomic vulnerabilities. Multidisciplinary global actors should draw on lessons from the COVID-19 pandemic to prevent the inevitable next one.

Keywords

Food Systems, Food Security, COVID-19, Pandemic Response, Global Food System

Introduction

COVID-19 has highlighted the dynamic relationship between pandemic threats and global food systems. The emergence of SARS-CoV-2 is not only linked to food markets, but its widespread and facile transmission has also disrupted global food supply and demand (Ivanov, 2020). Despite important connections, research and policy-making on food systems and pandemics largely operate in silos (Chaudhary, Gustafson, & Mathys, 2018). We propose a framework that integrates food systems and pandemic planning and response, exploring the role of the food system in shaping pandemics and, consequently, the role of pandemics in disrupting a now global food system (Figure 1). This framework highlights several important connections between food production, distribution, and consumption at each stage of the pandemic cycle: prevention, response, and recovery. We use recent experiences with COVID-19 to illustrate vulnerabilities in systems interaction during the prevention and response phases. We provide recommendations for the recovery phase, calling on actors at the center of this framework—including national and international government organizations, private industry, and researchers—to integrate these systems to reduce population health risks and ensure sustainable food systems.

Prevention

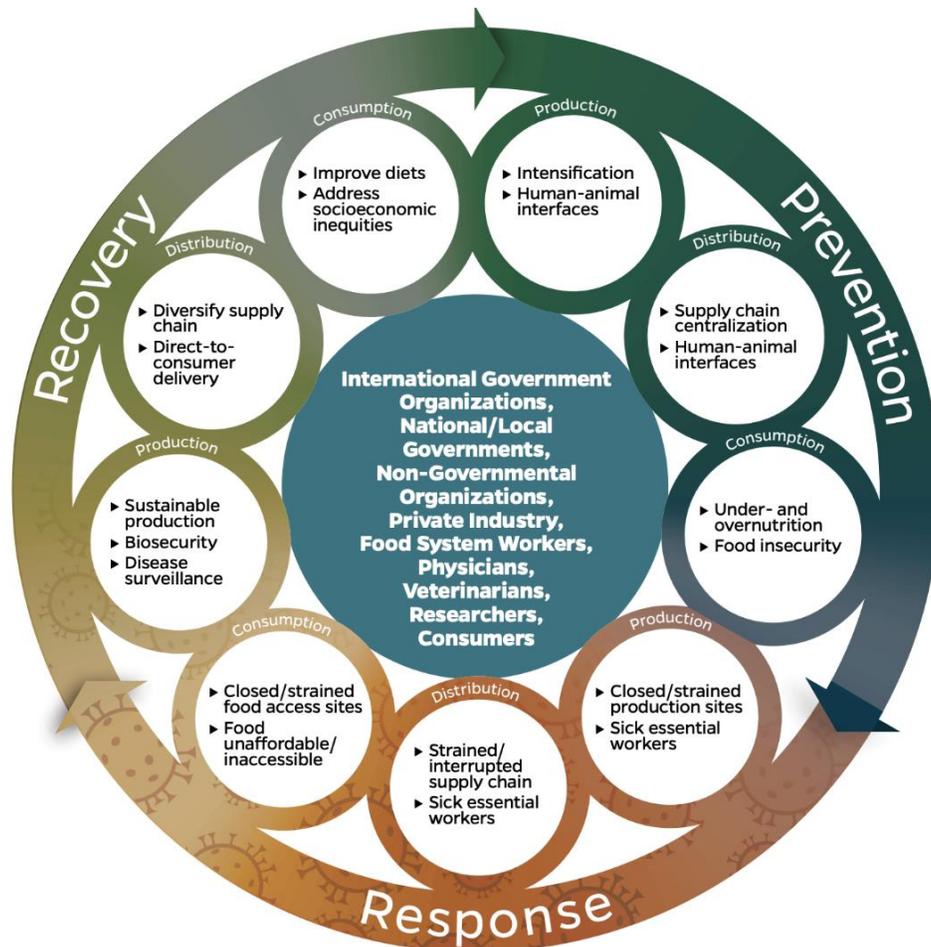
Food production operations impact the emergence of pathogens with pandemic potential. Current food production intensification practices, which prioritize volume and cost over quality and safety, promote increased human-animal and inter-species interactions (Benatar, 2007). Furthermore, changes in consumer demand and diets globally have led to increased deforestation and encroachment on animal habitats (Thornton & Herrero, 2010). These practices create opportunities for zoonotic pathogens to recombine and spillover into human populations (Wolfe, Daszak, Kilpatrick, & Burke, 2005).

A community's ability to prepare for and withstand pandemic threats is also a function of its food system, particularly its distribution operations. Food supply chains have increasingly moved towards consolidation, just-in-time delivery, and reduced redundancy in order to decrease costs and optimize efficiency (Food and Agriculture Organization of the United Nations [FAO], 2020a). This evolution has created choke points in the supply chain that make it ill-suited to respond to unexpected shocks.

On the consumption side, growing socioeconomic inequities, demonstrated by extreme poverty and under and overnutrition, put many populations at greater risk of food insecurity. Nearly two billion people, or 26% of the world's population, currently experience moderate or severe food insecurity (FAO, 2019). The bidirectional relationship between food insecurity and other infectious diseases has been well-established: food insecurity, exacerbated by pandemics, may also serve to propagate pandemics (Weiser

Figure 1. A global food systems framework for pandemic prevention, response, and recovery highlighting connections between food production, distribution, and consumption at each stage of the pandemic cycle.

Vulnerabilities in the prevention and response phases inform recommendations for actors at the center of the framework.



et al., 2011). Populations experiencing food insecurity do not have the resources to stockpile food and water in preparation for, or in response to, an emergency. Further, chronic diseases associated with food insecurity, such as obesity, may place food insecure populations at greater risk of pandemic-related morbidity and mortality (Kass, Duggal, & Cingolani, 2020).

Response

Government and community responses to reduce disease transmission, which have included forced closures of nonessential businesses, travel and stay-at-home restrictions, and worker safety regulations at essential businesses, have had downstream implications for the health and livelihoods of those employed along the value chain.

Food producers, including farms and processing plants, have been closed or strained due to illness among their essential workers, who by nature of their work, are at high risk of infection. For example, meat processing plant workers have experienced particularly high rates of infection due to lack of workplace distancing policies, insufficient personal protective equipment, and inadequate disinfection of high-

touch surfaces (Dyal et al., 2020). Additionally, in many countries, global migrant farm workers who have experienced job loss and are unprotected by occupational and migration policies, have been forced to repatriate, making unsafe journeys that put them at high risk of disease exposure (FAO, 2020b).

On the distribution side, crop destruction and excess milk disposal have been reported in some countries due to an overdependence on complex intermediate systems between the farm and table (Yaffe-Bellany & Corkery, 2020). Panic buying and consumer stockpiling has further strained some supply chains (Sim, Chua, Vieta, & Fernandez, 2020). Essential workers employed in food distribution, including restaurants, retail outlets, and food delivery services, have also been at increased risk of infection.

The pandemic has had severe consequences for food access and affordability. Forced closures of non-essential business has led to widespread unemployment, leaving many consumers with reduced incomes to purchase groceries and prepared foods. Many critical feeding sites such as schools, senior centers, and emergency food providers have been closed to limit community transmission (Van Lancker & Parolin, 2020). Estimates suggest that prevalence of global chronic hunger could double due to COVID-19 (Food Security Information Network, 2020).

Recovery and Recommendations

Restarting economic and social activity inevitably introduces new risks to food systems workers and consumers. As pandemic response restrictions ease, actors must both address short-term risks and pursue long-term food systems transformation—promoting an enhanced level of systems functioning by reducing vulnerabilities and improving resilience. We identify four key recommendations for priority action to integrate global food systems and pandemic planning and response efforts. These recommendations include both long-term goals and short-term action steps to achieve these goals. These recommendations should be tailored to socio-political contexts. We note that these recommendations are not comprehensive, but rather serve as examples for how actors can engage in systems integration.

- 1. Implement and strengthen surveillance systems for both emerging infectious diseases and food systems functioning:** Production and distribution factors that play a role in pandemic emergence, such as intensified animal production and wet markets, should be addressed in ways that decrease risk and ensure sustainability. In the short term, enhancing surveillance systems for early detection of pathogens will be critical. Stakeholders should identify high-risk human-animal interfaces and implement evidence-based pandemic prevention strategies combined with early warning surveillance. In the longer term, real-time monitoring and evaluation platforms for food system functioning and value chains should be implemented. Drawing on lessons from infectious disease surveillance systems, metrics for evaluating food system function should include assessments of flexibility, representativeness, stability, simplicity, and acceptability. These tools should further draw on existing resources developed by the United Nations (UN), such as the Food Security Information System (FSIN), Vulnerability Analysis and Monitoring Unit (VAM), and Agricultural Market Information System (AMIS), which support rapid assessment and monitoring of food value chain functioning at all levels of the global economy (UN, 2020).
- 2. Strengthen global food supply chains:** In the short term, innovations are needed that facilitate direct-to-consumer delivery by leveraging evolving mobile and transport technologies. Over the longer term, global public-private partnerships must diversify and create redundancy within supply chains, while minimizing waste. Improving traceability of resources and products along the supply chain can strategically inform restructuring systems. Regionally, supply chains can be strengthened by

establishing strong local primary producer foundations and ensuring diversity in chain size, structure, and marketing. This can allow for more direct consumer supply chains from local farms and markets. To promote global collective action and continued flow of goods, trade policy agreements should be designed to minimize trade barriers during emergencies.

- 3. Create local and global stakeholder resource and data coordination mechanisms:** Coordination mechanisms, both formal and informal, should be established between countries to promote the flow of goods and facilitate resource and data sharing during public health emergencies. Targeted multilateral agreements can serve as food system coordination mechanisms between countries. For example, Agricultural Ministers in Latin American and the Caribbean formulated a regional agreement to work together to coordinate food availability during this pandemic (FAO Regional Office for Latin America and the Caribbean, 2020). Similar agreements have emerged in recent months in other regions and among politically allied nations such as the Association of Southeast Asian Nations, the African Union, and the G20 (ASEAN, 2020; FAO, 2020a; G20, 2020). Looking ahead, these food system alliances should be maintained and expanded; similar alliances can also be established at the local and national levels. Having strong relationships in place prior to disease outbreaks can help to ensure food security during future emergencies.
- 4. Address underlying socioeconomic vulnerabilities:** The world is not on track to meet the United Nations 2030 Agenda for Sustainable Development goal of eliminating poverty in all of its forms. Rates of poverty, and its pernicious sequelae, such as poor diet and food insecurity, remain especially high in low- and middle-income and conflict-affected countries that may also be less prepared for pandemic threats (UN, n.d.). Long-term strategies to promote equitable, inclusive, and sustainable economic growth, such as improved nutrition, health, and sanitation services and better management of the natural resources on which subsistence farmers depend, may both reduce poverty and decrease pandemic vulnerabilities. In the short term, as countries develop reopening plans and economic recovery strategies, they must prioritize food access and affordability for vulnerable populations. Implementing policies that promote equity, such as expanding and ensuring portability of social safety net programs and compensating those who have lost income due to the pandemic, are important first steps.

Conclusion

COVID-19 is the latest example of a pandemic that has exposed vulnerabilities in the global food system. An approach that integrates food systems and pandemic planning is needed to guide policy-making efforts to effectively prepare for, respond to, and recover from future pandemics and develop a safe and resilient food system. This framework and recommendations provide a launching off point; there are myriad other ways these systems can, and should be, integrated. We call on multidisciplinary actors to respond quickly, maximizing what is being learned from this pandemic to promote future resilience for the inevitable next one. 

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