REGIONAL DEVELOPMENTS

MALNUTRITION AND UNHEALTHY DIETS ARE A GLOBAL PROBLEM, BUT THE challenges, responses, and potential solutions vary across low- and middle-income regions. Recent shocks have compounded long-term problems of undernutrition, and demographic, socioeconomic, and marketing trends are making obesity increasingly common. This section examines the evolving problem of malnutrition as well as policy interventions designed to make healthier, more diverse diets more affordable, accessible, and desirable, including these topics:

- Increasing production of fruits, vegetables, and animal-source foods in Africa to address micronutrient deficiencies.
- Boosting resilience of food systems to frequent shocks in the Middle East and North Africa.
- Increasing nutrition knowledge in Central Asia to address the double burden of malnutrition.
- Making healthy foods more affordable through fiscal reforms in South Asia.
- Managing the nutrition transition in the rapidly urbanizing context of East and South East Asia.
- Promoting intraregional trade in Latin America and the Caribbean to increase availability of diverse healthy foods.

AFRICA

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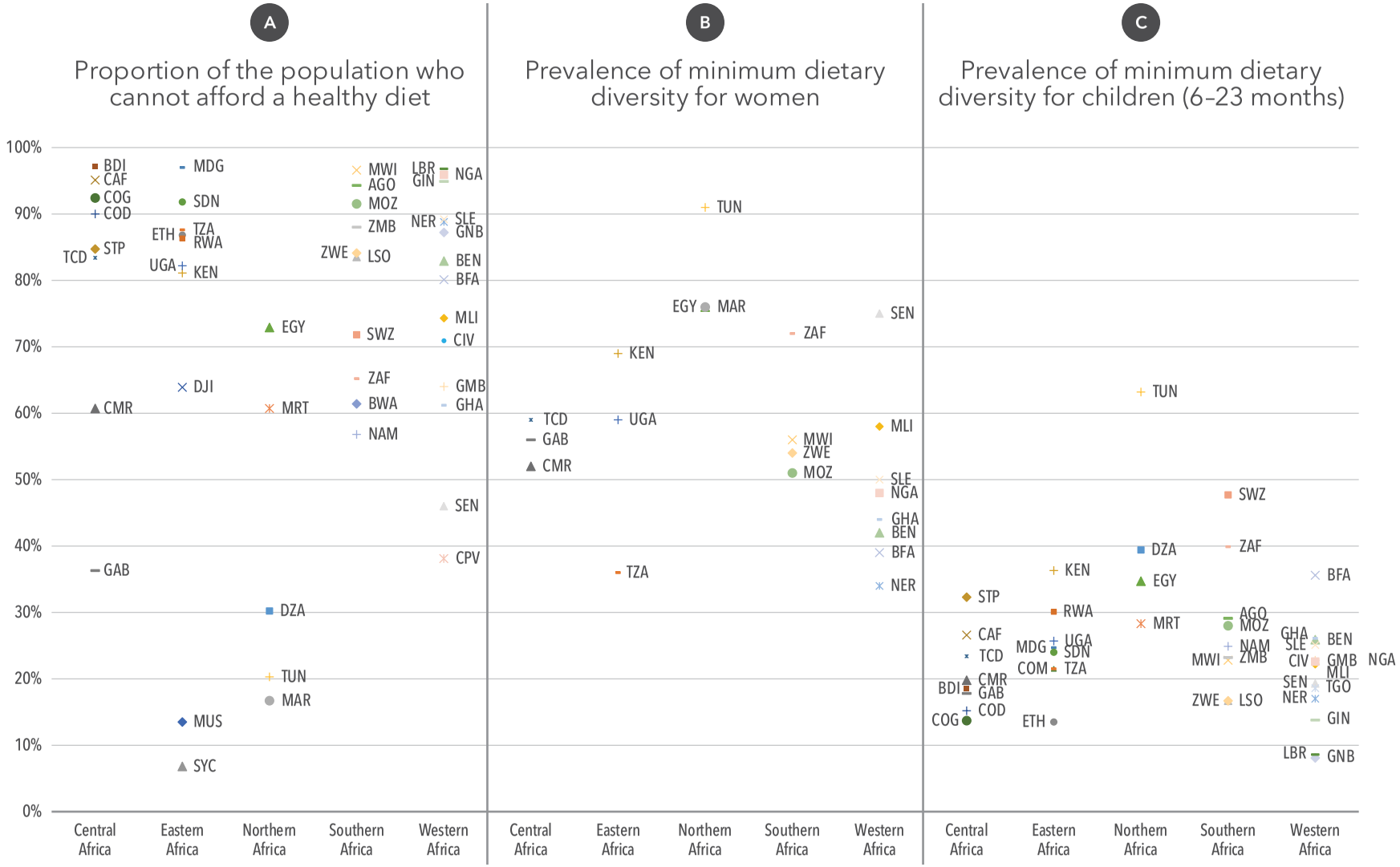
African food systems are dominated by cereals production, leaving them unable to supply sufficient nutrient-dense foods, such as animal-source foods, pulses, nuts and seeds, vegetables, fruits, and fats and oils.[1] The resulting high cost of nutrient-dense foods puts healthy diets out of reach for most Africans (Figure 1, panel A). A fifth of the region's population is undernourished,[2] and for many more, dietary diversity is inadequate (Figure 1, panels B and C), particularly in western and central Africa, where dietary diversity in young children is the lowest in the world.[3] Poorly diversified diets, together with poor health and sanitation conditions, increase the risk of maternal and child undernutrition and of various micronutrient deficiencies across population groups, which in turn heighten the risk of illness, disability, and death.[4] Poor nutrition has not only a high human cost but also a high economic cost. A study in 21 African countries estimates that about US$30.4 billion is lost in one year due to lower labor productivity and higher healthcare and education costs attributable to child wasting and stunting.[5] Overall, Africa faces a high burden of undernutrition, with prevalence of vitamin A and iodine deficiencies and of inadequacy of iron intakes among the highest in the world,[6] and with maternal anemia (39 percent) and child stunting (30 percent) well above global averages (30 and 22 percent, respectively).[7] Though child wasting (5.8 percent) gradually decreased in recent decades, child overweight (4.9 percent) and adult obesity (13 percent) gradually increased, reaching average levels on par with those observed globally. However, these averages hide important cross-regional and urban/rural disparities, with northern and southern Africa generally performing better in terms of undernutrition and worse on child overweight or adult obesity, compared with poorer regions in Africa.

The changing and diverse diet and nutrition conditions in Africa call for context-specific and evidence-based strategies to increase the supply, affordability, and consumption of healthy foods overall, and of nutrient-dense foods for the most vulnerable, while curbing the rising consumption of unhealthy foods. Integration of effective strategies into policy is key to their sustainable implementation at scale.

SUBNATIONAL GAPS IN NUTRITIOUS FOODS

Intake of adequate nutrients to meet recommended levels varies regionally within countries, depending on total food production, marketing, and consumption. Spatial nutrient adequacy profiles were derived for Burkina Faso, Ghana, Kenya, Rwanda, and Uganda, looking at six globally scarce micronutrients (calcium, folate, iron, vitamin A, vitamin B12, and zinc). The profiles show that both the nature and underlying causes of micronutrient gaps in household consumption vary widely between and within these countries.[8] In general, intake gaps for calcium, iron, vitamin B12, and zinc are greater than those for folate and vitamin

FIGURE 1 Affordability and diversity of women and young children's diets, by country and region



Source: Based on data from the *Food Systems Dashboard*, accessed December 2023. www.foodsystemsdashboard.org

Note: Central Africa: BDI = Burundi, CMR = Cameroon, CAF = Central African Republic, TCD = Chad, COG = Congo, COD = Democratic Republic of the Congo, GNQ = Equatorial Guinea, GAB = Gabon, STP = Sao Tome and Principe; Eastern Africa: COM = Comoros, DJI = Djibouti, ERI = Eritrea, ETH = Ethiopia, KEN = Kenya, MDG = Madagascar, MUS = Mauritius, RWA = Rwanda, SYC = Seychelles, SOM = Somalia, SSD = South Sudan, SDN = Sudan, UGA = Uganda, TZA = United Republic of Tanzania; Northern Africa: DZA = Algeria, EGY = Egypt, LBY = Libya, MRT = Mauritania, MAR = Morocco, TUN = Tunisia; Southern Africa: AGO = Angola, BWA = Botswana, SWZ = Eswatini, LSO = Lesotho, MWI = Malawi, MOZ = Mozambique, NAM = Namibia, ZAF = South Africa, ZMB = Zambia, ZWE = Zimbabwe; Western Africa: BEN = Benin, BFA = Burkina Faso, CPV = Cabo Verde, CIV = Côte d'Ivoire, GMB = Gambia, GHA = Ghana, GIN = Guinea, GNB = Guinea-Bissau, LBR = Liberia, MLI = Mali, NER = Niger, NGA = Nigeria, SEN = Senegal, SLE = Sierra Leone, TGO = Togo.

A, with the more serious gaps in calcium, iron, vitamin B12, and zinc often due to low domestic production of foods rich in those micronutrients. Nutrient losses observed between domestic production and markets, which may relate to postharvest losses or food trade, appear most critical in Burkina Faso and Ghana, and mainly affect foods rich in calcium, iron, and zinc. Limited demand is another cause of micronutrient inadequacy, particularly the limited consumption of foods rich in folate (in Burkina Faso, Kenya, and Uganda), vitamin A (in Ghana, Kenya, and Rwanda), and vitamin B12 (in Ghana, Kenya, and Uganda). The limited demand for folate-rich and vitamin A-rich foods is likely rooted in a lack of nutrition knowledge, while low demand for foods rich in vitamin B12 likely reflects the fact that animal-source foods are unaffordable for many households.

Despite these general observations, and given the diverse pattern of nutrient inadequacies within countries, food and nutrition security policies should devote more attention to addressing the context-specific drivers of poor diets through interventions that increase production, facilitate trade, and increase affordability and awareness of nutritious foods.[9]

LESSONS FROM SUCCESSFUL PROGRAMS

Strategies and programs that address gaps in the production, marketing, and consumption of diversified healthy foods have potential to improve nutrition outcomes.

NUTRITION-SENSITIVE AGRICULTURE PROGRAMS. Generally, nutrition-sensitive agriculture programs (see Chapters 2 and 3) can improve maternal and child diet adequacy, health, and care practices in rural areas by increasing micronutrient-dense food production for consumption, agricultural income to support household expenditures on health and food, nutrition-related knowledge, and/or women's empowerment, as well as by strengthening local institutions.[10] Enhanced homestead food production (EHFP), implemented by Helen Keller International, is one example of a nutrition-sensitive agricultural model that has proved effective in Africa. Targeted to women, EHFP integrates inputs and training to help farmers produce a variety of local micronutrient-dense crops and raise small animals, while also providing counseling on child nutrition, health, and hygiene. Rigorous impact evaluations of EHFP in Burkina Faso show positive impacts on child dietary diversity, nutrition, and health, and on maternal nutrition and empowerment.[11] Implementation of EHFP across four African countries showed that such complex programs require careful design, flexible and sequenced implementation, and cross-sectoral integration and coordination (see Chapter 2).[12]

Programs that provide livestock as a productive asset in low- and middle-income countries are generally associated with higher consumption of animal-source foods and higher overall dietary diversity, with mixed effects on child growth.[13] Examples of such livestock transfer programs in Africa that improved dietary outcomes include Heifer International's Passing on the Gift program in Rwanda and Zambia,[14] through which beneficiaries receive either a dairy cow, two draft cattle, or eight goats, with the requirement that they "pass on" the same number of female offspring to new beneficiaries. In Ethiopia, successful livestock transfer programs include a transfer of two egg-laying chickens (recognized through a public ceremony as child owned)[15]; a poultry production package with inputs and 16 vaccinated, improved-breed chickens in lieu of the same value in cash to beneficiaries of Ethiopia's Productive Safety Net Programme[16]; or 25 improved-breed chicks, with or without accompanying nutrition counseling.[17]

NUTRITION-SENSITIVE SOCIAL PROTECTION PROGRAMS. Nutrition-sensitive social protection programs (SPPs) involve transfers of cash, food, or vouchers; can be conditional or unconditional; and are generally designed to support access to food for the most vulnerable.[18] These programs can potentially reduce malnutrition directly, for example by improving diet quality, or indirectly, by increasing household food security,[19] although their impacts on nutrition outcomes for women and children in low- and middle-income countries have been mixed.[20] For example, systematic reviews on the effects of cash transfers on maternal

and child nutrition outcomes find consistent positive effects on dietary outcomes and less consistent evidence on micronutrient status and anthropometric outcomes that suggests effects are small or non-existent.[21] Globally and in Africa, expenditures on SPPs have grown rapidly. Countries in sub-Saharan Africa spend on average 1.5 percent of gross domestic product (GDP) on SPPs, close to the global average, though the African programs are largely donor funded. [22] Also, the level of spending on SPPs varies across the continent. African countries include some of the world's top spenders, notably Lesotho (7 percent of GDP) and South Sudan (10 percent), as well as many countries that spend very little.

School feeding programs are one common type of SPP (see Chapter 3). Considered the world's most extensive safety net in terms of the number of countries implementing them,[23] school feeding programs can improve nutrition outcomes for school children and their younger siblings, and they are particularly effective for the most vulnerable children.[24] These programs have the additional benefit of improving school enrollment, attendance, and learning.[25] For example, the Ghana School Feeding Program (GSFP), Ghana's largest assistance program, operates in 11,000 schools and serves 3.6 million children. A rigorous impact evaluation found that the GSFP improves children's nutrition status, as well as cognition and learning, with larger effects accruing in girls and in children from poorer households.[26] When foods are grown locally, school feeding programs have the potential to also improve food security of smallholder farmers, though the evidence on these benefits is limited.[27] However, these programs face challenges in supplying a sufficient amount of quality food in a timely way, as well as in accessing the infrastructure needed to prepare food hygienically.[28]

FOOD FORTIFICATION. Fortifying food with key micronutrients is another cost-efficient food-based strategy to improve diets and nutrition (see Chapter 6). In Africa, food fortification mainly relies on the release of biofortified crops and on the fortification of industrially processed foods. Microbial-based biofortification is an emerging strategy in the region; it relies on the production of micronutrients by microorganisms through traditional or optimized fermentation of local foods.[29]

Crops biofortified with vitamin A, including maize, cassava, and sweet potato, have been shown to improve vitamin A status among children and women in several African countries[30] in a highly cost-effective way (see Chapter 6).[31] To date, 284 biofortified crop varieties have been released in 20 African countries, mostly in eastern and southern Africa.[32] Testing is ongoing in 16 other African countries and includes new crops and nutrients such as Irish potato, lentil, rice, sorghum, and wheat, fortified with zinc and combined iron and zinc.[33] Challenges to scaling up biofortification in Africa include supply interruptions, lack of evidence on efficacy, and the unwillingness of farmers and consumers to grow and eat biofortified foods, in addition to difficulties coordinating among other key actors.[34] Because of Africa's great diversity of staple crops, compared with those of Asia or Latin America and the Caribbean, more biofortified crops and varieties within crops are needed to reach a wide population, thus increasing the relative cost and decreasing economies of scale for biofortification.

Industrial food fortification is also an effective strategy for tackling poor micronutrient status (see Chapter 6).[35] For example, a study conducted in urban Cameroon found that mandatory wheat flour fortification led to an improvement in iron, zinc, folate, and vitamin B12 levels among women and children.[36] A study in Abidjan, Côte d'Ivoire, found that fortified oil provided 37 percent of recommended vitamin A intake for women and 27 percent for children under age two.[37] In Africa, food fortification is expanding and is now mandatory in many cases: salt fortification is mandatory in 45 countries,[38] most often with iodine; wheat flour in 30 countries [39] and maize flour in 12 countries,[40] most often with iron and folate; and oil in 25 countries, [41] most often with vitamin A.[42] Successful scale-up of fortification generally relies on strong multisectoral action involving the food industry, research institutes, and the government for coordination, regulation, enforcement, and monitoring (see Chapter 8). In addition, regional authorities such as the Economic Community of West African States (ECOWAS) typically play a key role in ensuring program impact and scale-up through the establishment of fortification standards and regulation.[43]

FIGURE 2 Overview of key African Union milestones to improve food security and nutrition

Source: Based on African Union documents.

REGULATION AND TAXES. ECOWAS and partners have also led efforts to regulate complementary foods for infants and young children, including providing support to member countries to adapt and adopt international regulations and guidelines.[44] More broadly, regulations are used both to improve the availability and affordability of nutrient-dense foods in the food environment, and also increasingly to protect consumers from poor dietary habits that lead to obesity and related noncommunicable diseases, like hypertension and diabetes (see Chapter 5). For example, African national policies occasionally include bans on the sale of sugar-sweetened beverages, products high in saturated fats, and ultra-processed foods in the vicinity of schools, and likewise, mandatory or voluntary regulations on food labeling and marketing.[45] In South Africa, the Health Promotion Levy – a tax on sugar-sweetened beverages – has increased prices for carbonated drinks and corresponded to reductions of added-sugar intakes, especially among the largest consumers of these beverages.[46] This positive impact is consistent with global evidence that taxes and subsidies are generally effective at changing consumption of targeted items (see Chapter 5), although evidence of ultimate impact on health is lacking.[47]

FOSTERING A CONDUCIVE ENVIRONMENT

Incorporating successful programs into policy is key to their scale-up and sustainability. In recent decades, political commitment to food security and nutrition has grown at all levels across the continent, along with the coherence of multisectoral nutrition action.[48] For example, 42 of the 66 countries participating in the global Scaling Up Nutrition (SUN) movement are African countries.[49] The African Union has adopted numerous declarations, strategies, and programs to improve food security and nutrition (Figure 2).

Associated with these developments are the Continental Nutrition Accountability Scorecard (CNAS) and the Africa Agriculture Transformation Scorecard (AATS) led by the African Union, which aim to provide actionable information to African governments and stakeholders on country-level

BOX 1 NATIONAL NUTRITION POLICY ENVIRONMENTS: THE WEST AFRICAN CASE

A review of nutrition-relevant policies in West Africa found that, as of September 2020, all countries in the region had adopted a comprehensive or specific nutrition policy, strategy, or action plan. Most policies reported on mechanisms to coordinate nutrition across multiple sectors and bodies that support nutrition governance, and they are often placed in high-level and influential offices, such as the office of the president or the prime minister.

In the agriculture, economic, and social sectors, about half of the sectoral policy documents were oriented toward nutrition, meaning that they met the basic criteria of having a nutrition objective, indicator, or a budget for nutrition.

The situational analyses conducted for the policies generally described World Health Assembly nutrition targets, with under-five stunting and wasting most often covered. Macronutrient and energy deficiencies were rarely described as an issue, while micronutrient deficiencies were frequently cited (by order of importance: vitamin A, iodine, iron, zinc, folate, other B vitamins) and clearly linked to health consequences. Overweight and obesity was also described as a growing issue, although it was less well addressed with related activities and indicators than undernutrition.

Overall, the report points to several policies among those reviewed where more internal coherence is recommended to better align policy objectives, activities, and indicators with nutrition-relevant situational analyses. It also highlights the untapped potential of leveraging sectors that have known potential to contribute to better nutrition. For example, in the environment sector, only 5 of 45 documents were nutrition oriented.

Source: L. Casu, A.D. Diatta, I. Uzhova, M. Dramé, J. Kaboré, F. Touré, E. Becquey, and R. Verstraeten, *Nutrition-Relevant Policy in West Africa: A Comprehensive Review* (Dakar: TNWA; Washington, DC: IFPRI, 2022); L. Casu, I. Uzhova, A.D. Diatta, M. Dramé, and R. Verstraeten, *Guidance for Improving Nutrition-Relevant Policy in West Africa*, TNWA Evidence Note No. 25 (Dakar: IFPRI, 2021).

progress in achieving nutrition targets.[50] The CNAS shows that most countries have made progress in passing legislation on food fortification and breastfeeding and in developing multisectoral action plans on nutrition,[51] although gaps remain in mainstreaming nutrition into national policies (Box 1). However, most countries are not on track to achieve other CNAS or AATS targets, such as those focused on stunting and anemia or on access to key services such as water, sanitation, and agricultural extension.[52]

CONCLUSION

Addressing the high burden of micronutrient deficiencies and undernutrition in Africa will require leveraging local, national, regional, and continental food systems to increase the supply and reduce the cost of nutritious foods. In addition, this will require appropriately contextualizing evidence-based multisectoral policy and program approaches, including agriculture, health, nutrition, and social protection. The sustainability of these efforts also requires a focus on the food environments of growing urban areas and related dietary transitions, as well as on strengthening people's resilience and capacity to cope with global threats posed by climate change, conflicts, and other shocks that reduce access to and availability of the foods needed for a healthy diet.

MIDDLE EAST AND NORTH AFRICA

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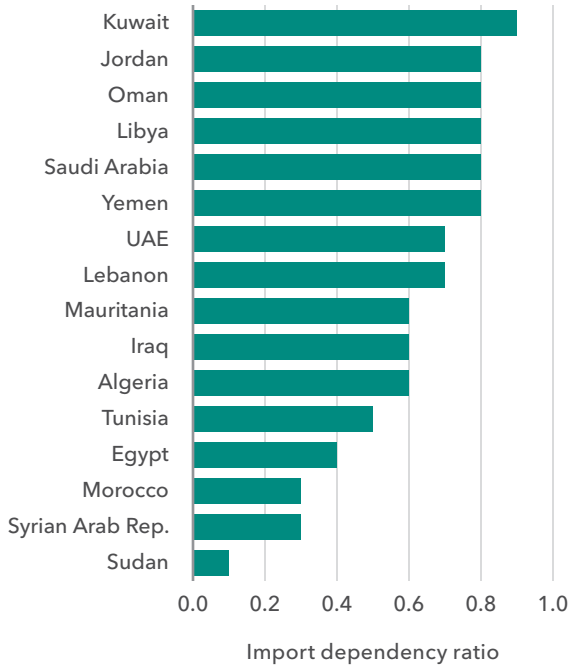
Over the past several years, global and regional trade shocks have triggered rampant inflation and spikes in food and fuel prices in the Middle East and North Africa (MENA). These shocks have disrupted domestic food systems, affecting the accessibility and affordability of nutritious diets. The MENA region is always vulnerable to such shocks, but the trade shocks triggered by the Russia-Ukraine war came at a crucial juncture, as the region is experiencing a rise in the double burden of malnutrition, characterized by the concurrence of micronutrient deficiencies and undernutrition with overweight and obesity. Even before the Russia-Ukraine war, the cost of a healthy diet was increasing in the region. In 2020, more than half the population – about 162.7 million people – could not afford a healthy diet,[1] with a slightly higher share in low-income countries and those affected by conflict and political instability, and the number of people suffering undernutrition reached 59.8 million.[2] At the same time, the overweight/obesity rates in the Arab countries are among the highest in the world.

FIGURE 1 Food import dependency in the MENA region, kilocalories, 2017–2019 average



Source: Data from FAOSTAT. https://www.fao.org/faostat/

The MENA region's heavy dependence on food imports leaves it particularly vulnerable to world food prices and trade shocks.[3] Most of the region's countries are sizable net importers of food (Figure 1). This is especially true for Gulf Cooperation Council countries, including Oman, Qatar, Saudi Arabia, and Yemen, where more than 80 percent of domestically available calories are provided through imports. In addition, MENA countries rely heavily on food imports to supply essential nutrients. In countries such as Egypt, Jordan, Libya, and Yemen, the average domestic food supply does not meet the recommended daily intake for some nutrient categories. Because of these dependencies, the recent global trade shocks have created strong inflationary pressures across the region. For example, food inflation in Egypt tripled over this period, rising from about 20 percent immediately before the Russia-Ukraine war to 63 percent in March 2023.[4]

The MENA region is also marked by political instability, fragility, and persistent conflicts that contribute to large refugee populations, many hosted by countries within the region, and to food insecurity more broadly. The region's protracted humanitarian crises triggered by natural disasters (for example, the 2023

earthquake in Morocco) and political instability in neighboring countries (the ongoing civil war in Sudan) are forcing major population displacements. In 2022, more than two-thirds of the region's undernourished people were from conflict-affected countries.[5] Projections show that by 2024 the region will host 15.8 million forcibly displaced and stateless people.[6] The recent Israel-Gaza conflict, which started in October 2023, is adding further pressure to an already fragile situation. The conflict has created a major humanitarian crisis and increased the influx of refugees to neighboring countries. MENA is also among the world's regions most vulnerable to climate change and water scarcity.[7] The compound crises arising from conflict, climate change, and trade shocks pose a long-term threat to national food security in many MENA countries.

AFFORDABILITY OF NUTRITIOUS DIETS

Rising food prices threaten the affordability of nutritious diets, especially for poor households, throughout the MENA region. Recent estimates find that the number of poor in MENA has increased by more than 20 million since the outbreak of the Russia-Ukraine war and the associated surge in food prices.[8] The World Bank estimates that a 1 percent increase in the price of food items in the region is likely to push about half a million more people into poverty.[9]

The impact of food inflation varies across countries and households, depending on their exposure to food prices and trade shocks. Poor and net-consumer households are the most vulnerable to inflation, mainly because they allocate a larger share of their income to food purchases. In response, these households are likely to increase their already heavy reliance on cereals and cheaper energy-dense foods because the cost per calorie is lower.[10]

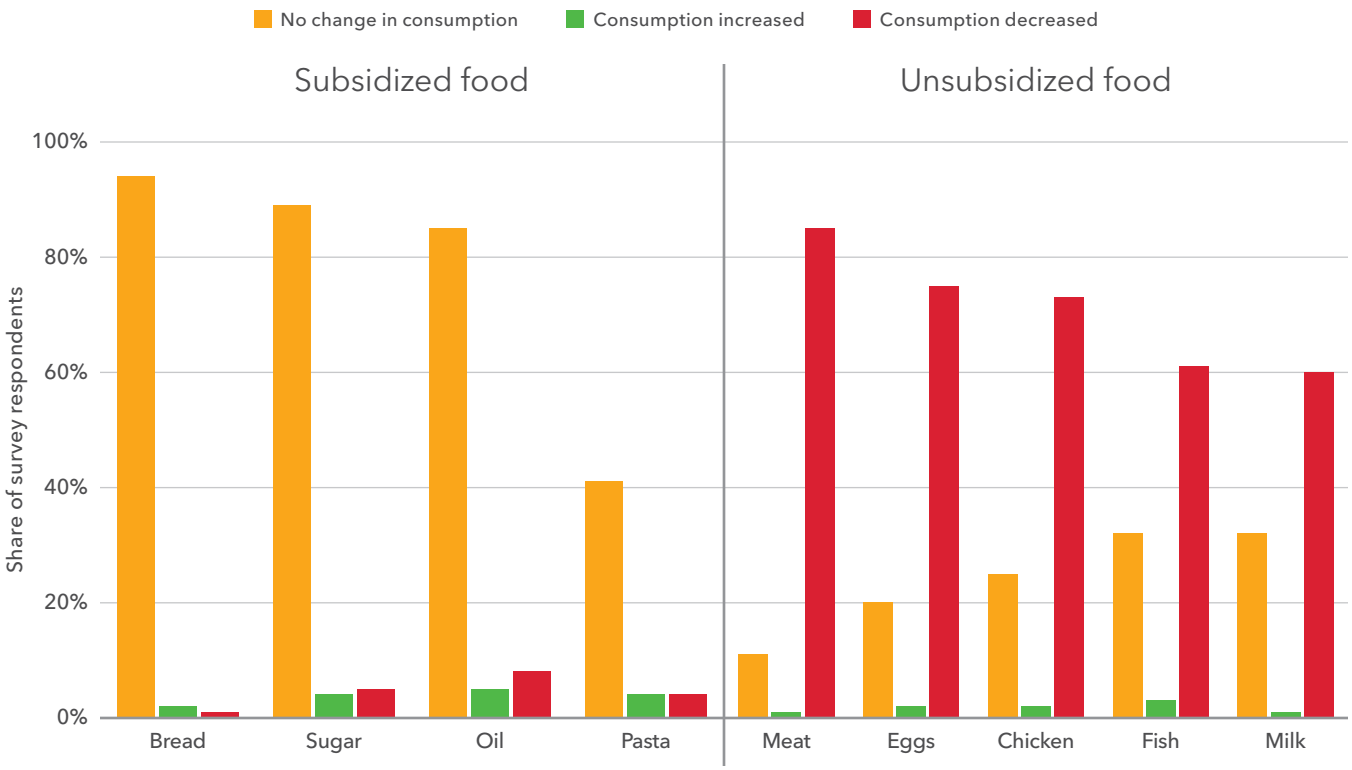
Immediately following the outbreak of the Russia-Ukraine war, IFPRI launched a phone survey of about 6,000 households in Egypt to assess how poor and near-poor households were responding to the economic stresses.[11] Households were asked about how their consumption habits had changed since the start of the war and the perceived drivers of these changes. A large share of households reported (1) a decrease in consumption of unsubsidized foods such as meat, chicken, and eggs, which are key protein sources, and (2) either a slight increase or no change in the consumption of subsidized foods, which are often calorie-dense staples. Some households reported increasing their consumption of less nutritious food groups to reduce food spending. For instance, households increased their consumption of starchy foods such as potatoes and pasta that, while filling, tend to have fewer nutrients. In response to questions about why they reduced their consumption of certain foods, more than two-thirds of households cited price increases as the main cause. Overall, these patterns suggest a shift from unsubsidized to subsidized products, highlighting the importance of Egypt's national food subsidy program (Figure 2).

The MENA region is very diverse, and although some oil-exporting countries (including Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and the United Arab Emirates) continue to benefit from the surge in oil prices, other countries are facing multiple shocks. Fragile and conflict-affected countries, such as Iraq and Yemen, witnessed deterioration in food security over the last couple of years (Figure 3). These countries continue to grapple with compounding effects of conflict and high food and fuel prices that ultimately increase food insecurity. For example, the share of households experiencing moderate or severe food insecurity in Yemen increased from about 53 percent in 2022 to 70 percent in 2023.

FISCAL POLICY RESPONSES TO SHOCKS

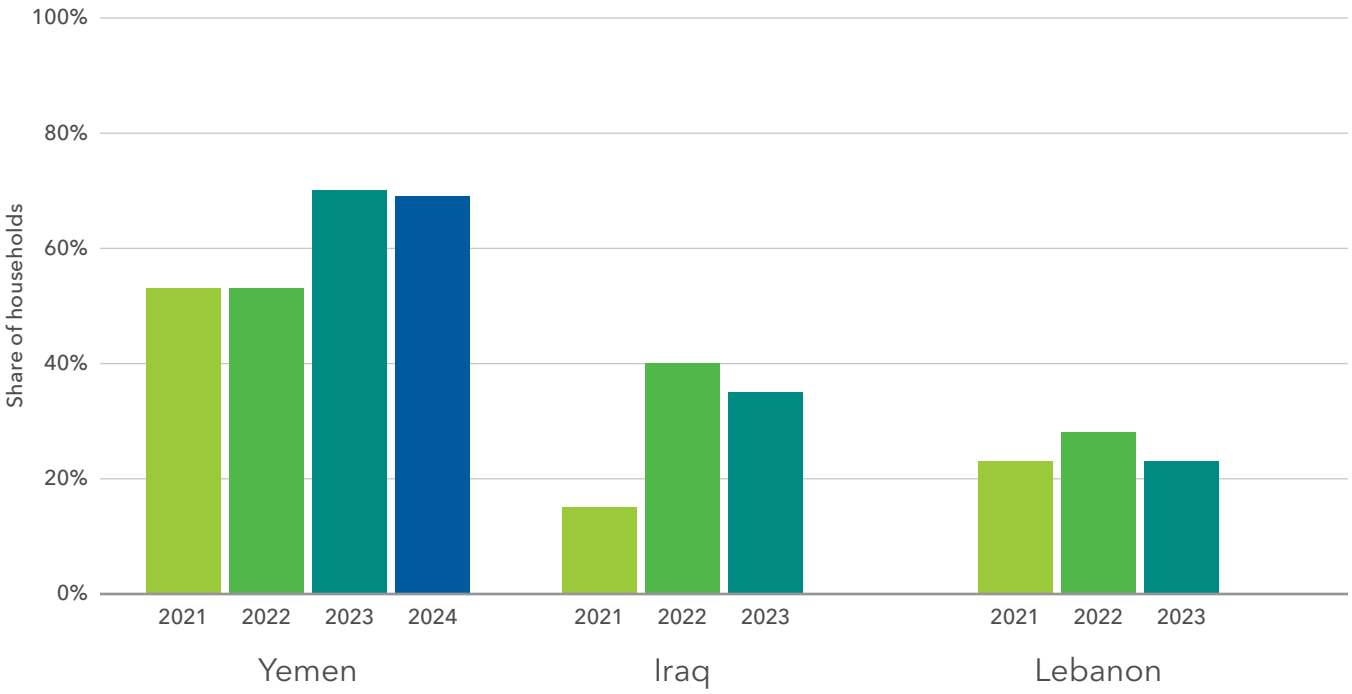
The recent inflationary and supply shocks have triggered important public policy responses in the MENA region. However, most of these responses add to existing fiscal pressures and have not been nutrition-sensitive, as they generally aim to ensure a minimum adequate level of calorie intake rather than diet quality. Most countries adopted and expanded conventional subsidies and price controls on calorie-dense staple foods rather than putting greater focus on supporting more diverse diets that would meet nutritional needs.

FIGURE 2 Consumption of subsidized and unsubsidized foods in Egypt, March–November 2022



Source: Based on phone survey data reported in K.A. Abay, N. Karachiwalla, S. Kurdi, and Y. Salama, "Food Price Shocks and Diets among Poor Households in Egypt," *IFPRI Blog*, Dec. 29, 2022.

FIGURE 3 Share of households experiencing moderate or severe food insecurity



Source: Data from Data in Emergencies Hub (DIEM), FAO, accessed March 2024. https://data-in-emergencies.fao.org

Most MENA countries introduced a variety of fiscal policies to cushion the adverse impacts of these inflationary pressures.[12] These included increases in food and fuel subsidies, new price controls, incentives to boost domestic agricultural production, trade regulations, indirect tax exemptions, product-specific exchange rates, and the introduction or expansion of cash transfers and financial support for vulnerable households, including utility coverage. Some policies were introduced immediately after the outbreak of the Russia-Ukraine war, while others have been introduced more recently. While some fiscal measures have helped to contain inflation, the medium-term impact on households and diets remains to be evaluated.

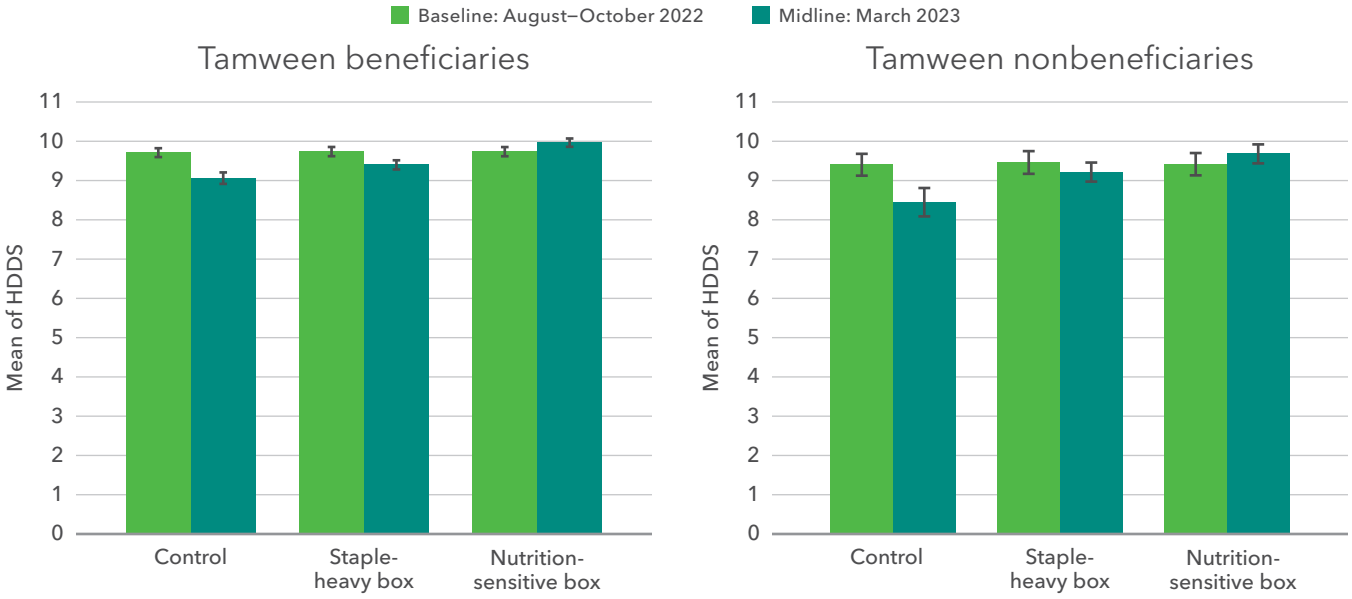
INTERVENTIONS TO IMPROVE DIETS AND NUTRITION

Existing social protection programs and related public policy responses can play an important role in limiting the impacts of rising food prices on diet quality and nutrition in the MENA region.

FOOD SUBSIDY PROGRAMS – THE CASE OF EGYPT

TARGETING FOOD SUBSIDY PROGRAMS TO THOSE MOST IN NEED. Egypt's long-standing bread subsidy program, the Tamween ration card system, reaches about 70 percent of the country's households. Recent assessments find that the coverage of this subsidy program is not sufficiently progressive; only a third of its total costs in 2015 were directed to households in the lowest two quintiles. Modeling work shows that replacing this staple-heavy food subsidy with targeted cash transfers of roughly equivalent fiscal cost could improve the welfare of the poorest households.[13] Consistent with this, another recent impact evaluation shows the importance of targeting food subsidy programs to the most vulnerable, as those households not covered by Tamween reported disproportionally greater deterioration in diet diversity after the recent inflationary shock (Figure 4).[14] Among these nonbeneficiaries, ultra-poor households reported a reduction in dietary diversity of about one food group, compared with a 0.56 reduction reported by program beneficiaries.[15]

FIGURE 4 Impact of subsidies on dietary diversity in Egypt, 2022–2023



Source: K.A. Abay, L. Abdelfattah, M. Elkaramany, D. Elsabbagh, and S. Kurdi, "Nutrition-Sensitive Food Distribution amidst Inflationary Shock: Evidence from a Randomized Intervention in Egypt," IFPRI Discussion Paper 2218, IFPRI, Washington, DC, 2023.

Note: HDDS = household dietary diversity score (range of 0–12; higher score is more diversity). For a description of this scale, see www.fao.org/nutrition/assessment/tools/household-dietary-diversity/

In addition, Egypt's food subsidy programs in the last decade have not been sufficiently nutrition-sensitive and have tended to encourage overconsumption of calorie-dense staples. Studies show that households participating in Tamween, and hence consuming energy-dense subsidized food items, exhibit higher rates of obesity.[16]

NUTRITION-SENSITIVE FOOD DISTRIBUTION. In early 2023, amid a period of inflationary shocks in Egypt, IFPRI conducted an impact evaluation of a direct food distribution program introduced by the Egyptian Food Bank.[17] The program offered two modalities: a standard "staple-heavy" food box and a "nutrition-sensitive" food box. The nutrition-sensitive food box represents an attempt to address micronutrient deficiencies and poor diet quality[18] by including more diverse and nutrient-dense food items.

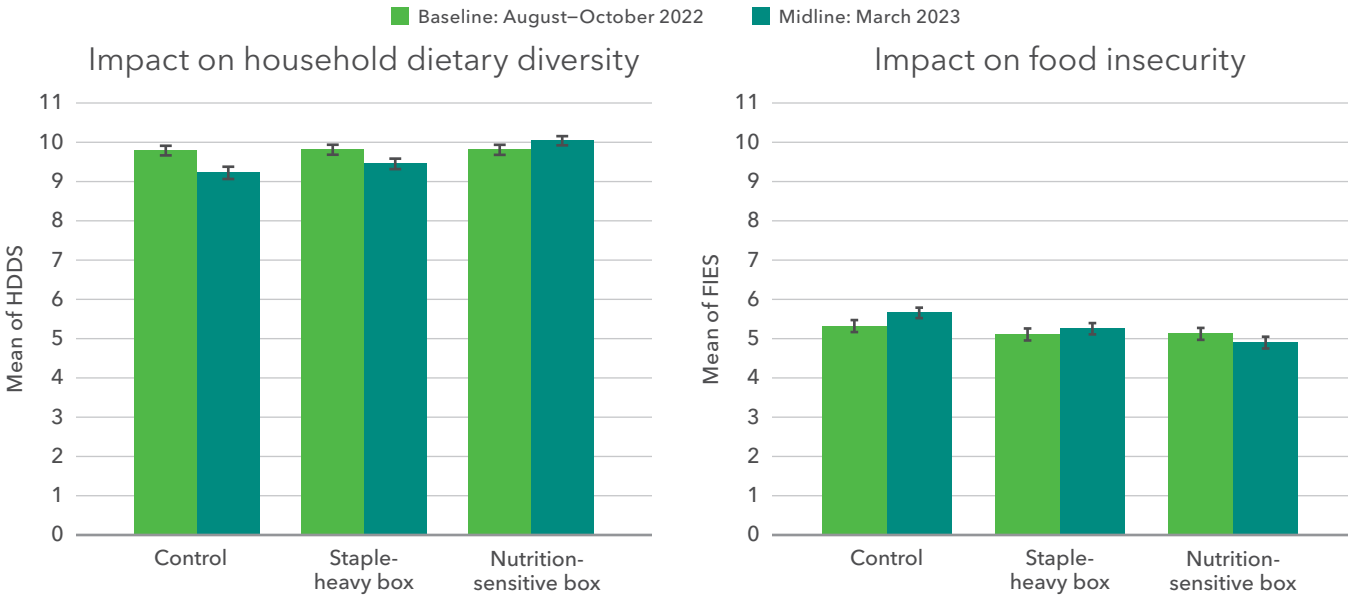
The nutrition-sensitive food box improved dietary diversity and food security[19] among ultra-poor households (Figure 5), and led to better outcomes in diet quality. Household dietary diversity increased by about 9 percent, and iron, protein, and energy intake increased by 19, 13, and 12 percent, respectively. In contrast, the staple-heavy food box did not significantly increase macro- or micronutrient intake. This evidence suggests that well-designed and nutrition-sensitive food transfers can effectively offset the adverse impacts of inflationary pressures on diet quality and food security.

SCHOOL FEEDING PROGRAMS

School feeding programs are gaining popularity in the MENA region (see Chapter 3). These programs not only deliver direct benefits for nutrition but also have potential to improve school participation; strengthen general diet quality by changing habits and improving food environments; promote gender equity; and improve learning and health outcomes.

School feeding programs generally take two forms in the region: humanitarian-type interventions, which rely on packaged, shelf-stable snacks, and more varied, complete programs, which offer sandwiches, fruits,

FIGURE 5 Impact of nutrition-sensitive food distribution on dietary diversity and food insecurity in Egypt



Source: K.A. Abay, L. Abdelfattah, M. Elkaramany, D. Elsabbagh, and S. Kurdi, "Nutrition-Sensitive Food Distribution amidst Inflationary Shock: Evidence from a Randomized Intervention in Egypt," IFPRI Discussion Paper 2218, IFPRI, Washington, DC, 2023.

Note: HDDS = household dietary diversity score (range of 0–12, higher score is more diversity); FIES = food insecurity experience (range of 0–8, higher score is more insecurity). For description of these scales, see www.fao.org/nutrition/assessment/tools/household-dietary-diversity/; and FAO, *FIES Basics: The Food Insecurity Experience Scale: Measuring Food Insecurity through People's Experiences* (Rome: 2014).

vegetables, and/or milk. Humanitarian school feeding has become increasingly common, especially in conflict-affected countries including Iraq, Syria, and Yemen. These programs are primarily implemented by governments in partnership with the World Food Programme and distribute high-energy biscuits or date bars, which are a cost-effective means of delivering nutritional benefits. In recent years, complete school feeding programs have been initiated in other countries, such as Jordan. These programs generally cost three to four times more per child per day than humanitarian interventions and have much higher operational costs. While relatively expensive, these programs offer more varied food options and are more likely to be preferred by students. They also generate greater benefits for the local economy, as food items are usually sourced locally and local women are employed in preparing and packaging the meals.

CONCLUSION

National policy responses to global food crises need to consider the region's double burden of malnutrition along with other vulnerabilities, including climate change, water scarcity, conflict, and rising public debt resulting from government spending. Countries in the MENA region need to reinforce their investments and efforts to increase the resilience of their food systems. To this end, countries should consider diversifying their food imports and exports while continuing to invest in social protection programs that protect poor and vulnerable households from food price hikes. Social protection needs to effectively target the most vulnerable groups, including women, who account for a large share of the poor. In addition, countries should consider reforming their food subsidies both to improve diets and reduce vulnerability to shocks. Investments in these subsidies, which have historically prioritized consumers over producers, need to be better integrated into national food systems. Rethinking consumer policies and encouraging the production of healthier and more sustainable diets are equally important.

Longer-term policies in the region should include strategies to mitigate vulnerability to trade shocks, climate change, and water scarcity. While some countries have the potential to increase domestic production, compounding crises arising from climate change and water scarcity could limit these ambitions. For example, in some countries, such as Egypt, adapting farming systems to become more resilient to water shortages and climate change should be the priority, rather than expanding production. The region's strong potential to develop wind and solar energy could facilitate a transition toward a greener future. Renewable energy expansion could reduce vulnerability to oil price shocks and climate change, while also generating additional revenues by diversifying exports. Most importantly, countries affected by prolonged conflict should focus on restoring livelihoods while also laying the groundwork for longer-term investment to support diversification and resilience to shocks.

Overall, the MENA region's food security challenges require a multifaceted policy approach that addresses immediate vulnerabilities to trade shocks and price fluctuations while also tackling long-term issues of climate change, water scarcity, and malnutrition. Strengthening social protection, diversifying food production and trade, and enhancing resource management and climate adaptation strategies are critical for building resilience against future crises.

CENTRAL ASIA

KAMILJON AKRAMOV, ISABEL LAMBRECHT, AND SARAH PECHTL

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Food systems in Central Asian countries face serious challenges related to diet quality and nutrition, which are compounded by the growing effects of climate change, unstable commodity markets, and a heavy reliance on remittances and undiversified trade flows. In the 1990s, these countries experienced a significant drop in gross domestic product, as well as high levels of inflation, poverty, and food insecurity. Over the past two and a half decades, however, economic growth in the region has rebounded due to the transition from centrally planned to more market-oriented economies. Central Asia includes five countries in economic transition: Kazakhstan and Turkmenistan are now classified as upper-middle-income economies; and the Kyrgyz Republic, Tajikistan (recently a low-income country), and Uzbekistan are now lower-middle-income economies. Economic growth has been accompanied by substantial increases in incomes, leading to noticeable progress in reducing poverty, food insecurity, and undernutrition among all population groups, including low-income people, youth, and women. Yet, micronutrient deficiencies are increasingly common, and the prevalence of overweight and obesity is rapidly rising in the region.

NUTRITION AND DIET QUALITY IN CENTRAL ASIA

FOOD SECURITY AND DIET QUALITY

The prevalence of undernourishment among the total population declined significantly from 2004/2006, when it was highest or close to highest, to 2020/2022 in almost all of the region's countries. While the most significant reductions were achieved in Tajikistan (from 37.6 percent to 9.3 percent), the country still reports the highest prevalence of undernourishment, just above the world average of 9.2 percent. Substantial reductions were also seen in Uzbekistan (from 14.8 percent to less than 2.5 percent), Kazakhstan (from 7.2 percent to less than 2.5 percent), and the Kyrgyz Republic (from 8.0 percent to 4.8 percent).[1] Only Turkmenistan saw a slight increase in undernourishment, from 4.2 percent to 5.7 percent, as the country faced a food crisis due to declining income from hydrocarbons, poor harvests caused in part by climate change, and government inaction in response to the economic impact of the COVID-19 pandemic.[2]

Beginning in 2020, the economic fallout of the COVID-19 pandemic increased food insecurity in Central Asia. The latest estimates suggest that 2.4 percent of the population in Kazakhstan and 6.9 percent in the Kyrgyz Republic were moderately or severely food insecure in 2020/2022, up from 2.1 percent and 6.3 percent, respectively, since 2016/2018. In Uzbekistan, however, the increase was much larger – the share of the population experiencing moderate or severe food insecurity rose from 14.9 percent before the pandemic to 26.1 percent in 2020/2022.[3] Comparable country-level data on food insecurity are not available for Tajikistan and Turkmenistan, both of which have a high prevalence of undernourishment. Moreover, patterns of food insecurity are highly context specific and can differ widely within countries, by subpopulation, and by time of year. An example from recent survey findings during winter, the lean season between harvests, in the Khatlon Region of Tajikistan is described in Box 1.

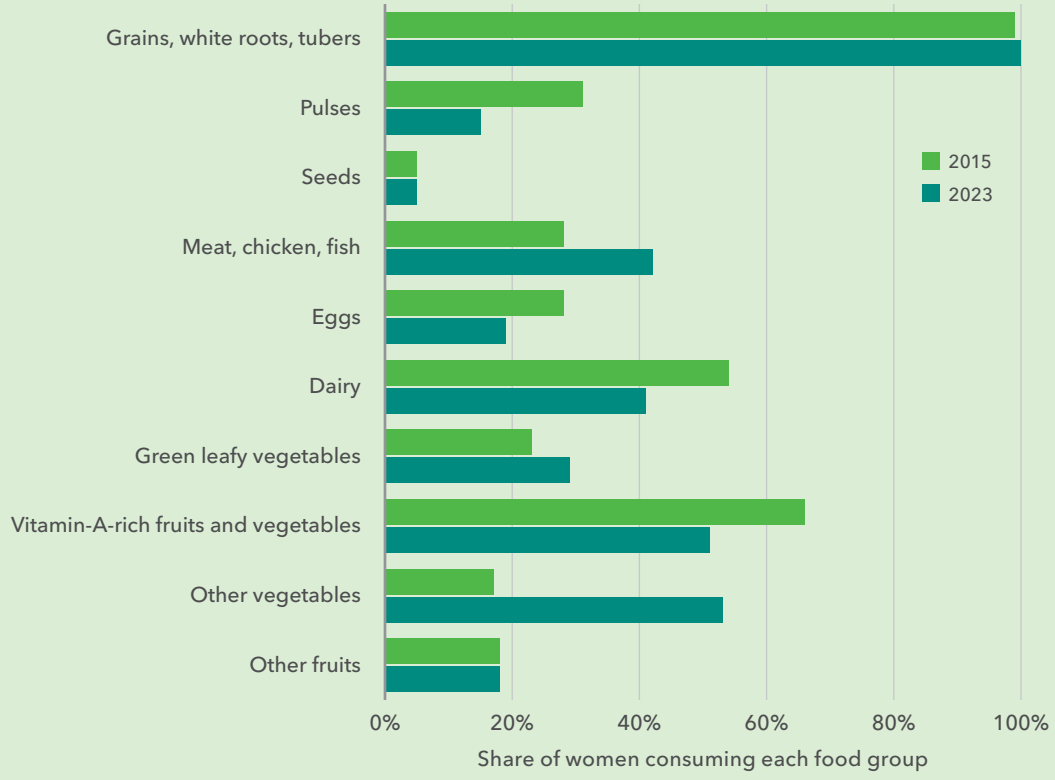
BOX 1 FOOD SECURITY AND DIETARY DIVERSITY IN KHATLON REGION, TAJIKISTAN

In 2015 and 2023, IFPRI surveyed 2,000 households in Khatlon, a region of Tajikistan that is predominately rural and historically the country's poorest. Data were collected during the winter in both years, the season when food insecurity is typically most prevalent in Tajikistan. The survey showed that food security improved substantially over this eight-year period: in 2023, 27.0 percent of households reported that they did not have food in their home at least once in the past month, as compared to 40.2 percent in 2015.

Hunger levels also improved, with the share of households reporting moderate to severe hunger falling by 1.7 percentage points to reach 12.1 percent in 2023. However, while 11.6 percent of households experienced improvements in their hunger status from 2015 to 2023, 9.7 percent reported a worsened hunger status, underscoring the tenuous food security situation for many families in Khatlon.

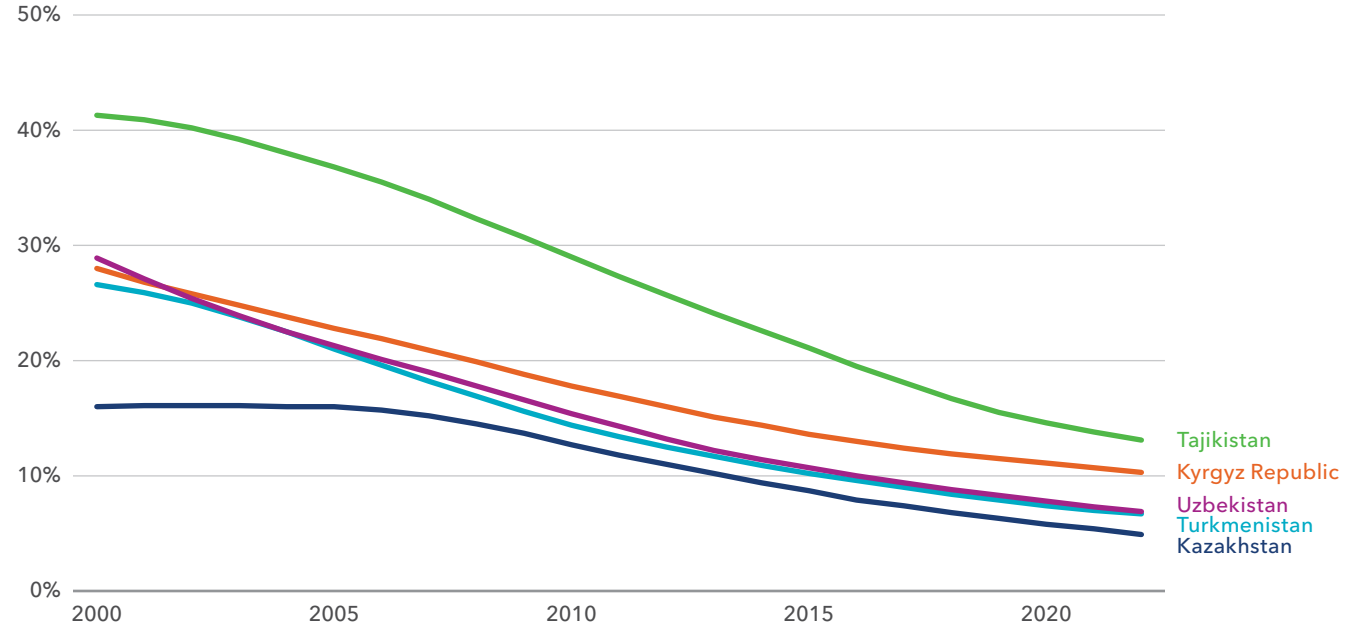
The findings on dietary diversity were also mixed. In both 2015 and 2023, only 31 percent of adult women achieved minimum dietary diversity. Women had less diverse diets than men, and lower consumption of meat, chicken, and fish (43 versus 53 percent) and dairy (45 versus 50 percent). Over the same period, diets shifted from less expensive protein sources (such as pulses) toward more expensive options (such as meat, chicken, and fish). Additionally, household consumption of vitamin-A-rich fruits and vegetables declined, and food consumed away from home increased more than threefold. Food expenditures increased from 2015 to 2023 but were directed toward purchasing more expensive food items that did not necessarily improve dietary diversity.

FIGURE B1 Minimum dietary diversity for women (24-hour recall), Khatlon Region, Tajikistan



Source: I. Lambrecht, M. Mardonova, and K.T. Akramov, "Welfare and Vulnerability in Tajikistan: Evidence from Twelve Districts in Khatlon Province, 2015–2023," Central Asia Working Paper 2, IFPRI, Washington, DC, 2023.

FIGURE 1 Prevalence of stunting among children under 5 years of age (2000–2022)



Source: Data from FAOSTAT, accessed March 18, 2023. https://www.fao.org/faostat

In the past decade, the prevalence of stunting in children under five years of age in Central Asia has fallen by about half (Figure 1), with the highest rates in 2022 found in Tajikistan (13.1 percent) and the Kyrgyz Republic (10.3 percent), and the lowest in Kazakhstan (4.9 percent).[4] The prevalence of wasting in the region has fallen below the world average of 6.8 percent, with the highest rates reported in Tajikistan (5.6 percent) and Turkmenistan (4.1 percent).[5] Based on these estimates, Tajikistan is considered a "medium" prevalence country for both stunting and wasting, the Kyrgyz Republic a "medium" prevalence country for stunting, and Turkmenistan a "low" prevalence country for wasting.[6]

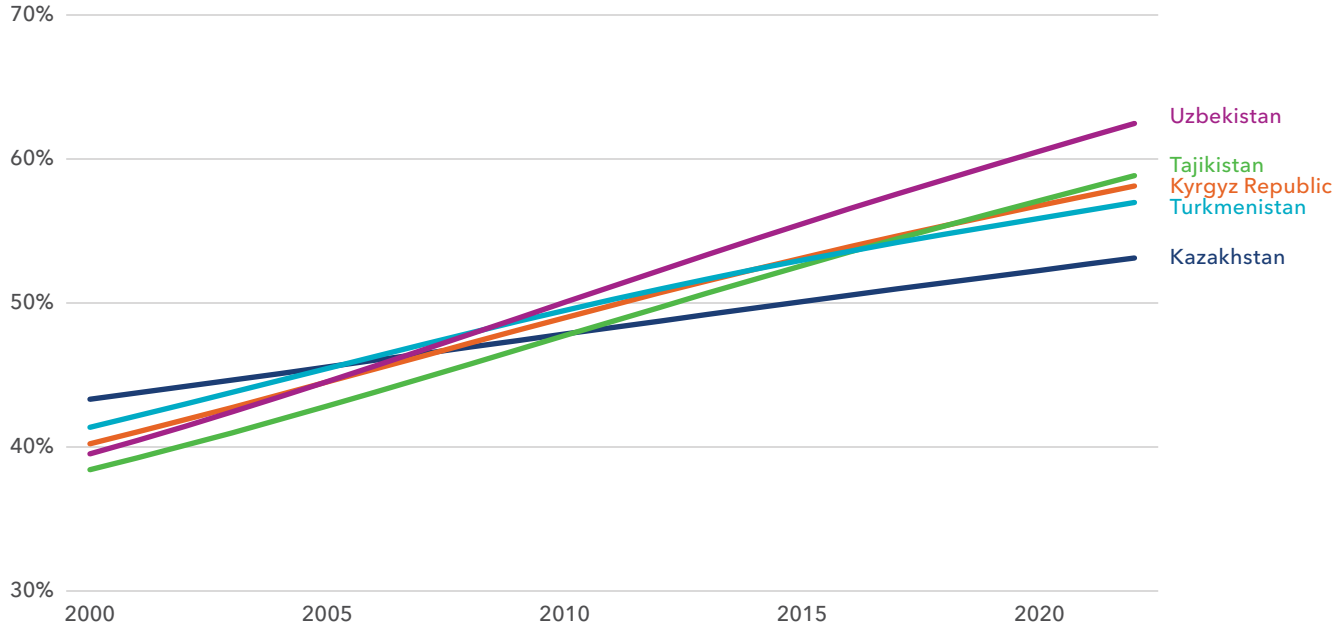
OVERWEIGHT AND OBESITY

The prevalence of overweight and obesity has increased rapidly in Central Asia (Figure 2). Based on data from 2022 for the region as a whole, more than half of the adult population is estimated to be overweight or obese. Rates vary by country, however, with 62.7 percent overweight or obese (BMI ≥ 25) in Uzbekistan (30.0 percent obese), 58.8 percent in Tajikistan (23.8 percent obese), 58.1 in the Kyrgyz Republic (26.6 percent obese), 53.1 percent in Kazakhstan (18.4 percent obese), and 27.0 percent in Turkmenistan (21.4 percent obese).[7]

A major driver of the increasing prevalence of overweight and obesity among adults is the shift in dietary patterns toward higher intakes of meat, fat, sugar, and processed foods.[8] Across the region, obesity disproportionately affects women,[9] which may be explained in part by women's lower levels of physical activity in Central Asia.[10] These differences are particularly notable in Tajikistan (27.5 percent of women and 19.8 percent of men are obese), Turkmenistan (23.5 percent and 18.8 percent), and Uzbekistan (32.7 percent and 26.8 percent), with a smaller difference seen in the Kyrgyz Republic (28.3 percent and 24.0 percent). Both men and women appear to be more active in Kazakhstan compared to the rest of the region, where obesity affects 18.0 percent of women and 18.3 percent of men.[11]

The prevalence of overweight (including obesity) is significantly lower among children under five years of age, but is high enough that some countries are categorized as "moderate" prevalence countries (5–10 percent).[12] Among children, 7.7 percent were estimated to be overweight in Kazakhstan, 6.4 percent in

FIGURE 2 Prevalence of overweight and obesity among adults (2000–2022)



Source: Data from FAOSTAT, accessed March 18, 2023. https://www.fao.org/faostat

the Kyrgyz Republic, 4.2 percent in Uzbekistan, 3.6 percent in Turkmenistan, and 3.0 percent in Tajikistan in 2022. Moreover, overweight among children (measured based on the child's weight for height) has declined in all Central Asian countries since 2012.[13] This decline in overweight may be explained in part by reductions in stunting over the period, which occurred from an early age (under six months) and perhaps began in utero, resulting in taller children. Other factors, such as improvements in infant and young child feeding (IYCF) practices, may also have contributed to this decline. The Kyrgyz Republic witnessed significant improvement in applying adequate IYCF practices between 2012 and 2018.[14] In contrast, a worsening trend in IYCF practices was observed in both Tajikistan (between 2012 and 2017) and Turkmenistan (between 2015 and 2019). Recent longitudinal data are unavailable for Kazakhstan and Uzbekistan.

Traditional cuisine and recently introduced foods are contributing to overweight and obesity. Traditional food markets and street vendors throughout Central Asia offer energy-dense products high in saturated and trans fats, refined carbohydrates and sugar, and sodium — including *samosa*, *piroshky*, *chebureki*, *shawarma*, hot dogs, sweet pastries, and candy, as well as sugar-sweetened beverages.[15]

Globally, Central Asia is among the regions with the highest sodium intake,[16] which is a major contributor to diet-related noncommunicable diseases. An estimated one in four deaths in Turkmenistan and Uzbekistan is attributable to dietary risks (such as diets low in whole grains, fruits, or vegetables, and/or high in sodium, red and processed meat, and sugar-sweetened beverages) — twice the global level — as is one in five deaths in the other Central Asian countries. Similarly, nearly half of all deaths in Turkmenistan and Uzbekistan are attributable to metabolic risks often related to diet quality (such as high blood sugar, high blood pressure, and high body mass index), as are more than one in three deaths in the other Central Asian countries.[17]

MICRONUTRIENT DEFICIENCIES

Micronutrient deficiencies are a critical concern in Central Asia, with minor to no improvement achieved in the last decade. Anemia is present among 30 percent of all women (15–49 years) in the region, and affects 35.8 percent of women in the Kyrgyz Republic and 35.2 percent in Tajikistan.[18] Among pregnant women,

this prevalence is even higher, with 34.0 percent having anemia in the region — again, this is highest in the Kyrgyz Republic (36.3 percent) and Tajikistan (38.6 percent), the latter bordering on "severe" prevalence (more than 40 percent). Similarly, between 20 and 40 percent of young children (6–59 months) in the region are affected by anemia, with the highest levels in Tajikistan (37.0 percent), the Kyrgyz Republic (33.4 percent), and Turkmenistan (33.1 percent).[19]

While most of the Central Asian population are able to meet their daily calorie intake needs, significant lack of dietary diversity and inadequate nutrient intake contribute to the rise in overweight and micronutrient deficiencies. Recent surveys using dietary recall, conducted in late summer, a time of the year when food availability and food security are typically at their best, show that 87–89 percent of women of reproductive age consume diets that meet minimum dietary diversity across Central Asian countries.[20] However, during other times of the year — especially winter — and in vulnerable areas, diet quality is significantly lower and may also differ by gender (see Box 1). Cereals, mainly wheat products, are the traditional staples of Central Asians and account for nearly half of the calorie intake in most countries. Specifically, cereals account for 55.6 percent of calorie intake in Turkmenistan (50.7 percent from wheat), 48.4 percent in Tajikistan (44.2 percent from wheat), 45.7 percent in the Kyrgyz Republic (36.1 percent from wheat), and 44.2 percent in Uzbekistan (40.9 percent from wheat).[21] The fortification of wheat flour, typically with iron and folate, is mandatory in all countries (see Chapter 6); Tajikistan was the last to sign a national fortification law, in 2019.[22] However, effective measures to ensure implementation of these laws have yet to be enacted.

KEY CHALLENGES

The key obstacles to improving diet quality and nutrition in Central Asia include socioeconomic challenges, the high cost of a healthy diet, inadequate nutrition knowledge, unhealthy consumption habits, and domestic and regional policies (such as constraints on farm decision-making, trade restrictions, and poor enforcement of flour fortification and salt iodization), which all hamper a shift to production and consumption of more nutritious foods. The improvements in nutritional outcomes witnessed in past decades were mainly due to a significant reduction in poverty, yet poverty rates remain relatively high in the region. Energy-dense, less nutritious foods are widely available and affordable, while nutritious foods are often more expensive and unaffordable for low-income households.

AFFORDABILITY OF HEALTHY DIETS. Overall, 24.4 percent of Central Asian people are unable to afford a healthy diet, which is considerably higher than in Eastern Europe (2.5 percent) and West Asia (9 percent), but significantly lower than in Southeast (54.9 percent) and South Asia (72.2 percent). Among countries in the region, there are stark differences in the affordability of a healthy diet. According to the latest estimates (2021), 2.3 percent of the population is unable to afford a healthy diet in Kazakhstan, while 58.2 percent of the population in the Kyrgyz Republic and 44.3 percent in Tajikistan cannot afford a healthy diet. This amounts to a total of 8.7 million people who cannot afford a healthy diet in just these three countries.[23] The total number of people unable to afford a healthy diet in Central Asia is likely significantly higher, given that data are lacking from both Turkmenistan and Uzbekistan, which report some of the highest levels of moderate and severe food insecurity in the region.[24]

PRICE SHOCKS. Poor households are the most vulnerable to food price shocks. Prices for staple foods (wheat flour and derived products) increased sharply in Central Asian countries that import food (the Kyrgyz Republic, Tajikistan, and Uzbekistan) when Kazakhstan and the Russian Federation responded to the COVID-19 pandemic by restricting wheat exports. While the Russia-Ukraine war has not directly disrupted food trade between Russia and Central Asia, it has negatively affected the region's trade with Ukraine and raised food prices by increasing uncertainty in agrifood markets. Increases in staple food prices in the past three to five years have reduced consumers' purchasing power and made healthy diets even less affordable.[25,26]

BEHAVIORAL FACTORS AND GENDER. Social and behavioral factors also present significant barriers to improving nutrition in the region. Basic nutritional knowledge is often inadequate. For example, recent evidence from Tajikistan found significant misconceptions about what constitutes a health-promoting diet and appropriate IYCF practices.[27] In addition, levels of physical activity are low, and recent increases in welfare have come with a more sedentary lifestyle.

Culturally and socially driven gender roles likewise have notable effects on nutrition and health. Women are disproportionately exposed to multiple burdens of malnutrition as a result of gender inequality and their limited decision-making power, among other factors.[28] For example, gendered differences in dietary knowledge and practices were apparent in a study conducted in rural Tajikistan.[29] Such differences were also found in the IFPRI study in the Khatlon Region of Tajikistan, which showed that men consume more diverse diets than women (Box 1). Moreover, gender norms and roles can also present notable barriers to women's participation in physical activity. The largest gender gaps in physical activity are seen in Tajikistan, where 38.7 percent of women were insufficiently physically active compared with 19.9 percent of men in 2016; and Uzbekistan, where 24.4 percent of women and 13.3 percent of men are considered insufficiently physically active.[30]

POLICY RESPONSES

Several policy interventions have potential to transform food systems in the region for better nutrition and diet quality. These include improving policy responses to crises; enhancing trade openness and diversity in trading partners;[31] implementing flour fortification; and promoting crop diversity, school meal programs, and policies to improve the food environment (see Chapter 5), among others.

AGRICULTURAL DIVERSIFICATION. In the past, regional agriculture following the central planning mandates focused singularly on specific products: the Kyrgyz Republic specialized in livestock, Tajikistan and Uzbekistan in cotton, and Kazakhstan in wheat. In the past two decades, national governments have facilitated agricultural diversification by focusing more on high-value, nutrient-rich food crops. For example, in the 2010s, the Uzbek government shifted its policy toward promoting horticultural crops and received large loans from international donors such as the World Bank and Asian Development Bank to promote this policy. As a result, by 2022, more than 21 percent of agricultural land was allocated to horticultural crops, representing a nearly 8 percentage point increase compared with 2010.[32] A similar increase occurred in Tajikistan.[33] Recent evidence from Tajikistan suggests that promoting nutrition-sensitive agricultural diversification (see Chapters 3 and 6) is a viable strategy to improve nutrition and diet quality in Central Asia. Strong linkages have been observed between dietary diversity and diversity in food production by smallholders, especially when market access is limited.[34] Further promotion of crop diversity by allowing farmers more freedom to farm and improving access to innovative horticultural technologies is necessary to enhance diet quality and diversity in the region.

SCHOOL MEAL PROGRAMS. School meal programs can improve food security and nutrition (see Chapter 3). While these programs are present in all Central Asian countries, some countries have national school feeding policies (Kazakhstan), while others rely largely on donor-supported programs (the Kyrgyz Republic and Tajikistan). In Tajikistan, the World Food Programme (WFP) supports a school feeding program for primary school children that reaches more than half of the country's schools and nearly a quarter of its school children. WFP also supports a similar program in the Kyrgyz Republic. In Kazakhstan, the government's national school feeding program aims to further improve nutritional outcomes through nutrition education. In 2022, Uzbekistan's government began to provide free meals to primary school students in two regions and subsequently expanded the program to all primary schools. While there is no credible evidence of the impact of these programs on children's welfare and nutrition in the region, evidence from Armenia, a neighboring

country with similar socioeconomic conditions and a comparable school meal program, shows that such programs have a modest impact on poverty.[35] Thus, better assessment of these programs in terms of their impact on nutritional outcomes is necessary as countries consider ways to enhance their design.

POLICIES TO IMPROVE FOOD ENVIRONMENTS. Assessing existing food environments is necessary to identify strategies and policies to promote healthy food environments in the region. The evidence suggests that countries in the region face significant problems related to food safety and sanitary and phytosanitary (SPS) standards. Outdated legislation, poor laboratory capacity, and poor coordination between border controls create vulnerability to transboundary pests and diseases, and constrain the potential of Central Asian countries to expand agricultural food trade.[36] Thus, aligning food safety systems and SPS standards with international standards will help boost food trade within the region and ensure food is available and affordable. Developing food-based dietary guidelines, promoting food labeling, and including nutrition information and caloric content on food product packages and restaurant menus will also contribute to healthy food environments in the region.

NUTRITION AND SOCIAL BEHAVIOR CHANGE COMMUNICATION. Behavior change campaigns are needed to improve basic nutritional knowledge, promote more diverse diets and consumption of whole grains, limit intake of processed food, reduce the use of oil and salt in both traditional and more newly introduced foods, and emphasize the importance of physical activity (see Chapters 3 and 5). These campaigns can prompt individual-level action and contribute to the critically needed efforts at the policy level to reduce malnutrition. Targeting this communication to both men and women, with attention to cultural factors such as gender-related norms and traditional roles, will be key in achieving improvements among men and women alike, across different age ranges. In addition, regulations on marketing ultra-processed foods and sugar-sweetened beverages to children could promote the establishment of healthy eating patterns during childhood and adolescence that reduce micronutrient deficiencies and mitigate increases in overweight and obesity.

DATA AND ANALYTICS. Central Asian countries currently lack comprehensive data on nutrition and dietary practices at the household and community levels. This lack of information, especially the absence of age- and gender-disaggregated data, poses a significant challenge in understanding disparities and inequalities of different demographic groups, including men and women, as well as children and adults. Moreover, none of the region's countries have national food-based dietary guidelines (see Chapter 3), though these are currently being developed in Tajikistan and Kyrgyzstan. Development of food-based dietary guidelines can lay the foundation for national food, nutrition, and health policies and programs. There is also a pressing need for enhanced data analysis capabilities and assessment in Central Asian countries. Investments in collecting age- and gender-disaggregated survey data and building analytical research capacity are essential to gain a deeper understanding of how to develop effective policy solutions to transform food systems for better nutrition and diet quality.

SOUTH ASIA

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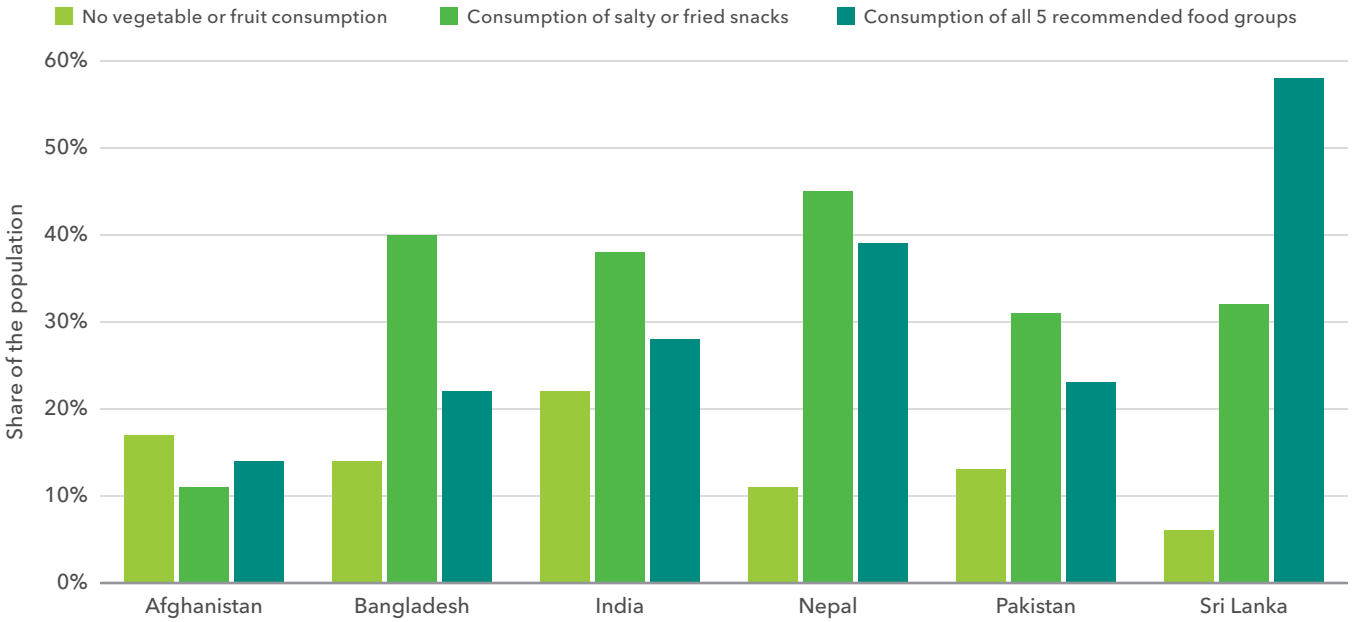
Malnutrition rates are high across South Asia, and poor diet quality is a major contributor to this problem throughout the region. Cereals and starchy roots account for a large share of total calories consumed, and the consumption of calorie-dense foods, such as fried snacks, is high and increasing,[1] while the consumption of vegetables and other micronutrient-rich foods is low (Figure 1).[2] As a result, high levels of undernutrition (stunting and wasting) and micronutrient deficiencies persist even as the prevalence of overweight, obesity, and related noncommunicable diseases (NCDs) is rising (Table 1).

DRIVERS OF POOR DIET QUALITY

The factors underlying poor diets are well known – they include affordability constraints, behavioral and cultural preferences, agriculture and food policies, and food environments that favor rice, wheat, sugar, and calorie-dense foods.

FIGURE 1 Share of population consuming all five recommended food groups, salty or fried snacks, and no vegetables or fruits, 2021–2022



Source: Based on data from the Global Diet Quality Project, accessed January 2024. https://www.dietquality.org/indicators

Note: All five recommended food groups includes (1) at least one starchy staple food; (2) at least one vegetable; (3) at least one fruit; (4) at least one pulse, nut, or seed; and (5) at least one animal-source food.

TABLE 1 Prevalence of malnutrition and noncommunicable diseases in the six most populous countries of South Asia

Country	Prevalence of undernourishment (%)		Prevalence of stunting in children under 5 years (%)		Prevalence of overweight in adults (%)		Prevalence of raised blood pressure in adults (%)		Prevalence of diabetes in adults (%)	
	2011	2021	2011	2016–2019	2006	2016	2011	2015	2011	2014
Afghanistan	19.7	30.1	40.4 (2013)	38.2 (2018)	14.4	18.1	30.3	30.6	11.1	11.9
Bangladesh	16.1	11.2	41.3	28.0 (2019)	12.9	17.1	25.2	24.7	9.2	9.8
India	15.4	16.6	38.7 (2012)	34.7 (2017)	12.9	16.4	25.7	25.7	8.5	8.7
Nepal	9.1	5.4	40.1	31.5 (2019)	13.8	17.6	29.1	29.6	10.0	10.6
Pakistan	14.9	18.5	43.6	37.6 (2018)	17.0	20.6	30.2	30.4	11.6	12.4
Sri Lanka	14.0	5.3	14.6 (2012)	17.3 (2016)	14.8	18.6	21.9	22.3	6.9	7.4

Source: Based on data from the Food Systems Dashboard, accessed January 2024. www.foodsystemsdashboard.org/indicators

Note: "Prevalence of undernourishment" is the percentage of the population whose habitual food consumption is insufficient to provide the dietary energy levels required to maintain a normal active and healthy life. For data on the prevalence of stunting, numbers in parentheses indicate the year data were collected.

POOR AFFORDABILITY. South Asia is among the world's poorest regions. More than 10 percent of the population (nearly 200 million people) live in extreme poverty (at or below $2.15/capita/day), and 44 percent (814 million) live below the poverty line for lower-middle-income countries ($3.65/day).[3] Nearly half of the more than 2 billion people worldwide who cannot afford a healthy diet reside in South Asia,[4] with the cost of the EAT-Lancet reference diet exceeding the daily incomes of more than 600 million people in the region (38.4 percent of the total population),[5] and too expensive for 75 percent of the population (see Chapter 4).[6] Even the least-cost nutrient-adequate diets are unaffordable for a third of all households in South Asia.[7]

RELATIVE PRICES. Micronutrient-rich foods are expensive in South Asia, while cereals, fats and oils, sugar, and sugary and salty snacks are relatively cheap (see Chapter 4). The cost premium – that is, the additional cost, for the least-cost nutrient-adequate diet above the least-cost source of calorie adequacy – is larger in South Asia than in any other region.[8] For example, dark green leafy vegetables and vitamin A–rich fruits and vegetables cost 8 to 22 times more per calorie than starchy staples and twice as much per calorie as sugary and salty snacks. In addition, calories from fats and oils and sugar cost even less than those from staples in India and other South Asian countries.[9]

CEREAL-CENTRIC AGRICULTURE AND FOOD POLICIES. As in many other parts of the developing world, agriculture and food policies across South Asia continue to focus on keeping starchy staples affordable, rather than on the diverse diets needed for lifelong health.[10] The need for balanced diets rich in micronutrients is widely recognized but largely ignored in allocation of resources. For example, rice, wheat, and sugarcane growers are entitled to price guarantees in India. Similarly, rice farmers in Sri Lanka have preferential access to subsidized fertilizers. This bias also extends to public investments in agricultural R&D, which have prioritized enhancing the productivity of rice and wheat, while neglecting coarse grains and pulses.[11] These

cereal-centric policies have led to low crop diversity across South Asia, with more than two-thirds of the region's arable land under cereals, and thus have contributed to poor nutritional outcomes.

ROLE OF SOCIAL SAFETY NET PROGRAMS. South Asian countries implement some of the world's largest food-based social safety net programs to support poor households, pregnant women, new mothers, and young children (see Chapters 3 and 4). Many of these programs subsidize rice and/or wheat for target households. For example, Bangladesh's Food Friendly Program (Khaddo Bandhob Karmasuchi) provides 30 kg of highly subsidized rice to the country's poorest households during the lean seasons between harvests (March–April and September–November). India's public distribution system (PDS) provides up to 25 kg of free rice and/or wheat every month to two-thirds of the country's poorest households. While the PDS may reduce hunger, it has not improved access to balanced diets for the targeted households (Box 1).

One study found that access to the PDS has no effect on consumption of micronutrient rich food[12]; rather, the PDS skews household consumption toward cereals, thus reducing consumption of items like fruits and milk. In addition, households with access to the PDS have reported replacing nutritionally richer coarse cereals with subsidized rice and wheat.[13] However, other studies suggest that subsidized rice and wheat act as income transfers and have a positive impact on consumption of all food groups.[14]

Switching from in-kind transfers to direct cash transfers for food subsidies could reduce the cost of this support for governments and eliminate the distortions affecting household choices.[15] However, in societies with high levels of poverty, poorly developed credit and factor and product markets, and widespread inequality, cash may not ensure the same food security that food transfers provide for households.[16] Moreover, households have been found to prefer food over cash in regions where the PDS is functioning well.[17]

BEHAVIORAL AND CULTURAL PREFERENCES. In addition to prices, incomes, and government policies, non-economic cultural factors, including vegetarianism and unusually late introduction of solid foods to infants, also have a strong influence on diets in South Asia.[18] Moreover, even the wealthiest households (in the top decile of monthly per capita consumption expenditure) consume less than the recommended quantity of vegetables and spend a large share of their food budgets on processed and ultra-processed foods.[19]

BOX 1 INDIA'S PUBLIC DISTRIBUTION SYSTEM AND DIVERSIFYING DIETS

There is an increasing demand in India to diversify the public distribution system (PDS) food basket by adding pulses, coarse cereals, and other nutrient-rich foods to make it more nutrition-sensitive. The state government of Karnataka in India has begun distributing 2 kg of subsidized finger millets per family per month through the PDS, and the governments of Madhya Pradesh, Maharashtra, Haryana, and Odisha are also introducing millets, including finger millets, in the PDS. Pulses have been added to the basket of subsidized goods sold through the PDS in states including Andhra Pradesh, Himachal Pradesh, Tamil Nadu, and Telangana.

However, adding subsidized pulses to the PDS basket led to only a small increase in household pulse consumption and almost negligible net nutritional impact, largely because the increase in consumption of PDS-subsidized pulses was offset by decreases in pulses purchased from the market.[a] The quantity of subsidized pulses or coarse cereals provided would have to increase dramatically to have any real impact on total consumption and nutrition. Small transfers of 2 kg per family per month are not enough to improve diet quality.

Expanding the PDS to include a sufficient amount of pulses and coarse cereals requires building a public procurement system and setting remunerative minimum support prices (MSP) for these crops, as is done for rice and wheat. Historically, MSPs for millets and pulses have generally been low compared to their market prices.[b] To encourage millet cultivation and its inclusion in the PDS, India's government has created an entity under the National Food Security Mission, but its impact remains to be seen.

EMERGING TRENDS IN SOUTH ASIAN DIETS

Consumption of calorie-dense and processed foods (chocolates and sugar confectioneries, salty snacks, beverages, ready-made and convenience foods, and breakfast cereals) is increasing in India and other countries of South Asia. After cereals and milk, snacks and prepared foods make up the largest share of Indian food budgets. Our analysis of data from a large nationally representative panel of households shows that India's total annual household expenditure on paid meals consumed away from home increased from Rs. 619 billion (US$8.8 billion) in 2015 to Rs. 820 billion (US$11.6 billion) in 2019 in real terms, an increase of about US$3 billion.[20] Similarly, the share of packaged (highly processed and calorie-dense) foods in household food budgets nearly doubled during this period, from 6.5 to 12 percent. Wealthier households spend a greater share of their food budgets on processed foods (Figure 2). A recent World Health Organization report also finds that sales of highly processed foods increased at an annual rate of 13.4 percent between 2011 and 2021.[21] It is not clear, however, whether increasing expenditure on prepared and ultra-processed foods is crowding out the consumption of healthier foods such as fruits and vegetables.

THE WAY FORWARD

To support a shift toward better nutrition and healthier diets, South Asian governments must correct the historical bias in their agriculture and food policies and allocate more resources to promote production and consumption of non-staple foods. "Crop-neutral" policies would allow farmers to respond to market signals,[22] including demand for more diverse diets (see Chapter 6), and the resulting diversification in domestic food production could also reduce poverty in the region.[23]

Rice and wheat subsidies are popular in many parts of India, but switching to direct cash transfers for food subsidies is worth trying in areas where grain markets are well developed and where consumers have easy access to banking services.[24] Cash transfers would reduce the cost to the government of food

FIGURE 2 Share of urban household food budgets spent on processed foods and purchased meals, by per capita consumption expenditure, India

Source: Based on data from the Centre for Monitoring Indian Economy's Consumer Pyramids Household Surveys. www.cmie.com

subsidies, reduce distortions in food production and consumption, and afford consumers more choices. When combined with nutritional behavior change and communication training (see Chapter 3), cash transfers have also been shown to have a significant positive impact on children's nutritional status.[25]

Tax rates are not aligned with the nutritional content of foods in South Asia. Higher taxes on foods high in fat, sugar, and salt could help to slow the rapid increase in consumption of these foods (see Chapter 5). Many countries in Asia, including India, the Philippines, Saudi Arabia, Sri Lanka, and Thailand, have imposed corrective taxes on sugar-sweetened beverages, with some impact on lowering the average sugar content of the taxed items.[26]

Effective front-of-package labeling that provides consumers with easy-to-understand nutrition information can promote healthy food choices and incentivize reformulation by manufacturers (see Chapter 5). This form of nutrition labeling is strongly recommended by international health agencies. Color-coded labeling of sugar-sweetened beverages along with media campaigns to raise awareness in Sri Lanka has led to reduction in the sugar content of beverages and a drop in sales of carbonated drinks.[27] However, efforts to implement similar, accessible front-of-package labeling is facing stiff resistance from the food industry (see Chapters 3 and 8).[28]

In countries like India, 90 percent of food enterprises are small, informal, and outside the regulatory and tax net.[29] The predominance of these in the region may limit the impact of taxes and regulations on food quality and may even divert demand to informal food enterprises. To address this gap, taxes and other regulations should be combined with awareness campaigns to improve nutrition literacy. Effective food labeling and corrective taxes on foods high in fat, sugar, and salt, combined with nutrition literacy, may reduce the supply and consumption of unhealthy foods.

Over the past decade, efforts to improve nutrition knowledge and awareness in South Asia have included several large-scale social and behavior change initiatives (see Chapter 3). These have included efforts conducted through frontline health workers and community platforms, for example, the National Nutrition Mission and women's group programs in India, frontline health worker programs in Nepal and Bangladesh, and more. Evidence of the impact of these programs on dietary diversity is quite robust, but evidence on improving other aspects of healthy diets, such as reducing the consumption of ultra-processed foods, is very limited. New policies and programs targeting all components of a sustainable healthy diet will be essential across South Asia, especially considering the persistence of multiple forms of malnutrition and the increasing burden of NCDs.

EAST AND SOUTHEAST ASIA

PHUONG HONG NGUYEN, KEVIN Z. CHEN, AND JODY HARRIS

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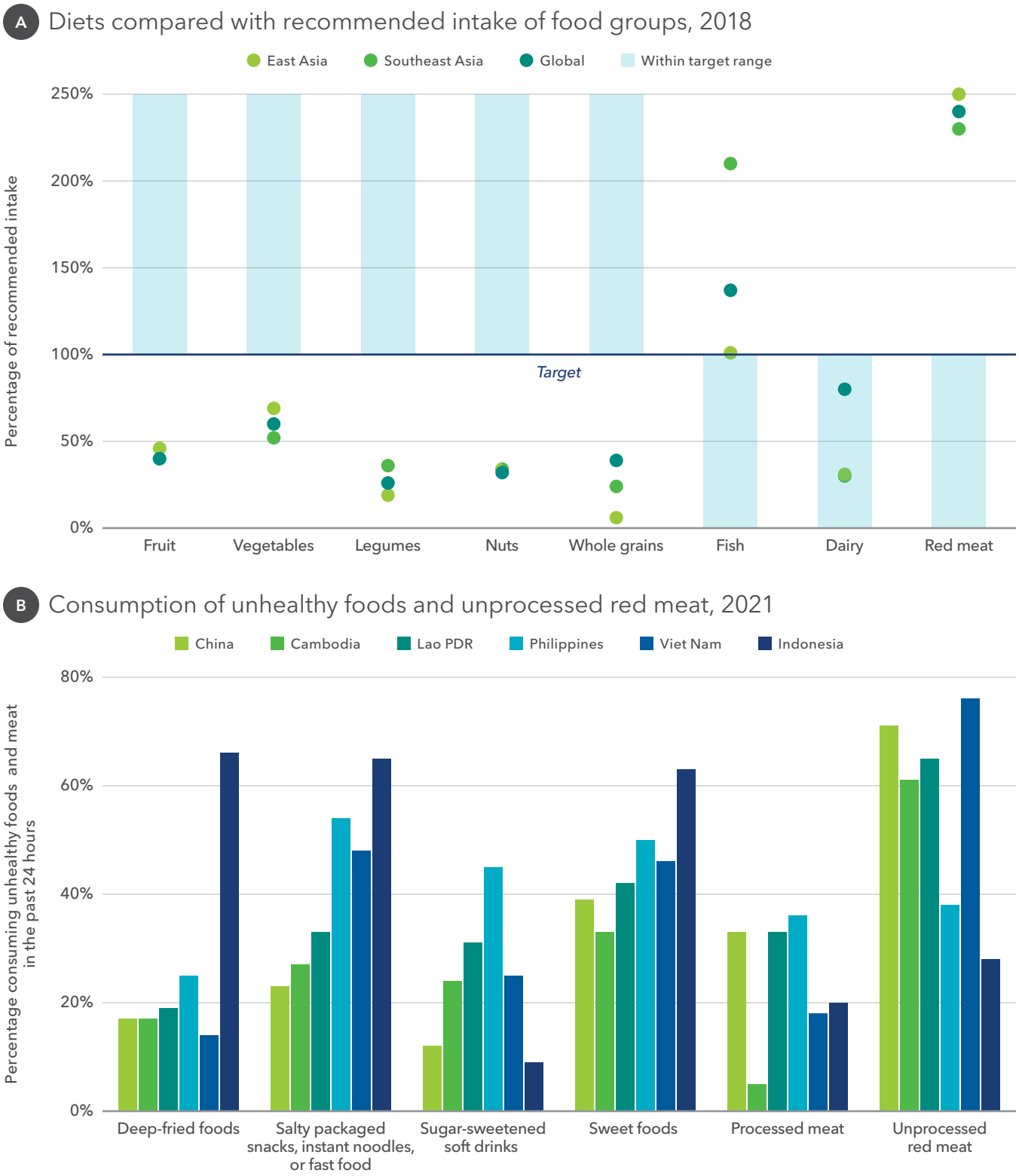
The food systems of East and Southeast Asia (ESEA) are shaped by a unique interplay between the major role of traditional smallholders in food production, widespread informal employment in food systems, and the region's high level of urbanization, as well as impacts of regional trade on food supply, all of which affect diets and nutrition. The double burden of malnutrition – hunger and micronutrient deficiencies, plus overweight and obesity – is evident across the region, driven by inadequate diets and the food systems that underpin them. The region is also highly diverse, both across countries (ranging from the smallest to the largest economies in the world) and within countries (home to some of the richest urbanites and some of the most marginalized rural and urban communities). This section describes the dietary trends in the region, highlights key food system drivers of the double burden, and suggests policy options to mitigate the challenges and build on successful experiences.

DIET AND NUTRITION TRENDS AND ISSUES

Regional diets have historically been predominantly rice-based and characterized by seasonal scarcity, particularly of fruits and vegetables. Many ESEA countries also have strong food cultures (the cuisine, ingredients, cooking methods, and attitudes about the production, preparation, consumption, and sharing of food). While calorie availability has improved across the region as a result of the Green Revolution and economic and trade reforms, both food insecurity and lack of dietary diversity remain persistent problems.[1] The ongoing nutrition transition from traditional to modern diets, which emerged in the region in the early 1990s, has led to increased consumption of ultra-processed foods and animal-source foods and a decline in heavily staple-based fresh and local foods.[2] Over the past three decades (1990–2017), inadequate diets (either nutrient-poor, staple-based diets in food insecure areas or diets high in ultra-processed foods, particularly in urban areas) have been responsible for 30 percent of all adult deaths and 21 percent of illness in East Asia and 22 percent of deaths and 17 percent of illness in Southeast Asia.[3]

While hunger, micronutrient deficiencies, and overnutrition coexist within the same countries and sometimes the same households, there are notable differences in diets and nutrition outcomes across countries. These differences reflect wide variations in food insecurity and access to healthy diets that disproportionately affect marginalized communities or populations. Nearly a quarter of the ESEA population experiences at least moderate food insecurity (limited access to adequate and nutritious food), ranging from less than 5 percent in Singapore and Japan to more than 30 percent in Cambodia, the Philippines, Thailand, and Lao PDR.[4] Diets do not meet recommendations for healthy and sustainable diets on average in the region (Figure 1, panel A),[5] with average intake of fruits, vegetables, legumes, nuts, and whole grains below recommended levels and intake of red meat above the recommended level. There is high consumption of sodium

FIGURE 1 Diets in East and Southeast Asia



Source: Panel A: Adapted from Development Initiatives, *2021 Global Nutrition Report: The State of Global Nutrition* (Bristol, UK: 2021); Panel B: Adapted from GBD 2017 Diet Collaborators, "Health Effects of Dietary Risks in 195 Countries, 1990–2017: A Systematic Analysis for the Global Burden of Disease Study 2017," *Lancet* 393, 10184 (2019): 1958–1972; data from Global Diet Quality Project, "Global Diet Quality Project," accessed November 2023. https://www.dietquality.org/

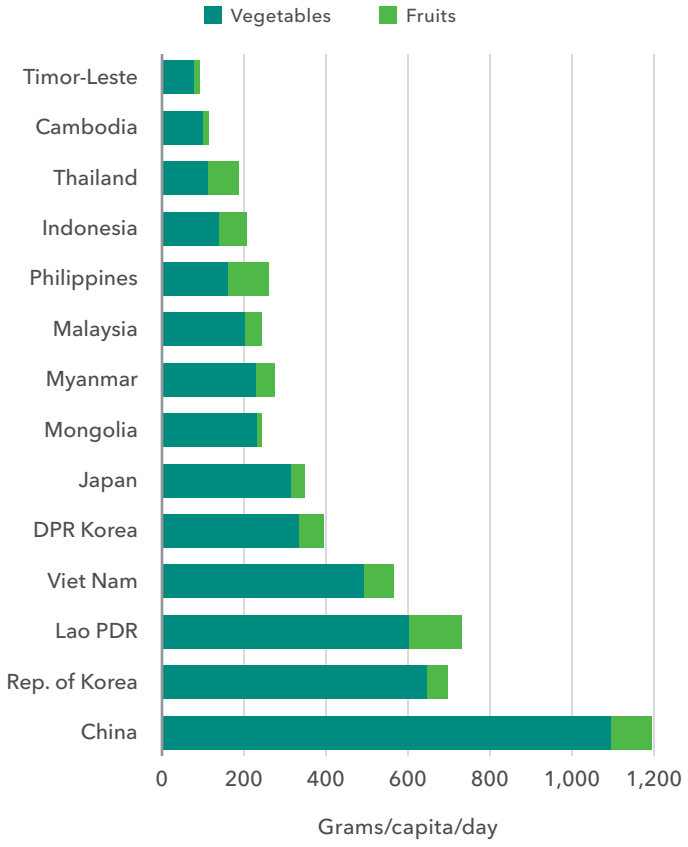
(through salt, salty snacks, and traditional condiments)[6] and of unhealthy and ultra-processed foods (high in sugar, fat, or salt and with ultra-high levels of processing or additives) across the region (Figure 1, panel B), though consumption of the latter is notably higher in some countries and populations than others.[7]

Poor diets lead to multiple micronutrient deficiencies. Nineteen percent of women in East Asia and 28 percent in Southeast Asia have anemia, and an estimated half of all children in the region have at least one micronutrient deficiency.[8] At the same time, the nutrition transition[9] is driving an increase in overweight and obesity across the region, though with large variations related to national food system characteristics and food cultures. Almost 58 percent of adults in Malaysia and around 20 percent in Viet Nam are overweight or obese,[10] and related noncommunicable diseases (NCDs) are significant. About 8 percent of adults in ESEA have diabetes, and high blood pressure affects 21 percent of adults in East Asia and 23 percent in Southeast Asia.[11]

FOOD SYSTEM DRIVERS AND CHALLENGES

Several food system drivers play a role in shaping diets in ESEA, including regional trade, the critical but stagnant role of smallholder farming, rapid urbanization, climate change and biodiversity loss, the nutrition transition, and food cultures. All of these, along with uncertain livelihoods and incomes, also have implications for affordability of healthy diets.

FIGURE 2 Availability of fruits and vegetables in East and Southeast Asia



Source: Based on data from the Food Systems Dashboard, accessed February 2024. www.foodsystemsdashboard.org

Note: Recommendation is 400 grams of fruits and vegetables a day. Amount available is calculated as the sum of production, imports, and net stocks minus exports, food manufacturing, feed, seed, waste, and other uses.

TRADE. While ESEA contributes significantly to current global rice and aquatic food production and export,[12] many countries within the region (including some of the largest) are net importers of food.[13] The diversity in national food trade profiles – ranging from import dependence to export orientation to self-sufficiency goals for particular foods – poses a challenge for coherent regional trade policy that considers nutrition alongside economic goals. This diversity is desirable particularly for evening out availability of nutrient-dense perishable foods such as fruits and vegetables, but important regional trade policies rarely consider nutrition and health issues, and in some cases, these policies are contrary to national public health policy goals.[14] Figure 2 shows the differences in fruit and vegetable availability across ESEA countries, which reflect limited regional trade.

FOOD SYSTEM EMPLOYMENT. In many countries, the share of agricultural employment, particularly among the working poor, remains high, and smallholder farmers are among those most likely to experience poor diets and malnutrition.[15] Although the region is home to some of the world's largest agribusinesses, smallholder and peasant systems involve 450 million smallholders and produce 80 percent of the region's food, often under poor

working conditions and with uncertain land tenure.[16] Employment in agriculture, and in food systems in general, is largely informal, with informal livelihoods accounting for an estimated 37 percent of agricultural employment in Thailand and as much as 90 percent in Cambodia (with the caveat that informal employment data are difficult to standardize across countries).[17] The range and informality of agricultural and food system work in ESEA have implications for designing food system policies that support livelihoods while improving the availability of nutritious foods for consumers.

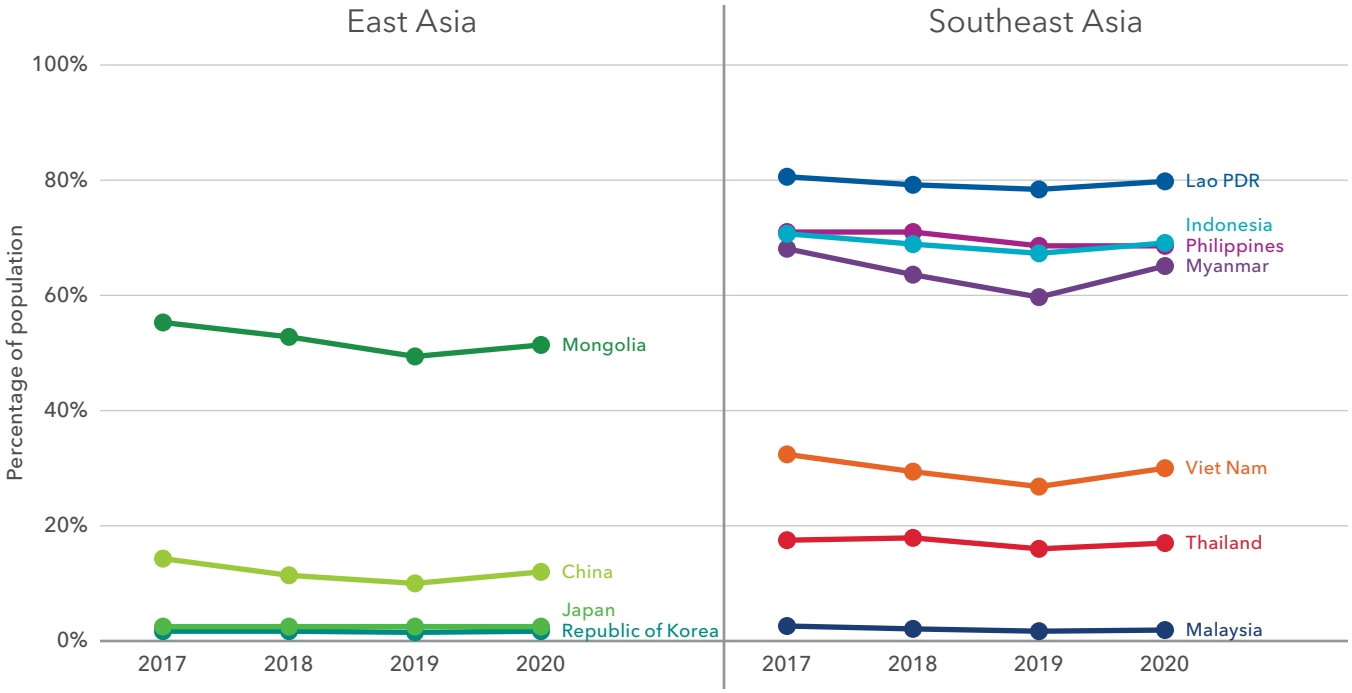
URBANIZATION. Urbanization is the most important demographic trend and a key driver of food system change in ESEA in recent years, but with mixed impacts. ESEA is the world's most rapidly urbanizing region, with an average annual urbanization rate of 3 percent.[18] More than 60 percent of ESEA's population and over 70 percent of East Asia's population[19] now live in urban areas, though urban populations still account for as little as one-third in some Southeast Asian countries. Of the region's urban population, approximately 40 percent live in informal settlements, while cities are also home to the region's wealthiest people.[20] Urbanization has driven increased demand for ultra-processed foods, which are often cheaper and more convenient but less healthy options for busy or poor urban workers (see Chapters 4 and 5). Urban markets enable more targeted transportation and logistical networks, contributing to market concentration (which reduces food choices for purchasers and market choices for producers), the proliferation of supermarkets and convenience stores, and increased sales of prepared foods and sugar-sweetened beverages from global and Asian firms.[21] These sales have accelerated recently because of increased use of delivery apps, largely for unhealthy foods.[22]

CLIMATE CHANGE AND BIODIVERSITY LOSS. Climate change and biodiversity loss can have complex and interconnected effects on diets, affecting food availability, diversity, dietary patterns, and nutritional quality.[23] Climate change affects crop yields and nutrient levels in plant-based foods, particularly cereals and legumes, due to increased carbon dioxide levels. Loss of genetic diversity limits the ability to breed resilient crops and reduces the variety of crops and livestock for a healthy diet. Rising temperatures lead to higher levels of heavy metals in crops and disrupt ecosystems by reducing beneficial organisms like pollinators and pest-control regulators. In addition, shifts in agricultural practices in response to climate change, such as changes in crop selection or farming techniques, may influence the types of foods that are produced and consumed.

FOOD CULTURES AND FOOD SAFETY. Strong traditional food cultures in the region have tempered the nutrition transition to some extent, and traditional foods remain a preferred element of many daily diets. However, while traditional diets may offer diversity and freshness, they are not always synonymous with healthy eating because they often contain large amounts of sugar or salt or rely heavily on low-nutrient starchy foods.[24] Asian food consumption is also characterized by informal food distribution, such as wet markets and food stalls, and by out-of-home eating. These sales outlets provide opportunities for accessing fresh foods as well as unhealthy snacks, but they lack robust food safety standards, which can drive consumers away from fresh foods (see Chapter 3).

AFFORDABILITY. Most importantly, healthy diets remain out of reach for a substantial population across all of Asia. An estimated 1.9 billion people in Asia could not afford a healthy diet in 2021[25] (see Chapter 4), with recent data showing that the proportion varies widely across the region (Figure 3). Less than 5 percent of the population in the Republic of Korea, Japan, and Malaysia faced affordability issues, whereas more than 50 percent in Indonesia, Lao PDR, Mongolia, Myanmar, and the Philippines struggled to afford nutritious food. The cost of a nutritionally adequate diet in ESEA averages about US$1.51 per person, per day, with nutrient-rich foods such as fish, vegetables, and legumes accounting for much of the cost.[26] In 2022, between 1 percent (Thailand, Malaysia) and 33 percent (Indonesia) of the Southeast Asian population lived

FIGURE 3 Share of population who cannot afford a healthy diet, 2017–2020



Source: Data from Food Systems Dashboard, accessed November 2023. www.foodsystemsdashboard.org

on less than US$3.65 per day (a key cut-off for poverty), representing millions of people and underscoring the challenge of food affordability in some countries.[27] In addition, shocks such as the COVID-19 pandemic have disproportionately affected ESEA because of the strong lockdown policies adopted and the large share of informal-sector workers in food systems, with the greatest impacts on marginalized populations, who faced both high food prices and lost livelihoods.[28]

Box 1 describes how some of these issues play out in two very different country contexts – China and Cambodia – and lead to different diet and nutrition outcomes, as well as distinct policy priorities. Other countries in the region fall somewhere between these two extremes.

OPTIONS FOR ACTION

Urbanization, income growth, and environmental changes in ESEA are occurring at a rapid pace, positioning the region both as an early-warning context for global shifts and as a potential model for policy responses that may be applicable elsewhere.

Food system surveys across the region consistently highlight several common food system challenges, most notably poor food standards; lack of consideration of diets and health in trade; and rising demand for healthier food, especially among wealthier and urbanizing populations,[29] as well as the insecure and risky livelihoods that continue to affect rural food producers. To address these issues, policies must consider the needs and preferences of diverse populations facing various food system issues; support the agency of the most marginalized producers and consumers; and strengthen regional cooperation to make diverse, healthy food available and accessible for all. Food systems, however, are often a blind spot for policymakers in ESEA and elsewhere. Sectoral policies in agriculture, economy, health, and other areas are often siloed, and decision-makers fail to consider their interconnections or combined effect on the diets and health of citizens. In addition, disaggregated data on different socioeconomic groups remain limited in many contexts.[30]

BOX 1 CASE STUDIES

Cambodia

Cambodia is among the world's smallest economies and remains largely rural. Its food system depends largely on traditional smallholder farmers, who are the major food producers and who focus predominantly on staple crops, seeking their own food security amid significant food imports. Some urban areas are expanding, along with modern fresh food and convenience retail chains. Agriculture contributes about 22 percent of gross domestic product (GDP) and employs a third of working-age adults (of whom 39 percent are women), but productivity growth in the sector is low.[a]

Diets in Cambodia are largely based on rice, roots, and tubers, which provide 69 percent of dietary energy.[b] Compared with the Southeast Asian average, Cambodian diets are low in fruits, vegetables, legumes, nuts, whole grains, and dairy, though they are relatively high in meat, fish, and sugar-sweetened beverages. Food and beverages account for 46 percent of average household expenditures (57 percent for the poorest), while a nutrient-adequate diet would cost 74 percent of an average household's income.[c] The most marginalized groups within Cambodia's food system – including Indigenous peoples, landless and tenant smallholder farmers, informal food system workers, and daily wage earners – are most affected by inadequate employment opportunities, limited land rights, and poor food security and nutrition outcomes.[d]

Beyond low incomes and a largely rural population, Cambodia's food system drivers include a high level of market liberalization, efforts to increase regional trade, and a relatively rich endowment of natural resources such as land and water. In contexts like this, policymakers are advised to address calorie and nutrient shortfalls through greater support to farmers and more diverse farming systems. Policymakers should also prioritize nutrition and health in regional food trade deals; food safety regulation (on-farm and in the retail sector); and steps to limit consumption of ultra-processed foods, such as taxes and regulation.[e]

China

China, one of the world's largest economies, has a complex food system geared both to feeding its huge population and to regional and global exports, and has made tremendous progress in reducing hunger in recent decades. However, current Chinese diets are characterized not only by an overconsumption of cereals and meat, accompanied by an insufficient intake of vegetables and fruits, but also by the heavy use of cooking oil and salt.[f] Average daily meat consumption reached 191 grams in 2023, approximately 2.6 times the amount recommended by the national dietary guidelines (the Chinese Food Guide Pagoda), and the average daily fat-to-energy ratio of food consumed is 34.6 percent, which exceeds the recommended limit of 30 percent.[g]

This dietary imbalance creates both health and environmental problems. In particular, overweight and obesity, along with major, chronic diet-related diseases, are becoming more prevalent. At the same time, the environmental burden of food consumption is growing, with CO_2 emissions expected to rise from 1.18 billion tons in 2020 to 1.28 billion tons by 2030.[h] Shifting Chinese dietary patterns toward a sustainable healthy diet is widely recognized as key to addressing these challenges. A complete shift in the current diet toward the national guidelines could avoid at least 1.15 million deaths and 425,000 premature deaths in China by 2030[i] and reduce CO_2 emissions by 146 million tons.[j]

China's government has initiated public campaigns to promote healthy diets, and more policy support is under consideration. Already, increased spending on agricultural research and development has increased the production of nutrition-enriched foods and facilitated access to healthier foods. Targeted interventions, such as the Nutrition Improvement Program, are promoting healthy diets for China's poorer regions. Chinese experts also recommend a strategic shift in investment and trade that emphasizes a nutrition-centric food supply both domestically and internationally.[k] In addition, social protection programs for low-income individuals could enhance their purchasing power and improve diet quality.[l]

Several policy responses can address these challenges:

- Promote engagement of nutrition and health representatives in trade negotiations, and inform trade negotiators of the food system implications of trade agreements.[31]

- Support small and marginalized food producers and promote diversified systems.[32] Initiatives for farmers can include better labor standards, inclusive rural development, and responsible investment in food and agriculture that supports farmers' livelihoods and diversified food production.[33] Diversified farming systems that move away from the existing rice-centric system can provide healthier food choices and also greater resilience to shocks such as COVID-19.[34] Given regional diversity, countries will need to address the particular barriers to better farm livelihoods that are relevant for their food systems, such as land tenure, access to extension for crops other than rice, and farmers' empowerment in engagement with buyers and contractors.

- Regulate food retail to limit sale of unhealthy foods and promote healthy foods, for example, through taxes and less preferential trade deals on ultra-processed foods and sugar-sweetened beverages[35] and through provision of healthy meals in public institutions (schools, hospitals) as well as in private sector workplaces.[36]

- Improve food safety through stronger implementation and enforcement of existing Association of Southeast Asian Nations (ASEAN) and national food safety policies, while protecting the livelihoods of informal food system workers.[37]

- Leverage strong traditional food cultures for healthier diets through (1) locally tailored dietary messaging to enhance nutrition literacy[38] and (2) locally adapted and environmentally sustainable food-based dietary guidelines that focus on local and regional production and trade, such as those recently released by China.[39]

- Strengthen social protection systems to (1) explicitly consider the ability to afford a healthy diet alongside other household expenditures and (2) connect the most nutritionally vulnerable groups to additional support services.

- Enhance data collection, particularly disaggregated by geography and population with an equity lens, for informed decision-making.

Raising the priority given to food and diets through advocacy and information sharing is crucial. Greater intraregional cooperation, such as within ASEAN, will be necessary to tackle issues of trade regulation and harmonization.[40] In addition, granting more autonomy to provinces or cities through careful decentralization can facilitate the creation of grounded, agile, and context-specific solutions.[41] All policies should consider equity and ensure that marginalized groups are not left behind.[42] Given the region's double burden of malnutrition, double-duty or multi-duty food system policies that address undernutrition and micronutrient deficiencies together with overnutrition need to be considered, as well as the synergies and trade-offs that these entail, including for the environment and sustainability.[43] Recommendations are available to help countries prioritize policy solutions that consider food systems, equity, and nutrition based on their particular context.[44] Ultimately, a proactive approach to food policy that is both integrative (considering synergies, trade-offs, and spillovers from multiple sectors) and inclusive (attentive to the welfare of the most marginalized stakeholders in food systems) is vital for healthy diets and the well-being of all in the region.

LATIN AMERICA AND THE CARIBBEAN

EUGENIO DÍAZ-BONILLA AND VALERIA PIÑEIRO

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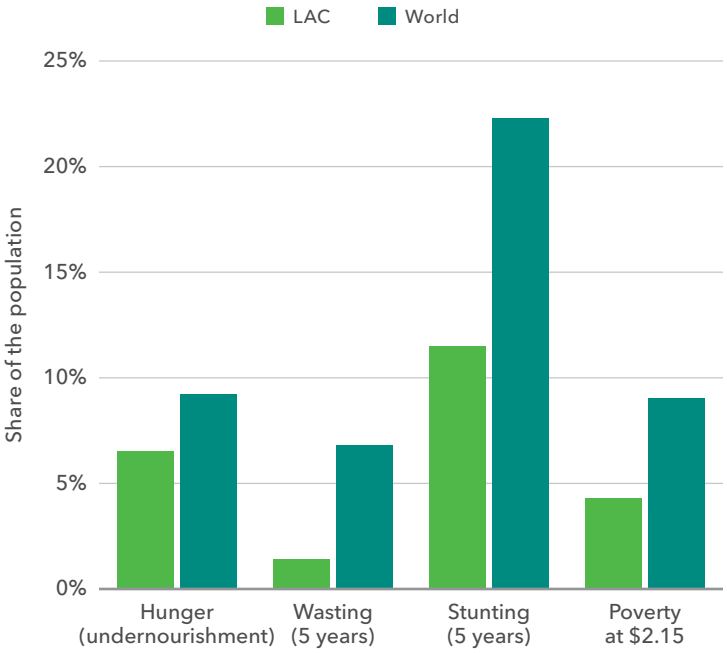
The nutrition transition in Latin America and the Caribbean (LAC) is well advanced compared with other developing regions, with high rates of urbanization and relatively higher incomes leading to an epidemic of obesity alongside persistent undernutrition and micronutrient deficiencies — known as the double burden of malnutrition. The great diversity of the region's countries — in terms of economic size and income levels — is reflected in the range and types of nutritional challenges they face.

Figure 1 compares four global indicators[1] with the averages in the LAC region: the prevalence of hunger (or undernourishment, the indicator used for Sustainable Development Goal 2.1.1); wasting (low weight-for-height) and stunting (low height-for-age) in children under five years of age; and poverty rates at the US$2.15 purchasing power parity (PPP) level, which indicates extreme poverty in the LAC region.

All four indicators in LAC are below the world averages. After showing some improvement from the early 2000s until about 2015, however, these indicators stagnated over the past decade as a result of several negative developments, most notably the end of the upward commodity cycle that had fueled growth in the region. In 2020, the COVID-19 pandemic and related responses led to an increase in all four indicators, and the subsequent shocks related to Russia's invasion of Ukraine and to climate challenges in different subregions within LAC have kept these levels relatively high. The most recent data show some improvement, but levels have not yet fallen to pre-COVID-19 numbers.[2] However, there are substantial differences across countries, such as the case of Haiti, where undernutrition and poverty rates are high.[3]

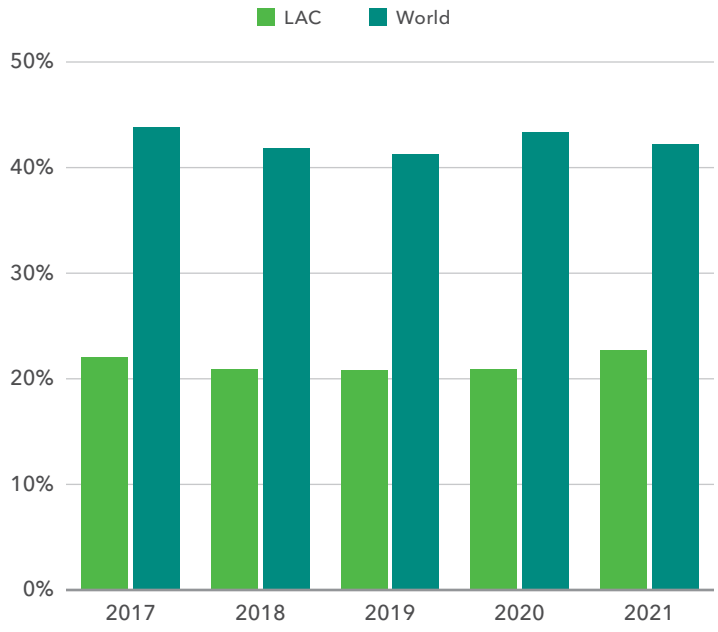
Dietary diversity and consumption of nutrient-rich foods, including fruits and vegetables, legumes, nuts, and animal-source foods (in moderation), contribute to health and are crucial to preventing maternal and child undernutrition and micronutrient deficiencies. For many people, however, healthy diets are unaffordable (see Chapter 4). Figure 2 compares the share of global and LAC

FIGURE 1 Indicators of hunger, undernutrition, and poverty, global and LAC, 2020–2022



Source: Data on prevalence of hunger (undernourishment), wasting, and stunting in children from FAOSTAT; data on poverty from the World Bank's World Development Indicators, both accessed January 2024.

FIGURE 2 Share of global and LAC populations unable to afford a healthy diet, 2017–2021



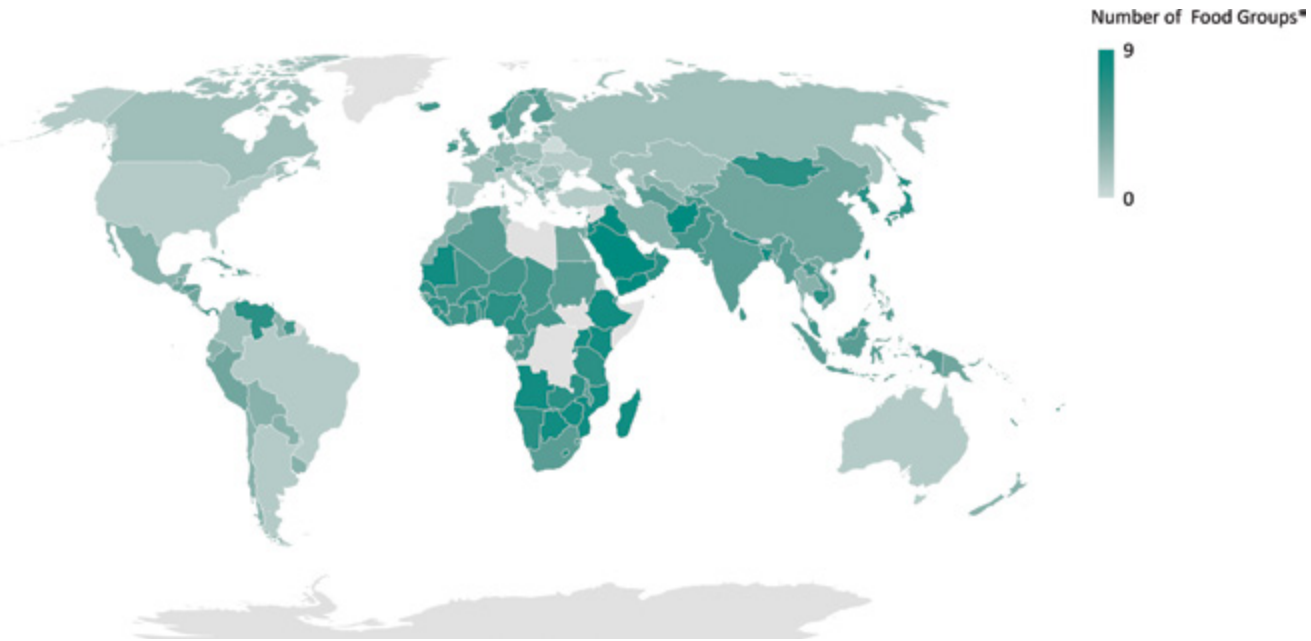
Source: Data from FAOSTAT, accessed January 2024.

populations who could not afford a healthy diet in recent years. While the LAC rate is well below the global average, at less than 23 percent in 2021, it is still high, and in several LAC countries it is much higher. Five countries (Belize, Haiti, Honduras, Jamaica, and Suriname) show levels above the world rate of more than 40 percent.[4]

Limited availability of the diverse foods needed for a healthy diet contributes to micronutrient deficiencies in the region. Figure 3 maps the number of major food groups for which national production is insufficient, with darker shades representing less diversity in production. In general, production is more diversified in LAC, with the exception of a few countries such as Venezuela, than in most of the developing world. However, low levels of intraregional trade mean that the region's population does not enjoy the full advantages of this diversity.

Obesity and overweight rates are higher in LAC than in other global regions. While obesity has been increasing globally, 24 percent of the adult

FIGURE 3 Number of food groups with insufficient national production



Source: D. Laborde Debucquet, V. Piñeiro, and J. Swinnen, "Tomorrow's Agri-food System: The Connections between Trade, Food Security, and Nutrition for a Sustainable Diet," in *Routledge Handbook of Sustainable Diets*, eds. K. Kevany and P. Prosperi (Routledge: 2022). Reproduced with permission of Informa UK Limited through PLSclear.

Note: The nine food groups are animal products (excluding dairy), milk, starches, legumes and beans, nuts and seeds, fruits, vegetables, vegetable oils, and sugar. This classification is more general than the one proposed by the EAT-Lancet report, allowing a degree of flexibility for substitution of foods at the national level. Numbers are adjusted for food loss and waste.

population in LAC was considered obese, compared with 13 percent worldwide, as of 2016. In addition, almost 8 percent of children under five years of age in LAC were considered overweight, compared with 5.5 percent globally. As a result, more people are suffering from obesity (110 million in 2016) in LAC than from hunger (43 million in 2022, using the prevalence of undernourishment).[5] Within LAC, obesity is most common in Argentina, Chile, Mexico, Uruguay, and some English-speaking Caribbean countries (all with a prevalence of about 28 percent or higher), while undernutrition is a larger problem in Haiti, Venezuela, and several countries in Central America.

WHAT CAN BE DONE?

The LAC region must address the double burden of malnutrition, including the associated economic and social costs, while also tackling the issues of accessibility and affordability of healthy diets. The region's heterogeneity affects the national extent of these problems, and each country will need to identify the set of policy solutions that best fits their particular context. Most will require a combination of demand- and supply-side responses, discussed in this section.

DEFINING THE PROBLEM

Public policy decisions must take a comprehensive view of the multiple malnutrition problems facing LAC countries. National programs for improving nutrition must start by defining the set of targets to address: undernutrition, micronutrient deficiencies, and/or obesity; access to and affordability of diverse and healthy diets; or a combination of these. Policies and programs must also clearly identify the groups of people affected and establish quantitative objectives for improved nutrition and the time frame for achieving them. This type of analysis will require broader and more frequent collection of basic information, which is lacking in many LAC countries. In particular, data on dietary diversity and anthropometric measures are needed, and should be standardized and collected uniformly in schools and health centers.

DEMAND-SIDE SOLUTIONS

SOCIAL SAFETY NETS. Undernutrition and lack of economic access to healthy and diverse diets are largely caused by poverty and inequality.[6] Of the 30 countries with the worst inequality indicators globally, approximately half are in the LAC region. LAC was a pioneer in the use of conditional cash transfers as a social safety net to combat poverty and inequality, and most LAC countries now have some variety of cash transfer program. But, given persistent problems of malnutrition and the high cost of nutritious diets, LAC countries need to expand program coverage and redesign their existing social protection programs, including the use of double- or multi-duty actions (Chapters 2 and 3).[7] With some estimates suggesting that up to half of the money for social safety nets goes to the non-poor, targeting must be improved.[8] Program design and operation also need to be expanded to include components for productivity, nutrition, and the environment; to better integrate emergency programs with more permanent ones to create shock-responsive safety nets;[9] and to improve other operational aspects, such as developing detailed registries of beneficiaries. School meal programs are among the region's most important social protection programs (see Chapter 3). Given their effectiveness, school-based programs should be expanded and made more nutrition sensitive. In some countries, including Brazil, school feeding interventions have been linked to food procurement programs that work with small farmers, thus adding regional economic multiplier effects.

INCREASING DEMAND FOR HEALTHY FOODS. The nutrition transition in LAC is closely related to the increased availability of cheap diets heavy in calories but lacking in necessary nutrients, as well as to more sedentary lives and marketing of ultra-processed foods high in sugar, fat, and salt. The problem has been exacerbated by poverty and the impact of COVID-19, which led to the consumption of cheaper, less healthy diets as

healthier options became more expensive.[10] While access to healthy diets can be addressed to some extent through social protection programs, combating obesity and micronutrient deficiencies will require additional policy tools.

Most prominently, interventions are needed to increase demand for healthy foods, reduce demand for ultra-processed foods and sugar-sweetened beverages, and make food environments more conducive to healthy food choices (see Chapters 3 and 5). These include the use of taxes and/or the elimination of subsidies for less nutritious food products; subsidies and support for the production of healthy foods to increase availability and lower costs (see Chapter 6); and subsidies to help vulnerable populations access healthy diets.

The LAC region has been a leader in addressing the growing consumption of ultra-processed foods through stricter regulations for labeling and information requirements to inform consumers' food choices (see Chapter 5), including on the types and amounts of some potentially unhealthy ingredients. For example, Chile has established a system of front-of-package labeling using black hexagons (acting as stop signs) to inform consumers about excess calories, salt, sugar, and fats. Evidence so far has shown that consumer awareness increased in Chile, and inclusion of those products in school lunches decreased, but behavior changes have been less pronounced (see Chapter 5 for a longer discussion).[11] Adoption of taxes on sugar-sweetened beverages in several LAC countries also shows potential for reducing consumption (see Chapters 5 and 8).[12] These policies also need to consider gender and nutrition, the roles played by men and women in food systems, and the different impacts they experience. For example, obesity in LAC affects far more women (28 percent as of 2016) than men (20 percent).

In addition to these policies focused on food systems, other approaches may be needed to control obesity, such as infrastructure for sports and exercise, alternative transportation methods, or behavioral nudges to avoid sedentary lifestyles.

SUPPLY-SIDE SOLUTIONS

PRODUCTION OF HEALTHY AND DIVERSIFIED PRODUCTS. Making healthy diets more accessible and affordable will require increasing the production and diversity of healthy food in the region, which will help to stabilize and even reduce prices for consumers. Greater investments in agricultural R&D are needed for fruits, vegetables, legumes, and nuts (see Chapters 4 and 6). Promotion of local "orphan" crops that have been marginalized and underutilized would also help, as the example of the recent expansion of quinoa in Bolivia and Peru has shown.[13] Support to family farms and home gardens to diversify their production and link them to short supply chains could both increase household incomes and increase the local affordability of healthy diets (see Chapter 3).[14] Public procurement schemes also need to consider gender aspects: for instance, Brazil's Food Acquisition Program, created in 2003, added a requirement in 2011 that a minimum of 40 percent of its suppliers be women.

THE ROLE OF TRADE. Diversity in production and availability of healthy foods for consumption differ in large part due to the key role of trade (see Chapter 4).[15] A global study using data for 151 countries has found a positive correlation between trade openness and key indicators of dietary health, such as dietary energy supply, diversity, and overall quality.[16] Moreover, adherence to science-based standards and regulations in food trade can further bolster food safety measures, ensuring the integrity of traded food products. By facilitating year-round access to a diverse range of food products, trade benefits countries with distinct seasonal conditions, serving as a crucial mechanism for mitigating variability and volatility in food supply. This suggests that differentiated strategies are needed to address nutritional deficiencies related to the limited availability and affordability of nutritious foods. For instance, while low-income nations may prioritize diversifying domestic production, middle- and high-income countries could leverage their economic resources to access a wider array of nutritional options through international markets. Strengthening intraregional

trade in LAC, which is relatively low compared with other regions, could also contribute to more diversified and affordable diets.[17]

In sum, LAC faces the complex challenge of identifying the most effective policies and standards associated with developing efficient and balanced national food systems that can meet the growing demand for food while ensuring environmental sustainability, food safety, nutritional quality, and economic and social sustainability. Clearly defining objectives, strengthening social protection programs, addressing the drivers of obesity and overweight, and increasing the availability and affordability of nutritious foods, including through trade, will all contribute to more sustainable healthy diets in the region, while maintaining and expanding the crucial role LAC plays in global food security and nutrition.