ALTERED DESTINIES

The Long-Term Effects of Rising Prices and Food Insecurity in the Middle East and North Africa

Roberta Gatti, Daniel Lederman, Asif M Islam, Federico R Bennett, Bo Pieter Johannes Andree, Hoda Assem, Rana Lotfi, Mennatallah Emam Mousa

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Altered Destinies: The Long-Term Effects of Rising Prices and Food Insecurity in the Middle East and North Africa

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Abbreviations

BCC	Behavioral Communication Change
Avg	Average
BHR	Bahrain
COVID-19	Coronavirus Disease 2019
CP01	Consumer Price Index Category Code Number 1 (CPI: 01 - Food and non-Alcoholic beverages)
CPI	Consumer Price Index
CSA	Ethiopian Central Statistical Agency
DHS	Demographic and Health Surveys
DJI	Djibouti
DOE	Developing Oil Exporters
DOI	Developing Oil Importers
DZA	Algeria
e	Estimate
EAP	East Asia and Pacific
EBCNV	Enquête Nationale sur le Budget, la Consommation et le Niveau de Vie des Ménages (Tunisia, National Survey on Household Budget, Consumption and Standard of Living)
ECA	Europe and Central Asia
EDAM	Enquête Djiboutienne Auprès des Ménages (Djibouti Social Indicators Households Survey)
EGY	Egypt
EM-DAT	Emergency Events Database
ENCDM	Enquete Nationale sur la Consommation et les Dépense des Ménages (Morocco, National Survey on Household Consumption and Expenditure)
ERF	Economic Research Forum
f	Forecast
FAO	Food and Agriculture Organization
FCS	Fragile and Conflict-Affected Situations
FIES	Food Insecurity Experience Scale
FRC	Famine Review Committee
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GEP	Global Economic Prospects
HEIS	Jordan Households Expenditure and Income Survey
HIC	High Income Country
HIECS	Egypt Household Income, Expenditure, and Consumption Survey
HTS	Harmonized Test Scores
IBRD	International Bank for Reconstruction and Development
IDA	International Development Association
IHSES	Iraq Household Socio-Economic Survey
IMF	International Monetary Fund
IPC	Integrated Food Security Phase Classification
IPV	Intimate Partner Violence
IRN	Iran (Islamic Republic of)
IRQ	Iraq
IYCF	Infant and Young Child Feeding
JME	Joint Malnutrition Estimates
JOR	Jordan
KWT	Kuwait
LAC	Latin America and the Caribbean
LBN	Lebanon
LBY	Libya
LIC	Low Income Country
LMIC	Lower Middle-Income Country
MAE	Mean Absolute Error
MAR	Morocco
MDD	Minimum Dietary Diversity
MENA	Middle East and North Africa
MEU	Middle East and North Africa Macroeconomic Update
MGRS	Multicentre Growth Reference Study
MIC	Middle-income Country
MICS	Multiple Indicator Cluster Surveys
MMBtu	Metric Million British Thermal Unit
MNA	Middle East and North Africa
m/m	Month-to-month
MPO	Macro and Poverty Outlook
N	Size of the population
NP	Not presented
NSOs	National Statistical Offices
OMN	Oman
PECS	Palestinian Expenditure and Consumption Survey
PPP	Purchasing Power Parity
PSE	West Bank and Gaza
Q	Quarter
QAT	Qatar
Qtl	Quintile
R2	R-Squared Coefficient of Determination
RMSE	Root Mean Squared Error
SA	South Asia
SAU	Saudi Arabia
SD	Standard Deviation

SES	Socioeconomic Status
SMART	Standardized Monitoring and Assessment of Relief and Transition
SSA	Sub-Saharan Africa
SYR	Syrian Arab Republic
TUN	Tunisia
UAE	United Arab Emirates
UMIC	Upper Middle-Income Country
UN	United Nations
UN IGME	United Nations Inter-Agency Group for Child Mortality Estimation
UNICEF	United Nations International Children's Emergency Fund
U.S.	United States
USAID	United States Agency for International Development
USD	United States Dollar
WBL	Women, Business and the Law
WDI	World Development Indicators
WEO	World Economic Outlook
WHO	World Health Organization
y/y	Year on Year
YEM	Yemen

Foreword: Seeing the Future Through the Fog of Global Uncertainty

The authors of *Altered Destinies* have accomplished a rare feat. They politely ask that their readers to pay special attention to the future of the Middle East and North Africa (MENA) region when we are consumed by the current trends of slowing economic growth and high inflation. The report argues that the time for action to address the long-term repercussions of food insecurity is now, before they spiral out of control in the years ahead. We thus recommend this report to academics, policymakers, civil society leaders, in fact to anybody who has a stake in building a prosperous future for the region's children.

In MENA we are seeing divergent growth paths across countries, a point with which we agree with the authors. High-income oil exporting economies, the members of the Gulf Cooperation Council (GCC) benefited from an oil-price windfall in 2022. Meanwhile oil and food importing economies faced growing pressures in 2022 that were augmented by pre-existing conditions, particularly fiscal vulnerabilities due to elevated levels of public debt. *Altered Destinies* provides a helpful review of basic facts concerning both growth and inflation. We largely agree with the macroeconomic diagnosis put forth by the authors, but to us it was eye-opening to see how private sector forecasts have evolved since the outbreak of the war on Ukraine in February 2022. They saw darkening skies in 2022 for most middle-income economies (MICs) in MENA and brightening skies for the GCC. And consistent with World Bank forecasts, private sector forecasters are seeing slowing growth in the GCC in 2023 and 2024, returning to rates similar or even below those of oil-importing MICs. More importantly, in our view, growth in incomes per person in the region is likely to go down to about 1.6 percent in 2023, according to the most recent World Bank forecasts.

Although our line of sight over the near future is clouded by global uncertainty—for example, we cannot predict with confidence how the war on Ukraine will evolve in the months ahead or when monetary tightening will end in the major global markets—we know for sure that the slowdown of income growth in MENA is taking place amidst fast rising prices in food. It is thus not a stretch of our imagination to see the authors' main point: we have a full-blown food insecurity crisis brewing across the region. Whether you agree with the authors' estimates or not, this is a report worth reading carefully.

In the current macroeconomic juncture, rising food prices are making it difficult for families to put meals on the table. Inflation hits the poor much harder than the rich, because the poor spend most of their budget on food and energy. This is a well-known pattern, that applies to MENA as it does across the world. The food insecurity resulting from the simultaneous effects of high food prices and the low economic growth can have far reaching consequences. While the immediate effects of food insecurity can be a devastating loss of life, when children are malnourished, even in utero, their destinies may have been forever changed as they are set on paths to limited prosperity. If you care about the next and future generations of MENA citizens, then the empirical analyses presented in *Altered Destinies* should be both instructive and humbling.

Even temporary increases in food prices can have long lasting effects in the region, causing long-term, irreversible damages, especially to children. The report suggests that the rise in food prices since February 2022 may have increased the risk of stunting for hundreds of thousands of newborns in the region. The authors tell us that prominent scholars find that not only does malnourishment lead to lower test scores and years of schooling, but when these children grow up they have lower incomes and health outcomes well into adulthood. Furthermore, the effects are intergenerational—the children of these adults may be affected too.

So, the existing literature reviewed in the report by itself is of interest to policymakers and analysts anywhere. Yet, we are warned by the report, MENA is special. The region's population is young, which means food insecurity may cause extensive harm in the region. More importantly the region already had inadequate child nutrition and health before the shocks from the COVID-19 pandemic and the war in Ukraine. Initial rates of stunting were much higher for many countries in the region relative to their income peers. The dietary composition of food for children is limited and the widespread presence of subsidies may have distorted household food expenditures toward items that are less nutritious. This is known as the double burden of malnutrition—child obesity and undernutrition coexist side by side in many MENA economies. More importantly, we are in the dark on current state of child health and nutrition, as we unfortunately do not have recent data. How can we go after the scourge of food insecurity if we search for it in the dark? This is yet another case of poor data systems obscuring our line of sight precisely when we know that the time to act is now.

To describe the current state of food insecurity in the region, the authors deploy the latest machine learning modelling techniques and provide estimates that sent chills down our spines. The prevalence of food insecurity in the region has been on the rise, going from about 11.8 percent in 2006 to 17.6 percent in 2023. In other words, in MENA almost one out of five people who live in developing countries is likely to be food insecure in 2023. This is largely due to the extreme situation is Syria and Yemen that have been identified by the Integrated Food Security Phase Classification (IPC) as having areas in crisis. But food insecurity is higher in the upper-middle-income and low-income MENA economies than their income peers. Like we said above, the time to act is now even when the macroeconomic conditions are unhelpful.

The region has a myriad of challenges to satisfy the aspirations of youth. Now, we are on track to fail the children in the region by putting their futures in jeopardy. Unless we act. Governments in the region need to act now not only for humanitarian reasons but for economic reasons as well—undernourished children grow up to become less productive workers. The challenge of food insecurity is enormous in scale. *Altered Destinies* argues that the projected development financing needs are in the tune of billions of dollars annually for the severely food insecure in the MENA region. We invite discerning readers to engage with the authors on both methodological and policy discussions. The subject matter is too important to ignore the report's findings.

We are committed to this agenda, but we are not naïve. The solutions for food insecurity are costly, but we are convinced by the authors' argument that the costs of inaction compounded over many future generations will be higher. Institutional social finance can be helpful for building long-term food security in the region. The report discusses several policy areas that merit our immediate attention, covering a broad set of policies for public discussion, including cash and in-kind transfers that can provide immediate relief. However, the effectiveness of these policies will depend on the context and targeting.

There are benefits to investing in resilience and tackling chronic food insecurity before it escalates into full blown crises. Mothers play a critical role in the most crucial period during in utero and early childhood and thus gender policies matter. The quality of medical care matters. Remedial medical investments may be needed to offset the harmful effects of the poor child nutrition and health in the MENA region that have been documented in this report.

Are our public health, child care, and social protection systems ready to confront these challenges that are visible even through the fog of global uncertainty? In a previously published report written by the same team we learned that the region was ill prepared to face the shock of Covid-19, despite rosy self-assessments of public health readiness prior to 2020.[1] Let's not repeat the same mistake driven by complacency, even when we must also address the glaring macroeconomic challenges. Act now to prevent higher costs down the road.

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Dr. Muhammad Al Jasser
Chairman
Islamic Development Bank Group

1 See Gatti et al. (2021), *Overconfident: How Economic and Health Fault Lines Left the Middle East and North Africa Ill-Prepared to Face Covid-19*. Washington, DC: The World Bank.


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B C

INTRODUCTION AND OVERVIEW OF FINDINGS

The fallout from the fight against inflation has accentuated vulnerabilities in the global economy. The increase in interest rates by central banks seeking to curb inflation is slowing global economic activity. At the same time the tightening financial conditions are likely to increase debt distress in emerging markets economies. Yet high inflation remains a challenge in the short run, especially among economies in the Middle East and North Africa (MENA) that have experienced currency depreciations. This report argues that even if the spike in inflation, particularly food-price inflation, turns out to be short-lived, it will still result in long-term development challenges that should, in principle, alter public policy priorities in the short- and long-term.

Rising food prices are making it difficult for families to put meals on the table. Inflation hits the poor much harder than the rich in the MENA region, although research suggests that this is likely occurring as well in other emerging and developing economies (Lederman and Porto 2016; Belhaj et al. 2022). This is largely due to the disproportionate share of family budgets the poor devote to food and energy. Average year-on-year food inflation between March and December 2022 was 29 percent in the MENA region, which is far larger than (19.4 percent) headline inflation. These outsized increases in food prices, even if temporary, can have long lasting effects. The increase in food prices associated with the Russian invasion of Ukraine may have increased the risk of stunting by 17–24 percent in the developing MENA region, which translates into about 200,000 to 285,000 newborns at risk of stunting.

Substantial peer-reviewed research has shown that child malnutrition can lead not only to poor performance in schooling, but also to lower incomes and poorer health outcomes well into adulthood. Furthermore, the effects are intergenerational—the children of adults who were stunted at birth may be affected too. The key link between food price inflation and its long run effects is early childhood, and the state of child health and nutrition in the region was already an area of public-policy concern before the current food crisis. Indeed, the prevalence of food insecurity in the region has been steadily on the rise from about 11.8 percent in 2006 to 17.6 percent in 2023. Thus, this report links the short-run challenges posed by the evolving global environment for the region's macroeconomic outlook, particularly economic growth and inflation, to long-term development challenges that will need to be addressed well after the shocks emanating from the war in Ukraine have receded.

Regional Growth Prospects

World Bank economists forecast that the MENA region will grow by 3.0 percent in 2023 and by 3.1 percent in 2024, much lower than the growth rate of 5.8 percent in 2022.[2] The MENA average growth rate masks the stark differences across countries. In the Gulf Cooperation Council (GCC)—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates—growth is expected to decelerate from 7.3 percent in 2022 to 3.2 percent in 2023, driven by the expected decline of oil prices from the highs reached in 2022. Developing oil exporters are forecast to grow at 2.2 percent in 2023, a deceleration from their 3.9 percent growth in 2022. Developing oil importers are expected to grow by 3.6 percent in 2023 and 3.7 percent in 2024—although this is largely driven by Egypt's relatively high expected growth. Setting Egypt aside for a moment, other developing oil importers are expected to grow by 2.8 and 3.1 percent in 2023 and 2024 respectively.

2 The MENA regional growth numbers exclude countries in memorandum, namely Libya, Lebanon, Syria, and Yemen. See Table I.1 for details.

Changes in real GDP per capita are arguably a more accurate measure of changes in living standards. Following a recovery of 4.4 percent in 2022, growth in real GDP per capita for MENA is expected to decelerate to 1.6 percent and 1.7 percent in 2023 and 2024 respectively. The slowdown in growth will be experienced across the region, but more acutely in the GCC. GDP per capita growth for GCC countries is expected to decelerate from 5.5 percent in 2022 to 1.8 percent in 2023 and 2.0 percent in 2024. For developing oil exporters, the corresponding rates are 0.8 percent in 2023 and 1.0 percent in 2024. For developing oil importers, GDP per capita is expected to grow 2.1 percent in 2023 and 2.2 percent in 2024.

Inflation Hurts the Poor and Vulnerable

Food price inflation reached double digits for most of the middle-income and low-income MENA economies in 2022. For most MENA economies, food price inflation is much higher than headline inflation. In fact, food inflation accounts for about half or more of headline inflation in many countries in the region, even though food's weight in the consumer price index (CPI) is typically around 25 percent. Importantly, the data indicate that that poorer households in December 2022 experienced about 2 percentage point more inflation (year-on-year) than rich households on average in the MENA region.

Food Insecurity and Altered Destinies

Food price inflation, even if temporary, can increase food insecurity with lasting effect. Even temporary increases in food prices can cause long-term, irreversible damages, especially to children. There is mounting evidence in the literature that negative shocks can have multi-generational effects on development outcomes in education, health, and income, among other areas. Besides the immediate health effects, inadequate nutrition in utero and early childhood can disrupt the destinies of children, setting them on paths to limited prosperity. The region's population is younger than any but sub-Saharan Africa's, which means food insecurity may cause extensive harm as it reverberates through children in the region. Food insecurity poses challenges to a region that already had inadequate child nutrition and health before the shocks from the COVID-19 pandemic and the war in Ukraine.

Initial rates of stunting—which is recognized as a measure of the cumulative impact of health deficiencies in a child from pre-birth to age 5—are much higher for many countries in the region relative to their income peers. The dietary composition of food for children is limited and the widespread presence of subsidies may have distorted household food expenditures toward items that are less nutritious. This manifests in the double burden of malnutrition—child obesity and undernutrition are prevalent side-by-side in many MENA economies. That means that addressing inadequate child nutrition and health is a critical policy challenge not only for humanitarian reasons but for economic reasons as well. Undernourished children grow up to become less productive workers.

The report relies on a machine-learning model to estimate food insecurity across countries and over time. The resulting estimates suggest that almost one out of five people in developing MENA is likely to be food insecure in 2023. The report explains both the methodologies as well as the intra-regional differences across countries underlying these aggregate regional estimates in Part II.

Food inflation plays a key role in driving food insecurity. Across all four MENA subgroups—developing oil importers, developing oil exporters, conflict countries and the GCC—inflation accounts for 24 percent to 33 percent of 2023's forecasted food insecurity. The food insecure population in MENA attributed to inflation grew by 66 percent between pre-pandemic and 2023.[3] Since the MENA region is relatively young compared to other regions, except sub-Saharan Africa, under conservative assumptions the report suggests that about 8 million children in the MENA region are severely food insecure. Unfortunately, this is likely to be a conservative estimate because food insecurity disproportionately affects the poor, and the poor in the region tend to have more children.

The Enormity of the Food Insecurity Challenge

The challenge of food insecurity is enormous. According to the estimates presented in this report, the projected development financing needs for the severely food insecure in the MENA region are in the billions of dollars annually. Those financing estimates are made under modest assumptions about the costs of a minimum energetic diet in 2021—one that aims at a 100 percent replacement cost of food expenditures for the severely food insecure population and is adjusted annually for food price inflation. Although addressing food insecurity will require substantial resources, the costs of inaction compounded over many future generations would be much higher.

There are several policy tools that can help alleviate food insecurity. Which tools are appropriate will depend on whether food insecurity is chronic or acute. There are advantages to investing in resilience and tackling chronic food insecurity before it escalates into full blown crises. Since the human and economic costs of food insecurity grow over time, logic dictates that implementing preventive and coping policies are superior to allowing the consequences of food insecurity to fester over time.

Some policies, such as cash and in-kind transfers, can be enacted immediately to stem acute situations of food insecurity. Others may take longer to implement—such as policies aiming to enhance maternity leave, childcare, medical care, and food systems. Importantly, the report finds the region's data systems are ill equipped to monitor and track the rising threat of food insecurity. The report concludes with a brief call to arms with a focus on the types of policies that can help reduce the dire long-term socio-economic costs of rising food insecurity.

Simply put, the time to act is now, even when policymakers' attention will be distracted by the immediate macroeconomic challenges of low growth and high inflation.

3 Note that the data is available as three-year centered moving averages. Therefore, the pre-pandemic period refers to the 2017–2019 period, while 2023 refers to the 2022–2024 period.

PART I: MACROECONOMIC DEVELOPMENTS AND OUTLOOK

Part I Takeaways

- High growth in the MENA region during 2022 was concentrated in high-income, oil-exporting economies. Forecasts for 2023 project growth in the region will be slower than in the previous year. Oil exporters are expected to experience the sharpest deceleration within MENA in 2023 although this would not undo the divergence seen in the previous year between high-income MENA countries and the rest of the region.
- Countries whose currency depreciated vis-à-vis the US dollar also experienced higher levels of inflation in MENA. After accounting for exchange rate fluctuations, inflation in most MENA countries was moderate or low, indeed lower than the levels seen in the United States.
- When faced with rising prices in commodity markets, in particular oil and food, countries in MENA put in place policies aimed at containing domestic inflation. Despite these efforts, food inflation in most MENA economies increased since the war in Ukraine and indeed was higher than headline inflation. Increases in the price of food products accounted for half or more of the headline inflation.
- In developing MENA, the poorest and most vulnerable households experienced higher levels of inflation than their richer counterparts. This is a direct consequence of elevated food inflation and the outsize share that food products have in poorer households' expenditure.

I.1 The Global Context: Elevated Inflation and High Interest Rates

The global economy exhibited slow growth and high inflation in 2022. Prices soared because of supply and demand factors—including the food and energy market disruptions that followed the war in Ukraine.[4] Advanced economies and numerous emerging markets last year tightened monetary policy to stabilize prices by dampening demand and growth. Developing MENA countries were affected by higher interest rates in advanced economies which led to currency depreciation that resulted in a further acceleration in domestic prices. Oil exporting economies in MENA experienced high growth in 2022 boosted by the surge in oil prices even as many increased policy rates.

The current economic climate is in stark contrast to the low-inflation, low-interest-rate equilibrium that had persisted before the pandemic, at least since the lackluster recovery from the global financial crises. The World Bank's *Global Economic Prospects* (GEP) in January 2023 projects that global growth this year will decelerate from the already low levels experienced in 2022. At a projected rate of 1.7 percent in 2023, over the last quarter of a century, only 2008, during the global financial crisis, and 2020, the pandemic-spawned recession, would be worse.

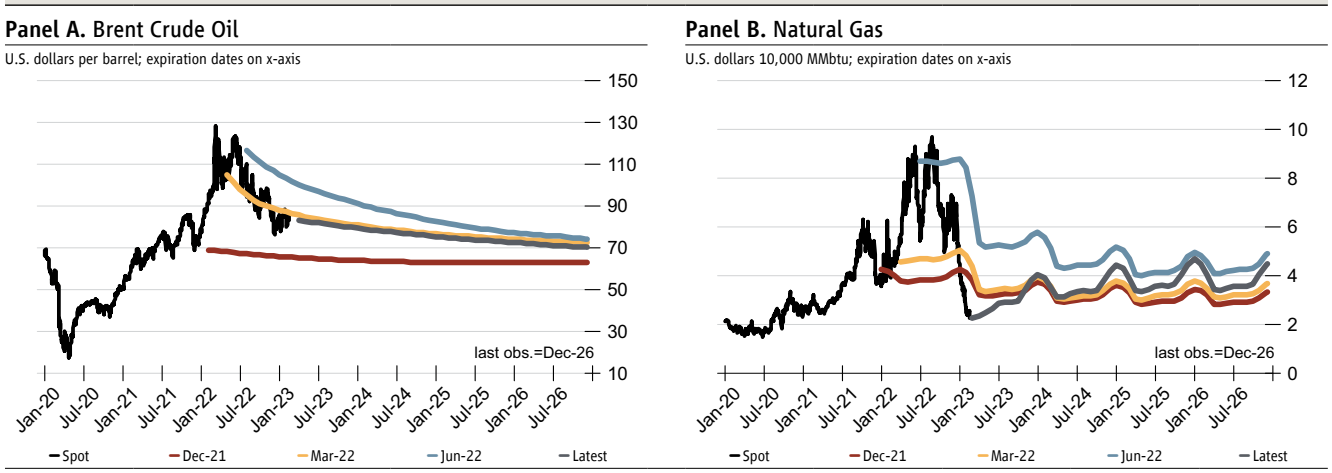
4 In some major economies, such as the United States, aggregate demand was also growing due to various reasons, including fiscal stimulus and pent-up demand as private savings had grown during the early stages of the pandemic.

I.1.1 Easing but Still Elevated Global Inflation

Global inflation is expected to be lower in 2023 than in 2022, but is still projected to remain at higher levels compared to those seen before the pandemic—and higher than central bank targets in most inflation-targeting economies.

Waning global demand combined with the readjustment of supply chains after the disruptions in international markets from the war in Ukraine are two important factors contributing to easing global inflation and commodity prices, especially in energy and food markets.

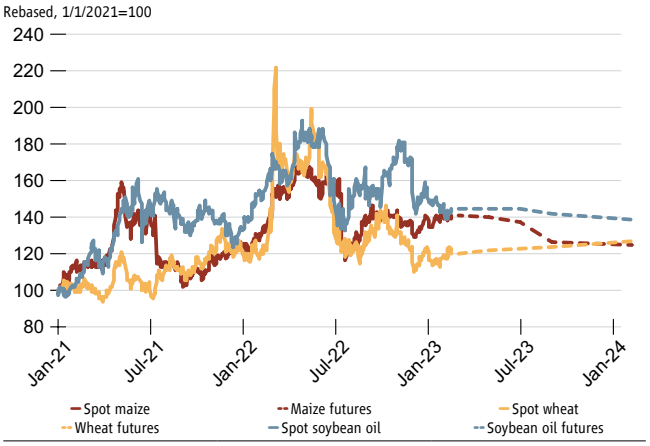
Figure I.1: Hydrocarbon Prices



Sources: World Bank MNA Chief Economist Office; and Bloomberg, L.P.
Note: The black lines indicate the spot prices of Brent crude oil and of 1st Generic Natural Gas, in each panel separately. The colored lines illustrate the futures prices of Brent crude oil and natural gas on December 1, 2021, March 1, 2022, June 1, 2022, and February 17, 2023, respectively.

Energy prices have declined sharply since mid-2022 (see Figure I.1, Panel A). The Brent crude oil spot price dropped from more than US$120 per barrel in June 2022 to about US$ 80 per barrel in February 2023—which still is higher than before the war in Ukraine. Natural gas went from US$9 per million BTU back to pre-war levels of about US$2.5 per million BTU over the same time period (See FigureI.1, Panel B). Importantly, energy futures have also declined since mid-2022, indicating that markets expect the war-induced surge in oil and gas prices to decline faster than previously projected.

Figure I.2: Agricultural Prices



Sources: World Bank MNA Chief Economist Office; and Investing.com.
Note: The solid lines indicate spot price per commodity; the dotted lines show futures prices as of February 15,2023.

International prices of agricultural commodities—such as wheat, corn, and vegetable oils—have declined since their peak in mid-2022 but remain high relative to pre-war levels (see Figure I.2). This comes as Ukraine resumes exports of these products—albeit in much smaller amounts than before the war—and as the international supply response to high agricultural prices kicks in.

Although inflation in international markets may be subsiding, domestic inflation will not necessarily follow suit. Factors other than international prices influence domestic inflation. In a textbook "small open economy"—one that trades with foreign entities—changes in the domestic prices of goods traded in international markets depend on two factors: fluctuations in the international prices of these goods and on the exchange rate between local currency and the currency denomination of international prices, which is typically U.S. dollars. In practice, the passthrough of these two factors into domestic inflation is less-than one-to-one. For one thing, goods not traded in international market account for a significant fraction of consumption and for another, governments may engage in product-market interventions to hold down prices of specific goods or services. These factors also influence the overall price level. Indeed, across MENA, policies were put in place to forestall the passthrough of inflation in international markets onto domestic prices. Among developing MENA economies, currency depreciation vis-à-vis the US dollar accounted for a large fraction of domestic price increases after the war in Ukraine.

I.1.2 High Global Interest Rates

Although global inflation is expected to ease, forecasts indicate it will remain above pre-pandemic levels longer than earlier projections suggested (World Economic Outlook, January 2023). This may signal that underlying inflation pressures are more persistent than previously thought and elevates the risk that advanced economies will further tighten monetary policy.[5] Higher policy rates in advanced economies would weigh on capital flows in developing MENA, applying more pressures on exchange rates in those countries, which could then lead to further inflation because internationally traded goods will cost more in domestic currency. Policymakers may use reserves to keep the currency from depreciating too quickly or try to avoid depreciation altogether by increasing domestic interest rates, but these usually come at a cost, either by squeezing domestic financial markets or further hindering growth—or both. Moreover, countries that peg their currencies to those of advanced economies must also raise rates when the advanced economies do so to maintain the uncovered interest rate parity and forestall a capital outflow.[6]

In 2022, policy rates rose rapidly as central banks responded to high global inflation. While part of the easing in global inflation can be attributed to interest rate hikes from tighter monetary policy, the higher rates contributed to worsening financial conditions. Low growth accompanied by still-high inflation and strong monetary tightening has dampened risk appetites and led lenders to demand higher yields on sovereign debt securities, particularly from economies with preexisting vulnerabilities and low credit ratings. This comes as many countries have been running large deficits in response to the global pandemic and, more recently, the war in Ukraine. Economies with large stocks of debt and high debt-servicing costs may have difficulty refinancing existing debt when it comes due—increasing the risk of financial instability and default. That markets fear such developments is evidenced by the increasing difference, or spread, between what they must pay to borrow and what the U.S. Treasury pays.

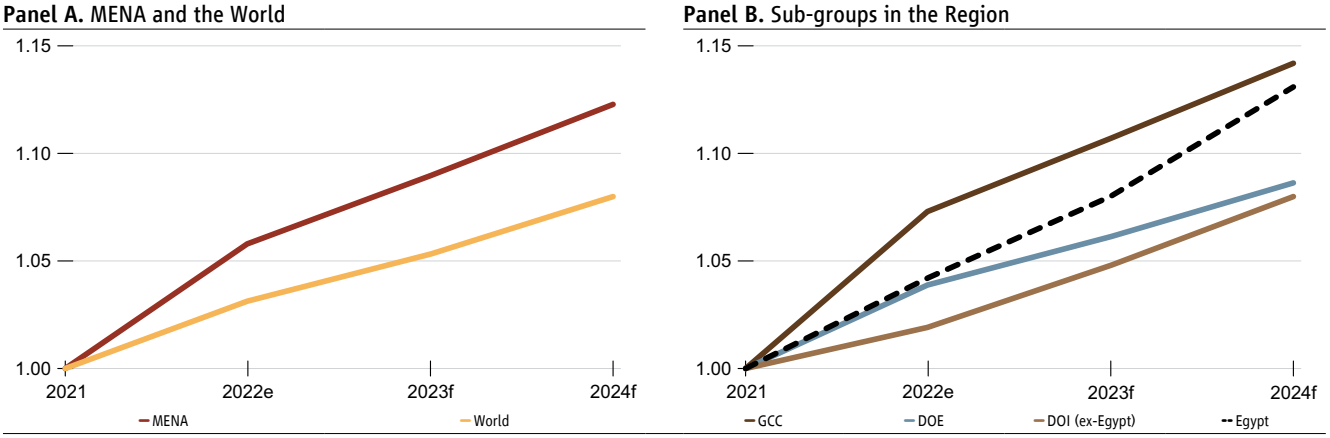
5 At the time of writing in mid-March, U.S. government authorities had taken over one regional bank from California with substantial assets, namely the Silicon Valley Bank, and had closed another regional bank based in New York, namely Signature Bank. As part of the U.S. government's attempt to limit contagion of bank runs, the Federal Reserve opened an emergency line of credit for other banks to be able to meet the demands of their depositors. The secondary market for U.S. treasury bills reacted with investors fleeing to safety thus reducing U.S. government T-bills yields. It is possible that, in light of the financial concerns, the Fed will choose to slowdown future policy rate increases or even reverse them towards the end of 2023. These events occurred too recently to be able to say if or how the financing terms for emerging and developing countries will be affected. If they lead to another round of flight to safety, MENA countries' financing conditions could worsen further, but if it leads to monetary policy loosening in the months ahead, it could have the opposite effect.

6 This is particularly true in the case of hard or conventional peg arrangements. Other soft-peg arrangements, such as pegged exchange rates within horizontal bands, allow for the exchange rate to fluctuate and adjust at the margins.

I.2 Economic juncture in the Middle East and North Africa

In contrast to the global growth decline, the Middle East and North Africa (MENA) as a whole grew extraordinarily fast in 2022 (see Figure I.3, Panel A). However, growth was uneven among the region's economies (see Figure I.3, Panel B). Most of the growth stemmed from the oil price boom that followed the war in Ukraine. Indeed, economic activity in the oil-producing Gulf Cooperation Council (GCC) countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates) accelerated in 2022, outpacing the rest of the region and the world average. Relative to the GCC, other oil-exporting MENA economies seem to have been unable to benefit as much from these tailwinds and grew at a slower pace in 2022. Oil importers in MENA grappled with the double hit of high oil and high food prices—both of which they import—and grew very little. The exception is Egypt, which outpaced other oil importers. As a whole, the region had extraordinary growth in 2022, but that growth was driven almost totally by the high-income oil exporters in the region. Most of the rest of the MENA region had a lackluster performance.

Figure I.3: Cumulative GDP Growth in MENA



Source: The World Bank's Macro Poverty Outlook, April 2023.
Note: GCC = Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the UAE. DOE (Developing Oil Exporters) = Algeria, Iran, and Iraq. Developing Oil Importers ex-(DOI ex-Egypt) = Djibouti, Jordan, Morocco, Tunisia, and Palestinian Territories. Egypt's growth is transformed to calendar year. World = World Bank member countries. MENA, GCC, DOE and DOI ex-Egypt average growth is calculated as the weighted average annual GDP growth, using year t-1 GDP as a weight.

As world growth further slows in 2023, the MENA region is expected to follow suit. Oil exporters in MENA, and GCC economies in particular, will see the sharpest deceleration as the 2022 rise in oil exports unwinds. Still, the divergence between GCC countries and the rest of the region (excluding Egypt) is forecasted to persist into 2023 and 2024.

I.2.1 Macroeconomic Prospects in the Region

World Bank economists forecast that the MENA region will grow by 3.0 percent in 2023 and 3.1 percent in 2024 (see Table I.1). In the GCC, growth is expected to slow to 3.2 percent in 2023 and to 3.1 percent in 2024. This comes after GCCs grew 7.3 percent in 2022. The fastest growing economy within the GCC in 2023 is projected to be Oman, at 4.3 percent growth. Despite weakening demand for oil, relatively high growth is expected to be sustained by increased hydrocarbon production capacity, in particular aided by the development of new natural gas fields.

Developing oil exporters are forecast to experience trends similar to those of the GCC but at lower levels— with 2023 growth expected to decrease to 2.2 percent after growing at 3.9 percent in 2022. Iraq leads the group with growth forecasts for 2023 at 2.8 percent down from 7.9 percent in 2022—partly sustained by growth in non-oil GDP (projected at 4.5 percent) which is assisted by a planned budgetary expansion in 2023. Growth in Algeria will decrease to 2.0 percent in 2023, from 3.1 percent, the year before. These projections may have some upside potential because Europe's efforts to diversify its energy supply could support hydrocarbon sector investment in Algeria, which would help medium-term growth. Because of intensifying economic sanctions, Iran's growth will likely remain at low levels. As oil prices decline, Iran's GDP is forecast to grow 2.0 percent in 2023.[7] This represents a deceleration from 2.7 percent growth in 2022 which was constrained by water and electricity shortages as well as political instability. In 2024, average growth for developing oil exporters is expected to slightly pick up to 2.4 percent.

World Bank economists expect developing oil importers will grow on average by 3.6 percent in 2023 and 3.7 percent in 2024. These projections reflect moderately high growth forecasts for Egypt, which is expected to grow at 4.0 percent in both fiscal year 2023 and 2024.[8] Relative to other developing oil importers in MENA, Egypt's forecast reflects the expectation that its competitiveness might be increased due to the recent depreciation of the Egyptian pound. Growth in the services sector (mainly tourism and Suez canal activity) as well as in construction are projected to sustain growth. Other developing oil importers are forecasted to grow at lower levels—at 2.8 percent for 2023 and 3.1 percent in 2024. This represents a higher growth than in 2022 for other developing oil importers, which had grown 1.9 percent.

Changes in real, that is inflation-adjusted, GDP per capita are arguably a more accurate measure of changes in living standards. Following an acceleration from 2.3 percent in 2021 to 4.4 percent in 2022, growth in real GDP per capita for MENA is expected to drop to 1.6 percent in 2023 and 1.7 percent in 2024. This pattern is pervasive across country groups. After an extraordinary growth of 5.5 percent in GCC countries during 2022, GDP per capita is expected to decelerate to 1.8 percent in 2023 and 2.0 percent in 2024. Similarly, developing oil exporters are forecasted to slow to 0.8 percent in 2023 from 2.5 percent in 2022 and to 1.0 percent in 2024. Developing oil importers' GDP per capita growth is also projected to decelerate this year—from 3.7 percent in 2022 to 2.1 percent in 2023 and 2.2 percent in 2024. Ten out of 15 MENA countries will have returned to their pre-pandemic level of real GDP per capita by the end of 2023, and one more will reach it by the end of 2024.[9]

MENA's current account balance (the difference between what a country pays foreign entities and foreign entities send to the country) is projected to drop from a 2022 high of 10.0 percent of GDP to 6.9 percent in 2023. Fiscal balances (the difference between government revenue and expenditures) for MENA are projected to drop from 1.8 percent of GDP to 0.0 percent in 2023, reflecting lower hydrocarbon prices. For the GCC, the current account balance is expected to fall from 16.3 percent of GDP in 2022 to 12.1 percent in 2023 and 11.1 percent in 2024. Fiscal balances are also forecast to decrease, but remain in the surplus territory, with Qatar expected to post a fiscal surplus of 6.5 percent and the UAE 6.2 percent in 2023. Despite the recent slowdown, both current accounts and fiscal balances are significantly higher than the pre-pandemic GCC average of 5.7 for current account and -3.2 percent for fiscal balances in 2019. Developing oil exporters are also forecast to experience a decrease in their current account, from 7.2 percent of GDP to 2.6 percent of GDP between 2022 and 2023 and fiscal balances will move into deficit territory at -3.2 percent of GDP in 2023,

7 In Iran, the fiscal year runs from March 21st to March 20th. For example, fiscal year 2022 runs from March 21st 2022 to March 20th 2023.
8 In Egypt, the fiscal year runs from July through June. For example, fiscal year 2022 runs from July 2021 to June 2022.
9 The 15 countries exclude in memorandum economies. Under the plausible assumption that the countries in memorandum will not return to pre-pandemic levels of GDP by end of 2023, then 10 out of 19 MENA economies are expected to return to pre-pandemic levels in 2023.

Table I.1: MPO Forecasts

	Real GDP Growth				Real GDP per capita Growth				Current Account Balance				Fiscal Balance			
	percent				*percent*				*percent of GDP*				*percent of GDP*			
	2021	2022e	2023f	2024f	2021	2022e	2023f	2024f	2021	2022e	2023f	2024f	2021	2022e	2023f	2024f
MENA	**3.5**	**5.8**	**3.0**	**3.1**	**2.3**	**4.4**	**1.6**	**1.7**	**4.5**	**10.0**	**6.9**	**6.0**	**-2.9**	**1.8**	**0.0**	**-0.5**
Middle-Income MENA	**3.7**	**4.4**	**2.8**	**3.0**	**2.3**	**3.0**	**1.4**	**1.5**	**0.1**	**1.8**	**-0.2**	**-0.5**	**-4.1**	**-1.4**	**-4.3**	**-4.4**
Oil Exporters	**3.2**	**6.1**	**2.8**	**2.9**	**2.3**	**4.5**	**1.4**	**1.6**	**7.0**	**13.6**	**9.2**	**8.0**	**-1.8**	**3.8**	**1.3**	**0.5**
GCC	3.2	7.3	3.2	3.1	3.6	5.5	1.8	2.0	7.9	16.3	12.1	11.1	-2.0	4.3	3.2	2.6
Qatar	1.5	4.6	3.3	2.9	4.2	-2.4	2.2	2.2	14.6	22.5	15.9	12.1	0.2	8.4	6.5	5.3
United Arab Emirates	3.5	6.6	3.6	3.4	2.6	5.1	2.5	3.4	10.5	13.7	11.7	10.8	0.3	7.4	6.2	5.6
Kuwait	1.3	7.9	2.7	2.6	3.9	4.2	1.7	1.0	16.0	26.3	21.9	20.9	-7.3	2.2	1.3	0.3
Bahrain	2.7	4.3	3.1	2.8	3.7	3.7	2.1	1.9	6.7	12.5	8.0	5.4	-11.0	-3.3	-4.5	-5.2
Saudi Arabia	3.9	8.7	2.9	3.3	4.0	7.3	1.4	1.8	5.1	15.7	11.0	10.6	-2.3	2.6	1.7	1.1
Oman	3.1	5.0	4.3	2.4	3.6	3.7	2.7	0.9	-4.9	5.7	3.5	2.3	-3.2	5.4	2.5	2.7
Developing Oil Exporters	3.3	3.9	2.2	2.4	1.9	2.5	0.8	1.0	4.6	7.2	2.6	1.5	-1.5	2.3	-3.2	-3.7
Iran, Islamic Rep.	4.7	2.7	2.0	1.8	3.9	2.0	1.3	1.0	3.5	3.8	3.1	2.3	-2.0	-2.3	-2.5	-2.9
Iraq	-0.6	7.9	2.8	4.4	-2.9	5.4	0.4	2.0	13.2	13.7	2.9	1.5	4.4	12.5	-2.7	-3.4
Algeria	3.4	3.1	2.0	2.0	1.7	1.4	0.4	0.5	-2.9	5.9	1.2	-0.5	-7.2	-0.9	-5.2	-6.3
Developing Oil Importers	4.2	4.9	3.6	3.7	2.8	3.7	2.1	2.2	-4.4	-4.4	-4.2	-3.9	-6.7	-5.8	-5.9	-5.5
Egypt, Arab Rep.	3.3	6.6	4.0	4.0	1.8	5.2	2.2	2.2	-4.3	-3.5	-3.4	-3.0	-7.1	-6.2	-7.0	-6.9
Tunisia	4.4	2.5	2.3	3.0	3.5	1.8	1.4	2.1	-6.0	-8.5	-8.0	-8.4	-7.6	-6.6	-4.6	-3.4
Jordan	2.2	2.6	2.4	2.4	0.2	1.3	2.0	2.0	-8.2	-9.7	-5.7	-4.3	-6.3	-5.4	-5.0	-4.5
Morocco	7.9	1.2	3.1	3.3	6.8	0.2	2.1	2.3	-2.3	-4.1	-3.7	-3.5	-5.5	-5.1	-4.6	-4.0
Djibouti	4.8	3.0	4.4	5.4	3.6	1.7	3.2	4.2	-0.7	-0.1	-1.6	-3.3	-2.9	-1.5	-1.7	-1.4
West Bank and Gaza	7.1	3.6	3.0	3.0	4.5	1.1	0.6	0.6	-8.2	-8.9	-8.6	-8.5	-5.7	-1.8	-1.4	-1.2
Memorandum																
Libya	31.4	-1.2	NP	NP	29.7	0.9	NP	NP	13.9	14.5	NP	NP	11.0	2.5	NP	NP
Lebanon	-7.0	-2.6	-0.5	NP	-5.8	-0.8	0.5	NP	-12.5	-20.6	-14.0	NP	1.0	0.3	-0.5	NP
Yemen	-1.0	1.5	-0.5	2.0	NP	NP	NP	NP	-5.1	-14.0	-21.0	-13.8	-2.2	-2.2	-2.6	-2.3
Syria	-2.9	-3.5	-5.5	NP	NP	NP	NP	NP	-2.8	-2.6	-3.2	NP	-8.6	-8.4	-8.6	NP

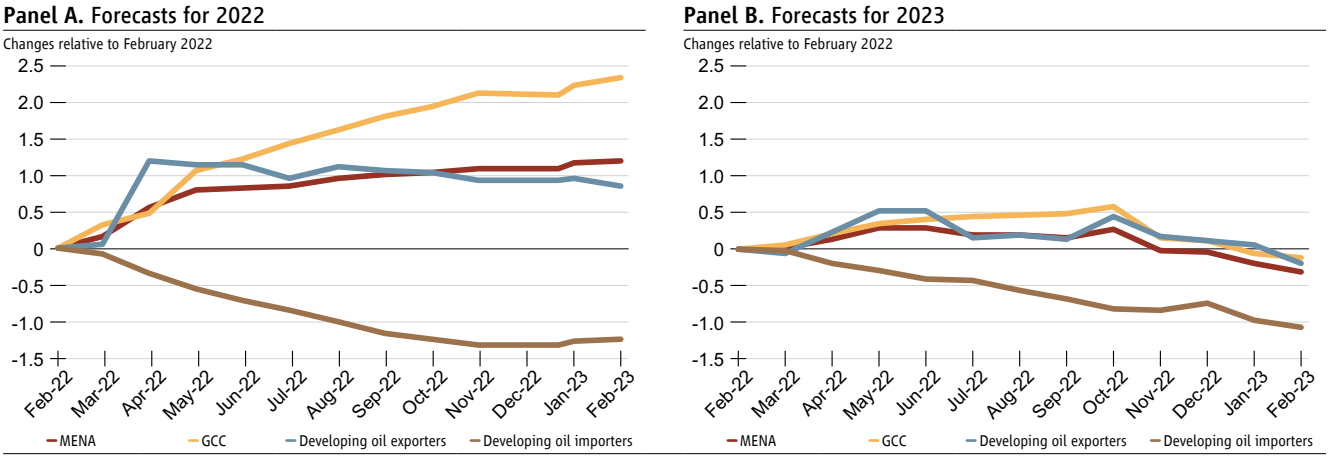
Sources: Authors' calculations based on data from World Bank *Macro and Poverty Outlook*, April 2023.
Note: e = estimate, f = forecast and NP = not presented. Countries are displayed in descending order by 2022 GDP per capita within country groupings. Data are rounded to one decimal point. Data for Egypt correspond to its fiscal year (July–June), data for Iran correspond to its fiscal year (beginning in March 21st). Lebanon, Libya, Syria, and Yemen are not included in the regional and sub-regional averages due to extreme values. MENA Region excludes Lebanon, Libya, Syria and Yemen. Middle Income MENA = Egypt, Tunisia, Jordan, Morocco, West Bank and Gaza and Djibouti. Oil Exporters = Algeria Bahrain Kuwait, Iran, Iraq, Oman, Qatar, Saudi Arabia, United Arab Emirates. Real GDP Growth Regional and Sub-Regional Weighted averages are calculated using previous year Real GDP levels as weights. Real GDP per capita growth regional and sub-regional weighted averages are calculated by finding actual real GDP per capita for each category (combined real GDP level divided by the combined population), and then calculating yearly growth rates. Current account balance and fiscal balancer regional and sub-regional averages are calculated using current year nominal GDP levels as weights. This table is updated as of 03/31/2023.

suggesting that benefits of increased oil prices in 2022 were short-lived. By contrast, among developing oil importers, a lower (but still elevated) bill for food and energy imports will partially offset the decrease in external demand, leaving their current account deficit for 2023 practically unchanged relative to the previous year at -4.2 percent, down from -4.4 percent in 2022. For this country group, the average fiscal deficit is also forecast to remain roughly the same, at -5.9 percent in 2023 compared to -5.8 percent in 2022.

I.2.2 Forecast shifts since February

Private forecasts have made major revisions to their growth outlook for the region since the war in Ukraine. They predict divergent growth within the region, largely the result of oil prices. Growth forecasts for GCC and developing oil exporters for 2022 were revised upwards (see Figure I.4, Panel A), while those for developing oil importers were revised downward. Developing oil exporters' growth forecasts for 2022 remained stable after April 2022—at around 1 percent higher than that projected in February, just before the war in Ukraine. In contrast, GCC's forecasted growth for 2022 continued to be revised upward as the year progressed, reaching a 2 percent positive revision by November 2022. The forecasts for 2023 were similarly revised to those for 2022 until October. That is, there were upward revisions in the 2023 forecasts for oil exporters, while the outlook for oil importers' 2023 growth deteriorated as the year progressed. Since October 2022 however, as it became clear that oil prices were falling faster than previously anticipated, growth forecasts for oil exporters were quickly revised downward (see Figure I.4, Panel B) and closed the year at levels similar to those of the forecasts made before the war in Ukraine. But forecasts for oil importers continued to deteriorate with January 2023 projections standing at a whole percentage point below those made in February 2022.

Figure I.4: GDP Forecast changes since February 2022



Sources: World Bank Staff calculations based on data from Focus Economics January 2023 Forecasts.
Notes: Graphs show the difference in 2022 and 2023 GDP growth rates forecasted over time compared to forecasts made in February 2022. "GCC = Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates. Developing Oil Exporters = Algeria, Iran, Iraq, Yemen. Developing Oil Importers = Egypt, Jordan, Lebanon, Morocco, Tunisia. MENA = countries in all three groups. 2022 Egypt data are adjusted fiscal year estimates: a weighted average of the year-over-year Q3 and Q4 growth rates for fiscal year 2022 and forecast growth for the first half of fiscal year 2023 (July 2022 to December 2022). 2023 Egypt data are calculated similarly: a weighted average of the fiscal year 2023 and fiscal year 2024 forecasts.

I.3 Inflation in MENA

Inflation matters for many reasons: it affects both consumers and businesses; it can erode purchasing power, especially when the increase in the price level substantially exceeds wage growth, as often is the case; and it can have serious distributive consequences. Price increases are particularly important in developing economies, whose most vulnerable population groups tend to be hurt disproportionately by rising prices.

After the start of the war in Ukraine in February 2022, inflation in MENA increased—the result of a rise in the international prices of commodities such as oil, gas, and food products. But there is a "tale of two MENAs" with regard to inflation levels. On one hand, GCC economies largely managed to keep their inflation well below global averages. Jordan and Iraq also had relatively low levels of inflation. All these countries maintained a stable peg between their currency and the U.S. dollar.[10] A fixed exchange rate along with fuel subsidies and other interventions helped contain inflation. On the other hand, countries such as Egypt, Morocco, and Tunisia experienced higher levels of inflation—with exchange rate depreciations relative to the US dollar playing an important role (between March and December 2022 Egypt's domestic currency depreciated vis-à-vis the US dollar by 32.2 percent,[11] Morocco's by 7.4 percent, and Tunisia's by 5.8 percent).[12]

I.3.1 Exchange Rate Fluctuations and Inflation

The contribution of exchange rate fluctuations to headline inflation varied by country in the MENA region. As Figure I.5 shows, between March and December 2022, inflation in most MENA countries was lower than in the United States (US)—or would have been lower had exchange rates relative to the US dollar held at their levels in February 2022. The two glaring exceptions are Lebanon and Iran, which even before the onset of the war in Ukraine had high rates of inflation and are presented on a different scale. In the case of Lebanon, three quarters of headline inflation is accounted for by fluctuations in the exchange rate; although even after accounting for this, the average year-on-year exchange-rate adjusted inflation rate was 46.0% indicating that domestic factors are also large drivers of inflation. For Iran, the exchange-rate adjusted inflation rate exceeded 30 percent.

Depreciations vis-à-vis the US dollar that led to higher levels of inflation occurred mainly in oil- importing countries such as Egypt, Morocco, and Tunisia. Their current accounts were hit by increases in the prices of food products and oil, most of which are imported. In these economies, this hit coincided with high levels of debt and worsening global financial conditions. Figure I.6 shows that, in the region, higher debt levels as percentage of GDP (plotted on the horizontal axis) correlate positively with headline inflation, although this relationship flattens once exchange rate fluctuations are accounted for—from a correlation of 24 percent to 2 percent.[13] While far from making broad claims on the direction of causality (if any) between inflation and debt, the takeaway from the stylized relationship presented in Figure I.6 is that exchange rate fluctuations may be an important factor in the link between inflation and debt in MENA countries during this period. One possibility is that countries with higher levels of debt find it more difficult to destine resources to lean against currency pressures, which would increase the likelihood of experiencing larger depreciations and inflating prices of imported goods in domestic currency.

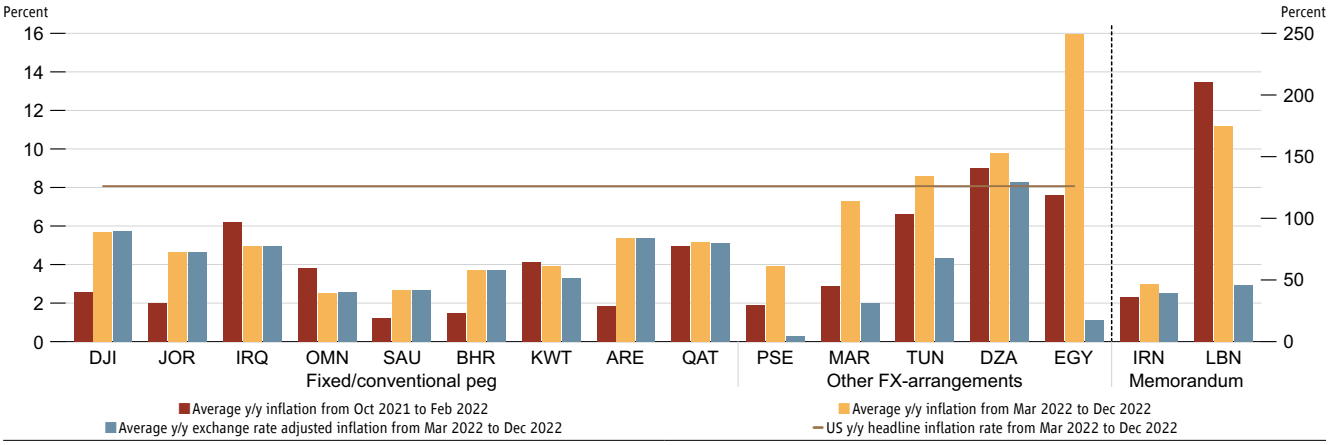
10 To be precise, Kuwait and Jordan hold conventional pegs relative to a basket of currencies or currency composite, not relative to the U.S. dollar. But the exchange rate of their local currencies remained virtually unchanged relative to the U.S. dollar during the period under consideration

11 The Egyptian pound depreciated even more in early 2023, losing about another 14 percent of its value on average in January.

12 The currency depreciation values are calculated between the average exchange rates (USD/LCU) in March 2022 and December 2022.

13 Several countries in the sample have large sovereign wealth funds. If these assets were netted from their sovereign debt, the countries would be shifted to the left on Figure I.6. This is particularly true of GCC economies that also display lower inflation and have pegged exchange rates. Correcting for these large positive asset positions would strengthen the pattern highlighted in Figure I.6.

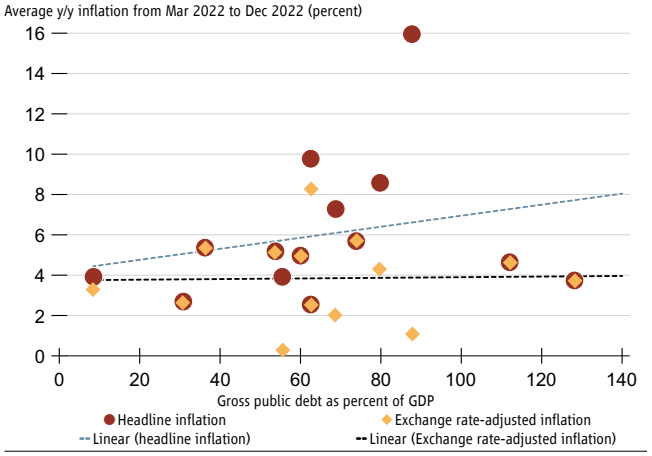
Figure I.5: Exchange-rate adjusted inflation rates across MENA



Sources: World Bank staff calculations based on data from Haver Analytics and national statistical offices.
Note: The blue bars show what the average year-on-year inflation rate would have been if each country's bilateral exchange rate with the U.S. dollar had remained at the February 2022 level. Libya, Syria, and Yemen are excluded due to lack of data. y/y inflation is year-on-year inflation. Countries are displayed in ascending order by 2022 GDP per capita within country groupings.

For the most part, after accounting for fluctuations in exchange rates, inflation in the region was moderate and often low. This speaks to an imperfect passthrough of international prices into domestic prices. Subsidies, price controls, and other product market interventions were put in place to contain inflation. Estimates in the October 2022 MENA Economic Update (Belhaj et al. 2022) found that, in most countries, inflation would have been higher had these policies not been in place. Indeed, estimates over the period between March and July 2022 show that, interventions in tradeable product markets, reduced year-on-year inflation by more than 1.5 percent in half the countries in the region.[14] For example, interventions in Egypt resulted in a 4.1 percentage-point reduction in inflation and in West Bank and Gaza a 3.1 percentage-point reduction.

Figure I.6: Debt as percent of GDP vs Headline Inflation



Sources: World Bank Staff calculations based on data from Haver Analytics, National Statistical Offices (NSO), World Bank *Macro and Poverty Outlook*, April 2023, and World Bank country economists.
Note: Countries included in this plot are Algeria, Bahrain, Djibouti, Egypt, Iraq, Jordan, Kuwait, Morocco, Oman, the UAE, Qatar, Saudi Arabia, Tunisia, West Bank and Gaza. Gross public debt as percentage of GDP corresponds to 2021 or to the latest available. y/y inflation is year-on-year inflation.

Nevertheless, inflation-mitigating policies have costs. Not only do some interventions directly increase government expenditure and pressure fiscal balances, but they can also create market imbalances and inefficiencies that may misallocate resources and taper entrepreneurship, which can put a drag on productivity. While some countries, such as those in the GCC, had the means to bear these costs—at least fiscally, thanks to the surge in oil prices—others in the region did not. The following section describes the inflation-mitigating policies that were in effect in countries across MENA during this period.

14 Product-market interventions did not reduce inflation in all cases. For three of the 15 countries considered in the analysis, the net effect of these interventions was an increase in inflation. For a discussion on these estimates refer to Belhaj, et al. 2022.

I.3.2 Inflation-Mitigating Policies

Inflation is widely considered a regressive phenomenon. This is particularly true when increases in the prices of food products and energy are important drivers (Lederman and Porto, 2016). In the MENA region, World Bank estimates indicate that for every 1 percent increase in the price of food products, about half a million people fall into poverty (Lopez-Acevedo et al., 2022). This implies that, since the war in Ukraine, the number of poor in MENA has increased by over 20 million people because of rising prices.[15]

Given the deleterious effects of inflation on poverty in the region, it is perhaps unsurprising that governments in MENA have employed a variety of policies with the aim to contain rising domestic prices. Table I.2 provides an overview of the types of product-market policies that have been implemented across MENA countries since February 2022. It is an updated version of Table 3.2 in the October 2022 MENA Economic Update. It focuses on policies that target domestic product markets—through changes in consumption subsidies, indirect taxes (or specific taxes on commodities), import tariffs, price controls, and the use of product-specific exchange rates aimed at reducing the costs of certain imports.[16] The table also lists changes in social protection policies, which aim to provide relief directly to households without altering the functioning of domestic product markets. It provides a qualitative summary of policies that can have opposing effects on domestic inflation.

Table I.2 does not include traditional macroeconomic policies, such as policy rate increases, that are used to steer inflation by supporting the national currency and/or reducing domestic aggregate demand. Neither does it include policies aimed at securing access to imported food staples, which have been ubiquitous among countries that depended on imports from Russia and Ukraine before February 2022.

Ten of 19 MENA countries increased food and energy subsidies to reduce the pass-through from global prices to domestic inflation. Almost every middle-income or lower-income oil-importing country announced increases in consumption subsidies. Lebanon is the only country in this group that did not. Since the last MENA Economic Update in October 2022, Morocco and Tunisia expanded fuel subsidies, while Egypt increased both food and fuel subsidies.[17] Although the enhanced subsidies depress domestic prices, they carry substantial fiscal costs, which might have large consequences for economies with pre-existing fiscal and public-debt vulnerabilities.

Ten countries imposed new price controls. Since October 2022, United Arab Emirates, Algeria, and Egypt enforced new food price ceilings. Jordan imposed new food and energy price controls. Five countries—Iraq, Algeria, Iran, Jordan, and Egypt—were reported to have loosened import restrictions on specific products to relieve domestic supply bottlenecks and thus ease domestic inflation. Since October 2022, Algeria, Iran, and Egypt have issued new regulations to facilitate import operations. Iraq is the only oil exporter to have instituted enhanced subsidies and loosened import regulations. These policies can attenuate domestic inflation, but at the expense of less strict oversight of the quality of imports or, if import tariffs are reduced, a decline in government revenue.

15 These estimates are likely a lower bound, they are obtained under the assumption that inter-household inequality remains unchanged relative to the most recent household surveys which predate the current crisis.

16 See Guenette (2020) for data and more analysis on price controls.

17 Note that not all subsidies are broad-based and thus the magnitude of their impact may vary. For example, the increase in fuel subsidies in Morocco was targeted at transport professionals, mainly truck and taxi drivers. Table I.2 provides a qualitative overview of subsidies put in place since February 2022 and does not assess the relative magnitudes of specific interventions

Table I.2: MENA's product-market and social transfers policy changes since February 2022

	Product-Market Interventions						Targeted Social Protection		
	Increased Food and Fuel Subsidies	Instituted New Price Controls	Trade Regulations	Indirect Tax Exemptions	Product-Specific Exchange Rates	Increasing Regulated Prices/ Reducing Subsidies	Cash Transfers	Utility and Financial Support	Improved Targeting
Gulf Cooperation Council									
Oman	✓	✓						✓	
Saudi Arabia		✓					✓		
Bahrain				✓				✓	
Kuwait	✓								
United Arab Emirates	✓	✓						✓	
Qatar									
Developing Oil Exporters									
Syrian Arab Republic			✓		✓	✓			✓
Yemen, Rep.			✓			✓		✓	
Algeria		✓	✓	✓				✓	
Iraq	✓		✓				✓	✓	✓
Iran, Islamic Rep.			✓		✓	✓	✓		
Libya		✓	✓					✓	
Developing Oil Importers									
West Bank and Gaza	✓	✓		✓					
Djibouti	✓	✓		✓			✓	✓	✓
Morocco	✓								
Jordan	✓	✓	✓	✓		✓	✓	✓	
Tunisia	✓	✓	✓			✓			
Egypt, Arab Rep.	✓	✓	✓			✓	✓	✓	
Lebanon					✓	✓	✓	✓	
Total: Out of 19	**10**	**10**	**9**	**5**	**3**	**7**	**7**	**11**	**3**

Source: World Bank country economists and staff estimates based on news reports as of February 2023.
Notes: Countries are displayed in ascending order by 2022 GDP per capita within country groupings.

Syria, Iran, and Lebanon appear to subsidize imports by using product-specific exchange rates that make it cheaper to buy the targeted imports. Since last October, Iran and Lebanon adopted new product-specific exchange rate measures. Subsidized exchange rates do not necessarily show up as fiscal expenditures but they are not cost free. At the very least, they can reduce a central bank's reserves and possibly weaken its balance sheet.

The last type of product-market intervention considered here is an increase in controlled price ceilings, which occurred in seven countries. Yemen, Jordan, Tunisia, and Lebanon have raised fuel price ceilings since last October. Price controls reduce the fiscal costs of the consumption subsidies. Jordan, Tunisia, and Egypt were reported to have implemented higher price ceilings (especially for fuel prices) along with increases in overall consumption subsidies. Because subsidies

kick in when the domestic price rises above a ceiling or threshold price, the net effect of the policy on inflation is ambiguous, since authorities can raise the ceiling while simultaneously increasing the subsidy.

Table I.2 also identifies the seven countries that have strengthened their cash transfer programs—including Egypt, which announced a further expansion of cash transfer programs since last October. Cash transfers are unlikely to affect the domestic prices of tradable goods such as food and energy but could affect the prices of non-tradable goods. In addition to cash transfers, 11 countries provided utility and financial support. Bahrain, Yemen, Algeria, Jordan, and Egypt offered or increased financial and utility assistance since October.

As discussed above, the expansion of subsidies, price controls, product-specific exchange rates, and other policies comes at a cost—be it directly on fiscal expenditures or through weakening central bank balance sheets. While some countries have raised price ceilings, in particular for energy products, virtually every country in MENA has strengthened inflation mitigation policies—which could exacerbate pre-existing fiscal and public-debt vulnerabilities, especially among highly indebted oil-importing countries of MENA. Only Syria, Iraq, and Djibouti reported improvements in targeting assistance to households in need, which likely reduces the fiscal burden of social transfers.

In summary, since February 2022, MENA governments have deployed a suite of specific policies to mitigate the damage from higher inflation, particularly in food and energy prices. These policies are separate from the standard macroeconomic policy responses to high inflation, such as interest rate increases by central banks, which occurred in 11 countries.[18] Most countries implemented some form of product-market intervention, and a few expanded or strengthened cash transfers.

I.3.2.1 The costs and long-term effects of inflation-mitigating policies

Since October 2022, governments in MENA have strengthened inflation-mitigation policies despite signs of easing global inflation—with a handful of exceptions along the margin of fuel price ceilings. The question remains whether these interventions are the most efficient use of scarce fiscal resources, especially for the oil-importing countries. Moreover, the failure of governments to roll back these policies may be a sign that, even if intended as temporary measures, they are harder to unwind than anticipated.

The broad-based interventions described above not only can be costly to implement and keep up, their distortive nature can create imbalances in product markets, which can have negative long-run implications for macroeconomic outcomes. Price controls can dampen investment and growth and worsen poverty outcomes (Guenette 2020), while subsidies can crowd out non-subsidized sectors and lead to inefficient allocation of labor among sectors (Plante 2014).

Cash transfers, on the other hand, have widely been considered less distortive than interventions in specific markets—such as subsidies and price controls—while, at the same time, increasing efficiency by facilitating targeting of assistance to needier recipients. While transfers can help households withstand the effects of inflation, they do not help reduce prices. However, pairing transfers with more traditional tools to steer inflation, such as decisive monetary policy, may help protect the most vulnerable against price rises in the short-term—while anchoring medium- and long-term inflation expectations without heavily distorting economic activity.

18 Eleven MENA countries—Oman, Bahrain, Saudi Arabia, Kuwait, United Arab Emirates, Qatar, Syria, Morocco, Jordan, Tunisia, and Egypt—increased interest rates. Since last October, Morocco, Jordan, Tunisia, Egypt, and all GCC countries hiked interest rates.

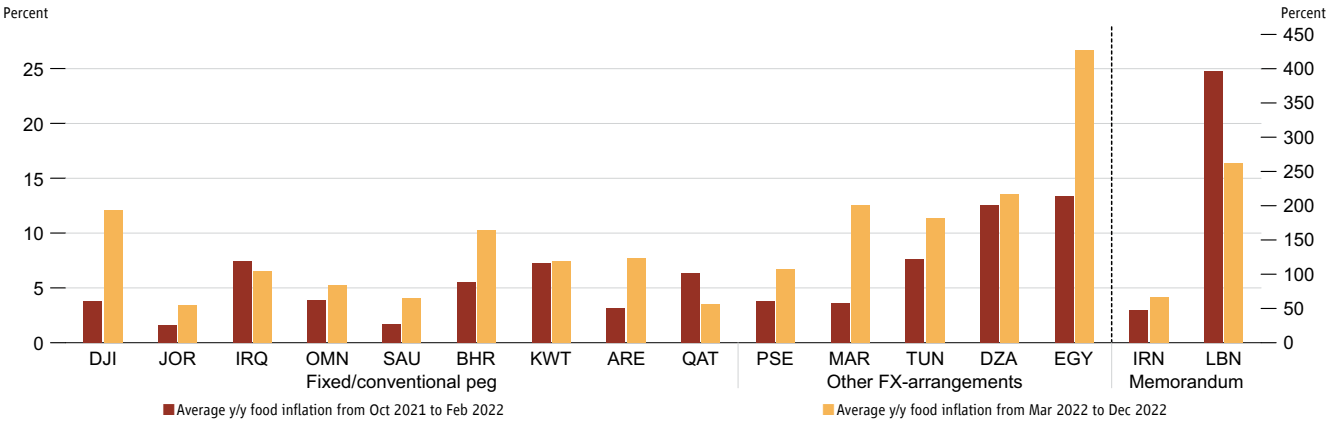
I.3.3 Food Inflation and Exposure to Commodity Markets

The heavy focus on mitigating increases in food and energy prices is perhaps unsurprising, given how the war in Ukraine disrupted those markets. Despite policies specifically aimed at containing increases in food prices, year-on-year food inflation has gone up for nearly all countries in MENA since the war, compared to the period before February 2022 (see Figure I.7).[19] This increase in food inflation across the region does not necessarily imply that the policies to contain food product prices were ineffective; food inflation might have been higher without them.

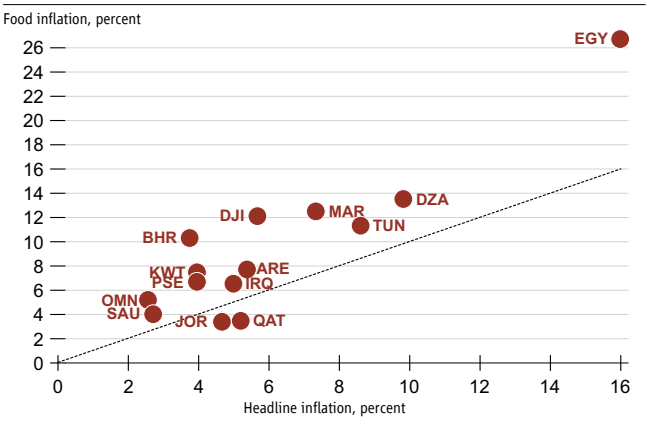
Moreover, food inflation levels are high across the region: six of the 14 countries considered (excluding Lebanon and Iran), have double-digit food inflation; only one country—out of 14—had double digit headline inflation over the same period since the war (see Figure I.5). Panel B of Figure I.7 compares headline and food inflation. Except for Qatar and Jordan, each country considered in this exercise experienced food inflation higher than headline inflation, and in some

Figure I.7: Food Inflation

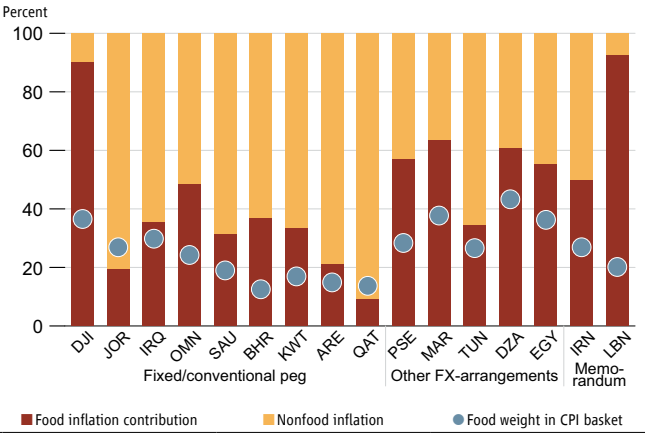
Panel A. Food Inflation in MENA



Panel B. Headline and Food Inflation in MENA



Panel C. Percent Contribution of Food Inflation to Headline Inflation



Sources: World Bank Staff calculations based on data from Haver Analytics and National Statistical Offices (NSO).
Note for Panel A: Countries are displayed in ascending order by 2022 GDP per capita within country groupings.
Note for Panel B: The scatter plot presents average headline inflation on the x-axis and average food inflation on the y-axis between March 2022 and December 2022.
Note for Panel C: The red portion of each bar represents the contribution of food inflation to headline inflation. The orange portion of each bar represents the contribution of all items excluding food to headline inflation. The sum of the contributions of the two categories (food, and non-food) equals headline inflation. Food includes food and non-alcoholic beverages (CP01). y/y inflation is year-on-year inflation. Countries are displayed in ascending order by 2022 GDP per Capita within country groupings.

19 Two notable exceptions are Iraq and Qatar. In addition, Lebanon also didn't experience an increase in food inflation because it already had exceptionally high levels of food inflation prior to the war.

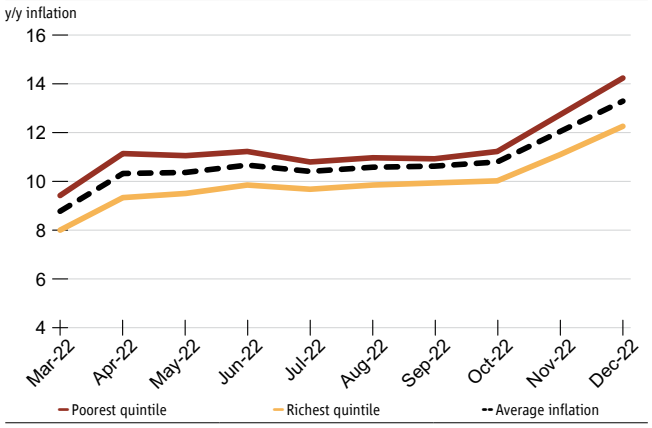
cases significantly so. Even though in most countries in the region food products carry a weight of between 10 and 30 percent in their consumer price index (CPI), the increase in food prices accounted for half or more of total inflation for many of them (see Figure I.7, Panel C). Indeed in 14 out of the 16 countries considered, food inflation accounted for a higher proportion of inflation than its CPI-weight would imply.

I.3.4 Inflation Across Expenditure Quintiles

Inflation was not only experienced differently across MENA countries, but it was also experienced differently within countries. The oversize influence of the increase in food prices in the overall inflation rate means that households that spend a larger share of their income on food products will be hurt more than those who spend a smaller share. The households whose food budgets are proportionately larger are also less wealthy. In MENA, the poorest and most vulnerable experience higher levels of inflation than do richer households.

For developing MENA economies, on average, the poorest households (as proxied by consumption expenditure), faced higher inflation than the richer households (see Figure I.8).[20] As of December 2022, households in the poorest 20 percent (quintile) of the population faced 14.3 percent annual inflation while the richest quintile faced lower annual inflation at 12.3 percent—a 2 percentage-point spread between the highest and lowest ends of the distribution. Qualitatively, this was the case for every month between March 2022 and December 2022—the average spread during this period is 1.4 percent (see Figure I.8).

Figure I.8: Population Weighted Average Regional Inflation across Quintiles



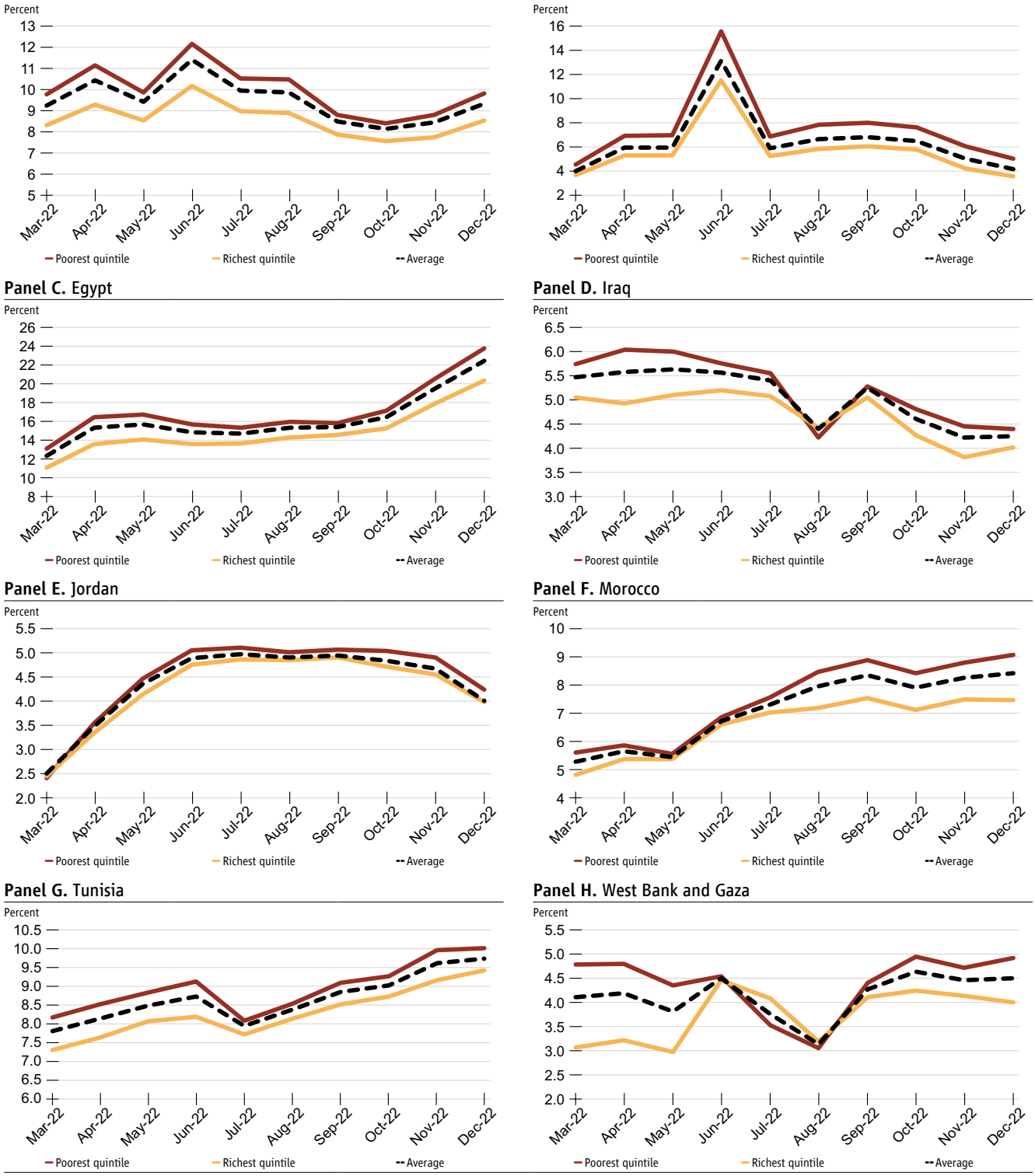
Source: HAVER Analytics, National Statistics Offices, latest Household Expenditure Surveys per country and World Bank Staff Calculations
Note: Developing MENA average includes Algeria, Djibouti, Egypt, Iraq, Jordan, Morocco, Tunisia and West Bank and Gaza. Households in each country are ordered in quintiles of expenditure per capita. Country-quintile specific annual inflation is calculated for each month and is then population weighted to obtain regional average quintile-specific annual inflation.

The pattern of poorer households experiencing higher inflation than their richer counterparts generally stands in each country (see Figure I.9). Except for summer dips in year-to-year inflation in Iraq and West Bank and Gaza, mainly due to lower food and higher transport inflation, the poorest households have had to face higher inflation than their wealthier counterpart for all of 2022. For December 2022, Egypt had the highest annualized inflation spread between the poorest and richest households—3.4 percentage points. Morocco was next at 1.6 percentage points. The highest recorded inflation spread for a given country in 2022 was 4.1 percentage points in June in Djibouti.

In Jordan, on the other hand, the difference between inflation experienced by the richest and poorest quintiles was very small. That's because food inflation was in line with headline inflation in that period (see Figure I.7, Panel B). That is, increases in food prices did not play an oversize role in inflation in Jordan during this period and so did not drive a wedge between the inflation experienced by the more and less wealthy.

20 In this exercise, the poorest households refer to the bottom 20% of households in terms of consumption expenditure per capita. The richest households refer to the top 20 percent along the same variable. For these groups, a quintile-specific price index is constructed based on their respective surveyed consumption baskets. Inflation experienced by each group is then computed using their corresponding price index

Figure I.9: Country-Specific Inflation across Quintiles



Sources: HAVER Analytics, National Statistics Offices (NSO), Algeria 2011 National Survey on Household Expenditure, Consumption and Quality of Life, Djibouti 2017 EDAM, Egypt 2017-2018 HIECS, Iraq 2012 IHES, Jordan 2013 HEIS (from ERF, representing 25% of the sample), Morocco 2014 ENCDM, Tunisia 2015 National Survey on Household Budget, Consumption and Standard of Living, West Bank and Gaza 2011 PECS, and World Bank staff calculations.
Note: Household Expenditure surveys are used to order households by household expenditure per capita to divide households into quintiles and obtain average expenditure shares on CPI basket items to recalculate a CPI for each expenditure quintile.

The disproportionate impact of food inflation on the poor underscores how food insecure this vulnerable group might be. Part II of this report discusses the long-term effects of food insecurity, demonstrating that even short spells of food insecurity can have lasting effects across generations.

PART II: THE LASTING IMPACT OF FOOD INSECURITY

Part II Takeaways

- Rising food prices intensify food insecurity, which is not only an immediate concern, but has repercussions across generations.
- Lack of proper nutrition—in utero or during early childhood—increases the risk of stunting and worsens schooling outcomes. Rough estimates show that 200,000–285,000 newborns may have been at risk of stunting in the developing countries in the Middle East and North Africa (MENA) due to rising food prices since the war in Ukraine. About 8 million children in the MENA region are forecast to be in food insecurity situations in 2023. Child nutrition and health were lacking even before the pandemic.
- The prevalence of food insecurity in MENA is high and is projected to increase. Syria and Yemen are classified as hunger hotspots based on the Integrated Food Security Phase Classification.
- The annual development financing needs for the severely food insecure population is forecast to be in the billions of dollars. Policymakers can address food insecurity in several ways: using social protection measures such as cash and in-kind transfers, through childcare and maternity leave policies, and by improving maternal education. Data transparency is a first step.

Despite efforts by governments to control high domestic inflation in the Middle East and North Africa (MENA) (Belhaj et al. 2022), the rise in food prices may push many people in the MENA region towards food insecurity—when people are forced to eat less, skip meals, or go hungry because of lack of money or other resources. The MENA region is largely a food importer, and has limited ability to increase supply to counteract rising prices. In addition, longstanding vulnerabilities, such as droughts, increase the region's susceptibility to food insecurity. More recently, as in other regions, the COVID-19 pandemic disrupted supply chains and food distribution—the effects of which were largely borne by the poor. Severe food insecurity has been rising in MENA over the past decade, and conditions are projected to deteriorate further over the next five years. There will be chronic food insecurity in most countries and acute food insecurity in Syria and Yemen, which have been identified as hunger hotspots by the Integrated Food Security Phase classification (IPC) (see Box II.B.1).

Although the immediate effects of food insecurity can be a devastating loss of life, governments and policymakers must understand that even temporary increases in food prices can cause long-term, irreversible damages, especially to children. There is mounting evidence in the literature that negative shocks can have multi-generational effects on development outcomes in education, health, and income—among other areas. Besides the immediate health effects, inadequate nutrition in utero and early childhood can disrupt the destinies of children in the MENA region, setting them on paths to limited prosperity. The region's population is younger than any but sub-Saharan Africa's, which means food insecurity may cause extensive harm as it reverberates through children in the region.

Food insecurity imposes challenges to a region that already had inadequate child nutrition and health before the shocks from the COVID-19 pandemic and the war in Ukraine. Initial rates of stunting—which is recognized as a measure of the cumulative impact of health insults to a child from pre-birth to age 5—are much higher for many countries in the region than in countries that are their income peers. The dietary composition of food for children is limited and the widespread

presence of subsidies may distort household food expenditures toward items that are less nutritious. This manifests as the double burden of malnutrition—child obesity and undernutrition are prevalent side-by-side in many MENA economies. Governments in the region must address inadequate child nutrition and health, not only for humanitarian reasons, but for economic reasons as well—undernourished children grow up to become less productive workers.

This part of the MENA report examines the long-term effects of food insecurity and the need for both urgent and decisive action and a different set of policies to combat it. The solutions will not be cheap, but the costs of inaction compounded over many future generations would be higher. Short-term food financing needs for the region are in the order billions of dollars, and are likely to rise. A multifaceted approach is needed. It should combine social protection interventions, such as cash transfers, with investments aimed at building resilience in food systems, which would enable them to withstand disruptions and ensure sufficient availability of foodstuffs. It also needs better maternal health policies. The key connection between immediate food insecurity and long-term outcomes is the deleterious effect inadequate nutrition has in utero and on early childhood. Policies that safeguard pregnant women from stress by granting maternity leave, increasing access to childcare, and improving maternal education can limit the long-term effects of food insecurity (Almond et al., 2018). Remedial medical investments may also be needed to curb the effects of food insecurity shocks.

Which interventions are appropriate will depend on whether food insecurity is chronic or acute. Acute food crises reflect the complex interactions of conflict, poverty, extreme weather, climate, and food price shocks that compound in the presence of long-standing structural factors (Misselhorn, 2005; Headey, 2011; Singh, 2012; D'Souza and Jolliffe, 2013; Maxwell and Fitzpatrick, 2012). There are advantages to investing in resilience and tackling chronic food insecurity before it escalates into full blown crises. Because markets and governance structures may still be functioning during chronic food insecurity, governments are better equipped to be successful than during a crisis. Finally, this economic update reaffirms a message that has been consistent through earlier regional updates: policymakers will be unable to ascertain the situation and act decisively if they don't have access to credible data.

Part II of this report consists of four sections. The first documents the extensive evidence on the long-term effects of food insecurity. The second section summarizes the state of child nutrition and health in the region largely during the period before the pandemic, based on estimates from survey data. The third section describes the status of food insecurity in the region based on recent state-of-the-art machine learning techniques. The final section discusses policy options and makes conclusions.

II.1 Food Insecurity Can Have Intergenerational Consequences

Underinvestment in early childhood can lead to long-term effects that can span generations. For example, the "fetal origins" thesis postulates that conditions such as inadequate nutrition during pregnancy hurt the fetus (Almond and Currie, 2011), which leads to poorer health outcomes for the child. For instance, individuals who lacked nutrition in utero are more likely to suffer from obesity, diabetes, and cardiovascular issues into adulthood. The nine months in utero are considered a critical period in shaping an individual's destiny. The effects can be persistent, and the poor health outcomes can take years to manifest themselves (Almond and Currie, 2011).

Vulnerability to the harmful effects of food insecurity may continue after birth. Research suggests that any deprivations in the first 1,000 days of life are likely to affect a child's physical and brain development (Doyle, 2020). There is evidence that from pregnancy to age three a brain is rapidly creating neural pathways (Knudsen et al., 2006). Negative shocks in this period may have long-term cognitive and other effects. Proper nutrition is necessary for the mental and physical well-being of children (Gatti et al., 2018; Corral and Gatti, 2020). Research has shown that children who live in extreme poverty may lose 25 percent of their income-generating potential as adults (Richter et al., 2017).

The literature on the long-term effects of early childhood circumstances can be classified by the types of shock exposed in utero and early childhood. A large section of the literature focuses on large external shocks such as famines, conflict, and pandemics. Researchers have also examined the effects of what they term "mild" shocks. In this section, the report focuses on three types of mild shocks that are likely to be related to food insecurity: nutritional shocks, maternal stress, and weather and climate change (Almond et al., 2018). Mild shocks that are not considered in this section include infectious disease, pollution exposure, and alcohol and tobacco consumption.

II.1.1 Large shocks: famines, conflict, and pandemics

A child who experiences famine early in life, even in utero, can face poor long-term health, education, and labor consequences. The literature is replete with examples from around the globe.

For example, early exposure to famine in China (Chen and Zhou, 2007), Germany (Jürges, 2013), the Netherlands (Lindeboom et al., 2010), and Ethiopia (Dercon and Porter, 2014) resulted in reduced height, fewer years of schooling, lower cognitive scores, and reduced labor earnings in adulthood.

The Dutch famine of 1944–1945 near the end of World War II was the result of a Nazi blockade in German-occupied Netherlands that cut off food in retaliation for a Dutch railway workers' strike. An estimated 4.5 million people were affected. A review of death records of hundreds of thousands of Dutch people born in the mid-1940s showed that women whose mothers were carrying them during the famine had lower birth weights (Lumey and Stein (1997). Their offspring also had lower birthweight. Veenendaal et al. (2013) show that fathers who were in utero during the famine had offspring who were heavier and had a higher body mass index (a measure of obesity) than did the offspring of fathers whose mothers were not exposed to the famine.

The great Chinese famine between 1958–1962 is considered one of the deadliest in human history. Li and An (2015) find that offspring of children exposed to the Great Famine have shorter life expectancies than offspring of unexposed parents. Li et al. (2017) find that a child who was exposed in utero to the Chinese famine had an increased probability of developing type two diabetes in adulthood. A study by Cheng et al. (2020) shows that prenatal and early life exposure to the great Chinese famine increases the risk of tuberculosis in adulthood across two generations.

The Ethiopian famine of 1983–1985 was largely driven by drought and was exacerbated by fighting in the North. Tafere (2016) uncovers intergenerational effects of famines on human capital. Children who were exposed in utero and up to three years after birth had children with problems. The children of mothers who were exposed to the famine were prone to be lower than average height, have less schooling, and lack self-esteem. The inter-generational transmission appears to be through mothers. Asfaw (2016) finds that individuals who were exposed in utero and early childhood to the 1983–

85 Ethiopian famine had reduced years of schooling, lower household wealth, worse health outcomes, lower probability of literacy, and increased likelihood of welfare enrollment. Famine exposure also resulted in an increased probability of stunting and lower than average height-for-age scores for children of those who were exposed to the famine.

Other large shocks have been found to have long-lasting deleterious effects on human capital, including the shocks from 1918 influenza pandemic (see Beach et al.,2022, for an overview). Harmful effects were discovered in several countries—including Japan, Taiwan, Sweden, and Brazil. The COVID-19 pandemic could spawn similar long-term consequences for COVID-19—although they may not be known for decades (World Bank, 2023).

It is not just exposure to large shocks that have had lasting consequences. Even mild shocks, which can be generated by temporary episodes of food insecurity, may have long-lasting effects.

II.1.2 Mild Shocks

Critical mild shocks tend to be more common than large shocks. Three types of mild shocks described in Almond et al. (2018) are related to food insecurity: nutritional shocks, maternal stress, and weather and climate change.

Mild nutritional shocks can have lasting effects. Mild shocks must be reasonably exogenous (that is, come from outside those being studied). To allow their effects to be measured, they must come as a surprise, so individuals cannot adapt to them. In that sense, studies on surprise pregnancies during periods of fasting are ideal for capturing the effects of mild malnutrition shocks in utero. For example, during Ramadan, the Muslim holy month, fasting is required from sunrise to sunset, which causes a mild nutritional shock. Although pregnant women are exempted from fasting, some may accidentally fast. Because the fasting is accidental, the shock can be classified as exogenous. Accidental fasting has only modest effects on birthweight, but it has long-term effects. Based on data from Iraq, Uganda, and the U.S. state of Michigan, Almond and Mazumder (2011) find that accidental fasting lowers birthweight. Census data show that accidental fasting in Uganda and Iraq can lead to a 20 percent increase in the likelihood that a child is disabled as an adult (and even more likely to have mental or learning disabilities) and is also more likely to be poorer (they have a lower probability of owning a house, for example). Almond, Mazumder, and van Ewidk (2015) find that accidental fasting in England leads to lower math, reading and writing test scores. Similar effects were found in Denmark for Danish, English, math and science scores for girls and children of mothers with lower socioeconomic status (Greve, Schultz-Nielsen, and Tekin, 2017).

Food insecurity is also likely to increase stress on a pregnant woman. Although they do not measure food-security-induced stress per se, numerous studies show the deleterious effect of stress in pregnancy, Persson and Rossin-Slater (2018) use prescription drug data from Sweden and find that when a family member dies while a woman is pregnant, the baby had adverse mental health outcomes up to age 30. Lee (2014) explores the intergenerational effects of maternal stress by using data from Korea. The study finds that grandchildren of women who experienced stress from a massacre of civilian demonstrators decades earlier exhibited low birth weight and were often born prematurely Aizer, Stroud and Buka (2016) measure cortisol levels—a hormone that mainly helps the body respond to stress—among pregnant women who used perinatal centers in the 1960s in two U.S. cities—Boston, Massachusetts and Providence, Rhode Island. Infants exposed to high levels of cortisol had one less year of schooling than their siblings by age seven. Domestic violence—as either a source of stress or injury—has also been found to have negative effects on birth outcomes (Aizer,

2011). There is some evidence that delays in nutritional assistance benefits in the United States (in the state of Illinois) increased domestic abuse (Carr and Packham, 2021).

Weather variability and climate change have also been documented to have long term effects that increase food insecurity. Hyland and Russ (2019) use data for 19 countries in sub-Saharan Africa from the Demographic and Health Surveys (DHS) program of the U.S. Agency for International Development (USAID) to study the effects of drought conditions on women over four decades. Women who lived through droughts during early childhood have less wealth in adulthood, fewer years of education, reduced heights, and perform poorly in measures of empowerment. Additionally, their children are more prone to low birthweight. The findings are confined to rural households, suggestive that the channel is through agricultural output. In Egypt, using DHS surveys, extreme weather events (higher than average precipitation or temperature) are found to increase the likelihood of stunting (Elayouty et al., 2022). Dry areas, common in the MENA region, are most sensitive to rainfall shocks (Damania et al., 2017). Furthermore, areas susceptible to weather shocks, are likely to remain vulnerable to inadequate investment because the instability and unpredictability of yields and prices makes it difficult for investors to assess financial feasibility (Diogo et al., 2017).

The literature contains much more evidence that suggests that shocks related to food insecurity from early pregnancy to early childhood can have long term negative consequences for individuals. The onset of rising food prices and corresponding food insecurity present further challenges to the MENA region, where child nutrition and health already appeared to be inadequate before the COVID-19 pandemic and the war in Ukraine. Moreover, there is evidence that in MENA, natural shocks and disasters occur more frequently than elsewhere and their frequency is increasing.[21] The current shocks may exacerbate the long-term effects of food insecurity on an already vulnerable state of child nutrition and health. However, the lack of high-quality data means the region is still mostly in the dark about the deficiencies in child health. The next section explores the state of child nutrition and health in the MENA region using the best survey estimates available.

II.2 The State of Child Nutrition and Health in MENA Before COVID-19 and the War in Ukraine

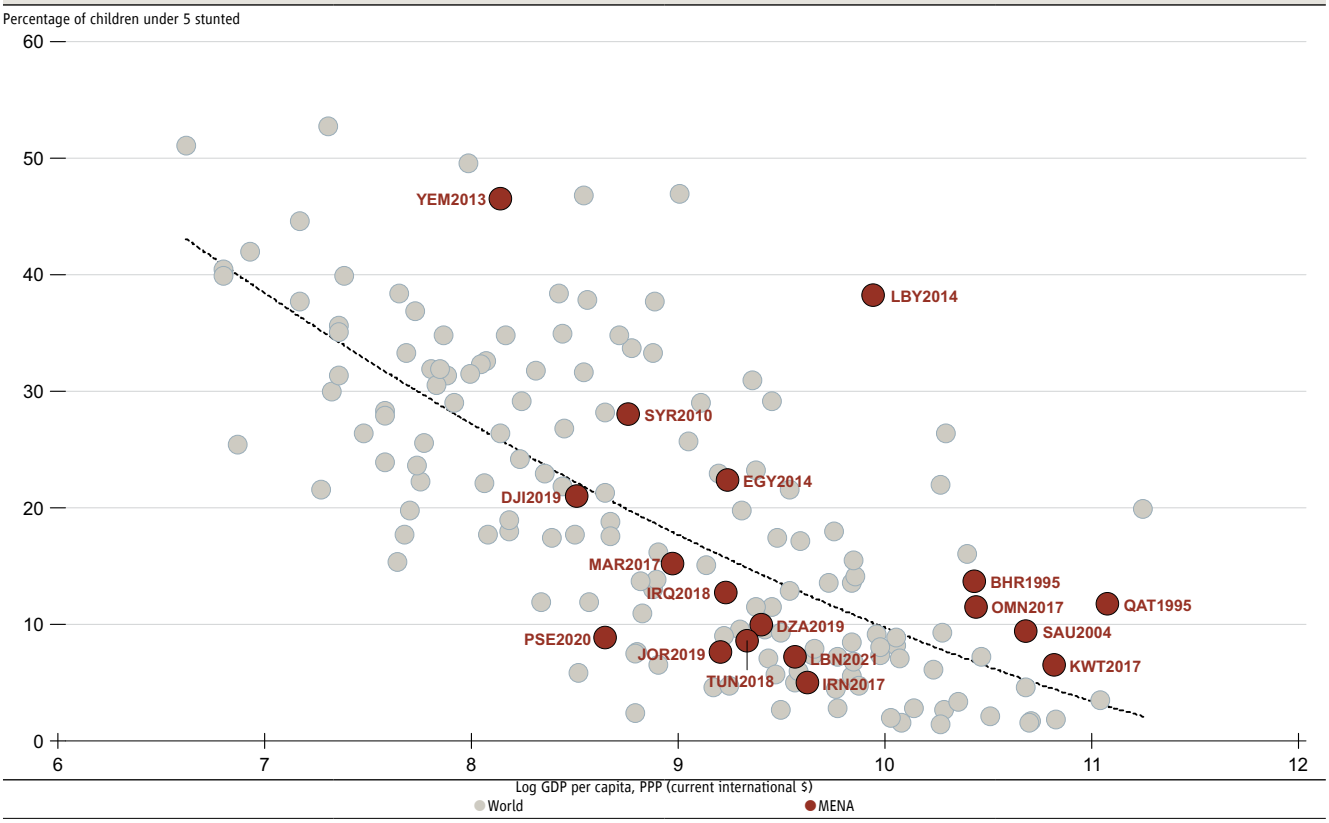
Child nutrition and health in the region were inadequate before the war in Ukraine and the COVID-19 pandemic, which suggests that health systems in the region generally are not up to the task. An already stressed health system and inadequate child nutrition and health may exacerbate the harmful effects of food insecurity. This analysis provides an overview based on indicators that are commonly used as markers of child health and that are reasonably comparable across countries: the prevalence of stunting, wasting, and some observations on the diversity of diets and child mortality rates.[22] For these indicators, only estimates from survey data are analyzed, excluding any estimates derived from models.

21 In 2021 there were 0.05 climate shocks per million square kilometers in the MENA region compared with 0.02 in the rest of the world, according to the Emergency Events Database (EM-DAT) maintained by the Centre for Research on the Epidemiology of Disasters. Their frequency in MENA increased from 0.03 climate shocks per million square kilometers in 2000. The Natural Disasters database defines shocks as: drought, flood, storm, landslide, extreme temperature and wildfire.

22 As is customary for the *MENA Economic Update (MEU)*, the analysis focuses primarily on cross-country and regional dimensions, complementing country-specific studies, which can delve into more depth.

A child's growth is considered stunted if his or her height is more than two standard deviations below the median *height-for-age* established by the World Health Organization (WHO).[23] Stunting is a consequence of the health insults—including chronic malnutrition—accumulated over a child's life. Figure II.1 displays the relationship between the percentage of children under five who are stunted (stunting prevalence) and income per capita for 155 economies—which include developing and some advanced economies.[24,25] Figure II.1 shows that both globally and within MENA, rich economies tend to have lower rates of stunting than poorer economies.[26] Libya, Syria and Yemen have some of the highest stunting rates in the MENA region. These high stunting rates preceded the conflicts in Syria and Yemen and the level of stunting is likely to have deteriorated since then. Moreover, stunting rates in Syria may be exacerbated by the earthquakes in 2023. There is a strong case for taking urgent action to measure stunting and to help children in these countries recover.

Figure II.1: Prevalence of Stunting: MENA vs Income Peers



Sources: The Joint Child Malnutrition Estimates (JME) database survey estimates maintained by UNICEF, the World Health Organization (WHO) and The World Bank, May 2022, and the World Bank's *World Development Indicators* (WDI).
Note: The figure includes the latest survey estimates available for stunting rates from the JME survey estimates. The stunting rate is the percentage of children under five years of age who are more than two standard deviations below the median height-for-age of the WHO Child Growth Standards. The GDP per capita PPP (current international $) is used as a proxy for the level of economic development. The latest year of the stunting rate is matched with the same-year GDP per capita PPP (current international $). The closest year available of GDP per capita PPP (current international $) was used for countries with missing data. Data points for Qatar (1995), Somalia (2012), and Syrian Arab Republic (2010) were extracted from the International Monetary Fund's World Economic Outlook Database. The figure is based on a sample of 155 countries, of which 126 are developing economies and 29 are advanced economies. The advanced economies include the United States, Germany, Belgium, and Portugal.

23 The WHO Multicentre Growth Reference Study (MGRS) (2006) found similarities in linear growth among children in six countries (Brazil, Ghana, India, Norway, Oman, and the United States), which justifies pooling the data and producing a single international standard from birth to five years of age.

24 Stunting may take considerable periods of malnutrition to manifest, and thus the relationship between income per capita and stunting is not indicative of a causal relationship, but a way to portray some interesting patterns in the data.

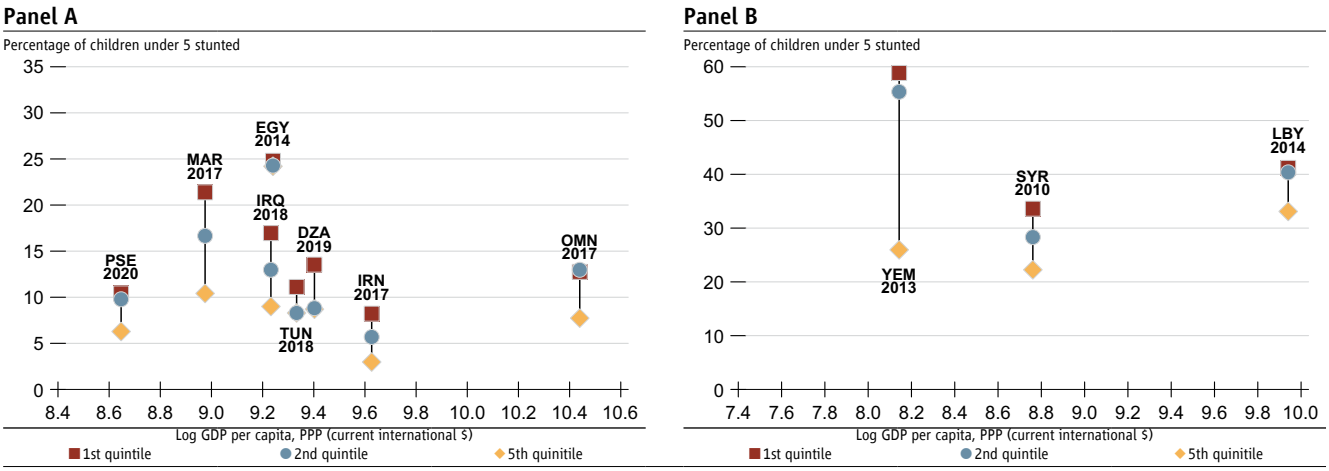
25 The data comes from survey estimates aggregated at the country level by the UNICEF-WHO-World Bank Joint Child Malnutrition Estimates (JME) database, May 2022 Edition. For more information, see https://data.unicef.org/resources/dataset/malnutrition-data/.

26 Stunting rates decrease as per capita income rises globally. Its prevalence dropped from 40 percent to 22 percent of children under five between 1990 and 2017 (Galasso et al. (2017); de Onis and Branca (2016) for 1990 data; World Bank (2019) for 2017 data).

Based on measures that existed before the crises, several MENA economies perform worse than their income peers. This is striking for the Gulf Cooperation Council (GCC) economies—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates—which have some of the lowest rates of stunting in the region but perform quite poorly when compared to their income peers. Some of these data are dated—information from Qatar and Bahrain is from 1995, for example. Still, GCC economies for which there is more recent data, such as Oman and Kuwait, underperform relative to income peers.

The average country stunting rates mask considerable differences within countries. Panel A of Figure II.2 ranks MENA countries by income—except for Yemen, Syria and Libya, which are displayed separately in Panel B on a different scale. Only countries with survey data estimates are included. The figure presents stunting rates for the first quintile (the poorest 20 percent of households), the second quintile and the fifth quintile (the richest 20 percent of households). The gap between the stunting rates of the richest and poorest households in the region is large. An extreme case of this is in Yemen before the economic collapse. Poor households on average had stunting rates close to 60 percent, while rich households had stunting rates less than half that. Income distribution effects show up in cross-country comparisons too. For example, the stunting rate for rich households in 2017 in less-well-off Morocco is lower than the overall stunting rate (15.1 percent) in high-income Oman as well as that of Oman's poor household (first quintile) stunting rate. Furthermore, just moving from the poorest quintile to the second-poorest quintile in many MENA countries results in a meaningful difference in stunting rates.

Figure II.2: Prevalence of Stunting by Wealth Quintile in MENA

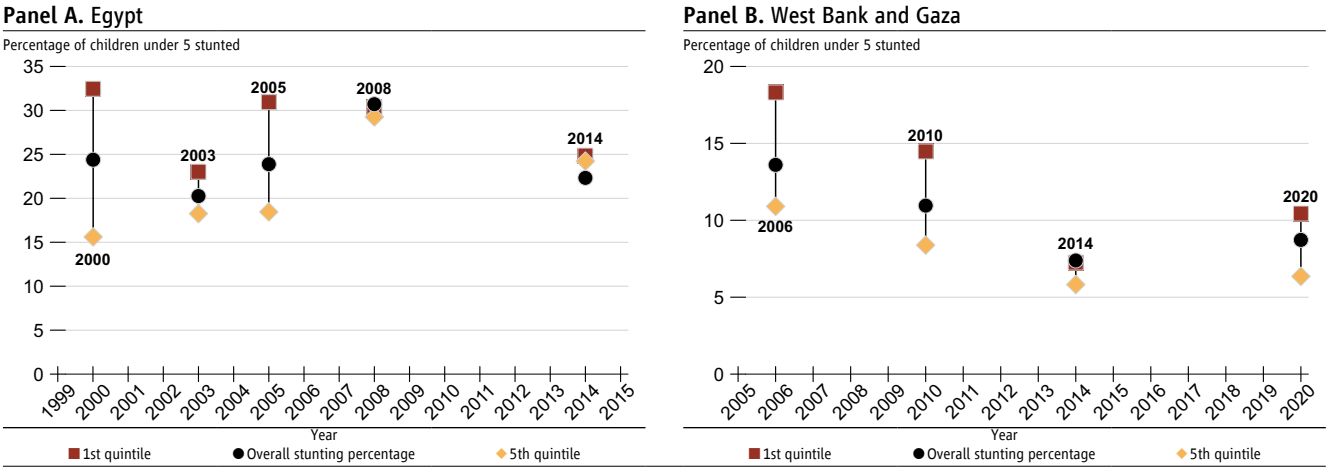


Sources: The Joint Child Malnutrition Estimates (JME) database survey estimates maintained by UNICEF, the World Health Organization (WHO) and The World Bank, May 2022, and the World Bank's *World Development Indicators* (WDI).
Note: The figure is based on the latest survey estimates available for stunting rate. Only countries that meet the criteria of having the latest stunting rate by quintile starting in the 2000s are included. The first quintile refers to the poorest 20 percent and the fifth quintile refers to the richest 20 percent. The GDP per capita PPP (current international $) is used as a proxy for the level of economic development. The latest year of the stunting rate is matched with the same-year GDP per capita PPP (current international $). The latest data point of GDP per capita PPP for Syrian Arab Republic (2010) was extracted from the International Monetary Fund's *World Economic Outlook* Database. Wealth quintiles are based on asset-based wealth scores. The JME database follows the standard methodology for combining household characteristics and asset ownership data from the DHS and MICS into "wealth" or "asset" indexes. Stunting can be broken down by quintiles of socioeconomic status (SES) using this wealth index. Both datasets use principal component analysis to aggregate responses to questions about asset ownership and housing attributes into a household-level SES index (See D'souza, Gatti, and Kraay, 2019).

Figure II.3 tracks overall, first, and fifth quintile stunting rates in Egypt and West Bank and Gaza over time. These are the only two MENA economies with at least four survey estimates since the year 2000. In Egypt, the data do not indicate an obvious downward trend in stunting rates over time (see Figure II.3, Panel A).[27] The overall stunting rate in 2014 is higher than what was reported in 2003. In contrast to the patterns in other countries in the region and from global

27 Stunting rates in Egypt do not seem to have a clear association with the level of development over time. Between 2003 and 2008, stunting rates increased with income per capita. Then, between 2008 and 2014, stunting rates fell in tandem with increases in per capita income.

Figure II.3: Trends in Stunting Prevalence by Wealth Quintile-Egypt and West Bank and Gaza

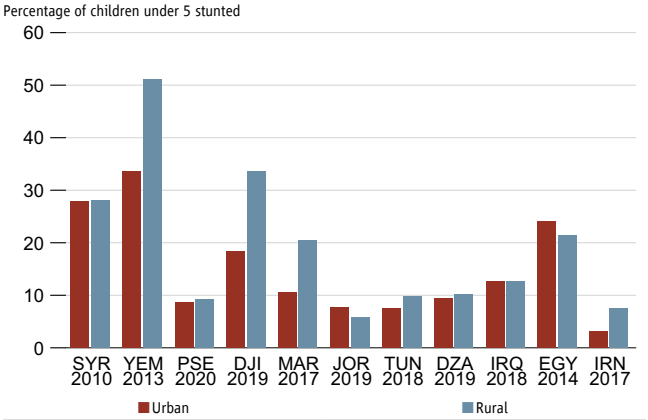


Source: The Joint Child Malnutrition Estimates (JME) database survey estimates maintained by UNICEF, the World Health Organization (WHO) and The World Bank, May 2022.
Note: The figure comprises the only MENA economies that have had at least four survey estimates since 2000—Egypt and West Bank and Gaza. The first quintile refers to the poorest 20 percent, and the fifth quintile refers to the richest 20 percent. Wealth quintiles are based on asset-based wealth scores. The JME database follows the standard methodology for combining household characteristics and asset ownership data from the DHS and MICS into "wealth" or "asset" indexes. Stunting can be broken down by quintiles of socioeconomic status (SES) using this wealth index. Both datasets use principal component analysis to aggregate responses to questions about asset ownership and housing attributes into a household-level SES index (See D'souza, Gatti, and Kraay, 2019).

evidence, there is little difference in stunting rates in Egypt between the first and the fifth quintile in the most recent year (2014).[28] This was not always the case. In 2000 and in 2005, there was a large gap in stunting rates between the richest and poorest quintiles. The gap narrowed considerably in 2008 and 2014, although stunting rates for both the rich and the poor quintiles were higher than the overall Egyptian stunting rates in 2003 and 2005.[29] The overall stunting rate in West Bank and Gaza has been declining since 2006, except for an upward tick in 2020 (see Figure II.3, Panel B).[30] This is likely due to the fall in GDP per capita caused by the pandemic. The gap in stunting rates between the richest and poorest quintiles was noticeably large in 2006 and 2010, however, it significantly narrowed in 2014, before widening again in 2020, albeit not by as much as in 2010.[31]

Rural households may be poorer and thus more vulnerable to shocks that exacerbate food insecurity. Health facilities may also be limited or inaccessible in rural areas. Most MENA economies are net food importers, so it is unlikely that spikes in food prices would be accompanied by an increase in rural incomes—in contrast to other economies where rural areas are predominantly engaged in agricultural activities and generally benefit from higher food prices. Figure II.4 shows that eight of the 11 MENA

Figure II.4: Prevalence of Stunting in MENA by Urban and Rural Areas



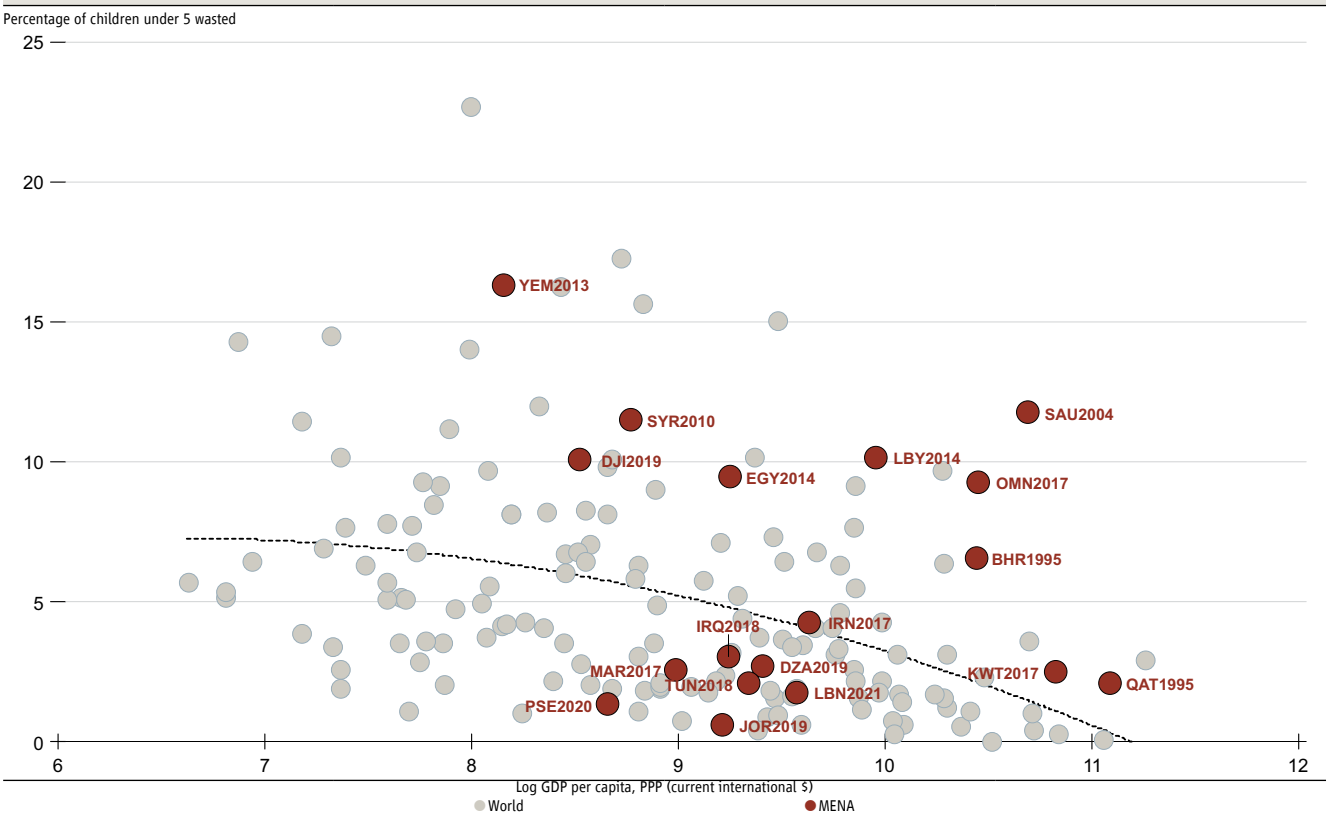
Source: The Joint Child Malnutrition Estimates (JME) database survey estimates maintained by UNICEF, the World Health Organization (WHO) and The World Bank, May 2022.
Note: The figure is based on the latest survey estimate available for stunting rates. Countries are displayed in ascending order by 2022 GDP per capita.

28 See Avitabile et al. (2020).
29 For both 2008 and 2014, the overall stunting rates in Egypt falls out of the poor and rich quintile bounds due to a non-monotonic relationship between the consumption/expenditure and stunting rates. This could be due to extreme outlier observations in the data.
30 Stunting rates in West Bank and Gaza are inversely correlated with the level of development over time. Between 2006 and 2014, stunting rates dropped with rising income per capita. Then, stunting rates increased in 2020 along with a decline in per capita income.
31 In 2014 the overall stunting rate in West Bank and Gaza falls out of the poor and rich quintile bounds due to a non-monotonic relationship between the consumption/expenditure and stunting rates. This could be due to extreme outlier observations in the data.

economies with available data have higher stunting rates in rural areas than in urban areas. Poverty rates also tend to be higher in rural areas in these MENA economies. However, obtaining accurate estimates of urban and rural poverty in the region have been a challenge. Policies may be more effective if they accounted for differences in rural and urban sectors of the economy.

Figure II.5 shows the correlation between income and the prevalence of wasting in children under age five for 155 economies—both developing and advanced. The wasting rate is the percentage of children between birth and 59 months who are more than two standard deviations below the median *weight-for-height* of the WHO Child Growth Standards. Wasting is considered an indicator of serious child health problems. The correlation is negative, implying that wasting declines as development increases. As with the stunting rates, several MENA economies perform notably worse than their income peers, which is particularly striking for the GCC economies.

Figure II.5: Prevalence of Wasting: MENA vs Income Peers

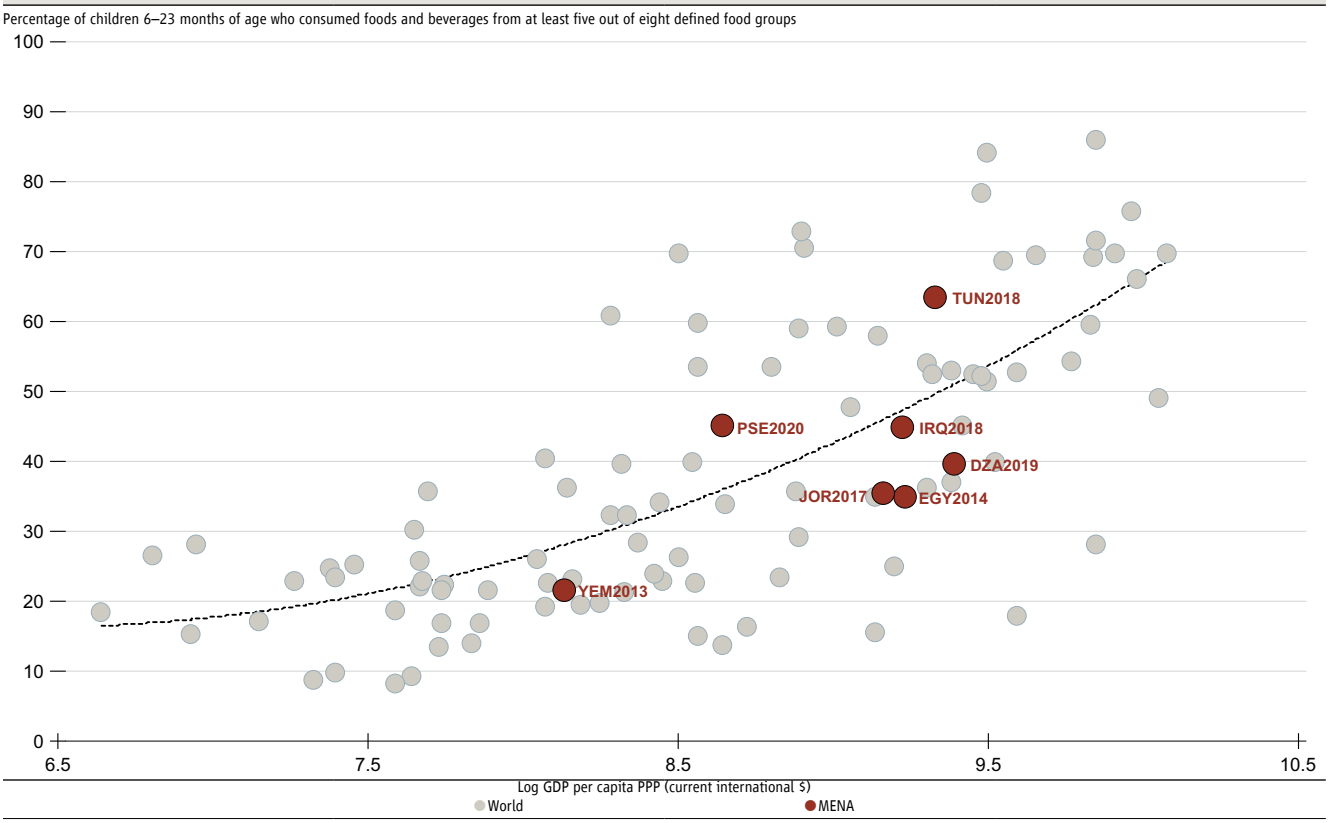


Sources: The Joint Child Malnutrition Estimates (JME) database survey estimates maintained by UNICEF, the World Health Organization (WHO) and The World Bank, May 2022, and the World Bank's *World Development Indicators* (WDI).
Note: The figure is produced using the latest survey estimates available for wasting rates. The wasting rate is the percentage of children under five years of age who are more than two standard deviations below median weight-for-height of the WHO Child Growth Standards. The GDP per capita PPP (current international $) is used as a proxy for the level of economic development. The latest year of the wasting rate is matched with the same-year GDP per capita PPP (current international $). The closest year available of GDP per capita PPP (current international $) was used for countries with missing data. Data points for Qatar (1995), Somalia (2012), and Syrian Arab Republic (2010) were extracted from the International Monetary Fund's *World Economic Outlook* database. The figure is based on a sample of 155 countries, of which 126 are developing economies and 29 are advanced economies—including the United States, Germany, Belgium, and Portugal.

Food insecurity is the result of different dynamics in the behavior of households. When food prices increase, as they have recently, families are less likely to be able to buy certain foods, which affects the quantity of food and/or calories that children might consume. Also, relative food prices might change—possibly because of subsidies on some items—shifting food expenditure toward less expensive, and often less nutritious, foods. In other words, food insecurity may

pressure families to alter the composition of their diets. There is evidence that food subsidies increase obesity in low- and middle-income economies (Abay et al., 2022), and particularly for Egypt (Ecker et al., 2016). The nutritional content of diets matters for children and many economies—especially in low- and middle-income countries—face the double burden of malnutrition—undernourishment co-existing with obesity. Food subsidies are prevalent in MENA as discussed in Part I. Figure II.6 shows a positive correlation between the level of development and how well children reach Minimum Dietary Diversity (MDD)—the percentage of children between ages 6 and 23 months who consumed five of the eight defined food groups. The food groups included in the MDD indicator are: breast milk; grains, roots and tubers; legumes and nuts; dairy products (infant formula, milk, yogurt, cheese); flesh foods (meat, fish, poultry and liver/organ meats); eggs; vitamin-A rich fruits and vegetables; other fruits and vegetables. The correlation is provided for 99 economies, almost all of them developing. Of the seven MENA economies in the sample, only two perform better than their income peers. Yemen is on par with income peers, but this data is from before the internal conflict, and the situation is likely to be far worse now. These findings suggest that the challenge in the region is not just calorie intake, but the diversity of the calories children consume.

Figure II.6: Minimum Dietary Diversity: MENA vs Income Peers

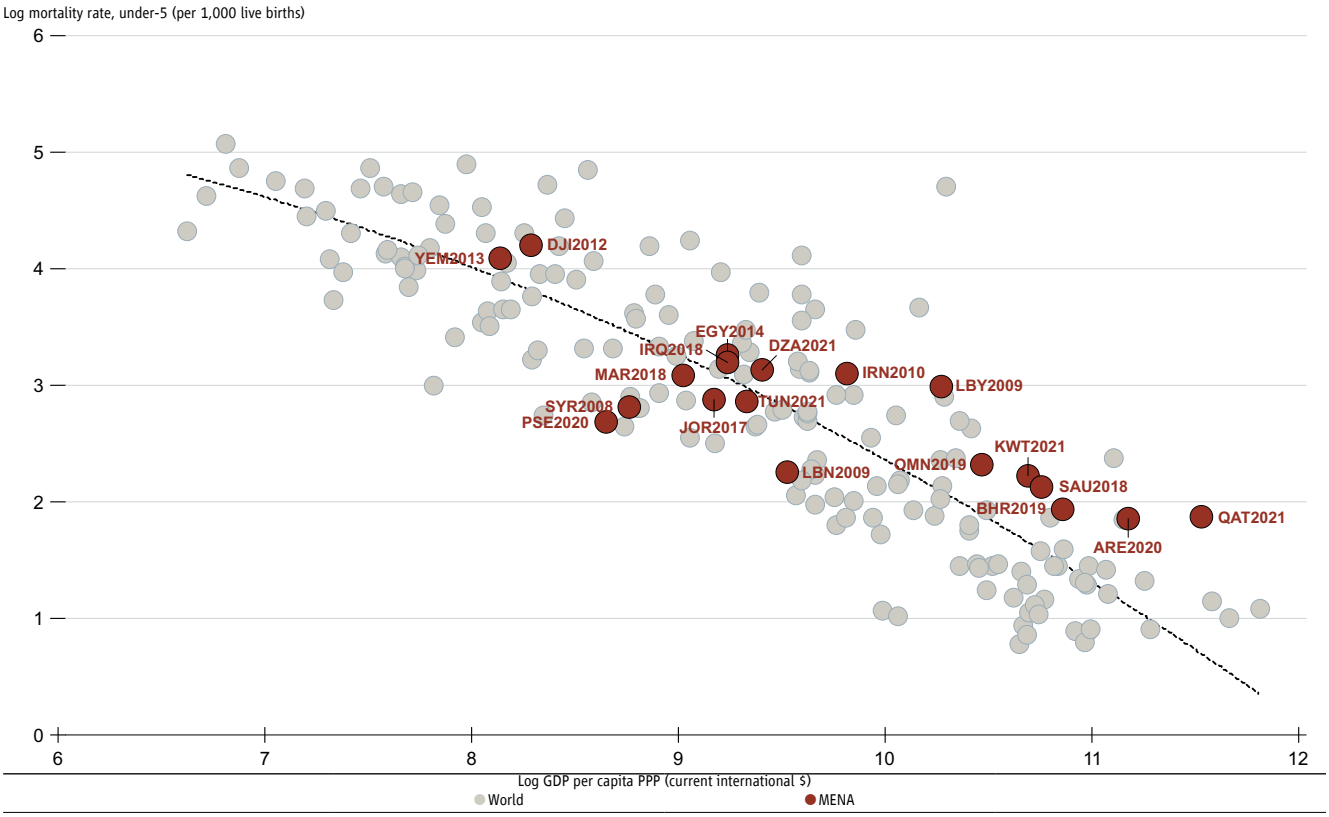


Sources: UNICEF Global Infant and Young Child Feeding (IYCF) databases, September 2021, based on Demographic and Health Surveys (DHS) from the U.S Agency for International Development (USAID); Multiple Indicator Cluster Surveys (MICS) from UNICEF, other national surveys and censuses, and the World Bank's *World Development Indicators* (WDI).
Note: The figure is produced using the latest estimate available for the Minimum Dietary Diversity (MDD) Indicator. The eight food groups included in the MDD Indicator are: breast milk; grains, roots and tubers; legumes and nuts; dairy products (infant formula, milk, yogurt, cheese); flesh foods (meat, fish, poultry and liver/organ meats); eggs; vitamin-A rich fruits and vegetables; other fruits and vegetables. The GDP per capita PPP (current international $) is used as a proxy for the level of economic development. The latest year of the MDD indicator is matched with the same-year GDP per capita PPP (current international $). The figure is based on a sample of 99 countries, of which one is an advanced economy (Uruguay) and 98 are developing economies.

In extreme cases, food insecurity can lead to higher child mortality. This is an immediate effect of food insecurity that is not the focus of this report, but it is important to acknowledge because it is devastating. Moreover, child mortality rates provide an indication of the overall state of child nutrition and health. Figure II.7 shows the correlation between

income and the deaths of children under five for 190 economies—developing and advanced. Before the COVID-19 pandemic and the 2022 rise in food prices in the MENA region, on average 21 children from every 1,000 live births died before their fifth birthday. Many MENA countries underperform with respect to their income peers, especially the GCC economies. Yemen and Djibouti have the highest child mortality rates among the MENA economies in the sample.

Figure II.7: Under 5 Child Mortality Rate: MENA vs Income Peers



Sources: United Nations Inter-Agency Group for Child Mortality Estimation (UN IGME) database, December 2021; the World Bank's *World Development Indicators* (WDI); Demographic and Health Surveys (DHS) from the U.S. Agency for International Development (USAID); Multiple Indicator Cluster Surveys (MICS) from UNICEF, national health surveys, censuses, national vital registrations, vital registrations submitted to the World Health Organization (WHO), and other nationally representative sources.
Note: The figure uses the latest survey estimates available for under-five mortality rates. The under-five mortality rate is the percentage of newborns per 1,000 live births who die before reaching age five. The GDP per capita PPP (current international $) is used as a proxy for the level of economic development. The latest year of the child mortality rate is matched with the same-year GDP per capita PPP (current international $). The closest year available of GDP per capita PPP (current international $) was used for countries with missing data. Data points for Kuwait (2020), South Sudan (2008), and Venezuela, RB (2011) were extracted from the World Bank's World Development Indicators Database. Data points for Andorra (2021), Djibouti (2012), Somalia (2012), and Syrian Arab Republic (2010) were extracted from the International Monetary Fund's *World Economic Outlook* Database. The figure is based on a sample of 189 economies—58 advanced and 131 developing.

To compound the child health and nutrition problems in the region, much of MENA has little to no information about the current state of child health. The Demographic and Health Surveys (DHS) run by the U.S. Agency for International Development (USAID) and the Multiple Indicator Cluster Surveys (MICS) run by UNICEF are the primary sources for the data in this section. A few countries in the region run their own surveys, which include modules that help assess the state of child health and nutrition. However, data largely are lacking for the MENA region. Table II.1 summarizes the availability and timelines of survey data in the region that feed into the UNICEF/WHO/World Bank Joint Child Malnutrition Estimates database—one of the most comprehensive datasets available. The MENA countries are benchmarked against Mexico, which conducted its last health and nutrition survey in 2020. Much data from MENA is dated. Only five of 19 economies in the MENA region have survey estimates since 2018, the two years preceding the 2020 Mexico benchmark. Only 11 of the 19 economies in the region have had the relevant household survey since 2015 (the five years preceding

the Mexico benchmark of 2020). Some countries in the region have surveys that date as far back as 1995 (Bahrain and Qatar) and 2004 (Saudi Arabia). Because of recent compounded shocks from the pandemic, conflict, debt default, and food insecurity, collecting key anthropometric data—such as height and weight—is urgent to create effective policy action to build back losses in human capital for children.

Table II.1: Availability of Surveys used by the UNICEF/WHO/World Bank Joint Child Malnutrition Estimates Database in the MENA region, 2022 Update

Country	Child Malnutrition Data Availability	Latest Survey Year Available	Recent Data Availability Within the past five years preceding 2020	Data Source of Latest Survey Available	Source in Detail of Latest Survey Available
Algeria	√	2019	√	MICS	Algeria Multiple Indicator Cluster Surveys
Bahrain	√	1995	X	GFHS	Gulf Family Health Survey: Bahrain Family Health Survey
Djibouti	√	2019	√	SMART	Nutritional Status Survey with Standardized Monitoring and Assessment of Relief and Transition Methodology
Egypt	√	2014	X	DHS	Egypt Demographic and Health Survey
Iran	√	2017	√	NNS	National Nutrition Survey: Children Anthropometry, Nutrition and Development Survey
Iraq	√	2018	√	MICS	Iraq Multiple Indicator Cluster Surveys
Jordan	√	2019	√	NNS	National Nutrition Survey: Jordan National Micronutrient and Nutritional Survey
Kuwait	√	2017	√	KNSS	Kuwait Nutrition Surveillance System
Lebanon	√	2021	√	SMART	Lebanon National Nutritional Standardised Monitoring and Assessment of Relief and Transitions (SMART) Survey
Libya	√	2014	X	PAPFAM	Pan Arab Project for Family Health: Libyan National Family Health Survey
Morocco	√	2017	√	PAPFAM	Pan Arab Project for Family Health: Morocco National Survey on Population and Family Health
Oman	√	2017	√	NNS	Oman National Nutrition Survey
Qatar	√	1995	X	Other	Nutritional assessment in Qatar, Assignment report, WHO.

Table II.1: Availability of Surveys used by the UNICEF/WHO/World Bank Joint Child Malnutrition Estimates Database in the MENA region, 2022 Update

Country	Child Malnutrition Data Availability	Latest Survey Year Available	Recent Data Availability Within the past five years preceding 2020	Data Source of Latest Survey Available	Source in Detail of Latest Survey Available
Saudi Arabia	√	2004	X	Other	El-Mouzan MI, Al-Herbish AS, Al-Salloum AA, Qurachi MM, Al-Omar AA. 2007. Growth charts for Saudi children and adolescents. Saudi Medical Journal, 28, pp.1555-68.
Syria	√	2010	X	PAPFAM	Pan Arab Project for Family Health: Family health survey of the Arab Republic of Syria
Tunisia	√	2018	√	MICS	Tunisia Multiple Indicator Cluster Survey
UAE	X	–	X	–	–
West Bank and Gaza	√	2020	√	MICS	Palestinian Multiple Indicator Cluster Survey
Yemen*	√	2013	X	DHS	Yemen National Health and Demographic Survey
Total Out of 19 countries	18	5 countries meet the Mexico standard of survey availability in less than 2 years preceding 2020	11		
Mexico	√	2020	√	Other	National Health and Nutrition Surveys: National Health and Nutrition Survey COVID-19

Source: World Bank staff calculations based on the UNICEF-WHO-The World Bank Joint Child Malnutrition Estimates database, May 2022.
Note: *Yemen has a new SMART survey produced in 2021, reviews of this survey for inclusion in the JME database are ongoing.

II.3 Food Insecurity Projected to Deteriorate in the MENA region

In this section we turn to the present and look into the future, relying on insights from food insecurity projections. The data on the state of child nutrition and health for the MENA region are largely dated, compiled before the high inflation in the region and worldwide. As rising food prices contribute to an immediate rise in food insecurity, data on current food insecurity conditions and possibly indicators that presage future food insecurity are needed to understand the threats to livelihoods in the MENA region.[32]

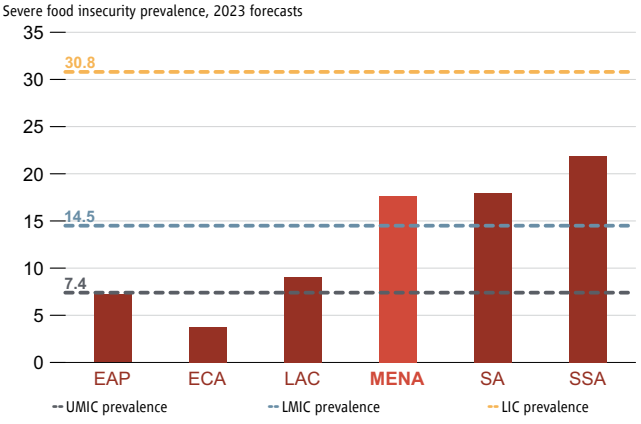
This section uses modelled estimates of food insecurity to provide some perspective on likely food insecurity trends within the region. The key indicator is the prevalence of severely food insecure people, defined by the UN Food and Agricultural Organization (FAO) as the percentage of people in the population who live in households classified as severely food

32 Data on food insecurity in the MENA region are lacking. Only the acute situation in Yemen is monitored by the Integrated Food Security Phase Classification (IPC). In middle-income countries, annual data on the prevalence of severe food insecurity are available from the UN Food and Agricultural Organization (FAO), but not for low-income countries in MENA, where food insecurity is likely worse. Moreover, these indicators are published with up to a two-year delay and so do not reflect the effects of recent growth and inflation shocks.

insecure. Based on the FAO's Food Insecurity Experience Scale (FIES), a household is classified as severely food insecure when at least one adult in the household in the last 12 months has reported being forced to reduce the quantity of food consumed, to have skipped meals, to have gone hungry, or to have had to go for a day without eating because of a lack of money or other resources. The estimates of food insecurity are updated projections based on Andree (2022), which uses a machine learning model to estimate likely food insecurity levels associated with macroeconomic indicators. This provides a model-based strategy to produce preliminary estimates of food insecurity outcomes that are in line with recent, or preliminary, economic assessments or produce projections of future food insecurity that are consistent with current expectations of future economic developments (see Appendix II.A for a brief discussion of the methodology and the data that have been updated specifically for the estimates used in this report).

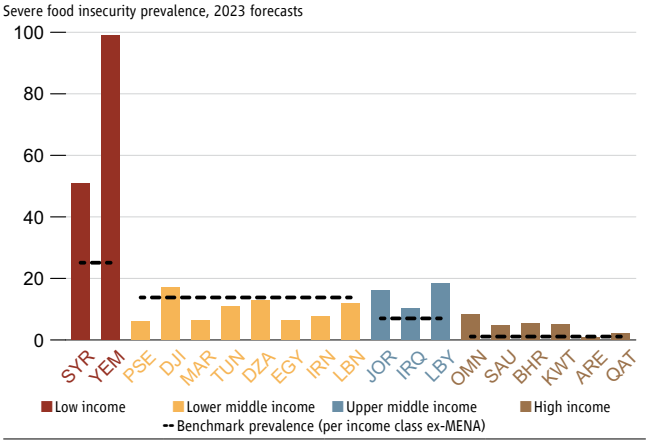
Figure II.8 shows the 2023 food insecurity prevalence projections across regions, excluding advanced economies. The prevalence of food insecurity in MENA is 17.6 percent; only sub-Saharan Africa, at 21.9 percent, and South Asia, at 18 percent, are worse off than the MENA region. These estimates predict that almost one in five people in MENA is likely to be food insecure in 2023.

Figure II.8: Prevalence of Severely Food Insecure People across Regions



Source: Andree, B.P.J. (2022): Machine Learning Guided Outlook of Global Food Insecurity Consistent with Macroeconomic Forecasts.
Note: Severe Food Insecurity Prevalence is the percentage of people in the population who live in households classified as severely food insecure. A household is classified as severely food insecure when at least one adult in the household in the last 12 months has reported to have been forced to reduce the quantity of food consumed, to have skipped meals, to have gone hungry, or to have to go for a day without eating because of a lack of money or other resources. The data is supplemented by projections based on machine learning techniques based on Andree, B.P.J. (2022). The country sample excludes high-income countries, so the MENA average excludes Gulf Cooperation Council (GCC) economies—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates. EAP=East Asia and the Pacific; ECA= Europe and Central Asia; LAC = Latin America and the Caribbean; MENA = the Middle East and North Africa; SA = South Asia; SSA + sub=Saharan Africa. UMIC=Upper-Middle-Income economies; LMIC = Lower-Middle-Income economies; LIC = Low Income economies. This data does not account for the aftermath of the 2023 Earthquakes in Syria.

Figure II.9: Prevalence of Severely Food Insecure People in MENA



Source: Andree, B.P.J. (2022): Machine Learning Guided Outlook of Global Food Insecurity Consistent with Macroeconomic Forecasts.
Note: This data does not account for the aftermath of the 2023 earthquakes in Syria. Severe Food Insecurity Prevalence is the percentage of people in the population who live in households classified as severely food insecure. A household is classified as severely food insecure when at least one adult in the household in the last 12 months has reported to have been forced to reduce the quantity of food consumed, to have skipped meals, to have gone hungry, or to have to go for a day without eating because of a lack of money or other resources. Countries are displayed in ascending order by 2022 GDP per capita within country groupings. Income groups are defined according to 2022 gross national income (GNI) per capita, calculated using the World Bank Atlas method. The groups are: low income, $1,085 or less; lower middle income, $1,086 to $4,255; upper middle income, $4,256 to $13,205; and high income, $13,206 or more.

The prevalence of food insecurity varies widely within the MENA region. Figure II.9 shows that most developing MENA economies have double-digit rates of food insecurity prevalence. Egypt (6.4 percent), Iran (7.7 percent), and Morocco (6.4 percent) have single-digit food insecurity prevalence, still the rates represent 6.9, 6.7, and 2.4 million severely food insecure individuals respectively. The upper-middle-income and low-income countries in the region largely have food insecurity prevalence rates that are higher than their income peers. The lower-middle-income MENA economies perform marginally better than their peers. In the low-income economies sample, severe food insecurity prevalence is extremely high—at 50.8 percent in Syria and 99 percent in Yemen. Both economies are fragile and conflict-affected states, and

have been marked as areas in crisis by the IPC (see Box II.B.1). Note that these estimates do not account for the 2023 earthquakes in Syria, so the situation is likely to be worse than the forecasts presented here. GCC economies in the MENA region perform considerably worse than their income peers, although the underlying data powering the projections for the GCC are generally more dated than for their income peers.

Box II.B.1: Integrated Food Security Phase Classification (IPC) of Hunger and Famines

The Integrated Phase Classification (IPC)—constructed by a consortium of governments, international organizations, and non-governmental organizations—describes the severity of food emergencies. The IPC classifies food insecurity of households and areas according to a five-phase scale. The five phases are: minimal; stressed; crisis; emergency; and famine (see Table II.B.1). The IPC defines famine as the absolute inaccessibility of food for an entire population or subgroup of a population that can cause death in the short term. Because Phase 5 applies to a population, when similar circumstances exist for a household group it is termed a catastrophe. A Phase 5 famine is so severe for an area that even with humanitarian assistance at least one in five households will have an extreme lack of food and other basic needs and starvation, death, and destitution are evident. A famine declaration must be approved by the IPC's Famine Review Committee (FRC), composed of leading food security experts. Hunger hotspots are situations where acute food insecurity is projected to deteriorate. As of October 2022, Syria and Yemen were marked in IPC phase 3, or crisis. The World Food Program marked Syria as a hunger hotspot of very high concern and Yemen of the highest concern.

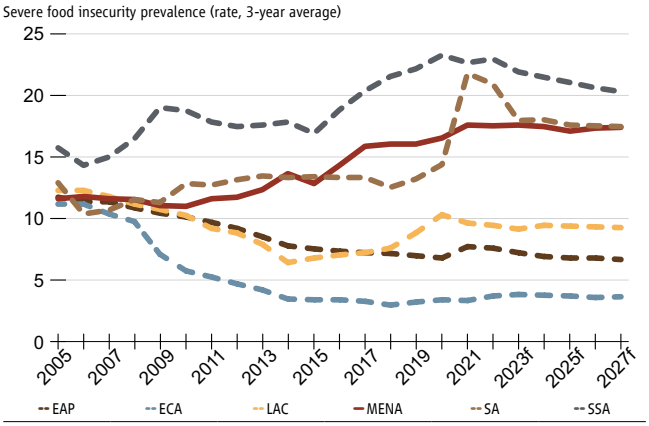
Table II.B.1: IPC Acute Food Insecurity Phase Descriptions (Area)

PHASE 1: Minimal	Households are able to meet essential food and non-food needs without engaging in atypical and unsustainable strategies to access food and income.
PHASE 2: Stressed	Households have minimally adequate food consumption but are unable to afford some essential non-food expenditures without engaging in stress-coping strategies.
PHASE 3: Crisis	Households either: • Have food consumption gaps that are reflected by high or above-usual acute malnutrition; or • Are marginally able to meet minimum food needs but only by depleting essential livelihood assets or through crisis-coping strategies.
PHASE 4: Emergency	Households either: • Have large food consumption gaps that are reflected in very high acute malnutrition and excess mortality; or • Are able to mitigate large food consumption gaps but only by employing emergency livelihood strategies and asset liquidation.
PHASE 5: Famine	Households have an extreme lack of food and/or other basic needs even after fully employing coping strategies. Starvation, death, destitution, and extremely critical acute malnutrition levels are evident. An area must have extreme critical levels of acute malnutrition and mortality.

Source: https://www.ipcinfo.org/ipcinfo-website/resources/resources-details/en/c/1129202/; https://fews.net/IPC.

Food insecurity has been worsening in the MENA region. The prevalence of severely food insecure people in the region has risen from about 11.8 percent in 2006 to a forecast of 17.6 percent in 2023 (see Figure II.10). Apart from MENA, only South Asia and sub-Saharan Africa have exhibited rising food insecurity within the same timeframe. Eastern Europe and Central Asia, East Asia and the Pacific and Latin America and the Caribbean all have forecasted lower prevalence of food insecurity in 2023 than in 2006.

Figure II.10: Prevalence of Severely Food Insecure People across Regions over time



Source: October 2022 estimates, following Andree, B.P.J. (2022): Machine Learning Guided Outlook of Global Food Insecurity Consistent with Macroeconomic Forecasts.
Note: Country sample excludes high-income countries, including those in the Gulf Cooperation Council (GCC) economies—Bahrain, Kuwait, Oman, Qatar, Saudi Arabia and the United Arab Emirates. This data does not account for the aftermath of the 2023 earthquakes in Syria. Severe Food Insecurity Prevalence is the percentage of people in the population who live in households classified as severely food insecure. A household is classified as severely food insecure when at least one adult in the household in the last 12 months has reported to have been forced to reduce the quantity of food consumed, to have skipped meals, to have gone hungry, or to have to go for a day without eating because of a lack of money or other resources.

The rise in food insecurity varies in developing MENA economies (see Figure II.11). Syria and Yemen are major contributors to the rise in food security in the MENA regional average. Food insecurity in Syria rose from 5.3 percent in 2005 to a forecast of 50.8 percent in 2023; in Yemen it rose from 10.1 percent in 2005 to a forecast of 99 percent in 2023 (see Figure II.11, Panel C). With the exception of Libya, oil-exporting developing economies are in a better position than they were at the beginning of the sample period (see Figure II.11, Panel A), although food insecurity spiked in Algeria because of a drought. Food insecurity rose in Libya because of its second civil war in 2014.[33] There is considerable variability in oil-importing developing economies (see Figure II.11, Panel B). Food insecurity has increased significantly in Lebanon and is projected to worsen. Lebanon's economic and political situation has deteriorated significantly since 2019. Hyperinflation, the depreciation of the Lebanese lira and the lifting of subsidies on medicine, fuel, and other inputs have increased food insecurity in the country. Djibouti and Jordan are the only other developing oil importers faring worse than at the beginning of the period. Both have been hit with droughts, which reduced local food production. The pandemic generated spikes in food insecurity in Jordan, Morocco, and Tunisia that have since declined. Morocco has been in a drought since 2022. Food insecurity in Egypt and West Bank and Gaza has declined during the sample period. But West Bank and Gaza remains vulnerable to changes in international food prices because of its reliance on food imports. This is reflected in the sharp increase in the prevalence of food insecurity in 2022.

Figure II.11, Panel D shows that food insecurity in the GCC economies has mostly declined or remained flat. However, consistently throughout the period, they have performed substantially worse than other high-income economies. Only the UAE has been on par with its income peers. In contrast, Oman performs eight times worse than the high-income average.

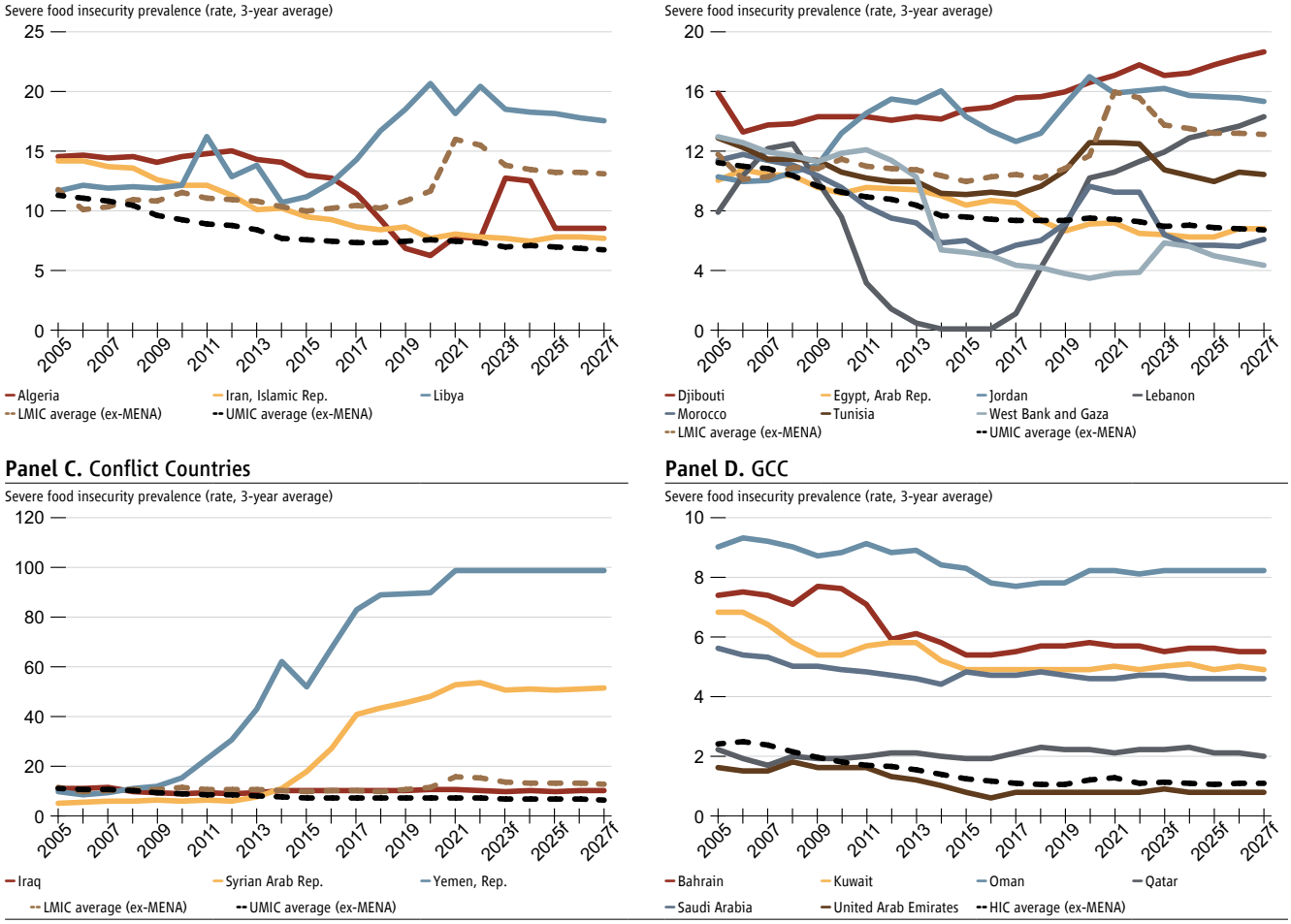
Food inflation plays a key role in driving food insecurity. Across all four MENA subgroups—developing oil importers, developing oil exporters, conflict countries and the GCC—inflation accounts for 24 percent to 33 percent of the prevalence of food security that is forecasted for 2023 (see Figure II.12). The portion of the population in MENA whose food insecurity can be attributed to inflation grew by 67 percent between the period before the pandemic and 2023.[34]

33 Libya is not classified as a conflict economy, but an economy with social and institutional fragility. Lebanon and West bank and Gaza also fall in the category of social and institutional fragility, but not an "in-conflict" economy (https://thedocs.worldbank.org/en/doc/69b1d088e3c48ebe2cdf451e30284f04-0090082022/original/FCSList-FY23.pdf).

34 Note that the data is available as three-year centered moving averages. Therefore, the pre-pandemic period refers to the 2017–2019 period, while 2023 refers to the 2022–2024 period.

Box II.B.2 provides a case study comparison of the drivers of food insecurity and the role of inflation in Lebanon and Yemen.

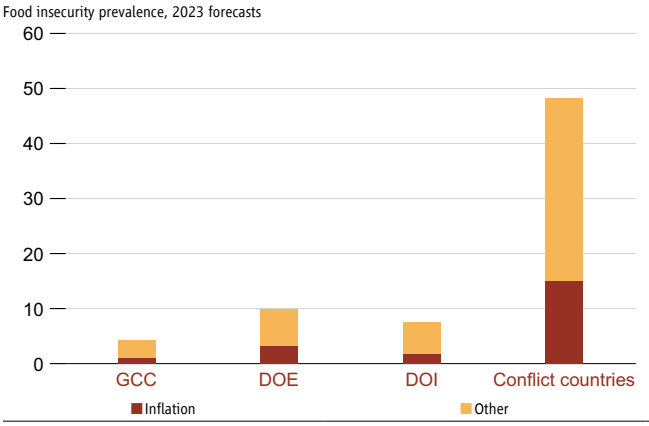
Figure II.11: Prevalence of Severely Food Insecure People in MENA over time



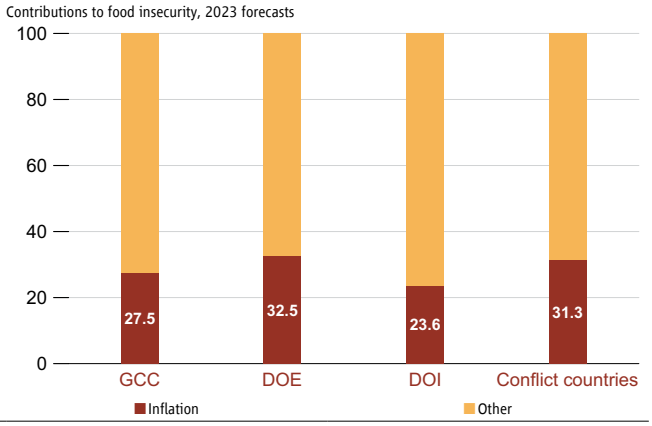
Source: October 2022 estimates, following Andree, B.P.J. (2022): Machine Learning Guided Outlook of Global Food Insecurity Consistent with Macroeconomic Forecasts.
Note: This data does not account for the aftermath of the 2023 earthquakes in Syria, thus the situation there is likely to be far worse than forecasted in this figure. Conflict countries are defined by the Fragile and Conflict-Affected Situations (FCS) Classification by the World Bank. The Fiscal Year 2023 official list can be accessed here: https://thedocs.worldbank.org/en/doc/69b1d088e3c48ebe2cdf451e30284f04-0090082022/original/FCSList-FY23.pdf. Severe Food Insecurity Prevalence is the percentage of people in the population who live in households classified as severely food insecure. A household is classified as severely food insecure when at least one adult in the household in the last 12 months has reported to have been forced to reduce the quantity of food consumed, to have skipped meals, to have gone hungry, or to have to go for a day without eating because of a lack of money or other resources.

Figure II.12: Drivers of Prevalence of Severe Food Insecurity in MENA in 2023

Panel A. Drivers of Prevalence of Food Insecurity



Panel B. Drivers as a share of Prevalence of Food Insecurity



Source: October 2022 estimates, following Andree, B.P.J. (2022) Machine Learning Guided Outlook of Global Food Insecurity Consistent with Macroeconomic Forecasts.
Note: The impact of inflation as a driver of the prevalence of severe food insecurity is measured through a three-year moving average of the end of period inflation (in 2022, 2023 and 2024). Other time-varying factors considered are the change in real GDP growth, the change in population growth, the change in the poverty rate ($1.90 PPP), the share of GDP produced by agriculture, and fuel imports as a share of merchandise imports. GCC = Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, and United Arab Emirates. DOE = Iran, and Algeria. DOI = Egypt, Jordan, Lebanon, Morocco, Tunisia, and West Bank and Gaza. Conflict Countries = Iraq, Syria, and Yemen. Conflict countries are identified using the Conflict-Affected Situations Classification by the World Bank. Fiscal Year 2023 official list can be accessed here: https://thedocs.worldbank.org/en/doc/69b1d088e3c48ebe2cdf451e30284f04-0090082022/original/FCSList-FY23.pdf.

Box II.B.2: Drivers of Food Insecurity, a comparative study of Yemen and Lebanon

Much can be learned by analyzing the roles different variables play in driving the evolution of food insecurity. Figure II.B.2 focuses on the roles of food imports and domestic inflation in Lebanon and Yemen. The graphs decompose the time variation in modeled food insecurity prevalence into the contributions of different time-varying variables (See Appendix II.A for the methodology), and group the results into three categories: food imports; CPI Inflation; and all other time-varying variables used in the model (changes in poverty, in GDP per capita (PPP), in fuel imports and in agricultural GDP shares). Both countries have different situations of food insecurity and for different reasons. Yemen has been in civil war since 2014; Lebanon faced successively the effects of the global food price crisis in 2008–2011, then an internal inflationary economic crisis since 2019.

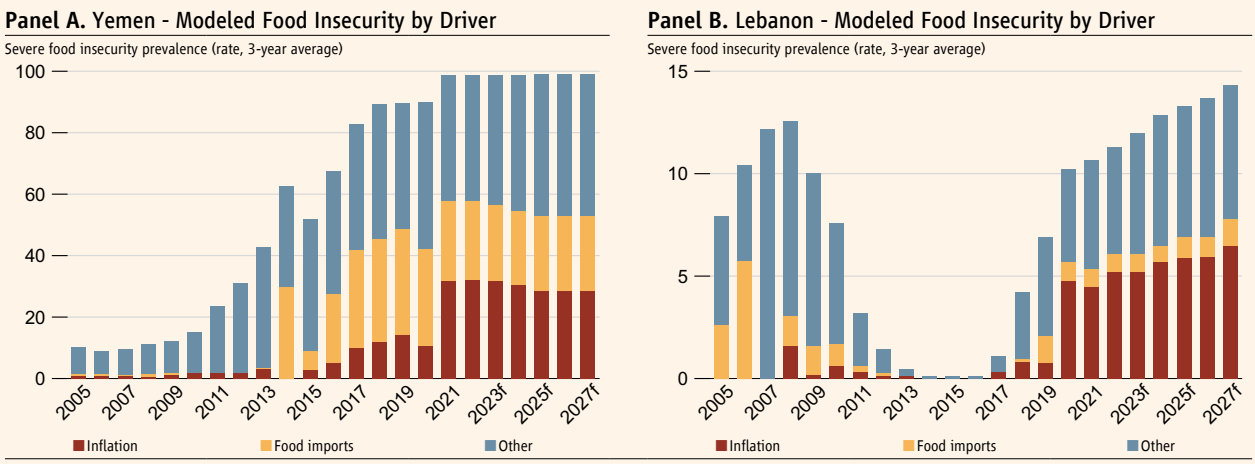
In Yemen, Figure II.B.2, Panel A shows that in 2014, when the war broke out, food insecurity spiked with the food import variable driving much of the initial impact. The timing corresponds to the heavy fighting and port blockades that severely disrupted Yemen's ability to import food. Subsequently, as the crisis progressed, an inflationary economic crisis took hold. Inflation—from the combined effect of currency depreciation and restricted supply—drove much of the projected future food insecurity. In Yemen's case, cash interventions may turn out to be band aids, while the pressing concern is rebuilding the economy.

In Lebanon, there were two spikes in food insecurity (see Figure II.B.2, Panel B). The first, in 2008, was driven by external price pressures, while the second, in 2019, was propelled by internal price inflation from an economic collapse. During 2005–2011, global commodity prices boomed, with spikes in 2008 and 2011. The effects of global prices trickled down into the local economy, first through the import variable and later through domestic inflation. After global food prices stabilized 2011, the domestic food insecurity effects resolved as the local economy continued to grow. The spike in food insecurity in 2019 is different, resembling the situation observed in Yemen—an economic collapse followed by protracted higher inflation. Lebanon shows that when risks are external, they can be expected to resolve eventually and there is a role for temporary measures, such as cash aid, to bridge a difficult transitory problem. When economic collapse triggers an inflationary spiral and a protracted food insecurity outlook, bridging through difficult times requires a deep reconstruction effort.

continued

Box II.B.2 continued

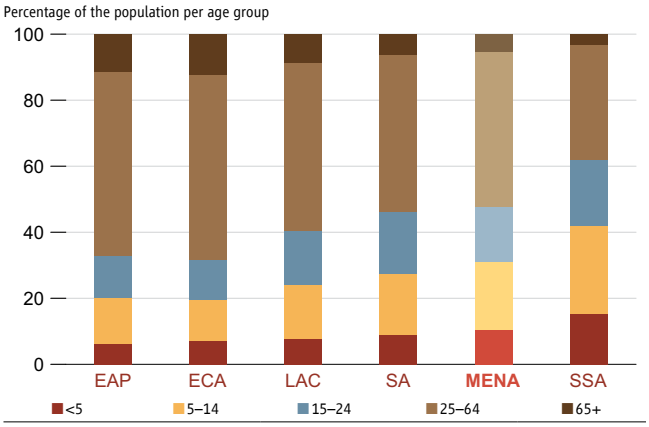
Figure II.B.2: Decomposition of Prevalence of Severely Food Insecure People in Lebanon and Yemen



Source: October 2022 estimates, following Andree, B.P.J. (2022): Machine Learning Guided Outlook of Global Food Insecurity Consistent with Macroeconomic Forecasts.
Note: Severe Food Insecurity Prevalence is the percentage of people in the population who live in households classified as severely food insecure. A household is classified as severely food insecure when at least one adult in the household in the last 12 months has reported to have been forced to reduce the quantity of food consumed, to have skipped meals, to have gone hungry, or to have to go for a day without eating because of a lack of money or other resources.

Many children in the region will face food insecurity. The MENA region is younger than all regions except sub-Saharan Africa (see Figure II.13). About 10 percent of the individuals in MENA have yet to reach their fifth birthday. Assuming that the prevalence of food insecurity is the same across all age groups, then about 8 million children in the MENA region are severely food insecure. This is likely a conservative estimate because food insecurity disproportionately affects the poor, and the poor in the region tend to have more children than financially better-off families. According to household income and expenditure survey data from Egypt, Djibouti, Iraq, Jordan, Morocco, Tunisia, and West Bank and Gaza, the poorest 20 percent of households each have almost twice as many individuals as do the wealthiest 20 percent (see Table II.2). That means that food insecurity has far-reaching long-term effects. Food insecurity may harm not only the current generation, but the next as well. And, as detailed in the first section of this part of the report, some of the effects are irreversible.

Figure II.13: Age Structure of Population by region in 2021



Source: United Nations Data Portal - Population Division for 2021.
Note: MENA sample = Algeria, Djibouti, Egypt, Iran, Iraq, Jordan, Lebanon, Libya, Morocco, Syria, Tunisia, West Bank and Gaza, Yemen.

This report so far has documented the state of child nutrition and health and the high prevalence of food insecurity in the MENA region. This section borrows estimates from the literature to ascertain the effects of rising food prices on childhood stunting and education for the developing economies in the MENA region. The main estimate is obtained from a study by Woldemichael et al. (2022) in Ethiopia. A 1 percentage point higher month-to-month food inflation rate

while an individual is in utero increases the risk of under-age-five stunting by 0.0046 probability points.[35] The increase in stunting has further effects on educational outcomes such as expected years of schooling and harmonized test scores. Estimates from Galasso and Wagstaff (2019) find that children who are stunted have 1.594 fewer years of education and score 0.625 standard deviations lower on standardized tests.

Table II.2: Number of people per household per capita expenditure quintiles

Quintiles	Egypt	Djibouti	Iraq	Jordan	Morocco	Tunisia	West Bank and Gaza
Poorest 20%	5.7	5.6	10.5	6.9	5.3	5.3	8.0
Richest 20%	2.7	3.5	6.2	3.4	3.3	3.3	4.0

Source: Egypt, Households Income, Expenditure and Consumption Survey (HIECS), 2017–2018; Djibouti, Enquête Djiboutienne Auprès des Ménages pour les Indicateurs Sociaux (Djibouti Social Indicators Households Survey - EDAM), 2017; Iraq, Iraq Households Socio-Economic Survey (IHSES), 2012; Jordan, Households Expenditure and Income Survey (HEIS), 2012; Tunisia, Enquête Nationale sur le Budget, la Consommation et le Niveau de Vie des Ménages (National Survey on Household Budget, Consumption and Standard of Living - EBCNV), 2010; Morocco, Enquete Nationale sur la Consommation et les Dépense des Ménages (National Survey on Household Consumption and Expenditure - ENCDM), 2014; West Bank and Gaza, Palestine Expenditure and Consumption Survey (PECS), 2011; and World Bank staff calculations.
Note: Micro data from Household Income and Expenditure surveys is used to calculate these estimates. Household per capita expenditure is used to order households into quintiles, and the average of number of people per household is calculated using household weights.

Table AII.B.1 considers the effect of food inflation between March and June 2022 on children exposed to inflation in utero for developing MENA economies. The analysis focuses on March-to-June 2022 because of the high rise in food prices triggered by the war in Ukraine. Food inflation between March and June 2022 is compared to three counterfactuals: pre-pandemic inflation (measured as average month-to-month food inflation in 2019), post-pandemic inflation (measured as average month-to-month food inflation in 2021) and pre-war inflation (measured as the average month-to-month inflation in the four months preceding the war in Ukraine—October 2021–January 2022). The findings suggest that the increase in food prices between March and June 2022 may have caused an additional 200,000 to 285,000 newborns to be stunted[36], which translates to an increase in that risk to between 17 and 24 percent, depending on the counterfactual used for comparison. This results in 0.06–0.08 fewer expected years of schooling (equivalent to 0.7–0.9 months decline in expected years of schooling), and a 0.02–0.03 standard deviation decline in test scores (equivalent to a 0.5 percent to 0.8 percent drop in Harmonized Test Scores (HTS)).[37]

II.4 Facing the Challenge of Food Insecurity

This section discusses policy options, backed by evidence, that have worked in certain contexts. There are no one-size-fits-all types of policies. Food insecurity is complicated, which becomes more evident in examining its most extreme manifestation: famine. Famines are complex. As described by Ravallion (1997), famines have defied simple explanations as well as geographic boundaries. They have happened under socialist and capitalist economic systems. They happened

35 This estimate is conservative. See Appendix II.B for details on other studies.

36 The estimates are sensitive to the counterfactual chosen. For instance, comparing month-to-month food inflation between March and June 2022 to a counter factual of the 2021 (full year) average month-to-month inflation shows that an additional 197,439 newborns are likely to be stunted. Using the four months preceding the war in Ukraine as a counterfactual, the number of newborns at risk of stunting is expected to increase by 239,754. A counterfactual of 2019 (full year) average month-to-month inflation would show that 285,447 newborns were at risk of stunting. The divergence in figures is largely due to changes in inflation rates, particularly in fragile and conflict affected countries, where inflation was already high before the pandemic. See Appendix II.B for more details.

37 To put these numbers in context, they could be compared to other estimates. Such comparisons are difficult because they are not exactly equivalent comparisons—many of the estimates are not confined to the effects in utero, and in some cases consider other channels beyond stunting. Based on World Bank (2021) report, the COVID-19 pandemic resulted in 0.51 fewer years of schooling (about 6 months) and a 0.14 standard deviation decline in test scores (a 3.7 percent decline) for children in MENA developing countries (Syria, Djibouti, and Libya are excluded for lack of data). However, these effects do not cover only in utero (they include children under 5), and they also include effects from school closures and dropouts. If only the channel through stunting is examined, children under 5 are expected to suffer a 0.004 drop in expected years of schooling (around 2 days) and 0.002 standard deviation decline in test scores (0.04 percent decline). These are far lower than the estimates of the effect of the war in Ukraine. Other studies examining children in utero find larger impacts. Bundervoet et al. (2018) find that children who were in utero during the genocide in Rwanda completed 0.3 years of education (equivalent to 3.6 months) less than children who were born a couple of months later. Andrabi et al (2021) find that a devastating earthquake in Pakistan resulted in test scores of children living within 20km from the fault line being 0.31 standard deviations lower than those who lived more than 20 kilometers away. This difference does not vary by age and is equivalent to about 1.5 school grades. See Appendix II.B for details on the calculations.

with and without declines in food supply, with and without wars, or unusual political or social stability. A holistic approach is better than dubious "single-cause" explanations for famines. A careful deliberation on the economics and context of famines is essential to devising effective policy responses.

The word "famine" packs a punch. It magnifies attention and drives action. However, to qualify as a famine a situation must meet exacting criteria that demand much data. The current food security situation is bleak in many "hotspots," but no famines have been declared in the MENA region. To declare a famine, an area must reach IPC phase 5 (see Table B1). This phase is reached if at least 20 percent of households have no access to food; 30 percent or more of children under five exhibit wasting; and two people per 10,000 must die per day. By the time the criteria are attained, it may be too late for many. For example, in Somalia in 2011, 258,000 deaths were attributed to the famine, but 43 percent occurred before famine criteria were met and famine was declared. Much of the remaining mortality occurred outside the areas declared to be in famine (Maxwell et al., 2020).

Policymakers should address chronic food insecurity before it becomes acute. A mix of short-term and long-term measures may prove effective in addressing food insecurity. But the origins of food insecurity matter, especially when deciding how best to address short-term needs. Andree (2022) provides projected development financing needs for the severely food insecure in the MENA region under the simplified assumptions that it costs US$0.75 per person in 2021 to provide a minimum energetic diet, for a basic program that aims at a 100 percent replacement cost of food expenditures for the severely food insecure population. The assessment here assumes that food prices follow the long-term trend (1999–2022). The lower and upper bound presented in Table II.3 is the 90 percent confidence range around the trend forecast.[38] Table II.3 shows that about US$27.73 billion to US$38.05 billion will be needed in the MENA region to meet the food needs of the severely insecure population in 2023. This is forecasted to grow to between US$25.1billion and US$50.6 billion in 2027. Yemen has the largest needs—a forecast of between US$11.82 billion and US$16.01 billion in 2023, and between US$11 billion and US$22 billion in 2027. Syria is forecasted to need between US$3.67 billion and 5.04 billion in 2023, growing to between US$3.6 and US$6.7 billion in 2027. These estimates do not account for the 2023 earthquakes in Syria. Thus, the needs are likely to be higher. Egypt's 2023 needs are forecasted to be between US$2.77 billion and US$4.15 billion, increasing to between US$2.8 billion and US$5.2 billion in 2027. These numbers underline the magnitude of the challenge, especially because they cover only the bare minimum calorie requirement, and do not account for the diversity needed for a healthy diet.

Although the challenges are enormous, there are a number of policy options to deal with food insecurity. They are discussed below. Some policies, such as cash and in-kind transfers, can be enacted immediately to stem acute situations of food insecurity. Others may take longer to implement—such as improving medical care and food systems.

Cash and in-kind Transfers: Large transfers—both in-cash and in-kind—can attenuate the immediate effects of food insecurity, but also have long term effects. There is considerable debate about in-cash versus in-kind (Gentilini, 2016). In-kind transfers, such as food, tend to be inefficient and costly. However, in-kind subsidies can also pursue more objectives—say, by targeting foods that are nutritious—than can cash transfers and could be effective depending on implementation. Cash transfers are highly efficient, although, depending on markets and the supply of food, cash transfers can lead to further increases in prices. There is considerable debate surrounding both types since the COVID-19

38 The trend forecast is made by extrapolating the 1999–2022 monthly global food price index using a structural time series local-level trend model. The confidence range is constructed from the residual. These estimates have limitations because they do not consider whether transfers are in cash or kind. Depending on the type of transfer, supply side conditions and implementation costs may have to be factored in. Furthermore, the estimates are conservative because they cover the bare minimum of calorie sufficiency, not what is needed for a healthy diet.

Table II.3: Short Term Development Financing Needs for Food Insecure People in MENA

Billions, Moving Average Forecasts	USD Value of annual development financing needs for the severely food insecure (100% replacement cost of a minimum calorie diet)					
	2022e	2023f	2024f	2025f	2026f	2027f
Algeria	1.48	2.22–3	2.1–3.23	1.35–2.3	1.31–2.42	1.29–2.57
Djibouti	0.08	0.07–0.09	0.06–0.1	0.06–0.11	0.06–0.12	0.06–0.12
Egypt, Arab Rep.	3.13–3.45	2.77–4.15	2.64–4.55	2.59–4.92	2.75–5.21	2.72–5.4
Iran, Islamic Rep.	2.89	2.54–3.44	2.37–3.88	2.45–4.21	2.37–4.48	2.32–4.68
Iraq	2.02	1.72–2.33	1.67–2.58	1.64–2.78	1.64–3.02	1.65–3.27
Jordan	0.72	0.62–0.85	0.58–0.91	0.55–0.97	0.54–1.01	0.52–1.05
Lebanon	0.32	0.28–0.39	0.28–0.44	0.28–0.49	0.29–0.55	0.29–0.59
Libya	0.63	0.51–0.69	0.48–0.76	0.47–0.8	0.45–0.83	0.43–0.87
Morocco	1.53	0.93–1.26	0.83–1.95	0.77–1.76	0.75–1.82	0.8–1.92
Syrian Arab Republic	4.27–4.3	3.67–5.04	3.56–5.72	3.55–6.24	3.55–6.73	3.56–7.28
Tunisia	0.64	0.49–0.67	0.45–0.7	0.42–0.75	0.44–0.81	0.42–0.84
West Bank and Gaza	0.07	0.1–0.14	0.09–0.14	0.08–0.14	0.08–0.15	0.08–0.15
Yemen, Rep.	13.32	11.82–16.01	11.44–17.6	11.22–19.05	11.08–20.45	10.99–21.84
Total	**31.1–31.45**	**27.73–38.05**	**26.56–42.56**	**25.44–44.52**	**25.3–47.59**	**25.13–50.59**

Source: Andree, B.P.J. (2022): Machine Learning Guided Outlook of Global Food Insecurity Consistent with Macroeconomic Forecasts.
Note: Severely Food Insecure people is the number of people in the population who live in households classified as severely food insecure. A household is classified as severely food insecure when at least one adult in the household in the last 12 months has reported to have been forced to reduce the quantity of food consumed, to have skipped meals, to have gone hungry, or to have to go for a day without eating because of a lack of money or other resources.

pandemic massively scaled up cash transfers across the globe (Gentilini, 2022a). Delving into the intricacies of the debate are beyond the scope of this report, but there is evidence supporting both types of transfer, suggesting that ultimately context and implementation may matter. A meta-analysis of 129 studies by Manley et al. (2022) finds that cash transfers reduce both child stunting and wasting by only 1.3 percent. García and Saavedra (2022) conduct a meta-analysis of conditional cash transfers on education based on 30 studies and find positive effects for schooling, but not learning, and the programs tend to be costly. In terms of food aid, food stamps in the United States (formally, the Supplemental Nutrition Assistance Program) has increased birth weights (Almond, Hoynes, and Schanzenbach, 2011) and reduced incidence of metabolic syndrome (Hoynes, Schanzenbach, and Almond, 2016). Barham, Macours and Maluccio (2013) used a randomized conditional cash transfer program in Nicaragua to determine that it had a positive effect on the cognitive skills of boys whose households were beneficiaries—when they were in utero and in the first two years of life.

Gentilini (2022a) outlines some ways through which transfers can lead to positive outcomes, noting that context matters given the mixed evidence. In general, income transfers increase the propensity to spend more on food, although in-kind transfers may be more effective. There is also evidence that income transfers improved dietary diversity. Calories can be cheap, but good sources of nutrients are not. Ratios of the prices of animal-sourced foods to staples tend to be higher in low-income countries than upper income settings (Gentilini, 2022b). Rising food prices can shift diets of the poor towards starchy staples. Training on specific related child-care issues and hygiene—also known as behavioral communication change—have been found to enhance the nutritional effects of transfer programs. Furthermore, the

safety nets can reduce maternal stress, as well as intimate partner violence (IPV), another channel through which childcare and nutritional outcomes could improve. Finally, school programs can serve as a form of in-kind transfers that can have direct improvements in nutritional outcomes. Hendren and Sprung-Keyser (2020) find that spending directed to low-income children is the highest marginal value use of public funds. Moreover, spending on child health and education, particularly targeted towards poorer groups is one of the highest value fiscal policies and has high long-run returns but can be hard to prioritize (World Bank, 2022a).

One of the problems is that cash transfer programs tend to cover a small share of the poor in the developing economies in the MENA region (Ridao-Cano et al., 2023). Egypt, Jordan and Iraq significantly expanded the coverage of regular cash transfer programs after the onset of the COVID-19 pandemic. However, only the cash transfer programs in Egypt and Jordan cover most of the poorest 20 percent of the population—mainly because of low spending in general on social assistance in the MENA region. MENA countries spend more than twice as much on energy subsidies as they do on social assistance. The expansion of poverty-targeted cash transfers—partly financed by funds freed up from reforming subsidies—would benefit the poor and vulnerable in the region.

Gender policies and childcare: Mothers play a critical role in the most crucial period during in utero and early childhood. Maternal stress, as detailed earlier, can harm children. Empowering mothers and providing them with flexibility is important. There is some evidence that maternity leave leads to positive outcomes for a child's education but also for wages at age 30 (Carneiro et al., 2015). However, some studies find mixed results from expansions of maternity leave (Danzer and Lavy, 2018). Maternal education has also been found to have positive effects on infant outcomes (Carneiro et al., 2013). Good quality childcare can also have a positive effect on a child's future employment and earnings (Heckman et al., 2013; Conti et al., 2016). The quality of childcare is important. Baker et al., (2008) find that an expansion of universal childcare increased maternal labor supply but may have reduced outcomes for children. Havnes and Mogstad (2011) find that a large-scale expansion of subsidized childcare in Norway had long run positive outcomes, especially for children of low-educated mothers. The authors state that the findings are likely to reflect movement from informal care, instead of parental care, to high quality formal care.

The state of childcare largely depends on availability (including diverse options), affordability, and quality. A study of 13 economies in the MENA region by the World Bank's Women, Business and the Law (WBL) team provides some insights (World Bank, 2022b). The study found that private sector provision of childcare is regulated in almost three-quarters of the economies, but public provision of childcare is regulated in only four. In terms of affordability, only three of the 13 countries provide financial support for parents or providers of childcare services. In terms of quality, 11 of the economies mandate teacher-to-child ratios in private childcare, but few do so for public childcare centers. Finally, only two of the 13 economies mandate educators in private childcare centers to undergo periodic training.

Medical care: The quality of medical care matters. A study by Sievertsen and Wust (2017) used extensive administrative registry data in Denmark to examine county-by-county variation in policies mandating same-day post-birth discharge. Same-day discharge was essentially a cost-saving policy and led to a 0.2 standard deviation decline in ninth grade test scores. Similarly, infants in Chile and Norway born below the 1,500-gram (3.3 pounds) birthweight threshold receive more intensive care than newborns whose weight exceeds the threshold. Bharadwaj, Løken and Neilson (2013) find that the intensive medical care the newborns received increased their wages as adults by 1.8 percent in Norway and 2.7 percent in Chile. More important, remedial medical investments may be needed to offset the harmful effects the poor child nutrition and health in the MENA region that have been documented in this report.

Supply side: Food systems are critical for the MENA region. The region is both water scarce and land scarce. Climate change is expected to put extreme pressure on both, with severe implications for regional food security and livelihoods. Building resilient food systems that can withstand disruptions and ensure an adequate food supply requires a multipronged approach. Although MENA countries are largely food importers, there are countries in the Maghreb in northern Africa that do produce and export food. Making food systems resilient would entail building efficiency in supply chains and improving their response to and recovery from climate and market shocks. This can be achieved by leveraging technology and innovation to mitigate production risks, with a focus on climate smart agriculture and early warning systems, facilitating access to finance and export and input markets and promoting better risk transfer and coping mechanisms (such as insurance, food reserves). Accelerating regional collaboration and initiatives can be helpful in achieving several of these goals. Subsidy reforms and increasing efficiency of public expenditures can improve the resilience of food systems.[39]

Data: A major problem for authorities and others trying to analyze issues and devise policy responses is the lack of good data in the MENA region:

- Early warning systems for famines rely on extensive data that can be hard to come by, especially in difficult times.

- Good data are essential to the food inflation estimates needed to ascertain the possibility of food insecurity. Most of the weights used in the calculations of CPI in the MENA region are based on out-of-date surveys.

- The surveys that underline the state of childhood health and nutrition are largely infrequent and inaccessible. The type of administrative data that has been utilized by state-of-the-art studies in the literature are not feasible due to limited administrative data in the region.

- Data collection in fragile and conflict-affected states is difficult (Favari et al., 2022). There is enormous political pressure to interfere in traditional household surveys, which can distort the surveys considerably. Furthermore, phone surveys may be less effective because respondents fear repercussions of being identified. Each alternative data collection exercise has some limitation. But ways to address some of the difficulties include using internet surveys, which tend to be more anonymous. Interviewing local governments can help gather an understanding of revenue-sharing and the implementation of blockades—critical information for humanitarian efforts. Finally interviews of key informants can provide crucial information regarding the state of the conflict and the challenges of accessing basic necessities.

39 For further reading see World Bank (2015), Nin-Pratt et al., (2018), and Gautam et al., (2022).

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Appendix II.A Food Insecurity Projection Methodology

Multi-year projections of severe food insecurity are derived from a parsimonious machine learning model as detailed in Andree (2022).

Food insecurity measure: The metric used for food insecurity is the prevalence (rate) of severe food insecurity, derived from the Food Insecurity Experience Scale (FIES), which tracks food insecurity at three levels: food security, moderate food insecurity, and severe food insecurity. This data is available for individual countries from the UN Food and Agriculture Organization (FAO) as three-year centered moving averages. The prevalence of severe food insecurity is defined as the percentage of people in the population who live in households classified as severely food insecure. A household is classified as severely food insecure when at least one adult in the household in the last 12 months has reported being forced to reduce the quantity of the food consumed, to have skipped meals, having gone hungry, or having to go for a whole day without eating because of a lack of money or other resources. This food insecurity metric captures chronic food insecurity. It differs from acute measures such as the percentage of people that are in food crisis—that is, unable to meet minimum dietary needs without adopting irreversible coping strategies that have long-term effects. The severely food insecure population is at risk of becoming acutely food insecure and therefore is of particular interest to strategies aimed at prevention and resilience. An important distinction from a policy perspective is that when food insecurity is primarily chronic, markets are typically still functional so that a wider range of economic interventions may still be considered as part of a prevention and resilience strategy.

Machine learning model: The model is a local-linear regression implemented using a Cubist model. The Cubist model algorithm includes two steps. First, a set of rules are used to divide the data into smaller subsets using decision trees. The second step involves applying linear regression models within the subsets of the data. This allows a novel approach to combining the flexibility of decision trees, with the stable extrapolation properties of linear regression techniques. The model can scale in flexibility and is non-parametric, as described by Quinlan (1992) and Witten et al. (2017) and implemented by Kuhn et al. (2012). This piece-wise linear model can capture smoothed versions of Random Forest type of nonlinearities that can be locally extrapolated. In particular, where a Random Forest or Boosted Trees algorithm can only interpolate (by returning, for instance, a median within the range of values seen) at terminal nodes, the terminal node in Cubist ends in a linear regression that can extrapolate. This generally also results in smoother transitions around the cutoffs of decision trees, which is more suitable for numeric data. Due to the local linear nature, local extrapolations generally remain reasonably stable, which is a benefit over neural network predictions that can rapidly turn explosive outside observed data intervals. Cubist models have done well on a variety of prediction problems, often reaching accuracy not far below that of deep learning methods on complex prediction tasks and often performing better on smaller data sets. For applications see, for instance Morellos et al., (2016); Ng et al., (2019); Andree, (2021); and Sbahi et al., (2021). The predictions are validated against different sets of holdout data that test the model's ability to forecast large temporal changes and fill regional gaps. The model here was updated with new data, and the updated cross-validation estimates indicated that the model was able to explain about 97 percent of the variation in out-of-sample partitions of the 2015–2020 data. Within the MENA region specifically, the R2 was 0.97 (MAE of 1.51, RMSE of 3.44, for N=80 and an average observation of 12.0), and 0.94 across high income countries (MAE of 0.28, RMSE of 0.44, for N=257 and an average observation of 2.0).

Sample: The original model used 2015–2019 data for 144 countries and has been updated here using 2015–2020 country-level data on food insecurity conditions scaled up to 188 countries included in both the World Bank's *World Development Indicators* (WDI) and the International Monetary Fund's *World Economic Outlook* (WEO) database. This includes all International Development Association (IDA) and International Bank for Reconstruction and Development (IBRD) countries (59 IDA, 15 both, 70 IBRD). The model is applied to historical economic data from the WDI through 2021 and the WEO of October 2022—a database of macroeconomic projections that is updated semiannually by the IMF—to reconstruct and project severe food insecurity through 2027. The resulting food insecurity outlook covers all MENA countries, and the projected food insecurity figures are internally consistent with the October 2022 economic outlook of the IMF that serves as the input for the projections.

Covariates: The covariates used by the model can be grouped roughly across five dimensions: macro-economic stability, food affordability, the ability to expand the short-term food supply, pressures on food resources, and pre-existing vulnerabilities. The specific variables used for model estimation purposes include: (1) the poverty rate at US$1.90 per day; (2) GDP per capita, PPP adjusted; (3) the three-year average real GDP growth rate; (4) the three-year average population growth rate; (5) the three-year average Consumer Price Index inflation rate; (6) agriculture, forestry, and fishing, value added (percent of GDP); (7) food imports (percent of merchandise imports); (8) fuel imports (percent of merchandise imports); (9) agricultural land cover (percent of land); (10) forest land cover (percent of land); (11) historical child mortality. To improve the fit of the model, the poverty data has been complemented by poverty estimates from the Asian Development Bank for all countries where the assessments are consistent with those from the World Bank and for which observations are not included in the WDI.

Decompositions: To overcome interpretability challenges related to nonparametric regression models, Andree et al. (2020) developed a two-step prediction decomposition strategy for food insecurity forecasts that relies on assessing observation-level variable importance and overlaying the standardized importance of combined predictor groups with the modeled share of population that are food insecure. This provides comprehensible interpretation of the data groups that contribute to the prediction output. The decompositions here are based on a model-agnostic calculation of local variable importance estimated using a Random Forest grown on the updated predictions from Andree (2022) and the input indicators used to generate these estimates and forecasts. The method to calculate observation level variable importance uses the permutation techniques originally developed by Breiman (2001). Specifically, the reduction in Mean Absolute Error in Out-Of-Bag predictions that result from including variables. Since Random Forest models are stochastic, each model fit may result in different variable importance scores on the same data, simply because the observations are sampled differently. To ensure a general and robust result, the variable importance scores are estimated 500 times, each time for a model with the number of variables in bags randomly selected from the allowed values. The Mean Absolute Error reductions are combined for variable groups by summing them. The final grouped variable importance scores are standardized from 0 to 1 and multiplied by the predicted prevalence rate.

Appendix II.B. Impact of Food Price Shock on Children in Utero

This section details the calculations required to estimate the effects of food inflation from March through June 2022 on health and educational outcomes of children who were in utero in that period (see Table AII.B.1).[40] To obtain these estimates, the analysis relies on the literature to ascertain the effects of rising food prices on childhood stunting and education for the MENA region. The main estimate is obtained from a study by Woldemichael et al. (2022) in Ethiopia.[41] A 1 percentage point higher month-to-month food inflation while in utero increases the risk of under-five stunting by 0.0046 probability points.[42] This estimate is on the conservative side.[43] The monthly increase in the risk of stunting due to in utero exposure to inflation is calculated by multiplying the effect of food inflation on stunting by the monthly inflation shock (equation 1).

The increase in the risk of stunting in month m for country c is calculated as follows:

$$\Delta\ stunting_{\ m,c} = (\partial\ stunting\ /\ \partial\ inflation\ rate) \times (inflation\ rate_{\ m,c\ 2022} - inflation\ rate_{c\ counterfactual}) \quad (1)$$

Where $\Delta\ stunting_{\ m,c}$ is the change in the risk of stunting in month m for country c. $inflation\ rate_{\ m,c\ 2022}$ is the month-to-month food inflation in month m for country c in 2022. $inflation\ rate_{\ c,counterfactual}$ is the average month-to-month food inflation for the counterfactual scenario described later on in the section.

The monthly increase in the number of newborns at risk of stunting is calculated by multiplying the number of children in utero in a given month by the monthly increase in the risk of stunting (equation 2).

The increase in number of newborns at risk of stunting in month m for country c is calculated as follows:

$$\Delta\ number\ of\ stunted\ children\ in\ utero_{\ m,c} = (\partial\ stunting\ /\ \partial\ inflation\ rate) \times (inflation\ rate_{\ m,c\ 2022} - inflation\ rate_{\ c,counterfactual}) \times number\ of\ children\ in\ utero_{\ m,c} \quad (2)$$

Where $\Delta\ number\ of\ stunted\ children\ in\ utero_{\ m,c}$ is the change in the number of stunted children in utero in month m for country c.

The number of children in utero in a given month is based on the birth rate in 2021 assuming a gestation period of 40 weeks (Almond and Mazumder, 2011; Persson and Rossin-Slater, 2018; Woldemicheal et al., 2022).[44]

The number of children in utero in month m for country c is equal to:

$$number\ of\ children\ in\ utero_{\ m,c} = (yearly\ birth_{\ c,2021} / 12) \times 10 \quad (3)$$

40 We focus on the period from March to June 2022 to account for the immediate effects of the beginning of the war in Ukraine.

41 The study is based on data from the Ethiopian Demographic and Health Surveys (DHS) conducted in 2005 and 2010 and the monthly retail food price data from the Ethiopian Central Statistical Agency (CSA).

42 The study controls for child, parental, household, and geographical characteristics, survey year-region interaction and age-birth cohort.

43 Mary et. al. (2020) analyze the relationship between stunting and inflation for a sample of 90 developing countries between 2002 and 2014 and find that a 1 percentage point increase in inflation raises the probability of stunting by 2.3 percent, however the result is not statistically significant. Headey and Alderman (2019) find that a 1 percent increase in milk prices is associated with a 4.8 percentage points rise in stunting rates for a sample of 101 countries. Additionally, a 1 percent increase in eggs and infant cereals prices were also associated with a 3.3 and 3.14 increase in stunting rates respectively. In this report we opt for the more conservative estimate from Woldemichael et al. (2022).

44 Yearly birth is obtained from World Population Prospects (2022).

The increase in stunting has further effects on educational outcomes such as expected years of schooling and harmonized test scores. Estimates from Galasso and Wagstaff (2019) find that children who are stunted obtain 1.594 fewer years of education and score 0.625 standard deviations lower on standardized tests.[45] The effect of the price shock on expected years of schooling is calculated by multiplying three terms: (i) the effect of stunting on expected years of schooling, (ii) the effect of food inflation on stunting and (iii) the price shock. The effect of the price shock on standardized test scores is similarly calculated using the effect of stunting on standardized scores (See equations 4 and 5).

The decline in years of schooling and test scores in month m for country c is equal to:

$$\Delta EYS_{m,c} = (\partial EYS / \partial stunting) \times (\partial stunting / \partial inflation\ rate) \times (inflation\ rate_{m,c\ 2022} - inflation\ rate_{c,counterfactual}) \quad (4)$$

$$\Delta HTS_{m,c} = (\partial HTS / \partial stunting) \times (\partial stunting / \partial inflation\ rate) \times (inflation\ rate_{m,c\ 2022} - inflation\ rate_{c,counterfactual}) \quad (5)$$

Where $\Delta EYS_{m,c}$ is the change in expected years of schooling and $\Delta HTS_{m,c}$ is the change in harmonized test scores in month m for country c in 2022.

The price shock is calculated as the difference between month-to-month food inflation[46] and the counterfactual food inflation rate under three scenarios: pre-pandemic inflation (counterfactual is measured as average month-to-month food inflation in 2019), post-pandemic inflation (counterfactual is measured as average month-to-month food inflation in 2021) and pre-war inflation (counterfactual is measured as the average month-to-month inflation in the four months preceding the war in Ukraine—October 2021–January 2022). The calculations are done for each month from March to June 2022, and then aggregated for the four-month period. The estimates for the three scenarios are presented in Table AII.B.1 in Panel 1, Panel 2, and Panel 3. Inflation was already a problem before the Ukraine war in some economies in MENA, especially those in fragile and conflict situations (FCS). Comparing month-to-month food inflation during March through June 2022 to the annual average pre-pandemic month-to-month inflation in 2019 shows that 285,447 additional newborns may be at risk of stunting while using the average month-to-month inflation in 2021 (post-pandemic) as counterfactual shows that 197,439 additional newborns may be affected. Using the four months preceding the war in Ukraine as a counterfactual, the number of newborns at risk of stunting is expected to be 239,754. The divergence in figures is largely due to changes in inflation rates, particularly in fragile and conflict affected countries where inflation was already high before the pandemic and the war in Ukraine.

45 The elasticities of educational outcomes to stunting are based on the literature review in Galasso and Wagstaff (2019). They are the mean value across six studies derived from data from nine countries (Bangladesh, Brazil, Guatemala, India, Indonesia, Mexico, the Philippines, South Africa, and Zimbabwe). See Galasso and Wagstaff (2019) for more detail.

46 Food Inflation is obtained from Haver Analytics and National Statistical Offices (NSO). For Syria, Yemen and Libya, food inflation is obtained from FAO Stat.

In summary, the increase in the number of newborns at risk of stunting translates into a total increase in the risk of stunting by 17–24[47] percent—that is, between 197,439-285,447 additional newborns at risk of stunting. These children are expected to have 0.06–0.08 fewer years of schooling, and 0.02–0.03 standard deviation decline in test scores.[48]

To illustrate a specific case, consider Egypt. The effects of the price shock on children's health and educational outcomes are calculated for each month during the period March through June 2022, then the estimates are aggregated for the four months. Here are the detailed calculations for March 2022. The month-to-month food inflation in Egypt in March 2022 was 4.43 percent while the average month-to-month food inflation in 2019 was 0.02 percent. The price shock is the difference between the two inflation rates, that is 4.41 percentage points. The risk of stunting is expected to increase 0.02 probability points (0.0046 x 4.41), which translates into 41,634 additional newborns at risk of stunting in March. This number is obtained by multiplying the increase in the risk of stunting (0.02 probability points) with the total number of children in utero March (2,054,170). A number of assumptions are made to obtain the total number of children in utero in March. The number of live births in 2021 in Egypt was 2,465,004 and assuming that the number of yearly live births is distributed equally across the year, then the monthly live births in March 2022 in Egypt is equal to 205,417 (2,465,005/12). We assume a gestation period of 40 weeks (Almond and Mazumder, 2011; Persson and Rossin-Slater, 2018; Woldemicheal et al., 2022) and therefore multiply the number of monthly live births by 10 to obtain the number of children in utero in March 2022 (205,417x10=2,054,170). The increase in stunting due to in utero exposure to the food price shock for March 2022 was associated with 0.032 (0.0046 x 4.41 x 1.594) fewer expected years of schooling and a 0.013 (0.0046 x 4.41 x 0.625) standard deviation lower standardized test scores.

These estimates would be lower if we consider month-to-month food inflation in 2021 as a counterfactual, because 2021 average month-to-month food inflation in Egypt was 0.79 percent. In some months, the price shock is negative, which means that inflation in these months is lower than the counterfactual. For example, In June 2022, Egypt's month-to-month food inflation was -2.26 percent, which is lower than the average month-to-month food inflation in 2019 (0.02 percent). The price shock for June 2022 is therefore -2.28 percent. Over the full period between March and June 2022, the number children at risk of stunting in Egypt ranges from 69,963 to 98,856, depending on the counterfactual. The decline in the expected years of schooling is between 0.05 and 0.08 years. The decline in the standard deviation of harmonized test scores ranges from 0.02 to 0.03.

47 The initial stunting rate is 16.2 percent which means that out of 7.3 million children in utero between March and June 2022, 1.2 million may be stunted. After exposure to food inflation due to the war in Ukraine, we estimate that the number of newborns at risk of stunting will increase by 200,000–285,000 taking the total of stunted children to around 1.4–1.5 million. This represents a 17–24 percent increase in stunting rate.

48 To put these numbers in context, they could be compared to other estimates. Such comparisons are difficult because they are not exactly equivalent comparisons—many of the estimates are not confined to the effects in utero, and in some cases consider other channels beyond stunting. Based on World Bank (2021) report, the COVID-19 pandemic resulted in 0.51 fewer years of schooling (around 6 months) and 0.14 standard deviation decline in test scores (3.7 percent decline) for children in MENA developing countries (Syria, Djibouti, and Libya are excluded for lack of data). However, these effects are not just in utero (they include children under 5), and they also include effects from school closures and dropouts. If only the channel through stunting is examined, children under 5 are expected to suffer 0.004 drop in expected years of schooling (around 2 days) and 0.002 standard deviation decline in test scores (0.04 percent decline).

Table AII.B.1: Effect of Food Price Shocks on Children in Utero Health and Education across MENA (March–June 2022)

Country Name	Counterfactual = Average 2019 m/m inflation				Counterfactual = Average 2021 m/m inflation				Counterfactual = Average m/m inflation for 4 months before war			
	Risk of Stunting	Number of Children who may be stunted	Expected Years of Schooling due to Stunting	Harmonized Test Scores due to Stunting (SD)	Risk of Stunting	Number of Children who may be stunted	Expected Years of Schooling due to Stunting	Harmonized Test Scores due to Stunting (SD)	Risk of Stunting	Number of Children who may be stunted	Expected Years of Schooling due to Stunting	Harmonized Test Scores due to Stunting (SD)
	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)	(1)	(2)	(3)	(4)
Syria	-0.0096	-3,420	0.0153	0.0060	-0.0140	-4,986	0.0223	0.0088	-0.0058	-2,049	0.0092	0.0036
Yemen, Rep.	-0.0005	-391	0.0007	0.0003	0.0061	5,089	-0.0096	-0.0038	0.0091	7,658	-0.0145	-0.0057
West Bank and Gaza	0.0088	1,068	-0.0141	-0.0055	0.0091	1,097	-0.0145	-0.0057	0.0129	1,556	-0.0205	-0.0080
Djibouti	0.0904	1,849	-0.1441	-0.0565	0.0954	1,951	-0.1520	-0.0596	0.1003	2,050	-0.1598	-0.0627
Morocco	0.0313	16,953	-0.0498	-0.0195	0.0254	13,770	-0.0405	-0.0159	0.0269	14,590	-0.0429	-0.0168
Jordan	0.0068	1,388	-0.0109	-0.0043	0.0028	580	-0.0045	-0.0018	0.0043	875	-0.0068	-0.0027
Tunisia	0.0066	1,088	-0.0105	-0.0041	0.0039	644	-0.0062	-0.0024	0.0046	750	-0.0073	-0.0028
Algeria	0.0257	20,392	-0.0410	-0.0161	0.0108	8,561	-0.0172	-0.0068	0.0254	20,143	-0.0405	-0.0159
Iraq	0.0077	7,645	-0.0123	-0.0048	-0.0052	-5,216	0.0084	0.0033	0.0014	1,370	-0.0022	-0.0009
Egypt	0.0481	98,856	-0.0767	-0.0301	0.0341	69,963	-0.0543	-0.0213	0.0400	82,132	-0.0637	-0.0250
Iran	0.1248	125,213	-0.1989	-0.0780	0.1102	110,571	-0.1757	-0.0689	0.1139	114,273	-0.1815	-0.0712
Lebanon	0.1893	13,323	-0.3017	-0.1183	-0.0773	-5,438	0.1232	0.0483	-0.0648	-4,561	0.1033	0.0405
Libya	0.0148	1,484	-0.0236	-0.0093	0.0085	853	-0.0136	-0.0053	0.0096	965	-0.0154	-0.0060
MENA	**0.0490**	**285,447**	**-0.078**	**-0.031**	**0.0343**	**197,439**	**-0.055**	**-0.021**	**0.0400**	**239,754**	**-0.064**	**-0.025**

Source: World Bank Staff calculations.
Note: Table AII.B.1 presents the effect of in utero exposure to food inflation from March through June 2022. The food price shock is calculated as the difference between monthly month-to-month inflation and three counterfactuals. Panel 1 uses the average month-on-month inflation in 2019. Panel 2 uses the average month-on-month inflation in 2021. Panel 3 uses the average month-on-month inflation for the 4 months preceding the war in Ukraine (October 2021–January 2022). Column (1) presents the increase in the risk of stunting caused by in utero exposure to inflation during March through June 2022. This is calculated by multiplying the month-to-month effect of food inflation on stunning by the monthly price shock. Column (2) gives the expected marginal increase in number of stunted children. This is calculated by multiplying the number of children in utero in a given month by the monthly increase in the risk of stunting. The number of children in utero in a given month is calculated using the birth rate in 2021 and assuming a gestation period of 40 weeks (Almond and Mazumder, 2011; Persson and Rossin-Slater, 2018; Woldemicheal et al., 2022). Column (3) provides the effects on the years of schooling, while Column (4) provides the effects for standardized test scores. These estimates are obtained for each month from March 2022 through June 2022 then aggregated for the four months. Effect of food inflation on stunting is equal to 0.0046 and obtained from Woldemicheal et al. (2022). The effect of stunting on expected years of schooling and harmonized test scores (in SD) are equal to 1.594 and 0.625 respectively and are obtained from Galasso and Wagstaff (2019). Yearly birth is obtained from World Population Prospects (2022). Food Inflation is obtained from Haver Analytics and national statistical offices. For Syria, Yemen and Libya, food inflation is obtained from FAO Stat. The last row presents the population weighted averages for MENA developing countries for columns (1), (2) and (4) and the total for column (3). Countries are displayed in ascending order by 2022 GDP per capita.

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ALTERED DESTINIES: The Long-Term Effects of Rising Prices and Food Insecurity in the Middle East and North Africa

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