WORLD BANK GROUP

MENA ECONOMIC UPDATE OCTOBER 2021

Overconfident: How Economic and Health Fault Lines Left the Middle East and North Africa Ill-Prepared to Face COVID-19

WORLD BANK MIDDLE EAST AND NORTH AFRICA REGION

MENA ECONOMIC UPDATE OCTOBER 2021

Overconfident: How Economic and Health Fault Lines Left the Middle East and North Africa Ill-Prepared to Face COVID-19

WORLD BANK GROUP

2021 International Bank for Reconstruction and Development / The World Bank
1818 H Street NW, Washington, DC 20433
Telephone: 202-473-1000; Internet: www.worldbank.org

Some rights reserved

1 2 3 4 24 23 22 21

This work is a product of the staff of The World Bank with external contributions. The findings, interpretations, and conclusions expressed in this work do not necessarily reflect the views of The World Bank, its Board of Executive Directors, or the governments they represent. The World Bank does not guarantee the accuracy of the data included in this work. The boundaries, colors, denominations, and other information shown on any map in this work do not imply any judgment on the part of The World Bank concerning the legal status of any territory or the endorsement or acceptance of such boundaries.

Nothing herein shall constitute or be considered to be a limitation upon or waiver of the privileges and immunities of The World Bank, all of which are specifically reserved.

Rights and Permissions

This work is available under the Creative Commons Attribution 3.0 IGO license (CC BY 3.0 IGO) http://creativecommons.org/licenses/by/3.0/igo. Under the Creative Commons Attribution license, you are free to copy, distribute, transmit, and adapt this work, including for commercial purposes, under the following conditions:

Attribution—Please cite the work as follows: Gatti, Roberta; Lederman, Daniel; Fan, Rachel Yuting; Hatefi, Arian; Nguyen, Ha; Sautmann, Anja; Sax, Joseph Martin; Wood, Christina A. 2021. "Overconfident: How Economic and Health Fault Lines Left the Middle East and North Africa Ill-Prepared to Face COVID-19" *Middle East and North Africa Economic Update* (October), Washington, DC: World Bank. Doi: 10.1596/978-1-4648-1798-4. License: Creative Commons Attribution CC BY 3.0 IGO

Translations—If you create a translation of this work, please add the following disclaimer along with the attribution: *This translation was not created by The World Bank and should not be considered an official World Bank translation. The World Bank shall not be liable for any content or error in this translation.*

Adaptations—If you create an adaptation of this work, please add the following disclaimer along with the attribution: *This is an adaptation of an original work by The World Bank. Views and opinions expressed in the adaptation are the sole responsibility of the author or authors of the adaptation and are not endorsed by The World Bank.*

Third-party content—The World Bank does not necessarily own each component of the content contained within the work. The World Bank therefore does not warrant that the use of any third-party-owned individual component or part contained in the work will not infringe on the rights of those third parties. The risk of claims resulting from such infringement rests solely with you. If you wish to re-use a component of the work, it is your responsibility to determine whether permission is needed for that re-use and to obtain permission from the copyright owner. Examples of components can include, but are not limited to, tables, figures, or images.

All queries on rights and licenses should be addressed to World Bank Publications, The World Bank Group, 1818 H Street NW, Washington, DC 20433, USA; e-mail: pubrights@worldbank.org.

ISBN (electronic): 978-1-4648-1798-4

DOI: 10.1596/978-1-4648-1798-4

Photo credits in this publication. Further permission required for reuse.
Cover photo credit: MJGraphics/Shutterstock.com

Contents

List of Figures

List of Tables

List of Boxes

Acknowledgements

The MENA Economic Update is a product of the Office of the Chief Economist for the Middle East and North Africa Region (MNACE) of the World Bank. The report was written by Roberta Gatti (Regional Chief Economist), Daniel Lederman (Deputy Chief Economist), Rachel Yuting Fan (Team Lead), Arian Hatefi, Ha Nguyen, Anja Sautmann, Joseph Martin Sax, and Christina A. Wood.

We are indebted to Abdo Yazbeck for his ideas and advice that shaped the report, particularly concerning the role of economic, demographic and epidemiological transitions. Inputs from Johannes G. Hoogeveen and Minh Cong Nguyen are much appreciated.

Claudio Jeremias Rojas Guzman and Rana Mohamed Amr Mohamed Nabil Lotfi provided invaluable research assistance.

Helpful comments were provided by Ferid Belhaj (Regional Vice President), Stefan G. Koeberle, Jesko S. Hentschel, Nadir Mohammed, Fatima Zehra Shah, Ismail Radwan, Tania Meyer, Nancy Lozano Gracia, Anush Bezhanyan, Jens Kromann, Paul Welton, Laura De Castro Zoratto, Sara B. Alnashar, Majid Kazemi, Ashwaq Natiq Maseeh, Anastasia Janzer-Araji, Saadia Refaqat, Wael Mansour, Wissam Harake, Luan Zhao, Jaime de Pinies, Dalia Al Kadi, Amr Elshalakani, Paul Moreno Lopez, and Javier Diaz Cassou.

We gratefully acknowledge the World Bank's MENA Health Sector team for its overall support, guidance, and comments, namely Rekha Menon (Practice Manager), Mansour Faisal H Alrumayyan, Sherin Varkey, Sameh El-Saharty, Son Nam Nguyen, Denizhan Duran, Fatima El Kadiri El Yamani, Iryna Postolovska, Fernando Xavier Montenegro Torres, Takahiro Hasumi, Christopher H. Herbst, Jorge A. Coarasa, and Ronald Eduardo Gomez Suarez.

Susan Pleming provided timely advice on messaging during the final stages in the production of this report.

We thank James L. Rowe Jr for editing the manuscript. Help from the Translation and Printing & Multimedia Unit of the World Bank's Global Corporate Solutions is acknowledged. Stellar administrative support was provided by Swati Raychaudhuri.

Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
AMR	Antimicrobial Resistance
BHRIMS	Botswana HIV Response Information Management System
CDC	Centers for Disease Control and Prevention
COVID-19	Coronavirus Disease 2019
DOE	Developing Oil Exporters
DOI	Developing Oil Importers
EAP	East Asia and Pacific
ECA	Europe and Central Asia
EMRO	Eastern Mediterranean Regional Office
FAO	Food and Agriculture Organization
FE	Fixed Effects
GAVI	Global Alliance for Vaccines and Immunization
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GHE	Global Health Expenditure
GHO	Global Health Observatory
GHS	Global Health Security
GHSI	Global Health Security Index
GNI	Gross National Income
HCAI	Healthcare Associated Infections
HICs	High Income Countries
HIV	Human Immunodeficiency Virus
ICU	Intensive Care Unit
ID	Identity Document
ID4D	Identification for Development
IHR	International Health Regulations
IMF	International Monetary Fund
JEE	Joint External Evaluation
LAC	Latin America and the Caribbean
LGBTQI	Lesbian, Gay, Bisexual, Transgender, Queer, Intersex
LICs	Low Income Countries
MCM	Medical Countermeasures
MCV1	Measles-Containing-Vaccine First-Dose
MENA	Middle East and North Africa
MERS	Middle Eastern Respiratory Syndrome
MICs	Middle Income Countries
MPO	Macro and Poverty Outlook
NAC	North America
NCD	Non-Communicable Disease
OEC	Oil-Exporting Countries
OECD	Organization for Economic Cooperation and Development
OLS	Ordinary Least Squares
OOPS	Out-of-Pocket Spending
OPEC	Organization of the Petroleum Exporting Countries
PCA	Principle Components Analysis
PHC	Primary Health Care
PMI	Purchasing Managers' Index
PPE	Personal Protective Equipment
PPP	Purchasing Power Parity
RMNCH	Reproductive, Maternal, Newborn and Child Health
SAR	South Asia
SDI	Service Delivery Indicators
SPAR	State Parties Self-Assessment Annual Reporting Tool
SSA	Sub-Saharan Africa
UAE	United Arab Emirates
UHC	Universal Health Coverage
UNICEF	United Nations International Children's Emergency Fund
USAID	United States Agency for International Development
WDI	World Bank Indicators
WHO	World Health Organization

Foreword

With the emergence of Covid-19 in 2020, public health systems across MENA were overwhelmed by the pandemic, which came on top of the need to care for patients with non-Covid diseases. Although there is a lot about the Covid-19 outbreak in MENA and elsewhere that we do not understand, it is clear that a health system's capacity to absorb a sudden increase in patients due to an unexpected health shock remains a key dimension of public health preparedness. Simply put, running out of oxygen tanks, hospital beds, and even doctors and nurses during a health emergency are all symptoms of a lack of resilience.

While MENA was not unique in having faced a dreadful pandemic that exhausted available public health resources, MENA was unique compared to the rest of the world in how it ended up ill-prepared to absorb the shock of Covid-19. The authors of this report argue that three long-term trends left MENA's public health systems with low capacity to handle emergencies. In the past decade, slow reforms toward market-oriented economic systems and transparent institutions left a legacy of large public sectors that effectively crowded out investments in social services such as public health. Meanwhile, epidemiological trends left MENA with uncharacteristically high burdens of both non-communicable and communicable diseases compared to their income peers. And rising or atypically high fertility rates yielded a young population that made it seem as though MENA's citizens overall enjoyed good health while, in fact, the region had a comparatively high number of young people in poor health.

As in other regions, MENA's pandemic response challenges reflected not only the unpreparedness of its health systems to deal with Covid-19, but also issues related to a lack of leadership, poor availability of reliable data, and inadequate deployment of modern technologies to identify and contain the spread of the virus. Nonetheless, public health systems in middle-income MENA countries were particularly unprepared to face the pandemic, contrary to perceptions of the regions' health authorities. Thus, the authors argue that MENA was not only ill-prepared but was also overconfident: as of 2019, public health authorities from across the region had painted overly optimistic pictures of the capacity of their health systems to handle the consequences of unexpected health emergencies.

Indeed, as this report highlights, the region's authorities were optimistic about the preparedness of their health systems when compared with independent expert assessments by public health specialists. Insufficient information and data contributed to this optimism. Combined with strained fiscal resources in middle-income countries, insufficient data undermined health sector planning.

The pandemic's systemic effects on MENA countries' health systems have been apparent, causing issues with staffing, quality of care for non-Covid patients, and straining of the health systems' physical resources. While vaccination is a pathway out of the pandemic, vaccination rates in the region are uneven, with some of MENA's high-income countries far ahead, while middle-income and low-income countries trail behind.

This tale of public health systems that lacked resilience is consistent with other trends that are well known to analysts of the region. Many countries in the region entered 2020 with a decades-old history of chronic low growth, macroeconomic imbalances, and governance challenges, including a deficit in data availability and transparency. The region's emerging recovery in 2021 will be uneven across countries, and only a few countries will surpass the GDP per capita levels achieved prior to the pandemic.

The assessment of health-system resilience contained in this report has implications well beyond Covid-19. With more and better health system data, MENA health authorities could become more realistic about their health system capabilities. And by incorporating more comprehensive information into the planning process, MENA countries could leverage data to craft and implement health system reforms that are better suited to their citizens' needs. High-quality, reliable, and timely data that can be linked across government databases and deployed effectively, can help MENA health systems offer quality health services, particularly preventive medicine, in the near future and allow the region to be better prepared for future health emergencies that might arise not only from future epidemics, but also from climate-related natural disasters and armed conflict.

As the pandemic persists, the World Bank will continue to support the region, not only to facilitate short-term responses and disaster relief needs, but also to address systemic data system and institutional needs required to strengthen the foundations for more resilient, effective, and equitable health care systems in the years to come.

Ferid Belhaj
Vice President
Middle East and North Africa Region
The World Bank

CHAPTER 1. INTRODUCTION AND OVERVIEW OF FINDINGS

The Covid-19 pandemic challenged even the best of the world's healthcare systems. Scientists are still learning about the virus every day. Scientific uncertainty abounds. In the political realm, even some of the best healthcare systems lacked the leadership needed to contain the outbreak. Moreover, successive mutations of the coronavirus continue to threaten global public health systems and, in turn, global economic prospects.

Amid the uncertainty, one thing is certain: core public health functions such as surveillance, disease prevention and preparedness have never been more important than they are today. In addition, the need for an open and data-driven rapport between the state and its citizens has never been more apparent. Both are necessary for successful pandemic control. Yet, on the eve of the pandemic, the transition towards participatory and market-oriented institutions that stalled during the prior decade in MENA left many countries in the region unprepared. Fiscal vulnerabilities associated with the participation of the public sector in the economy impeded investments needed to strengthen public health systems.

It became apparent that, as of 2019, most MENA countries were overconfident about the resiliency of their health systems. More than a year and a half into the pandemic, some governments are still unable to use data systems effectively to help citizens protect themselves from infection. Together with a strong focus on building core public health functions, embracing and leveraging the power of data openness can help promote the region's recovery and transition towards market institutions.

Before the social unrest associated with the Arab Spring erupted in 2011, countries in the Middle East and North Africa (MENA) were pursuing a clearly inadequate economic development model that over-relied on public sector expenditures and employment. Since then, reforms in MENA advanced more slowly than hoped, resulting in a piecemeal, truncated transition toward market economies. As the economic reforms sputtered, public spending priorities continued to favor public employment rather than investments in core public goods, such as the building of resilient public health systems. Consequently, on the eve of the pandemic in 2019, public health systems in MENA tended to be underfunded, particularly among middle-income countries, even though the size of the public sector had grown as a share of Gross Domestic Product (GDP). Low expenditures in public health relative to the public sector's wage bill seems to have shifted more of the financial burden of health care toward individuals, as evidenced by disproportionately high out-of-pocket spending on medical care. As important, transparent disease surveillance practices were overlooked, while reserve health service capacity was comparatively limited. In other words, two key components of pandemic response—surveillance and absorptive capacity—were inadequate when Covid-19 hit even though the economic footprint of the state in the economy had actually increased since 2009.

Since 2009, most MENA countries also experienced demographic and epidemiological changes that also contributed to health systems that were ill-prepared to handle health emergencies. The demographic profile of MENA's population was shaped by atypically high fertility rates and associated increases in the dependency ratios—the shares of children and older people in the population—which exacerbated macroeconomic imbalances in the form of current account deficits. Perhaps more importantly, high fertility rates produced a young population and created the statistical illusion of a healthy population because children are less susceptible to non-communicable diseases than adults.

Meanwhile, truncated epidemiological transitions observed in MENA since 2009 resulted in abnormally high burdens of diseases. Several countries recorded high deaths per capita from both communicable and non-communicable diseases (NCDs), while all MENA countries experienced either high death rates due to NCDs relative to other countries at the same level of development, or atypically high increases in the burden (deaths) of NCDs.

Thus, truncated socio-economic transitions resulted in public health systems that were ill-prepared to absorb the massive shock of the Covid-19 pandemic. Yet empirical evidence compiled for this report also shows that MENA's public health authorities were painting a relatively rosy picture of their public health systems in 2018-2019, on the eve of the pandemic. Their self-reported preparedness indicators were systematically more optimistic than that of countries with similar levels of the development, while objective indicators showed MENA countries underperforming their peers.

The last two years have shown that economic performance depends to an important extent on pandemic control. Stressed health systems have combined with global economic factors—such as fluctuations in commodity prices, particularly oil—to produce an uneven economic recovery for the region and a tenuous outlook. The region is forecasted to grow by 2.8 percent in 2021 and by 4.2 percent in 2022, but these averages mask important differences across countries. Each economy's performance depends heavily on its exposure to commodity-price fluctuations and how well it managed the pandemic. More important, most countries might not rebound fast enough to reach their pre-pandemic levels of Gross Domestic Product (GDP) per capita until 2022, let alone the levels predicted before the pandemic. Downside risks abound—including the possibility of a prolonged pandemic, especially in the middle-income and low-income countries in MENA, where vaccinations are lagging.

In sum, the crisis caught most MENA countries with underfinanced, imbalanced and ill-prepared health systems. Most countries were hit hard by the Covid-19 crisis but there is a silver lining in two respects. First, some countries were able to adapt and react quickly to the pandemic and managed impressive responses both on the policy and pandemic containment fronts. Unfortunately, many other countries in the region did not. Second, the use of data—a necessary ingredient—became centerstage for public health policy making and the advances made in this regard can be built upon for deeper reforms and building preparedness capacity after the pandemic.

The rest of this report is organized as follows. Chapter 2 presents an overview of macroeconomic forecasts, with an analysis of how the costs of the crisis are related to both economic and public health factors. Chapter 3 looks empirically at the truncated economic transition, showing how in the aftermath of the Arab Spring public spending in health was overshadowed by rising government expenditures in public employment. Chapter 4 analyzes the truncated demographic and epidemiological transitions. Chapter 5 takes stock of MENA's public health system preparedness on the eve of the Covid-19 outbreak, showing how numerous countries in the region painted overly optimistic pictures of the capacities of their public health systems. Chapter 6 examines the Covid-19 outbreak, which acted as a stress test of health systems already performing more poorly than those in the rest of world. Chapter 7 focuses on lessons from academic research about the potential socio-economic gains that can be achieved with smart digitized public health information systems.

CHAPTER 2. A TENUOUS AND UNEVEN ECONOMIC RECOVERY IN AN ONGOING PANDEMIC

Main takeaways

- *The World Bank estimates that MENA's regional GDP contracted by 3.8 percent in 2020 and forecasts it to grow by 2.8 percent in 2021.*
- *The recovery is tenuous in that most economies in MENA are expected to reach levels of GDP per capita in 2021 that remain below the levels of 2019.*
- *The recovery is expected to be uneven because the region-wide estimates mask differences across countries and within countries.*

Economies in the Middle East and North Africa (MENA) are experiencing a tenuous and uneven economic recovery amidst the ongoing Covid-19 pandemic. The World Bank estimates that MENA's GDP contracted 3.8 percent in 2020 and forecasts it to grow by 2.8 percent in 2021 (see Data Appendix Table B1).

The modest GDP growth in 2021 is 0.6 of a percentage point higher than the forecast made in April 2021[1] (see Data Appendix Table B2). Still, the region in aggregate would remain 1.1 percent below its pre-pandemic GDP level (see Figure 2.1 Panel A). Overall, the output cost of the Covid-19 crisis thus far in MENA is almost $200 billion dollars, a number derived by comparing the region's forecast GDP level with that of the no-Covid-19 scenario. Moreover, the potential for new virus mutations causes much uncertainty about the economic outlook, especially in countries that lag in vaccinations.

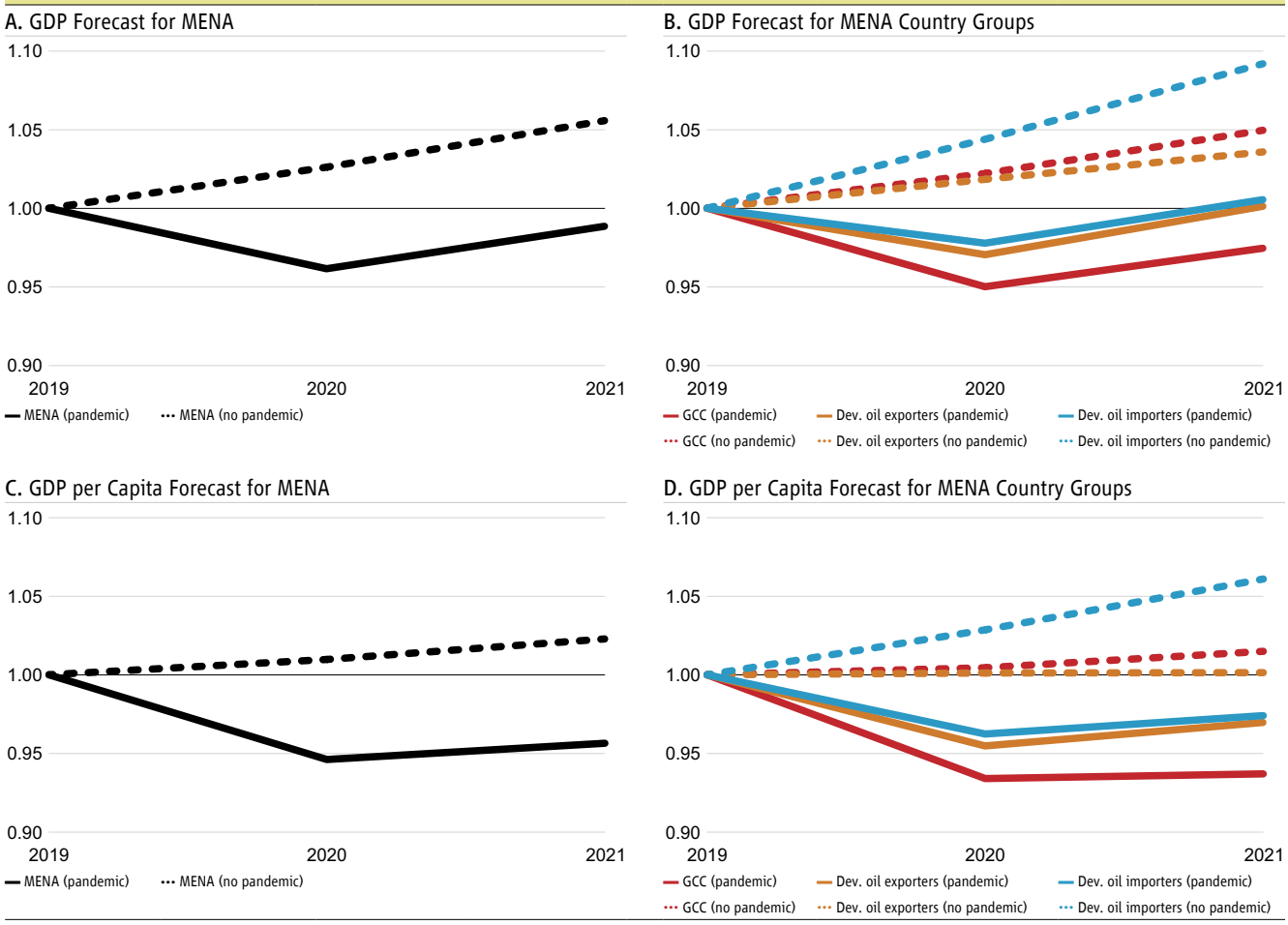
GDP per capita is arguably a more precise measure of the region's standard of living than GDP which, in the case of MENA, conveys a similar though more sobering message. The region's average real GDP per capita is forecast to increase by only 1.1 percent in 2021 after declining an estimated 5.4 percent in 2020. The region's real GDP per capita in 2021 would thus be 4.3 percent below its level in 2019 (see Figure 2.1 Panel C).

The GCC as a group is forecast to grow 2.6 percent in 2021 after contracting 5.0 percent in 2020, and other developing oil-exporting countries (OEC) are forecast to grow 3.2 percent in 2021 after contracting 3.0 percent in 2020. On the other hand, partly from an expected rebound in tourism and other economic activities, the region's oil-importing countries (OIC) are forecast to grow 2.8 percent in 2021, after contracting by an estimated 2.2 percent in 2020.

The recovery in GDP levels is also forecasted to be uneven across MENA country groups. In 2021, the GDP level for the GCC countries is forecasted to be 2.5 percent below the pre-pandemic level. However, the OEC and OIC will fare better because they did not experience as severe a contraction in 2020 as the GCC did. GDP levels of the OEC and OIC are forecast to exceed their pre-pandemic GDP levels (see Figure 2.1 Panel B). To be noted is that the OIC's performance is dominated by the recovery of the Egyptian economy, which accounts for more than half of this group's GDP.

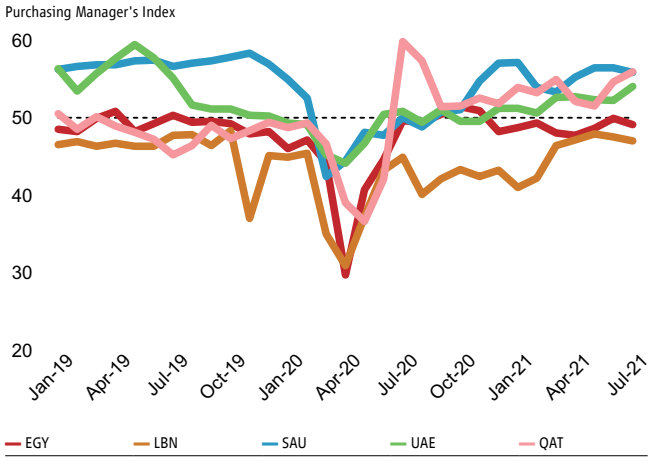
[1] In April 2021, World Bank economists forecasted the region's economic growth in 2021 would be 2.2 percent.

Figure 2.1. GDP Level and per Capita Forecasts (2019=1)



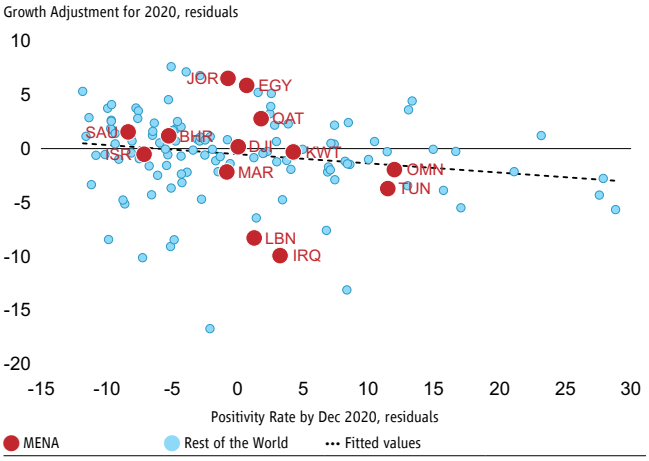
Sources: World Bank Macro Poverty Outlook.

Figure 2.2. An Uneven Recovery



Source: Bloomberg, L.P.
Note: Markit PMI for whole economy, seasonally adjusted, retrieved through Bloomberg.

Figure 2.3. Growth Adjustments and Positivity Rate



Source: Authors' calculation.
Note: The scatter plot shows the partial correlation between growth adjustment in 2020 and positivity rate, based on regression (1) discussed in Appendix Table A1.1.

Growth in GDP per capita in 2021 for the GCC, the other oil exporters, and the oil importers, is forecast to be only 0.3, 1.6, and 1.2 percent, respectively (see Figure 2.1 Panel D). In terms of GDP per capita, all three MENA country groups are forecast to still be below their pre-pandemic levels.

The risks to the region's growth outlook are also uneven. While the GCC is among the best in the world at vaccinating its citizens, the slow pace of the vaccine rollout in many developing MENA countries leaves them vulnerable to surges in covid cases as new variants emerge.[2] Political uncertainty and fragility in many developing oil exporters—such as Iran, Iraq, Libya, and Yemen—pose additional risks to the growth outlook for those countries.

Expectations of a modest global recovery in demand is fueling a correspondingly tenuous recovery in private-sector business confidence. Monthly Purchasing Managers' Indices (PMI), which track month-to-month changes in private sector investment decisions in anticipation of expected market conditions, can be interpreted as indicators of business sentiment. PMIs are available for a handful of MENA economies: Egypt, Lebanon, Saudi Arabia, the UAE, and Qatar. Readings above 50 signal improving business conditions for the private sector. In Lebanon, the PMI has been below 50 since at least 2019.

Figure 2.2 shows sharp contractions in March and April of 2020, but by September 2020, Egypt, Saudi Arabia, the UAE, and Qatar were all above 50, a level that signals improving business conditions. Saudi Arabia, the UAE, and Qatar have had PMIs above 50 since the beginning of 2021, which indicates continuous economic expansion in the private sector, consistent with the forecasts in output growth.

The PMI for Egypt, in contrast, fell again and has been below 50 since December 2020, which suggests a continuous deterioration in private sector confidence and investment prospects. Furthermore, beginning in the third quarter of 2020, the year-over-year decline in public investment in Egypt lessened and started to increase year-over-year in the first quarter of 2021. According to data from the Egypt Ministry of Planning and Economic Development, retrieved on August 17, 2021, nominal private investment fell by 43 percent year-on-year in the first quarter of 2021, while public investment increased by 14 percent year-on-year during the same period. Thus, at least for Egypt, there is abundant evidence suggesting uneven contributions of the private and public sectors to growth in 2021.

Impact of Public Health Surveillance

While the Covid-19 pandemic stopped the global economy in its tracks in early 2020, differences across countries in estimates of the economic costs of the Covid-19 pandemic are associated with the ability of each country's health systems to deal with the pandemic. Testing capacity is a crucial part of the health surveillance that is essential to disease prevention and response (de Walque and others 2020). Figure 2.3 shows the partial correlation between Covid-test positivity rates and the macroeconomic costs of the pandemic, proxied by the difference between pre-pandemic growth forecasts and the current estimates of GDP growth rates for 2020. The econometric estimates suggest that a 1 percent reduction in a country's test positivity rate is associated with 0.08 percent deterioration in the expected growth rate in 2020, after controlling for GDP per capita in 2019. A similar exercise to gauge the impact of the Covid-test positivity

[2] See a discussion on vaccination at Chapter 6.

rate on the expected accumulated macroeconomic cost of the crisis through 2021 also shows a downward adjustment in GDP for 2021, although smaller and less statistically significant.[3]

Fiscal balances in the region are expected to improve in 2021, especially in the GCC and other oil exporters thanks to rising oil prices (see Data Appendix Table B1). Nonetheless, with the fiscal deficits at 5.2 percent for MENA as a whole and 7.1 percent for the Oil Importing Countries in 2021, fiscal space—the ability of a government to ramp up spending sustainably to meet needs—remains limited at a time when the pandemic still requires substantial health and social expenditures. Public debt as a share of GDP will improve slightly but will remain high. For MENA on average, public debt as a share of GDP in 2021 is forecast to decline from 56.3 percent to 53.6 percent, while in the developing oil importing countries, public debt-to-GDP is forecast to rise, from 90.4 percent to 92.3 percent in 2021, as fiscal deficits remain large.[4]

Current account balances for MENA countries are also expected to improve in 2021, driven mainly by a large rebound in the region's exports, specifically due to oil. GCC and OEC countries are forecast to improve the most, as increased exports and increased oil prices buoy the revenues of all oil exporters.

Impact of Rising Commodity Prices

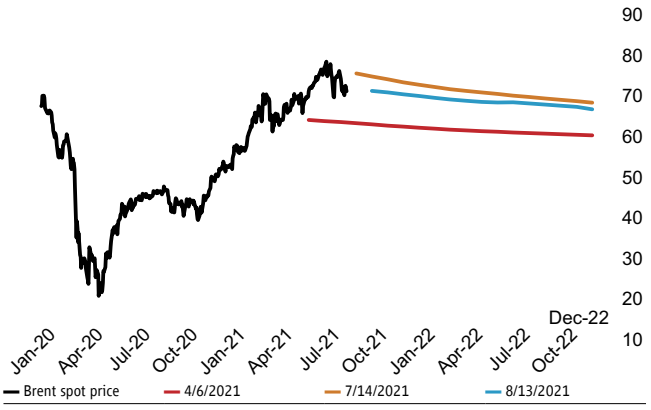
Since the last MENA Economic Update in the first quarter of 2021, oil prices have been rising continuously, while food price inflation, which tends to hurt the poorest families most, has moderated. Given MENA's diversified exposure to the commodity markets, the impact of the commodity price shocks differs across countries.

Figure 2.4 shows that at the beginning of the pandemic, when there was a petroleum price war, the price of oil was below $20 per-barrel. It rebounded following a production cut by the Organization of the Petroleum Exporting Countries (OPEC), then stalled a bit in September and October 2020, when fears of a slow economic recovery raised concerns about weak oil demand. The price of oil has been rising since the end of October 2020. It broke the $70-per-barrel mark in July 2021, as major world economies vaccinated large numbers of their residents and the oil production cuts continued.

The market expects that the oil price will gradually settle around $65 per barrel by the end of 2022. However, there is significant uncertainty regarding the trajectory. The downside risks come from two fronts. First, the Delta variant of the virus is pushing up Covid-19 cases around the world, generating new waves of stalled economic activity, which could reduce oil demand. Second, the global supply

Figure 2.4. Oil Prices and Futures

U.S. dollars a barrel; expiration dates on x-axis



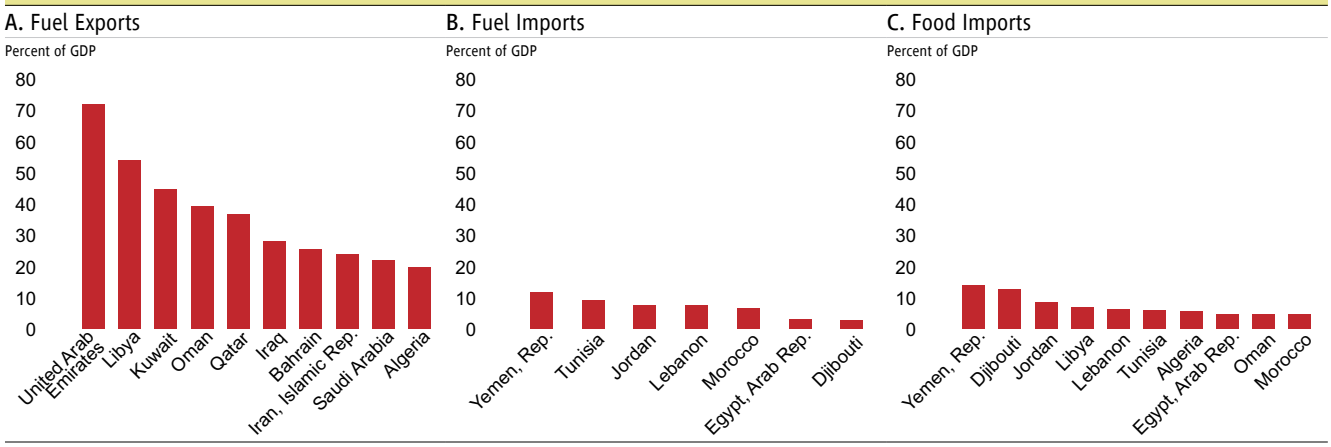
Source: World Bank MNA Chief Economist Office; and Bloomberg, L.P.
Note: The black line indicates spot price of Brent crude oil. The colored lines illustrate the futures prices of Brent crude oil on, respectively, April 6, 2021, July 14, 2021, and August 13, 2021.

[3] See Appendix A1.
[4] See Gatti et al. (2021) for a discussion about public debt vulnerability in the region.

of oil could increase so long as prices remain high. For example, shale oil production in the world's largest producer, the United States, could gradually resume if the oil price remains above producers' breakeven prices—estimated to be in the range of $60 to $90 per barrel (Kleinberg and others 2018).

Although high oil prices seem to be fueling economic activity in oil-exporting economies, they are probably depressing economic activity in oil-importing economies. Econometric evidence from a global sample of countries shows that a positive export price shock lifts GDP growth on average, while import price shocks do not seem to affect GDP growth significantly (see Appendix Table A2.1). But the situation appears to be different in MENA, where positive and negative commodity-price shocks have larger impacts on growth than in the rest of the world. Assuming the same exposure and price shocks, our econometric evidence suggests that export price shocks boost GDP growth for MENA's middle-income oil exporters much more than for the rest of the world. On the other hand, import price increases affect MENA countries, especially oil importers, more negatively than the rest of the world.

Figure 2.5. Exposure to International Commodity Markets



Sources: World Bank, *World Development Indicators*, and World Bank staff calculations.
Note: For Panel A: United Arab Emirates, Kuwait, and Qatar as of 2019; Libya, Oman, Bahrain, and Iran as of 2018; Algeria as of 2017; Saudi Arabia and Iraq as of 2016. For Panel B: Data as of 2019, except for Lebanon and Yemen as of 2018; and Djibouti as of 2009. For Panel C: Data for Egypt, Morocco and Tunisia as of 2019; Lebanon, Libya, Oman and Yemen as of 2018; Algeria as of 2017; and Djibouti as of 2009.

Figure 2.5 Panel A shows that fuel exports as a percentage of GDP exceeded 70 percent in the UAE in 2019 and were 20 percent or higher among all major fuel exporters—although the data reporting dates vary from 2016 to 2019. This means the region's top oil exporters, including developing oil exporters such as Libya and Iraq, will likely benefit from the high oil prices expected in the coming year.

Between March 1 and September 16 in 2021, the spot price of oil increased by 16 percent. Thus, it is worth asking if this oil price shock can explain the changes in the World Bank's growth forecasts since April 2021. Using econometric estimates presented in Appendix Table A2.1, we can compute the magnitude of the effect of the increase in the price of oil on expected growth. For the case of the GCC as a whole, the net impact of the increase in oil prices (after netting out the impact through imports of fuels) is +0.43 of a percentage point. For the MIC oil exporters as a group, the net impact is +0.28 of a percentage point. In contrast, for the region's oil importers, the net impact on expected growth due to the increase in the price of oil between March and September is -0.14 of a percentage point. Interestingly, the data on growth forecast adjustments presented in Appendix Table B2 indicate that the change in the growth forecast of the GCC in 2021 is +0.4 of a percentage point, which is very close to our estimate concerning the impact of the increase in the price of oil of +0.43 of a percentage point.

On the other hand, increases in oil prices can be a burden on the economies of fuel importers (see Figure 2.5 Panel B). Likewise, several MENA economies are also exposed to price increases in other commodities. Yemen, which is both the highest importer of oil and the highest importer of food in the region, is the most exposed economy in the region to the international market (see Figure 2.5 Panel C). Inflation in food prices is particularly damaging to those living in poverty. The number of people living in poverty (less than $5.50-a-day) is expected to rise to 189 million in 2021. This forecast underestimates the poverty rate, because it assumes that every household is equally affected while, in fact, food prices disproportionally affect the poor.

Admittedly, when the price of oil increases, remittances from citizens working as expatriates in oil-exporting countries are one source of income for oil importers. Nevertheless, these flows are unlikely to offset the depressive effect high energy prices have on growth in oil-importing countries, at least not contemporaneously.

In sum, the MENA region is experiencing an uneven and tenuous recovery from the Covid-19 crisis. World Bank forecasts indicate that few MENA countries will recover to the levels of economic activity they had reached in 2019. The few cases in which GDP in 2021 is expected to surpass the pre-Covid levels—Egypt, for example—remain constrained by anemic private sector dynamism. Oil exporters appear to be recovering as global oil markets rebound, and this recovery seems to have buoyed private sector activity as well. Yet, a majority of these economies will remain below their pre-Covid-19 levels at the end of 2021. In addition, global fluctuations in other commodities, particularly food staples, were associated with domestic food price inflation, which tends to hurt poor households the most. In the end, economic performance during 2020 seemed to be partly associated with the ability of countries to deploy effective public health surveillance strategies, whereas vaccination rates are likely to play a more important role in the near future.

The following chapters provide a longer-term view of how broader socio-economic and health fault lines left MENA ill-prepared to absorb the massive shock of the Covid-19 pandemic.

CHAPTER 3. MENA'S TRUNCATED ECONOMIC TRANSITIONS AND THEIR IMPLICATIONS FOR ECONOMIC GROWTH

Main takeaways

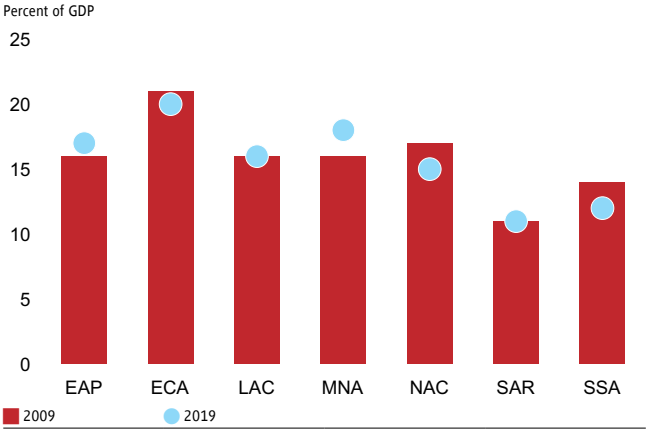
- *The region abandoned a transition to market economies as the economic footprint of the public sector grew during the decade ending in 2019.*
- *In the process, MENA suffered from fiscal myopia: as public sector wage bills rose, public expenditures in health ended up being atypically low for MENA's level of development.*

Before the social unrest associated with the Arab Spring in 2011, MENA countries pursued a state-centered development model that was clearly under duress as evidenced by rising macroeconomic vulnerabilities, including public debt, fiscal deficits, and trade imbalances. However, post Arab Spring, governments in the region failed to embark on the deep reforms that were needed to move towards market-based and inclusive growth. If anything, some of the very policies that characterized the traditional social contract became more entrenched and the footprint of the public sector in the economy increased. For example, data from Tunisia showed a sharp jump in public sector employment after 2010. Across the board, this trend resulted in an unfinished economic transition towards a market economy. This chapter documents how this transition was cut short and left MENA countries with persistently large public sectors that likely crowded out investment in other priorities such as public health.

Appendix A3 describes the empirical strategy used to characterize the extent to which MENA countries experienced truncated economic transitions during the decade before the Covid-19 shock. Specifically, the econometric approach compares the level of specific indicators for MENA countries on the eve of the pandemic with those of countries at the same level of development in 2009, a decade before the global pandemic.

Despite a need to transition to market economies, the public sector's role instead expanded after 2011. To document the region's truncated economic transition, this report uses government expenditure as a share of total GDP as the proxy indicator to represent the size of the public sector's economic footprint. MENA is the only region in the world where government expenditures as a share of GDP grew substantially from 2009 to 2019 (see Figure 3.1). The more than 2 percentage point increase in MENA contrasts with a decline in Europe and Central Asia, Latin America and the Caribbean, North America, and sub-Saharan Africa. Public expenditures as a percentage of GDP grew by less than 0.5 of a percentage point for East Asia and the Pacific and South Asia. As of 2019, the size of the public sector in the MENA region was second only to Europe and Central Asia's.

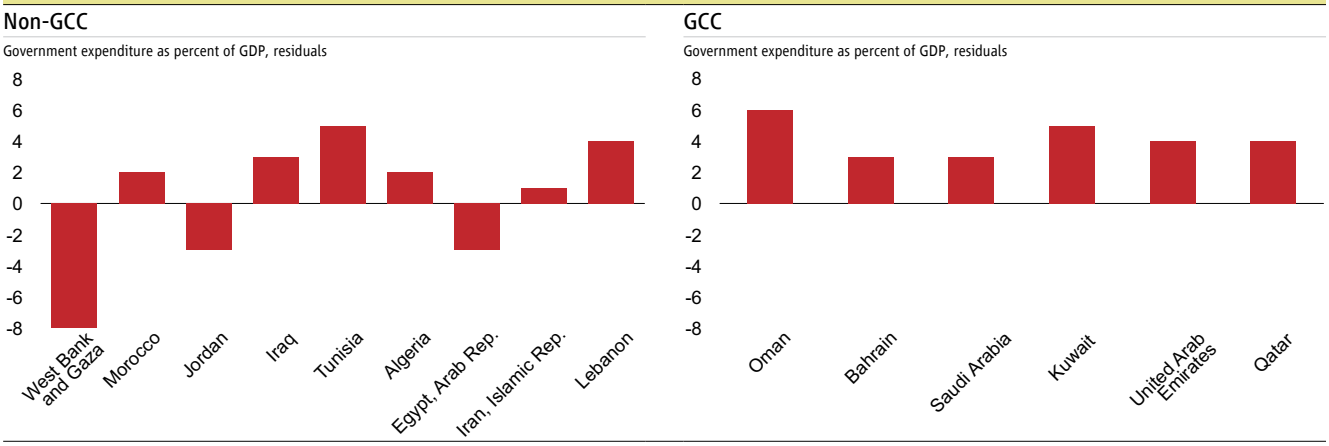
Figure 3.1. Government Expenditure in Total GDP in 2009 and 2019



Source: World Bank, World Development Indicators.
Note: based on data from 160 countries whose data are available. Data from 2017 and 2018 are used when 2019 data is not available.

Perhaps more important than the increase in the size of the public sector is the region's performance compared to what was expected, given the regional economies' levels of development. At the country level, on the eve of the pandemic, half of GCC and half of MENA's middle-income economies had government expenditure shares of GDP that were higher than the global average. However, the econometric results in Figure 3.2, indicate that all GCC countries had higher-than-average increases in government expenditure shares between 2009 and 2019, when compared to their peers that started at the same level of income per capita in 2009. Except for Egypt, Jordan and the West Bank and Gaza, non-GCC countries also experienced higher increases (or smaller declines) in the share of government expenditure in GDP relative to their peers. Thus, the growth in MENA's public sector was atypical compared with countries with the same level of GDP per capita.

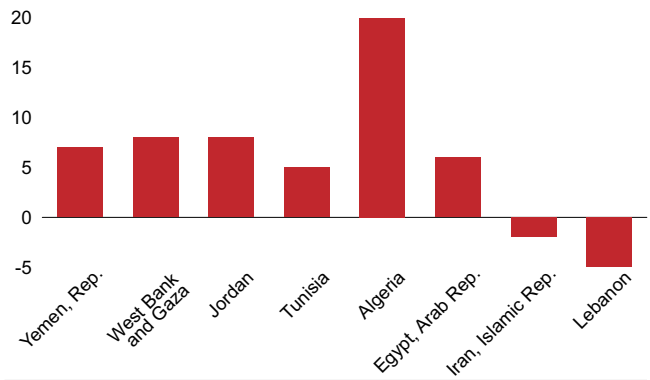
Figure 3.2. Changes in Government Expenditure over GDP, 2019 minus 2009 Relative to Benchmarks by Levels of Development



Source: World Bank, *World Development Indicators*, World Bank staff calculations.
Note: The charts present residuals from regressions of the difference between 2019 and 2009 shares of general government consumption expenditure as percent of GDP, on 2009 log GNI per capita in model (2) as discussed in Appendix A3. The placement order of the country bars reflects a sorting of the countries in ascending order by GDP per capita, PPP.

In the social contract prevailing in the region, many countries overused public employment to maintain social peace and consensus (Gatti and others 2013). As such, a similar analysis of the size of public sector employment yielded similar results to those of government size. Figure 3.3 shows the regression residuals relative to the benchmark for countries of similar levels of GDP per capita for non-GCC countries with internationally comparable data. In this sample, only Lebanon appears to have had low public-sector employment for its level of development.[5] Of course, Lebanon was already struggling to finance its public sector in 2019, the data year used for benchmarking, prior to its eventual default on its public debt payments in March 2020.

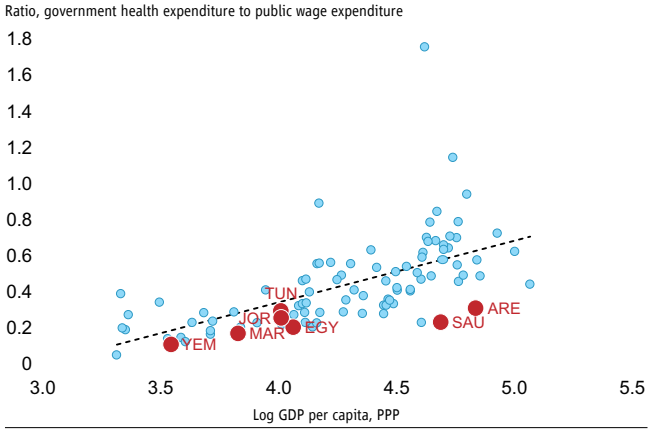
Figure 3.3. Shares of Public Employment in Non-GCC MENA Relative to Benchmarks by Levels of Development



Sources: United Nations, International Labor Organization; World Bank, *World Development Indicators*, World Bank staff calculations.
Note: Residuals from simple OLS regression of public share of employment (latest year available) on 2009 log GNI per capita. Employment data years: 2019 (Lebanon, Egypt, Iran, Jordan), 2018 (West Bank & Gaza), 2017 (Algeria, Tunisia), 2014 (Yemen). The placement order of the country bars reflects a sorting of the countries in ascending order by GDP per capita, PPP.

[5] The literature started by Paolo Mauro (1995) and then continued by Alesina and others (2003), shows that highly fractionalized countries underinvest in the public good. This seems to be the case of Lebanon.

Figure 3.4. Public Health Expenditures over Public Sector Wage Bills versus GDP per Capita, 2018



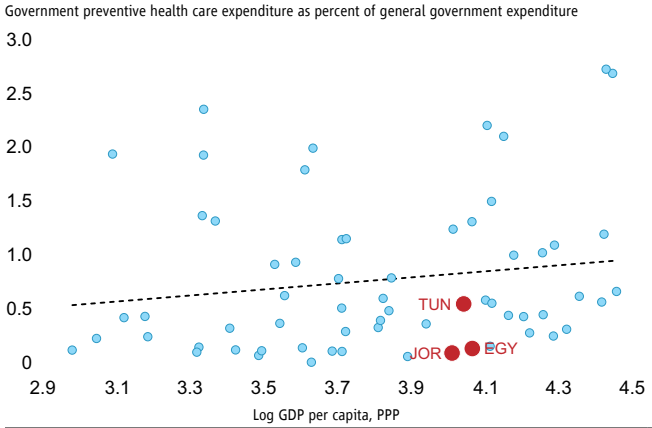
Sources: World Health Organization, *Global Health Expenditures* database (government health expenditure), International Monetary Fund (GDP, public compensation expenditure), World Bank (PPP), World Bank staff calculations.
Note: Linear trendline shown. Country data years: 2018 or later (UAE, Saudi Arabia, Jordan), 2015 (Egypt), 2012 (Tunisia, Yemen), 2011 (Morocco).

The truncated economic transitions left MENA countries with notable fiscal and financial vulnerabilities that could have negative implications for productive public spending (see Huidrom and others 2020; Gatti and others 2021). Figure 3.4 shows that spending on health is overshadowed by large public-sector wage bills. For all MENA countries with available data, the ratios of government health expenditure to public wage expenditure are below those of other countries with similar income.

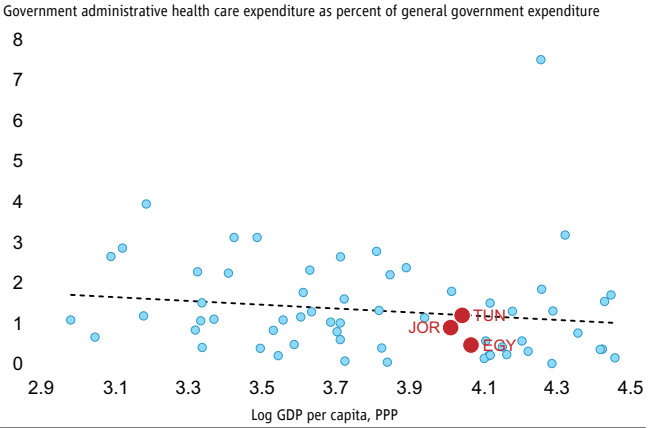
There is a large literature discussing health spending by public and private actors (for example, Kurowski 2021). While there isn't global consensus on an optimal threshold for health spending, some countries clearly spend large shares of GDP on health and others spend very little. Some MENA countries, such as the UAE, devote a significant share of government expenditure to health. Yet, what matters is how, and how well, money is spent. A growing consensus in the health literature is that reforms should aim at achieving universal health coverage (UHC) in ways that promote preventive and primary care and build resilient health systems. This couldn't be more relevant than in the present, considering the health care needs during the pandemic. Yet, the data show that fewer resources are devoted to preventive health and building a health system. Data for 65 countries, including three in MENA—Egypt, Tunisia and Jordan, show that preventive health care expenditure as a share of general government expenditure in these three MENA countries, is lower than in the other countries in the sample. Panel A of Figure 3.5 shows that the share of preventive health care is lower than would be predicted based on income. Spending is also lower for governance, health system, and administration expenditure. That is, Jordan, Egypt and Tunisia spend less on building a national health system (as a share of total government spending) than their income peers (see Figure 3.5 Panel B).

Figure 3.5. Spending on Preventive Health and Health System Functions

A. Preventive Health in Government Spending vs GDP per Capita



B. Health System Expenditure in Government Spending vs GDP per Capita



Source: WHO GHE Database (Government Preventive Health Care Expenditure, Government Health Care Expenditure on Governance, Health System and Financing Administration); World Bank, *World Development Indicators* (GDP per capita, PPP), World Bank staff calculations.
Note: Observations are from 65 countries. Data are as of 2018.

Part of this underinvestment in health, and specifically preventive health, can be explained by the notion of "fiscal myopia." Governments usually face pressing short-term needs, many of which carry important political implications, and find it more convenient to focus on spending that generate short-term effects rather than long-term social gains.[6] Viewed through this lens, expenditures on public employment arguably have favorable short-term political effects: public employment can help maintain social order. Preventive health care, on the other hand, can have long term salutary effects on both public health and economic growth.[7] But since the Arab Spring, fiscal myopia has been severe in MENA, as evidenced by the fact that spending on preventive care and on the health system more generally, was abnormally low compared to other countries with similar income. This in a region where overall government expenditures grew. When combined with other factors in the region that hamstrung policymaking—particularly governance failures, including lack of transparency and accountability—this short-term thinking indirectly prevented investments in public health (and other public services) that were needed to build resilient public health systems capable of absorbing the shock of unexpected health events, such as those that can arise during epidemics, natural disasters and armed conflict. Indeed, the region's armed conflicts also limit fiscal space for long-term public health investment in conflict-affected countries, but importantly also in countries that bear the cost of hosting refugees.[8]

The truncated economic transitions thus left MENA with notable fiscal and financial vulnerabilities, while public health and possibly many other public services were left to deteriorate. The developmental challenges produced by the abandoned transition to market economies were compounded by truncated demographic and epidemiological transitions, which are discussed in the following chapters.

[6] The literature on political business cycle discusses how fiscal and monetary policy tools are used by incumbent politicians hoping to stimulate the economy prior to an election and thereby greatly improving their own and their party's reelection chances. See Drazen (2000) for an overview.

[7] Preventive care includes immunization, health checkups, health education, disease detection, monitoring and emergency response programs.

[8] In many conflicted-affected countries, the private sector and non-governmental organizations are a key source of healthcare where government services are unavailable.

CHAPTER 4. MENA'S TRUNCATED DEMOGRAPHIC AND EPIDEMIOLOGICAL TRANSITIONS

Main takeaways

- *A truncated demographic transition left behind inflated dependency ratios associated with external macroeconomic imbalances in some countries and created the illusion of low burden of disease that were due to an increase in the population's share of children.*
- *MENA's truncated epidemiological transition left the region with atypically high age-adjusted burdens of non-communicable diseases (NCDs).*

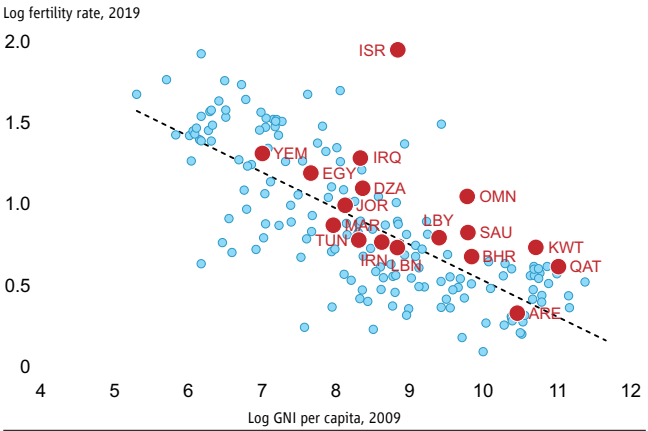
MENA's Truncated Demographic Transition

As countries develop and take advantage of advances in health and medical care, life expectancies increase and fertility rates decline. At some point these two developments increase the working-age cohort relative to the young and elderly cohorts. The resulting decrease in the two dependency ratios (which, together, essentially measure the percentage of the population that does not work) boosts aggregate output per capita, enabling an acceleration in the growth rate of GDP per capita. This outsized representation of the working age population that benefits output has been dubbed the "demographic dividend."[9] In addition, as the relative size of the working-age population rises, national savings increase, which reduces the current account deficit, a major macroeconomic vulnerability that has been observed in several MENA economies since the onset of the Arab Spring in 2011.

The MENA region has not realized the full potential of the demographic dividend. The evolution of MENA's population distribution by age has been characterized by the growth of young people and the elderly. Fertility rates remained elevated, even as life expectancy increased and infant mortality declined, thus yielding higher youth and old-age dependency ratios. MENA has yet to experience its demographic dividend and thus is relegated to lower economic growth rates than it could otherwise achieve.

This section uses a country's fertility rate as a proxy indicator to represent the demographic dynamics of the country. Figure 4.1 shows the relationship between fertility rates in 2019 and GDP per capita in 2009 across a global sample of countries. Fertility rates tend to decline as the

Figure 4.1. Fertility Rates versus Gross National Income per Capita

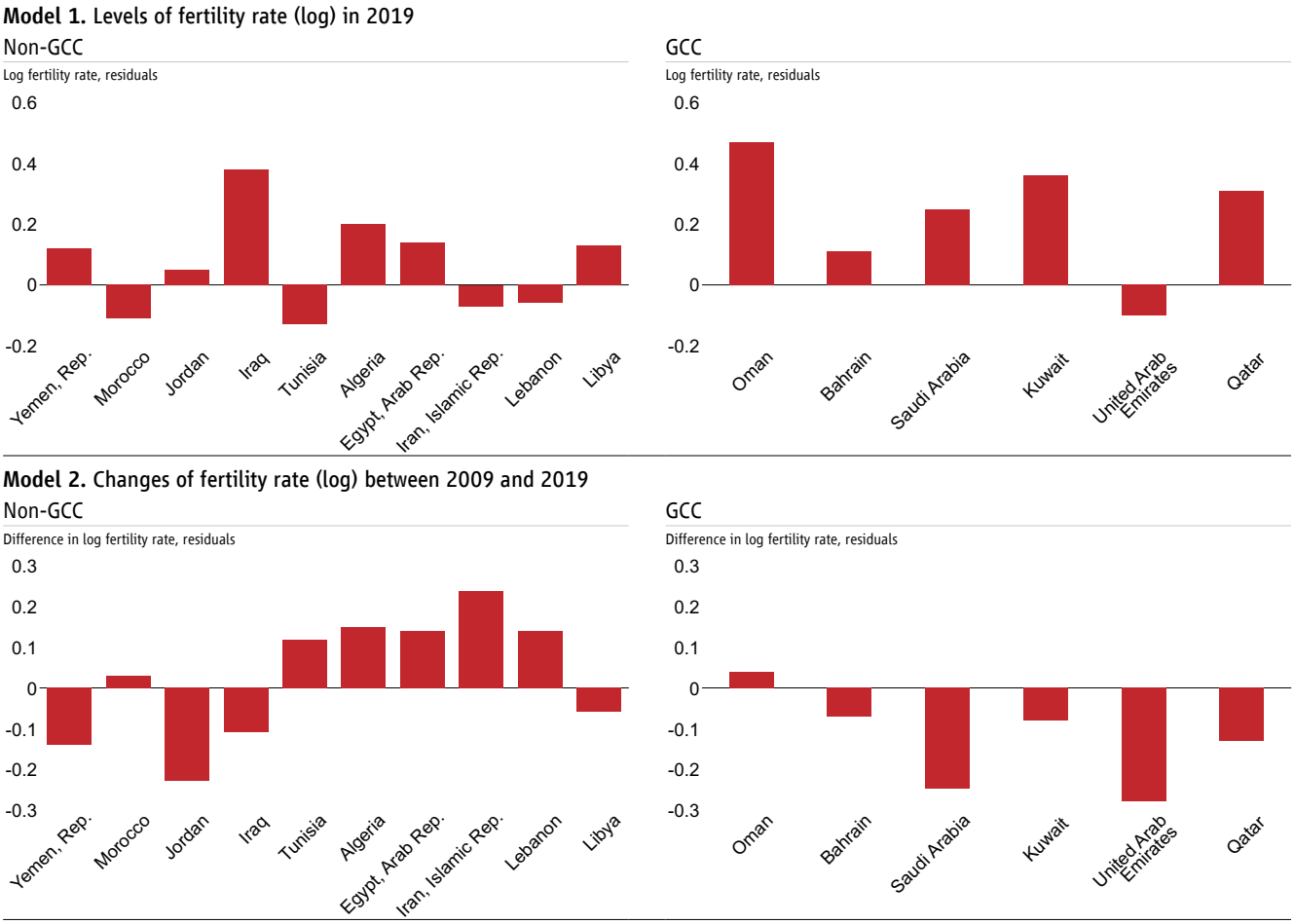


Sources: United Nations, *World Population Prospects*; World Bank, *World Development Indicators*, World Bank staff calculations.
Note: Linear trendline shown.

[9] See World Bank (2016) https://www.worldbank.org/en/publication/global-monitoring-report.

level of development rises: a 1 percent increase in GDP per capita is associated with a 0.22 percent decline in the fertility rate. More importantly, while this negative relationship seems to hold up within MENA—richer countries in the region seem to have lower fertility rates—MENA countries have fertility rates that are above the expected levels compared with countries at similar income levels. This applies for all income country groups in the region, including the GCC (except the UAE) and most non-GCC countries (except Morocco, Tunisia, Lebanon, and Iran). The exceptions are only slightly below the expected levels.

Figure 4.2. Fertility Rates in MENA Compared to Benchmarks by Levels of Development



Sources: United Nations, *World Population Prospects*; World Bank, *World Development Indicators*, World Bank staff calculations.
Note: Residuals in top panels calculated from regression of 2019 log fertility rate on 2009 log GNI per capita in model (1) as discussed in Appendix A3. Residuals in bottom panels calculated from regression of the difference in 2019 and 2009 log fertility rates on 2009 log GNI per capita in model (2). The placement order of the country bars reflects a sorting of the countries in ascending order by GDP per capita, PPP.

Figure 4.2 shows the econometric benchmarking results for MENA countries. All GCC countries (except for UAE) and more than half of non-GCC countries had higher fertility rates than their income peers in 2019. Furthermore, non-GCC countries with relatively lower fertility growth rates, such as Jordan and Iraq, remained above their peers in 2019. Meanwhile, countries with fertility rates lower than their peers, such as Iran and Tunisia, experienced higher-than-expected increases in fertility between 2009 and 2019. Data from U.N. World Population Prospects show that the fertility rate dynamics in many countries of the region changed from years of continued declines to a sudden increase in the late 2000s and early 2010s (see El-Saharty et al. (2021) for the case of Egypt). Indeed, in the aftermath of the Arab

Spring, most MENA countries had atypically high fertility rates for their levels of development as of 2009, or experienced unusual increases in fertility rates between 2009 and 2019—thus yielding truncated demographic transitions.

Why MENA's fertility rates have remained elevated is an issue beyond the scope of this report. Nevertheless, taking the high fertility rates as a given, the effect was that the young-age dependency ratios were higher on the eve of the pandemic, with important health, fiscal and economic consequences.

First, an elevated high young-age dependency ratio could hurt women's health or hamper public and private investment per capita in children's education and health, especially in low-income countries.

Second, the incomplete demographic transitions in MENA could have damaged the region's macroeconomic balances and growth. The elevated young-age and old-age dependency results in higher fiscal burdens for MENA countries and a fiscally unsustainable public sector, as government tax revenues become insufficient to meet the population's health and education expenditure needs even as the public sector continues to play an outsized role in MENA economies. Yet, the development model in which the public sector is the employer of first resort, as in MENA, is not sustainable in the long run as evidenced by chronic low growth and fiscal vulnerabilities. Moreover, the higher dependency ratios also depress private savings because more household resources are allocated to the needs of children and the elderly, which diverts resources that otherwise could have been available to fund investments needed to underpin economic growth. As a result, low government and private savings contributed to chronic current account deficits. Indeed, higher young-age and old-age dependency ratios are associated with a negative and significant impact on the current account balance (Arezki and others 2020). The high dependency ratios also lower output per capita (as the young and the elderly largely do not work).[10]

MENA's Truncated Epidemiological Transition

Epidemiological dynamics—the evolution of the causes of mortality in a country's population—operate in tandem with demographic dynamics as a country progresses from lower- to higher-income levels. Specifically, as countries become richer, better access to health and medical care results in fewer deaths from infectious (communicable) diseases. During this process, the share of deaths due to non-communicable diseases (NCDs) tends to rise (Omran 2005).[11] Because the old-age dependency ratio in MENA is elevated during this truncated epidemiological transition, NCDs—such as cancers, cardiovascular diseases, diabetes, and chronic respiratory infirmities—become a bigger cause of mortality. For example, diabetes is a major biological risk factor for NCDs, and the prevalence of diabetes has increased by 99 percent over the past decade in Saudi Arabia, from 1.4 million cases in 2009 to 2.7 in 2019. It has become both a health burden and a large economic drag because of its effect on human capital (World Bank forthcoming). The prevalence of obesity and diabetes in MENA is among the highest in the world (see Figure 4.3).

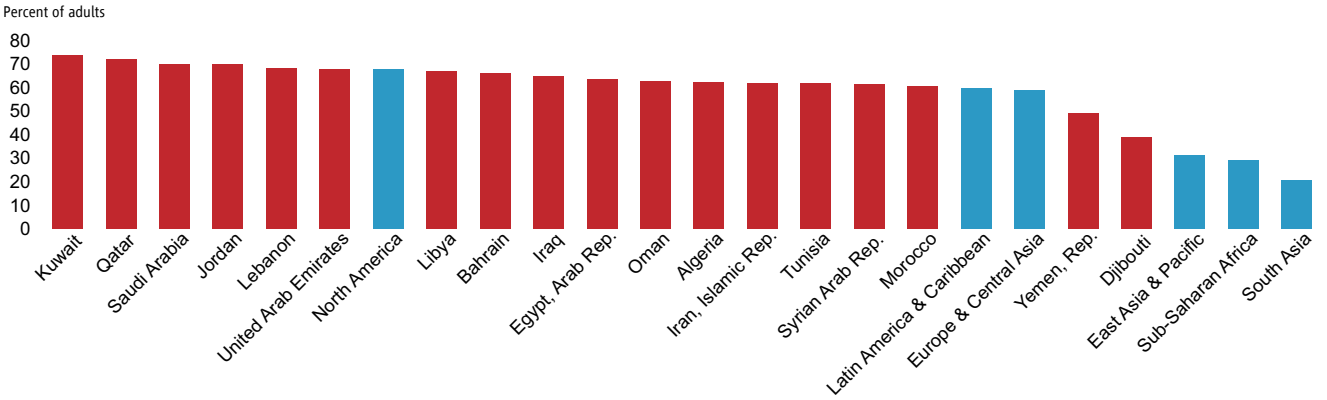
A symptom of an incomplete epidemiological transition is a high burden of disease from both communicable and non-communicable diseases. In MENA, instead of transitioning from communicable diseases to NCDs as the main

[10] To put the negative effects into perspective, in 2019, the fertility rate for MENA is on average 1.14 percentage points higher than for other countries with similar development levels. In 2019, the simple average share of the working age population in MENA was 51.8 percent, hence the 1.14 additional percentage point higher fertility rate implies a 2.2 percent higher young-age dependency over the course of the next 14 years (i.e., until the children get to 15 years old). Feeding this input into the estimated coefficient obtain in Arezki and others (2020), we find that the accumulated effect is a current account deterioration of 0.8 percent of 2019 GDP (assuming real GDP is growing at 1 percent a year).

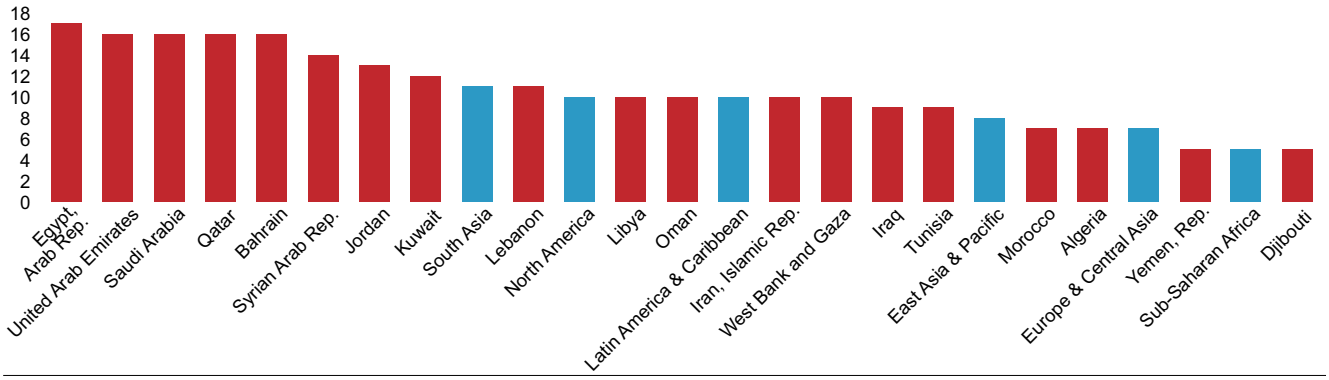
[11] Appendix Table B3 in the Appendix contains basic health indicators in MENA and the rest of the world by income groups.

Figure 4.3. Obesity in MENA and the Rest of the World

A. Prevalence of Overweight in MENA Countries and the Rest of the World



B. Prevalence of Diabetes in MENA Countries and the Rest of the World

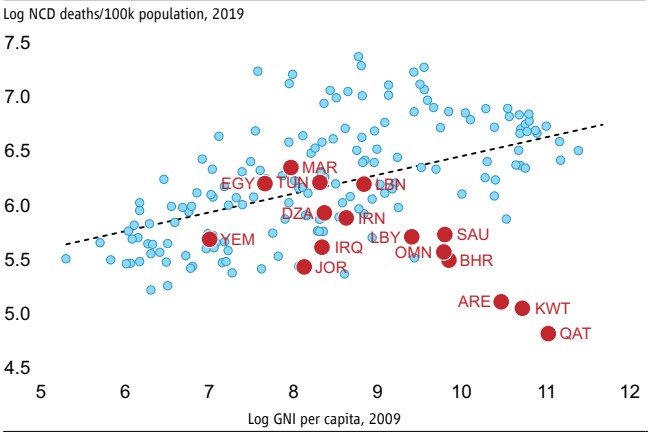


Source: World Bank, *Health Nutrition and Population Statistics*.

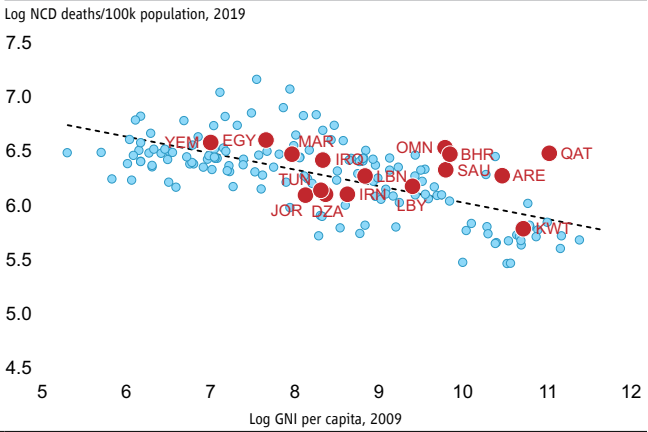
Figure 4.4. The Illusion of Healthy Populations when Age Demographics Differ across Countries

Deaths per Capita due to Non-Communicable Diseases

A. Without age adjustment



B. With age adjustment



Sources: World Health Organization, *Global Health Observatory*; World Bank, *World Development Indicators*.
Note: Age adjustment calculations conducted by World Health Organization. Linear trendline shown.

causes of deaths when incomes rose, the middle-income countries of MENA were experiencing many deaths from both communicable diseases and NCDs in 2019, on the eve of the Covid-19 pandemic. MENA countries began the 2010s well below income peers in rates of communicable disease death, but by 2019 that gap had begun to close regionwide. Meanwhile, all GCC states except for Bahrain ended the decade with communicable disease death rates higher than their income-level peers.

MENA's deaths from NCDs per 100,000 people are shown in two charts in Figure 4.4. Panel A plots NCD deaths per 100,000 people (log) against GDP per capita in 2009. Panel B relates NCD deaths per 100,000 (log) to the initial income level in 2009—after age standardization, which assumes that age groups have the same representation in all countries. The panels show MENA from two different angles. Age standardization is critical for comparing NCD burdens across countries because NCDs are not uniformly distributed across age groups.[12] Without age-standardization, countries with younger populations, such as most of those in the MENA region, will appear to have very low NCD death rates because a smaller portion of their population is in an age range that is susceptible to NCDs. However, it is also possible that NCDs are affecting the health of the young at abnormally high rates—for example, due to obesity and diabetes. Standardizing the data by reweighting each country's age categories to reflect a synthetic reference population developed by the World Health Organization (WHO) permits the comparison of each country's NCD burden while controlling for its population age distribution.[13]

In Figure 4.4 Panel A it appears that MENA countries had fewer deaths from NCDs than did their peers in 2019. But it is a statistical illusion, due entirely to the age composition effect. In Panel B, after adjusting for age of the population, almost all MENA countries have a greater-than-expected number of deaths from NCDs. This is worrisome because it implies that the co-morbidities and lifestyle factors that underlie NCD deaths are high in MENA for all age groups relative to societies at similar levels of development. Because the strongest co-morbidities for Covid-19 infections are rooted in weight and metabolic health (diabetes, heart disease, insulin resistance), the fact that NCDs are occurring more than they should among a younger population in MENA is concerning. This truncated epidemiological, as well as demographic, transition, is largely a result of weak public health systems—the same systems now tasked with dealing with a pandemic.

Furthermore, MENA's rates of communicable diseases did not recede as quickly as in the rest of the world during the past 10 years (see Figure 4.5 Panel A). Also, except for North America, MENA has had the smallest decline in age-adjusted NCD deaths of all regions in the world (see Figure 4.5 Panel B).

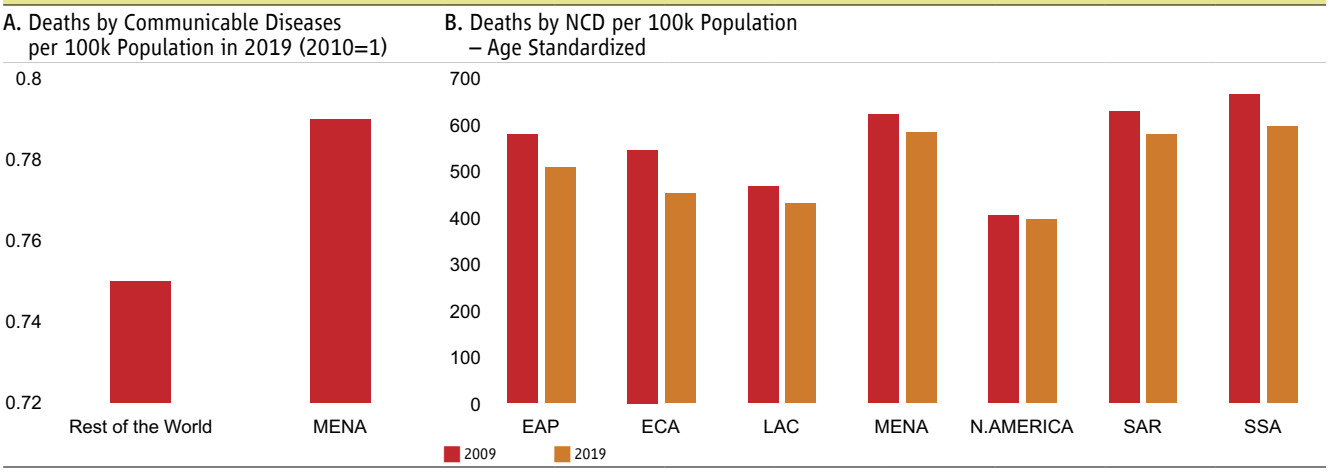
Figure 4.6 shows the econometric benchmarking results at the country level. They suggest that NCD burdens remain high relative to peers across the income spectrum in the region. As of 2019, except for Kuwait, GCC countries had higher NCD deaths per capita than their peers. More than half of the developing countries in MENA also suffered higher NCD death rates than peers—except Jordan, Algeria, Tunisia, and Iran.

GCC countries were making progress relative to income peers. As shown in the lower panel of Figure 4.6, the results from the econometric benchmarking model of changes in the burden of NCDs over the past decade are slightly more negative than peers, except for the UAE. Rates for non-GCC countries, meanwhile, either increased more quickly or declined more slowly over the past 10 years than did those of their income peers—except for Algeria and Jordan.

[12] For more details on NCD deaths distribution across age groups, see Ramon Martinez and others (2020).

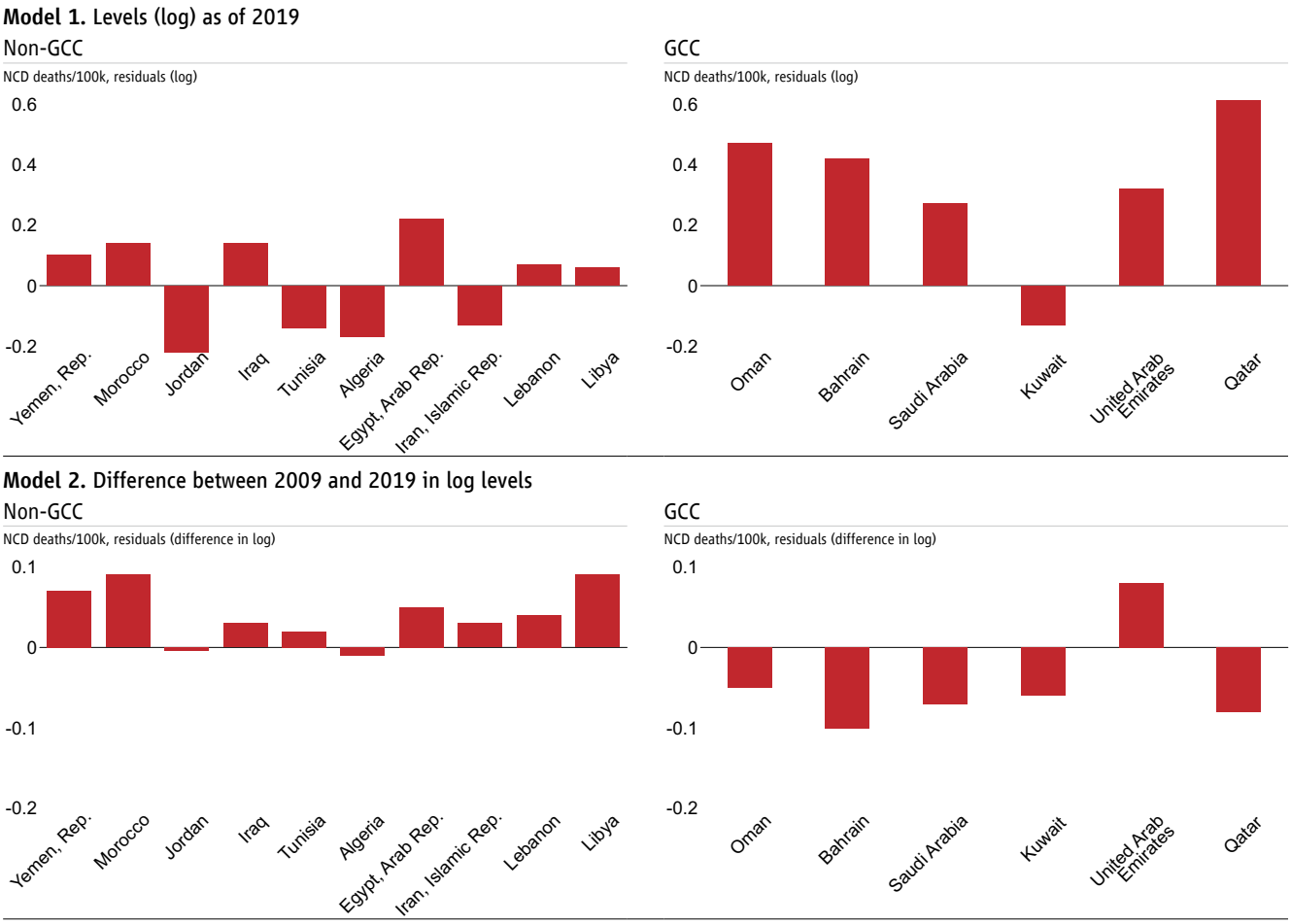
[13] For a description of the age-standardization procedure, a history of the practice, and background behind the WHO's current global standard population, see Ahmad, Omar B., and others. "Age standardization of rates: a new WHO standard." *Geneva: World Health Organization* 9.10 (2001).

Figure 4.5. Burden of Communicable and Non-Communicable Diseases



Source: Authors' calculations based on data from *World Health Organization*.
Note: Regions are represented by weighted average of member countries.

Figure 4.6. Age-Standardized Deaths from Non-Communicable Diseases per 100,000 Population in MENA Relative to Income-Level Benchmarks



Sources: World Health Organization; World Bank, *World Development Indicators.*
Note: Residuals in top panels from a regression of 2019 log age-adjusted deaths from noncommunicable diseases per 100,000 population, on 2009 log GNI per capita in model (1) as discussed in Appendix A3. Residuals in bottom panels from a regression of the difference between 2019 and 2009 log age-adjusted deaths from noncommunicable diseases per 100,000 population, on 2009 log GNI per capita in model (2). The placement order of the country bars reflects a sorting of the countries in ascending order by GDP per capita, PPP.

The preponderance of the evidence indicates that MENA experienced truncated economic, demographic, and epidemiological transitions in the decade preceding the Covid-19 pandemic. The truncated demographic transition caused inflated dependency ratios associated with external macroeconomic imbalances in some countries and created the illusion of low burdens of disease that was purely the result of an increase in the already outsized share of youth in the population. In turn, MENA's truncated epidemiological transition left the region with atypically high age-adjusted burdens of NCDs for countries at similar levels of development as MENA's. The few countries that had comparatively low burdens of NCDs were also countries that had unusually large increases in the age-adjusted NCD burdens between 2009 and 2019.

This report will next assess the state of MENA's public health systems on the eve of the pandemic. Empirical evidence indicates that numerous MENA governments were overconfident about the capabilities of their health systems.

CHAPTER 5. OVERCONFIDENT: THE STATE OF MENA'S PUBLIC HEALTH SYSTEMS ON THE EVE OF THE PANDEMIC

Main takeaways

- *Resource adequacy for MENA's health systems varies greatly, but the availability of basic health system data is uneven at best.*
- *Empirical evidence indicates that numerous MENA governments were overconfident about their health systems' capabilities.*

Even as the incomplete demographic and epidemiological transitions left MENA with high disease burdens and unprepared health systems at the end of 2019, officials in many of those countries had an overly optimistic view of the readiness of those systems.

High-quality health systems are essential to good health outcomes.[14] The recent pandemic has highlighted the importance of public health systems' resilience, which is best understood as their "capacities to prepare for, recover from, and absorb shocks, while maintaining core functions and serving the ongoing and acute care needs of their communities" (Haldane and others 2021). Health system resilience is determined by a system's functional and reserve capacities across the various building blocks of the health system. *Functional capacities* supply core health system services to meet chronic demands. *Reserve capacities* are the abilities of a system to ramp up services quickly when demand for them increases sharply, such as happens during a pandemic. The system's building blocks include resourcing, comprising financing, workforce, medical products and technologies; delivery, comprising individual health services and public health functions; and governance, which comprises the political and management elements of a health system. Each building block of the MENA health system is discussed below.

Inadequate Financing Hinders Health System Resources

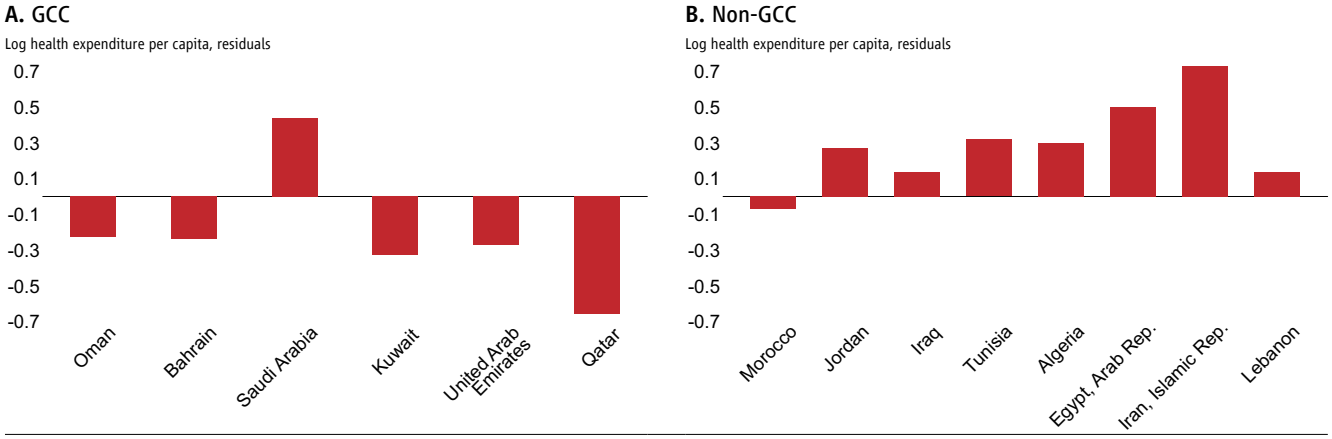
Financing is critical to providing resources for the health system, yet both GCC and developing MENA face major, albeit different challenges, in funding their systems. There is no clear optimum target for health spending because the effectiveness of such spending varies from country to country. However, some analysts argue that low- and middle-income countries that increase efficient government health spending up to about 5 percent of GDP, tend to attain better health outcomes (World Bank 2018; Andrews and others 2019). According to data from the WHO, as of 2018, Egypt, Iraq, and Djibouti fell short of the 5 percent goal.

Comparisons of health spending controlling for the country's level of development, are perhaps more revealing than fixed expenditure targets. In this respect, MENA shows a mixed picture of total health expenditures per capita. The GCC countries typically spend less per capita than peers (see Figure 5.1 Panel A) and developing MENA countries typically

[14] https://www.thelancet.com/commissions/quality-health-systems.

spend more per capita than peers (See Figure 5.1 Panel B). However, the reality is that citizens of MENA countries, especially in the developing economies, risk being impoverished by high out-of-pocket spending at the point of service because public spending covers so little of health services.

Figure 5.1. Health Spending in MENA Compared to Level of Development



Sources: World Health Organization, Global *Health Expenditures*; World Bank, *World Development Indicators*.
Note: Residuals from regression of 2018 log health expenditure per capita on 2008 log GNI per capita in model (1). The placement order of the country bars reflects a sorting of the countries in ascending order by GDP per capita, PPP.

The limited fiscal space caused by the truncated economic transition to market economies, particularly in developing MENA, has two key consequences on health financing.

First, the lack of budget flexibility prevents governments from assuming the costs of providing healthcare and shifts health spending to patients, who must pay out of pocket. Out-of-pocket spending (OOPS) accounts for a major portion of health spending in many middle-income and low-income MENA countries (see Figure 5.2). For example, the share of OOPS in total health spending is around 60 percent in Egypt and 80 percent in Yemen. By contrast OOPS is 6 percent in Oman, where the government pays for most health services.

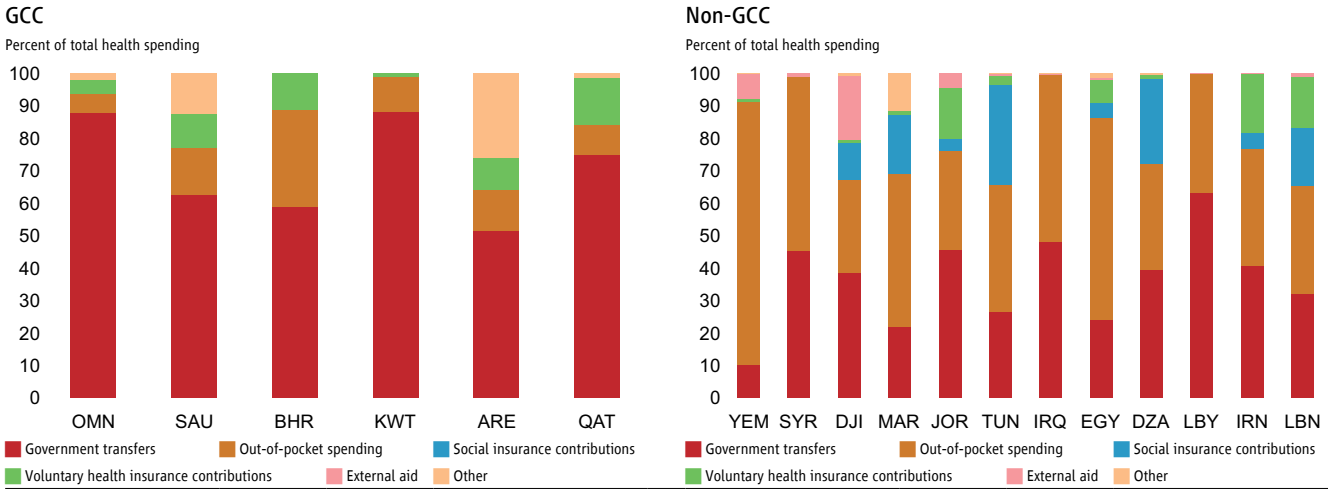
A good health financing system should spread the cost of paying for health care by providing prepaid health services—from pools funded by either taxes or commercial insurance—to those in need of services. The MENA reliance on OOPS, however, shifts the cost burden to patients and can drain household incomes.

This low reliance on health insurance pools reduces financial leverage on providers, which constrains a country's ability to direct funds to critical public health functions such as disease prevention and surveillance. That is the second consequence of underfunding public health because of limited fiscal space due to fiscal myopia. Individuals, not governments, are the *de facto* purchasers of services. This mechanism shifts purchasing power away from large population pools that demand upstream health measures, like prevention and disease surveillance, to those in need of downstream, often costlier, individual services.

The pandemic has demonstrated the need for prevention, detection, and response. But that need extends to longer-term, pervasive health stresses, such as NCDs. Strategic purchases of health services—which use purchasing power as leverage to make providers cooperate with health system objectives—are a powerful way to ensure funds for health priorities like NCDs. But the strategy is weakly pursued in middle-income MENA.

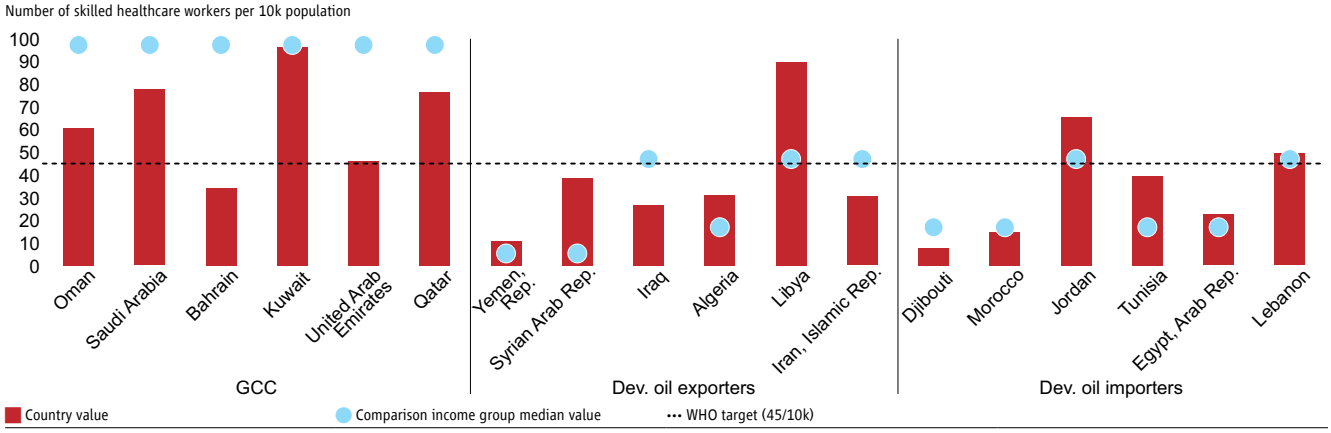
Low financial leverage on providers is only part of the reason that disease surveillance and prevention is weak. Strategic purchasing of health services is also technically challenging because of the lack of strong feedback mechanisms to monitor such complex data as provider behavior, system outputs, or health outcomes. In other words, strategic purchasing is challenged in MENA on two fronts: limited financial leverage due to low fiscal space and weak information collection and use.

Figure 5.2. Sources of Health Spending as a Share of Total Health Spending



Source: World Health Organization, *Global Health Expenditure Database.*
Note: Data from 2018, except: Libya, 2011; Syria, 2012; and Tunisia, 2015.

Figure 5.3. Skilled Health Worker Density



Source: World Health Organization, *The Global Health Observatory*.
Note: Data from 2014, except Oman, 2016; Kuwait, Bahrain, Jordan, Tunisia, 2015; Algeria, 2007. The GCC is compared with the high-income country median value; all others are compared with the middle-income country median.

Inadequate financing can challenge other health system resources—such as the *health workforce* and the reliable supply of *medical products and technologies*. Across the region, but particularly in middle-income MENA, both tend to be relatively inflexible, insufficient, and inefficiently distributed. This makes it difficult to provide core functions and leaves little reserve capacity for changes in demand. Physician density per 1,000 people in the GCC is low relative to the OECD (clustered around 2, compared with the OECD median of 3.4), while there is greater variability among developing MENA countries according to latest data from Global Health Observatory Data. Nurse and midwife density follows a

similar pattern, albeit with greater heterogeneity within the region. The WHO set a minimum threshold of 45 skilled health workers per 10,000 population to deliver system objectives (WHO 2016). In the GCC, only Bahrain failed to meet this target (33.8) in 2014, while only Libya, Lebanon, and Jordan in developing MENA met this target (see Figure 5.3). These data speak only of quantities, although the recent literature and practice pay increasing attention to the *quality* of service delivery such as competence of the health workforce.[15] Such data are missing for all countries in the region.

Supplies—including essential medicines, personal protective equipment, diagnostics, or advanced health technologies—are critical for effective service delivery. Yet, there is a lack of reliable public data on their availability. For example, there is varying data availability for essential medicine supply in GCC countries (those with public data report adequate supply), while developing MENA has greater heterogeneity and lower availability of essential medicines (WHO Eastern Mediterranean Regional Office 2019). Like other health system inputs, such as physical capital or human resources, adequate functional and reserve capacity are predicated on intact and efficient supply chains.

Overall, there is a stark divide between GCC and middle-income MENA countries in health system resources. The GCC is converging with other high-income countries. The GCC countries significantly prepay, or share the risk of, health care costs, mostly from public sources. But their total per capita health spending is lower than in other high-income countries, even though health spending accounts for a greater share of government expenditures than that of their peers. At the same time, developing MENA economies rely heavily on OOPS for health services, with few funds available to pay for core system functions (especially for public health), or to develop reserve capacities.

Financial, Human, and Physical Resource Limitations Challenge Health Systems

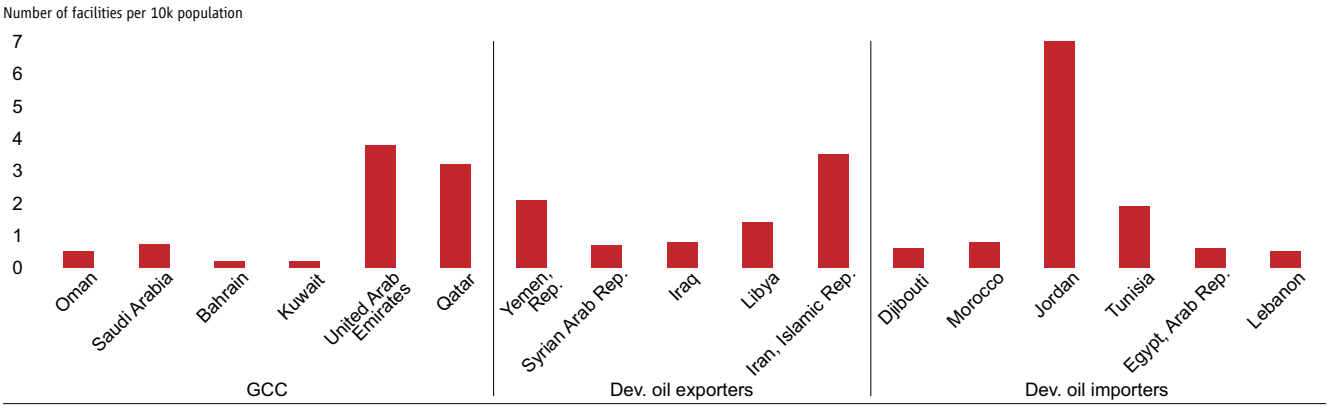
The region's healthcare resource limitations pose challenges to the coordination and provision of public health functions, financial risk protection, and delivery of first-level preventive and therapeutic health services. For example, despite the overdependence on hospitals, the number of hospital beds per 1,000 people (hospital bed density) in the region lags that of peers. In the GCC, hospital beds cluster around 2 per 1,000 people, and while it varies more in developing MENA, bed density is similar. In the OECD, hospital bed density is about 3.6. Inefficient distribution of hospital beds—particularly intensive care beds—further exacerbates inflexible functional capacity and limits reserve capacity. The WHO Eastern Mediterranean Regional Office (EMRO) also reports that primary health care (PHC) facility density per 10,000 population for all MENA countries is low (see Figure 5.4). There is wide variability within the region, but the overall low densities reflect the vulnerability of a region that relies on hospitals to provide basic care. Additionally, MENA has been slow to adopt digital health technologies to increase flexibility in delivering health service access and quality.

Publicly available service coverage and quality data are also limited. Key primary health care indicators—such as prenatal care, outpatient visits per capita, or select immunizations—are reported publicly, although data and/or service quality are less certain. Coverage data vary and provide proxy measures for first-level service delivery performance, but do not indicate the ability of these services to adapt to new or surging demands, according to latest data from Global Health Observatory data. These indicators are best summarized by the WHO's Universal Health Coverage service coverage index, which captures the geometric mean of 14 indicators that trace essential health service coverage. MENA countries underperform compared to income peers. The index ranges from 68 to 77 of a possible 100 in the GCC (compared with

[15] Gatti et al., 2021.

the average of 82 for high-income countries as a group), and from 42 to 75 in developing MENA (compared with 77 for upper middle-income countries and 55 for lower-middle-income countries). A score of 100 signifies full essential service coverage.

Figure 5.4. Primary Health Care Facility Density



Source: World Health Organization, Regional Office for the Eastern Mediterranean.
Note: Data for 2019.

Overall, availability of health service input and output data in MENA is uneven at best. Where available, it shows significant variability, unsystematic collection and suggests limited functional capacity to deliver core health services throughout the region. These data availability issues are further discussed in Chapter 7.

Public health functions complement and operate in parallel with individual health services and go beyond infectious disease prevention, detection, and response. Public health functions rely on feedback from an array of data—demographic, health, and risk factor, among other things—to promote health; prevent and detect diseases through screening, diagnostic testing, surveillance, and contact investigation; implement effective infection prevention and control practices; and mitigate environmental hazards. However, the availability and quality of data—for example, the percentage of births and deaths registered with authorities—varies throughout the region. Furthermore, as discussed, limited fiscal reserves and high OOPS for individual health services have led to underinvestment in the public health infrastructure. This combination of limited feedback systems and inadequate resources undermines public health functional and reserve capacities.

The following section empirically benchmarks MENA relative to peers with similar levels of development, along with objective indicators and self-reported preparedness for absorbing public health shocks. This allows for an assessment of the extent of overconfidence authorities had in MENA's public health systems on the eve of the Covid-19 pandemic.

MENA's Public Health System Preparedness versus Self Assessments

To further explore MENA countries' pre-Covid-19 pandemic preparedness, the analysis in this report relies on data from two existing indices of health security robustness. The first, the Global Health Security Index (GHSI) is conducted by

objective external evaluators. The second relies on a self-reported assessment by individual countries—the State Parties Self-Assessment Annual Reporting (SPAR) tool.[16]

The GHSI data contain proxies for many aspects of public health resilience. But because they emphasize pandemic measures, the GHSI data are not a comprehensive set of public health measures. Nevertheless, they provide good quantitative assessments of many aspects of a country's public health system.

Selected indicators from each dataset are reorganized into the four categories most relevant to health system resilience—surveillance capabilities, sharing of health information, capacity of a health system, and the extent of planning and readiness exercises. Scores are calculated for each of the categories (see Appendix A4). Each country's scores are then econometrically benchmarked against other countries at similar levels of development.

To construct a Resilience Framework for MENA countries, the GHSI data are adapted to provide a metric of MENA's public health systems' ability to absorb a shock prior to 2020. The four pillars derived from those indicators (all of which are contained in Appendix Table A4.1) are:

- *Surveillance capabilities*, measured by nine indicators, including surveillance for antimicrobial resistance and zoonotic diseases in wildlife.

- *Sharing of health information*, which relies on 12 indicators, among them mechanisms to engage the public and private sectors during a public health emergency, and maintenance of electronic health records.

- *Capacity of the health system,* composed of 13 indicators, gauges the availability of key public health resources such as the number of doctors and intensive care beds per capita.

- *Regular planning and readiness exercises, a* group of six indicators that measures whether a country had performed simulations and had plans for responding to public health emergencies.

In addition, we collected data from governments' self-assessments of their public health system resilience prior to 2020. The indicators from the self-assessments were grouped into the same four pillars as the objective indicators. By comparing the objective performance of each country to its self-assessments, we can compute an indicator of the extent of overconfidence that existed across MENA countries before the pandemic.

Table 5.1, Panel A, shows that MENA countries' GHSI data consistently underperformed their income-level benchmarks. Every country except Jordan has at least one pillar in which it underperformed peers and only Jordan and Morocco have three pillars in which they outperformed peers. Additionally, the table shows that wealthier countries in MENA underperformed relative to income peers in the objective score system. In a region widely criticized for lack of transparency in many government activities, only Lebanon and Morocco were in the top third of countries in information sharing. By contrast, only six of 15 countries gave themselves low enough ratings to show that they were underperforming (see

[16] See Appendix A4 for technical discussion of the indicators and methodology.

Table 5.1 Panel B). Egypt and Morocco rate themselves as outperforming their peers in all four pillars. The UAE, Algeria, Tunisia, and Iraq believed they would outperform their peers in three of the four pillars.[17]

The table also documents the region's tendency toward overconfidence by showing the differences between the objective assessments and the self-assessments of the region's public health system preparedness. In 41 of the 60 performance categories (four for each of 15 countries), MENA countries displayed over-confidence.

Table 5.1. Overconfident MENA: Public Health System Preparedness versus Self-Assessments

	A. Objective Preparedness Relative to Benchmarks				B. Self-Reported Preparedness Relative to Benchmarks				C. Overconfidence: Objective Minus Self-Reported Preparedness Relative to Benchmarks			
Country	Surveillance capabilities	Information sharing	Health system capacity	Regular planning & readiness exercises	Surveillance capabilities	Information sharing	Health system capacity	Regular planning & readiness exercises	Surveillance capabilities	Information sharing	Health system capacity	Regular planning & readiness exercises
QAT	-1.47	-2.02	-0.66	-2.47	-0.30	0.32	0.42	0.60	1.17	2.33	1.08	3.07
UAE	-2.20	-1.36	-0.44	-0.94	0.72	0.64	-0.15	0.76	2.92	2.00	0.29	1.70
KWT	-0.39	0.15	-0.48	-1.19	-0.46	-0.49	-0.59	-0.77	-0.07	-0.64	-0.11	0.42
SAU	0.56	0.04	0.67	-0.80	-0.03	-0.43	-0.39	0.12	-0.59	-0.47	-1.06	0.91
BHR	-0.34	-1.08	-1.13	-1.83	0.37	-0.06	0.23	0.99	0.72	1.01	1.36	2.83
OMN	-1.32	-0.39	0.27	-0.58	1.19	0.43	0.84	0.42	2.52	0.82	0.57	1.00
LBY	-1.26	-0.08	-0.23	-1.40	-1.30	-0.81	-0.30	-1.81	-0.04	-0.73	-0.07	-0.41
LBN	-0.30	0.56	1.15	-0.70	0.58	0.84	-0.26	-0.08	0.88	0.28	-1.41	0.63
IRN	0.93	-0.60	0.66	-1.32								
EGY	-1.15	-0.07	-0.25	0.69	0.74	0.86	1.52	1.76	1.88	0.93	1.77	1.06
DZA	-0.86	-1.14	-0.91	-1.66	1.86	0.88	1.53	0.06	2.72	2.02	2.45	1.72
TUN	-1.08	-0.74	-0.25	-1.64	1.17	0.61	0.85	-0.76	2.25	1.35	1.10	0.88
IRQ	-0.91	0.41	-1.24	-1.63	-2.89	0.95	1.60	0.96	-1.98	0.54	2.83	2.59
JOR	1.42	-0.10	0.56	1.26	-1.38	-1.27	-1.16	-1.58	-2.80	-1.17	-1.73	-2.84
MAR	0.79	1.34	1.24	-1.12	1.40	0.89	1.39	1.15	0.62	-0.44	0.15	2.27
DJI	-0.87	-0.62	-1.08	-1.37	-0.26	-1.13	-1.50	-1.24	0.61	-0.51	-0.41	0.13

Sources: Authors' calculation based on data from the Global Health Security Index and the State Parties Self-Assessment Annual Reporting tool.
Note: Country's scores on four pillars are regressed against GDP per capita. Numbers in Panel A show deviations from predicted values, normalized by standard deviations, using GHSI data. Cells are color-coded to show deviations within the 33 percent confidence interval of the predicted values in yellow, above the 33 percent confidence interval in green, and below 33 percent confidence interval in red—similarly, numbers in Panel B show color-coded standard deviations from predictions using SPAR data. Standard deviations in SPAR for each pillar each country from Panel B, subtract its corresponding standard deviations in GHSI from Panel A, results in over-confidence index in Panel C. Cells in Panel C are color-coded redder for a higher over-confidence index and greener for a lower (more negative) confidence index.

However, the GHSI data indicator is not necessarily a good predictor of a country's performance in dealing the Covid-19 pandemic. For example, the United States and the United Kingdom were high performers in the GHSI but had among the worst reported Covid-19 death rates during 2020. The performance of health systems in response to the Covid-19 shock depended on many factors, including how well their capabilities were deployed. Moreover, because Covid-19 testing differed widely across countries, with lesser developed countries having lower formal testing per capita than richer ones, it is difficult to draw strong conclusions from the reported case numbers.[18] Nevertheless, there is some evidence indicating that the GHSI data, based on objective indicators of public health system preparedness for large public health shocks, is systematically correlated with Covid-19 response performance. The World Bank's MENA Crisis Tracker (World Bank 2021) measures the cross-country variation in Covid-19 tests per capita as a function of the level of development, the GHSI composite score, population size (scale effects), and days since the beginning of the outbreak in each country. In this set of econometric regressions, which were updated monthly, the GHSI was consistently and

[17] Regarding analyses of data transparency and economic performance see Arezki and others (2020) and Islam and Lederman (2020).

[18] Testing per capita during the Covid-19 pandemic tends to rise systematically with GDP per capita. See the World Bank's MENA Crisis Tracker weekly newsletter. Even the number of confirmed deaths from Covid-19 are not strictly comparable across countries. Furthermore, uneven public access to mortality data across countries, particularly for MENA countries, does not allow for comparisons of "excess deaths" in 2020 and 2021 relative to previous years prior to the outbreak.

positively correlated with the testing rate per capita, even after controlling for GDP per capita (see Table 5.2). The MENA Crisis Tracker indicates that over time, the GHSI was associated with at least one key element of public health responses to the pandemic—testing per capita, which is a critical element in a successful pandemic response.

Table 5.2. Correlates of Testing per Capita

Model	OLS		
Outcome Variable	Log of Tests per Million of Population (as of as of August 16th, 2021)		
	(1)	(2)	(3)
Log of GDP per capita (constant 2010 US$), 2018	0.726***	0.707***	0.596***
	(0.084)	(0.085)	(0.086)
Log of Population, 2018	-0.234***	-0.267***	-0.269***
	(0.058)	(0.064)	(0.056)
Global Health Security Index, 2019	0.031***	0.030***	0.027***
	(0.010)	(0.010)	(0.010)
Days since the 100th case (August 15th, 2021)		0.002*	0.001
		(0.001)	(0.001)
Constant	8.528***	8.504***	9.721***
	(1.155)	(1.155)	(1.100)
Region dummies	No	No	Yes
Number of observations	163	163	163
Adjusted R2	0.728	0.730	0.767

Source: MENA Crisis Tracker weekly newsletter August 16, 2021.
Note: *** p<0.01, ** p<0.05, * p<0.1, Robust Standard Errors. East Asia & Pacific omitted.

Health Systems Governance Has a Way to Go

Politics and management of public health systems are crucial determinants of the efficacy of policy responses to the Covid-19 outbreak, which means there is a governance component to the health system resilience framework. Even a country with a perfect GHSI score can perform poorly during the pandemic if governance is weak. Before the pandemic, health governance in the region was subject to many sociopolitical trends of public dissatisfaction with, and distrust of, public stewards. Chapter 7 will discuss the importance of data to build trust.

Another issue that affects resilience is the stewardship of private providers of health services. Only a handful of MENA countries have formal accreditation protocols for private providers. Moreover, private provider reporting of health data (for example, surveillance data relevant to epidemic detection) is often not required, unsystematic, or not readily accessible to public sector authorities (Health Finance and Governance, USAID 2018). Health systems that rely on both public and private provision of care are the norm around the world. Yet, the weak stewardship of private providers in MENA creates two health systems operating in parallel: a public system led by public officials charged with prioritizing public health needs, and a private system whose objectives may not necessarily align with public health priorities. All this in the context of MENA countries that where suffering from fiscal myopia, which resulted in spending on public employment to the detriment of investments in other public health priority functions. Weak governance thus undermines health system performance when market forces do not align private providers with health system objectives—such as testing to detect cases of an epidemic infection—and reduces the system's ability to adapt to changing health needs, both chronic and acute.

In sum, health systems that struggle to fund basic functions during tranquil times are unlikely to have sufficient reserve capacity to absorb acute shocks. The economic, demographic, and health trends thus tell only part of the story of the MENA region's existing conditions prior to the Covid-19 pandemic. Nevertheless, a snapshot of key baseline health system capacities and performances across these domains further explains the region's vulnerabilities to the stress of the pandemic and suggests investment priorities. What is clear from the evidence is that many countries in MENA were underprepared to absorb acute shocks to their public health systems, yet they tended to exaggerate their level of preparedness relative to countries at similar levels of development.

Even though a large enough source of stress can overwhelm any system's resilience, the evidence presented here suggests that MENA health systems were already struggling to meet their core objectives (developing MENA in absolute terms and GCC in relative terms) because of insufficient resources and/or inefficient deployment of those resources. Limited functional health system capacity meant that there was almost no reserve capacity. That residual ability is essential if a public health system faces costly emerging or novel challenges, including the health and demographic transitions and acute and unexpected shocks, such as the Covid-19 outbreak. Meanwhile, weak feedback-response systems, coupled with a challenging economic context, limited MENA's ability to respond effectively, creating a vicious cycle of health and economic vulnerabilities that undermines future prosperity and predisposes the systems to new sources of stress. The next chapter examines the performance of MENA public health systems during the Covid-19 outbreak, which became a *de facto* stress test that is still playing out in real time.

CHAPTER 6. COVID-19 IN MENA: A STRESS TEST

Main takeaways

- *The Covid-19 outbreak put new and increased demands on governments that further depleted already limited functional and reserve capacities and exacerbated existing challenges.*
- *On top of the direct morbidity and mortality burdens MENA countries experienced from Covid-19, the pandemic caused issues with staffing, displaced care of chronic and non-Covid acute conditions, and strained the physical resources of health systems.*
- *While vaccination remains an important pathway out of the pandemic, the pace of immunization in the region is uneven as middle-income and low-income countries lag richer countries.*

By late August 2021, there were more than 200 million confirmed cases of Covid-19 and more than 4 million confirmed deaths around the globe, although both are likely undercounts because of such factors as insufficient testing or inadequate reporting on deaths (WHO Corona Virus Dashboard 2021; The Independent Panel, WHO 2021). Various estimates suggest far higher death tolls and infections. Data gaps in the MENA region (and other regions) contribute to this uncertainty about the scope and devastation of the pandemic.

One thing is certain: the Covid-19 pandemic was an unprecedented shock capable of overwhelming even the most resilient health systems. The virus's high transmissibility, particularly from asymptomatic cases,[19] propelled it from epidemic to pandemic, while its severity persuaded many governments to take drastic and costly actions to control it. Nevertheless, the disease spread so rapidly that it overwhelmed public health interventions, such as contact tracing, leaving only blunt policy options like widespread shutdowns and universal masking to slow infections.

A response to the pandemic that relied on pre-emptive measures saved lives and livelihoods. Handling the pandemic requires a comprehensive and cross-sectoral health system response that involves both public, private and civil society sectors, and adapts to a country's transmission phase. As indicated by the GHS Index and other preparedness assessments, the resilience of public health infrastructure in December 2019 varied from country to country and even in countries with seemingly well-prepared systems, leaders were either unable or unprepared to make informed decisions based on emerging global surveillance information from abroad. Countries that implemented stringent policy responses early in the pandemic reduced Covid-19 transmission and deaths significantly (Chisadza and others 2021; Flaxman and others 2020; Fuller and others 2021). However, as national cases escalated from being isolated to being widespread, countries were forced to undertake increasingly blunt response strategies to adapt to the local situation, straining both leadership and the capacities of health systems.

The adaptive Covid-19 response required effective feedback systems to provide useful, real-time information, and response systems that could receive and process the information, make informed decisions, and deploy public health service resources. The systems had to rely on functional and/or reserve capacities for both public health functions and individual health service delivery.

[19] See, for example, Johansson MA, Quandelacy TM, Kada S, and others, 2021.

These feedback-response mechanisms were challenged by many factors. The novelty of the threat created great uncertainty that challenged all countries at the onset of the pandemic. But some countries fared far better in case detection (as reflected by share of positive tests, or test positivity rate). The problems in worst-performing countries included poor testing capacities or delay, hesitation, denial, or even willful suppression of testing. Reliable case detection was the critical feedback mechanism for an adaptive response, yet the global surveillance infrastructure did not keep pace with Covid-19 transmission. Without reliable data, the public health response could not be well-designed, and decision-makers could not be held to account. As with diagnostic testing, similar stories could be told about viral genomic sequencing, availability of personal protective equipment for health and essential workers, utilization of hospitals, or vaccinations, among others.

Covid-19 in MENA: A Stress Test on Resilience in a Data Deprived Environment

At the end of August 2021, the MENA region had accumulated more than 12 million confirmed Covid cases and more than 200,000 confirmed deaths from Covid-19 (World Bank Data 2021). Official numbers indicate that Covid-19 became the fifth leading cause of death in the region (assuming 2020 causes of death were otherwise comparable to 2019). However, such factors as test positivity rates, seroprevalence (the actual infection rate), and known widespread health service disruptions suggest that the impact of Covid-19 is grossly underestimated.

Covid-19 placed intense demands on MENA health systems, which had limited ability to deal with shocks and were already struggling to cope with the truncated economic, demographic, and epidemiological transitions. On the eve of the pandemic, the capacity of public health systems in MENA to deploy public health service resources and deliver both individual health services and critical public health functions were stressed.

Resourcing a resilient health response. The existing weaknesses in financial, human, and physical resources before the pandemic challenged MENA health systems' abilities to absorb the Covid-19 stress while maintaining core functions. Indeed, this was probably true around the world; and it is probably too early to draw firm conclusions about performance of MENA health systems during the ongoing crisis, particularly because of the imperfect information and public communication that are deployed in MENA. For example, 2020 health financing data on Covid-19 outlays, changes in total health spending, and the effect on OOPS and/or impoverishing spending, are not systematically or widely available.

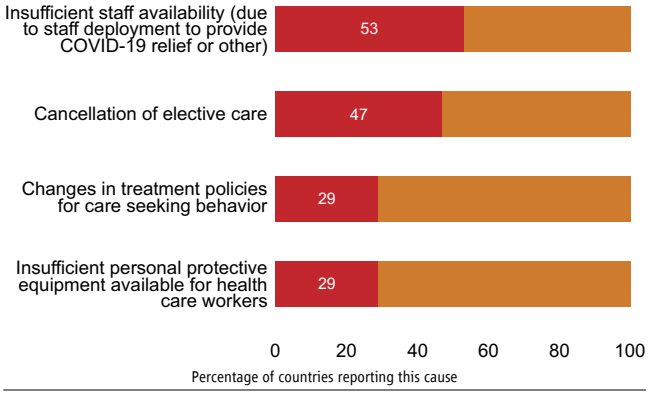
Even if the stress test occasioned by the pandemic has not yet produced firm conclusions on the resilience of health financing, it seems clear that the limited resilience of the health-care workforce and the supply of medical products and technologies, caused critical bottlenecks. The WHO Pulse Survey found that 53 percent of the WHO Eastern Mediterranean Regional Office (EMRO) countries[20] reported disruptions in the delivery of health care service because not enough staff were available (see Figure 6.1). Health care staffing was strained by the need to reassign workers to care for Covid-19 patients, the large number of infections among health care workers, and the absenteeism by workers who feared getting infected (fears that were undoubtedly exacerbated by a lack of personal protective equipment). Anecdotal evidence suggests that as many as 20 percent of health care workers contracted Covid-19 (WHO EMRO 2020), but there are no formally-collected or available data on worker infections (WHO Covid-19 Surveillance Dashboard 2021). Cancellations of elective care accounted for 47 percent of service disruptions.

[20] The WHO EMRO countries comprise all MENA countries (except Algeria) plus Afghanistan, Pakistan, Somalia and Sudan.

The protocols that protect both health workers and patients from infection rely on medical product supply chains that are frequently inefficient. Yet often, there were inadequate or no reserve stockpiles of such products as medical masks, face shields, and other forms of personal protective equipment (PPE). Global demand for PPEs quickly outpaced supply, escalating prices and limiting stocks (The Independent Panel, WHO 2021). Nearly 30 percent of EMRO countries reported service disruptions due to insufficient PPEs (WHO National Pulse Survey 2021).

Figure 6.1. Reasons for Service Disruptions

Supply-side Factors Causing Healthcare Service Disruptions in the EMRO Region



Source: World Health Organization Pulse Surveys, 2021.

Besides protective equipment, the region was largely unequipped with many basic tools needed to deliver health services, including essential medicines. Covid-19 further stressed MENA health systems by stoking demand for such key medical products as oxygen, certain medicines (including Covid-19 vaccines), and ventilators. In Saudi Arabia, ostensibly one of the most resilient MENA countries in resourcing health systems, 51 percent of survey respondents reported shortages of 10 or more essential medicines, 33 percent reported PPE shortages, and more than half cited price increases of 25 percent or more (Aljadeed and others 2021). Pre-existing oxygen shortages in MENA were estimated to be critically high. One model estimated that incremental demand for oxygen worsened a shortage of oxygen in MENA by a factor of nearly 20, far worse than in China, Europe, Japan and the United States (McKinsey and Company 2020). Covid-19 stressed already limited or inflexible upstream financial, human, and physical resources, further exacerbating the problems of health systems with already weak functional capacities for individual service delivery and public health functions.

Health Care Service Delivery. The pandemic put stress on both supply and demand for individual health care services. As a result, health systems reoriented their service delivery offerings to meet the acute Covid-19 challenge. This reorientation meant a reduction of chronic, core health services because of low reserve capacity. Fractured supply chains, health worker shortages, and limited financing reserves led to insufficient resources for both acute and chronic service needs. Meanwhile, fear of hospital transmission of Covid-19 and the lower priority of treatment for chronic conditions, reduced demand for core health services—even though the need for them was unchanged.

Measuring hospitalizations is critical to assessing service delivery during the Covid-19 outbreak, yet hospitalization data, including intensive care utilization, are not widely available. The WHO collects weekly data from countries on the percentage of Covid-19 cases that are hospitalized and in intensive care units (ICU) as well as on hospital bed occupancy (including ICU beds). However, these data are available for only a handful of countries and are made public in even fewer countries.

The pandemic stress further revealed limited resilience in the health systems' abilities to deliver core first-level health services. For example, between December 2020 and April 2021, 26 percent of the EMRO countries reported disruptions to communicable disease services; 26 percent to NCD services; 24 percent to mental health services; 24 percent to immunizations; 32 percent to reproductive, maternal newborn and child health services; and 16 percent to emergency, critical, and operative care. Over the same period, 44 percent of countries reported disruptions in outpatient services,

40 percent in community-based care, and 41 percent in inpatient care (WHO National Pulse Surveys 2021). Since then, there have been fewer service disruptions, but they continue (WHO National Pulse Surveys 2021). In addition, according to UNICEF, there have been significant disruptions to vaccinations both globally and in MENA, although the data in this regard are of limited availability and low quality (WHO 2021).

Covid-19 exacted direct and indirect costs on countries around the world. In MENA, the extent to which service delivery capacity could absorb the acute shock is unclear, as many core indicators such as hospital utilization or service quality are either unavailable or lack credibility. Moreover, limited pre-existing resilience contributed to an as-yet-unmeasured indirect toll: disrupted delivery of core health services likely led to excess mortality, both contemporaneous and long-term, because of deferred care.

Public health functions and health leadership. Covid-19 case detection is another test of public health resilience in MENA. Detecting infections is the backbone of epidemic intelligence because information about the course of infections is fundamental to every other aspect of the pandemic response. Case detection requires robust systems for both active and passive disease surveillance (including genomic surveillance to monitor the emergence of virus variants), testing, and exposure tracing (of both contacts and other environmental exposures). Epidemic intelligence also provides feedback to guide downstream responses, including quarantine or isolation of individuals and broad shutdowns of businesses and social activities. At the center of case detection is the ability to identify and test appropriately high-risk individuals within a population.

The stress that the pandemic is putting on the regional health system is partly reflected through the lens of the pandemic-related epidemiological outcomes, including Covid-19 and seroprevalence testing, excessive mortality and undercount ratio.

Testing is fundamental to understanding the extent of the burden of disease, but Covid-19 testing has largely been insufficient, both globally and in the MENA region. Five MENA countries—Bahrain, Oman, Saudi Arabia, the UAE and Yemen[21]—have cumulative test positivity rates under the WHO-recommended threshold of 5 percent (see Table 6.1), indicating that other countries in the region have generally not conducted enough tests to detect most cases. High test positivity rates suggest high levels of undetected or unconfirmed Covid-19 infections, which makes it difficult to interpret the data and take appropriate action. Moreover, it is unclear whether testing, case, and mortality data are comparable across countries. This means that, because most countries are likely undercounting cases,

Table 6.1. Reported Covid-19 Indicators as of September 13, 2021

	Tests per 1 million	Cases per 1 million	Test Positive Rate, Cumulative
Bahrain	3,471,842	154,482	4.45%
Kuwait	907,579	94,519	10.41%
Oman	4,751,451	57,608	1.21%
Qatar	914,675	83,568	9.14%
Saudi Arabia	791,231	15,397	1.95%
UAE	7,807,722	72,647	0.93%
Algeria	5,153	4,466	86.66%
Djibouti	210,550	11,799	5.60%
Egypt	29,326	2,800	9.55%
Iran	353,240	62,100	17.58%
Iraq	357,467	47,234	13.21%
Jordan	928,034	78,202	8.43%
Lebanon	704,140	90,369	12.83%
Libya	227,280	46,388	20.41%
Morocco	249,882	24,167	9.67%
West Bank & Gaza	441,415	70,526	15.98%
Syria	5,751	1,638	28.48%
Tunisia	228,204	57,245	25.08%
Yemen	8,666	275	3.17%

Source: Worldometer, September 13, 2021.
Notes: Indicators might not be comparable across countries because of differences in testing and reporting practices. World Bank staff have not been able to corroborate the data reported in the *Worldometer* database for Egypt, Syria, Yemen and Algeria.

[21] For Yemen, World Bank staff have not been able to corroborate the data reported in the *Worldometer* database.

even these disappointing test positivity rates should be interpreted with caution.

Seroprevalence testing, which looks for viral antibodies in the blood (a sign of prior infection) can complement data from official testing for the virus to fill in gaps left by insufficient testing for the infection itself. Such data can be fraught with sampling limitations but can help better estimate the spread of disease to the extent that sampled populations are nationally representative. Table 6.2 reports results from various seroprevalence studies conducted in MENA, noting, however, that the availability of seroprevalence data is limited, particularly for middle-income MENA. The region has a wide variation in results, depending on the country and the time of the study. The results range from 0 percent in a Libyan study in May 2020 to nearly 69 percent in the UAE during August 2020. A systematic review of seroprevalence studies worldwide identified a global median seroprevalence of 4.5 percent. But it was 8.2 percent in the MENA region, which suggests 71.2 undetected cases for every detected case (Bobrovitz and others 2021).

Excess mortality—the number of deaths from all causes above the expected number of deaths during a specific period—is widely considered another objective indicator of the deaths caused by Covid-19. All-cause mortality includes reported Covid deaths, unknown or unreported Covid deaths, and other deaths—whether from disease, accidents, or something else. These other deaths might have been related to the pandemic (say a suicide spawned by isolation or a condition inadequately treated because health resources were shifted to Covid-19 infection care). The excess mortality measure has long been used to estimate the death toll of pandemics and other extreme events (Karlinsky and Kobak 2021). Figure 6.2 shows rising excess mortality in Oman and Egypt in May 2021 and June 2021. Most, if not all, of the excess morality is believed to be the result of the pandemic.

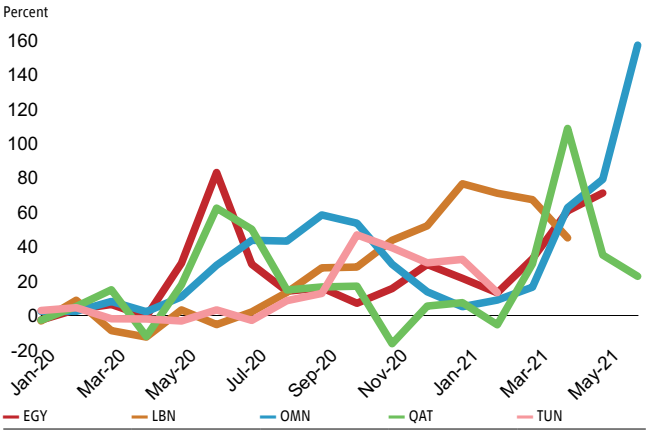
The *undercount ratio* relates excess mortality to reported Covid-19 deaths. A high undercount ratio implies that unknown and unreported Covid deaths and other deaths,

Table 6.2. Seroprevalence Studies in the Region Compared with the Official Confirmed Prevalence

	Number of Seroprevalence Studies	Seroprevalence Estimate	Confirmed Prevalence Estimate
Bahrain	-	-	15.29%
Kuwait	1	38.1% (Jun 26, 2020)	1.01%
Oman	1	21% (Sep 28, 2020)	1.87%
Qatar	7	13.3–64.4% (Sep 9, 2020)	4.30%
Saudi Arabia	9	1.4–24.24% (Jun 17, 2020)	0.40%
UAE	2	10.4–68.6% (Aug 14, 2020)	0.64%
Algeria	-	-	0.41%
Djibouti	-	-	1.16%
Egypt	5	1.3–34.8% (Oct 31, 2020)	0.10%
Iran	17	4.8–41.56% (May 20, 2020)	0.15%
Iraq	1	62.58% (Jan 30, 2021)	1.50%
Jordan	3	0–27.3% (Feb 5, 2021)	3.23%
Lebanon	-	-	8.43%
Libya	3	0–4.23% (May 18, 2020)	0.00%
Morocco	-	-	1.88%
West Bank & Gaza	-	-	6.08%
Syria	-	-	0.15%

Sources: SeroTracker, and *Worldometer*.
Note: The date below seroprevalence estimate is the end date of the study's sampling. When there is an interval of Estimates, the date refers to that of the higher bound of the interval. Confirmed Prevalence Estimate is Total Confirmed Cases as a share of the population.

Figure 6.2. Excess Mortality P-score



Source: Our World In Data.
Note: The lines capture excess mortality P-score, which calculates the *percentage difference* between the number of deaths in 2020–2021 and the average number of deaths in the same period—week or month—over the years 2015–2019.

which may or may not be related to the pandemic, were missed. Table 6.3 presents the undercount ratios for six MENA countries with available data. The undercount ratios for most MENA countries were below 3, except for Egypt. Egypt has one of the highest undercount ratios in the world (13, as of November 2020), along with Tajikistan (100), Nicaragua (51), and several others (Karlinsky and Kobak 2021).

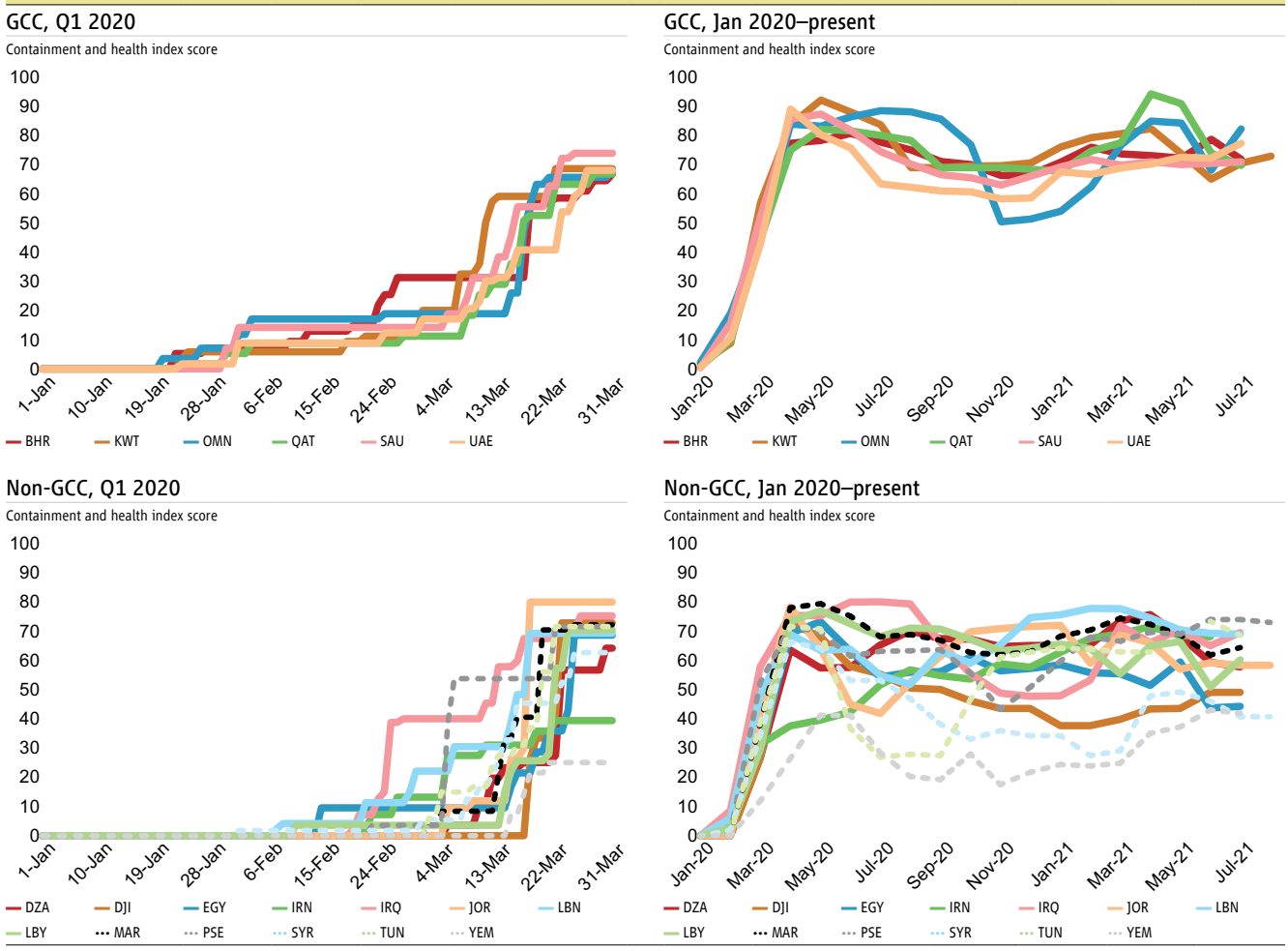
Table 6.3. Ratio between Excess Mortality and the Reported Covid Deaths

Country	Undercount Ratio	Data until
Egypt	13.1	Nov 30, 2020
Iran	2.4	Sep 21, 2020
Lebanon	1.2	Apr 30, 2021
Oman	0.9	May 31, 2021
Qatar	1.4	Apr 30, 2021
Tunisia	0.6	Feb 14, 2021

Source: Karlinsky and Kobak (2021).

The large number of deaths, the even larger number of serious infections, and the disruptions to the economy, health care system and private lives, presented public leaders with an emergency they had to respond to, and formulate policy for, with great speed under duress and incomplete information. As important as public health preparedness is, it did not necessarily predict government performance during the Covid-19 crisis. Rather, the decisive action of leaders was the key element in determining how effectively public health capacity was deployed.

Figure 6.3. Containment and Health Index in MENA - Intensity of Covid-19 Containment Policies over Time



Source: Hale and others (2021).
Note: The composite index score is based on 13 policy responses including school and workplace closures, travel bans, testing policies, contact tracing, face coverings, and vaccine policies. Scores are normalized to 0–100, where a score of 100 indicates the strictest levels. Where restrictions vary within countries, the strictest subnational level is shown.

The Oxford University Containment and Health Index provides a composite measure of 13 government policy actions taken to deal with the crisis over time (see Figure 6.3 for MENA). The actions include school and workplace closures, travel bans, testing policies, contact tracing, face coverings, and vaccine administration. The GCC was the first in MENA to begin taking these actions to deal with Covid-19 after cases were detected in the UAE in late January 2020. Most MENA governments waited until early March before taking major steps to deal with growing caseloads. Developing countries in MENA, such as Iran, were slow to adopt stringent policies in response to accelerating case burdens and generally did not sustain the toughest of them. The region as a whole—with some exceptions—was relatively slow to respond to intelligence from abroad during the early days of the pandemic.

The strength of health service resources and prior experience with the more severe but less transmissible Middle Eastern Respiratory Syndrome (MERS) coronavirus perhaps explain the GCC's public health performance, particularly that of Saudi Arabia and the UAE.[22] However, even some GCC countries failed to provide the basic function of epidemic intelligence. Instead, in absorbing the Covid-19 shock, they overly relied on resilience in other aspects of the health system—service delivery, health financing, the health workforce, and supply chains—to compensate for the data shortcomings. Yet, public health functional and reserve capacities could take countries only so far; epidemic intelligence provided some feedback, while sound leadership with early action commensurate with intelligence about the emerging epidemic was needed for a wholly effective response.

***

The truncated economic, demographic, and epidemiologic transitions combined with limited health system functional capacities meant that the region was struggling to compensate for chronic health deficiencies at the onset of the pandemic. Yet, these visible signs of pathology were likely just the tip of the iceberg. The stress of Covid-19 placed new or increased demands on governments that further depleted limited functional and reserve capacities, exacerbating existing challenges and revealing vulnerabilities that could no longer be compensated for. The pandemic was in effect a stress test on resilience that both highlighted the importance of meeting its pre-existing unmet needs and provided a new understanding of underlying weaknesses that predisposed countries to future and certain health risks.

The most important metrics throughout the pandemic are mortality, hospitalization (a proxy for severe illness), and transmission. The general inability of the public health complex to detect cases complicated efforts to understand the extent of transmission, the true burden of hospitalization, or the mortality from the disease. As a result, health systems could not design and deploy precise interventions to interrupt transmission and prevent illness or death.

Excess mortality is among the more important measures of a country's resilience and the simplest way to compensate for insufficient case detection, because it postulates, reasonably, that the excess deaths are either directly from Covid-19 or the result of health service disruptions caused by the pandemic. Yet, these data largely do not exist within MENA, in part owing to baseline shortcomings such as limited death registrations, data aggregation, or data reporting. Some data, however, are indicative for the region: excess deaths reported in Egypt in 2020, for example, were roughly 10 times greater than officially counted Covid-19 deaths.

[22] See, for example, Abu Baker Farag and others, 2019.

The Covid-19 pandemic imposed extreme stress on MENA health system resilience, testing MENA's pre-existing vulnerability to risk exposure. The slow speed of Covid-19 vaccinations gives a hint of the region's health systems' limited resilience. By the last week of July 2021 only 99 million vaccine doses had been administered in MENA. The region's vaccination rate ranked among the worst in the world (The Economist 2021; Our World in Data 2021). Only 9 percent of eligible individuals in MENA are fully vaccinated, as of early August 2021 (see Table 6.4). This aggregate number masks important heterogeneity across the region. The GCC countries and Morocco have done well in terms of vaccinations, while many developing MENA countries are struggling. The slow pace of vaccinations in many countries is due to demand issues, such as vaccine hesitancy, and supply issues, such as delivery bottlenecks (World Bank 2021b).

MENA's truncated transitions were associated with visible signs of vulnerability in the region's health system performance well before the pandemic began. Some factors helped mask health systems' weaknesses—including strong government authority and a relatively young population in which people get sick less frequently than they do in populations with more normal age distributions. Other factors exacerbated vulnerabilities, such as low fiscal space for public spending, rising NCD burdens, low functional and reserve capacities within the health systems, and weak data availability and/or transparency.

Table 6.4. Vaccination Progress by World Region as of August 9, 2021

Region	Doses administered (millions)	Aged 12+ with first dose (percent)	Aged 12+ with second dose (percent)
East Asia	2,110	78.2	28.2
European Union	487	69.0	56.8
North America	474	65.3	50.0
South America	287	56.7	25.8
Rest of Europe	270	43.9	33.7
South Asia	549	33.6	9.8
Central America	40.1	32.5	19.1
Oceanea	16.9	32.5	16.5
MENA	133	21.6	13.1
Central Asia	63	19.4	3.2
Sub-Saharan Africa	35.4	3.6	1.5

Source: The Economist 2021a.

Key data, such as information on healthcare-worker infection rates or hospitalizations, are missing and make it difficult to fully assess the ability of the MENA region to absorb the health shock. Other available data—such as excess mortality, seroprevalence, or test positivity rates—indicate both insufficient or low-quality data collection and the MENA region's limited resilience to new stressors that left it vulnerable to health risks. As will be elaborated on in the following chapter, broad but intentional data collection, and the transparent dissemination of those data, will be critical to improving the feedback-response mechanisms needed to respond to health security shocks.

Many questions are unanswered by the *de facto* stress test, either because it is too soon to tell or because data collection has not been sufficient. Health financing data typically has a lag time of one to two years, so it is unclear how the Covid-19 pandemic affected health expenditures, particularly, the potentially impoverishing OOPS. The health impact of the different burdens placed on vulnerable groups—such as the elderly, those with chronic diseases, and the disadvantaged—remains unclear. The transition to NCDs was partly explained by steady gains made against communicable diseases, and it is unclear whether, or to what extent, the pandemic has undone those gains. Furthermore, the long-term effects of health service disruptions may take years to reveal themselves.

However, one question has been answered by the stress test: health systems in MENA and across the world lack sufficient resilience to avoid and/or absorb the type of health risk that is certain to recur. The emergence of novel epidemics will continue, and evidence suggests their frequency is increasing (Smith and others 2014; WEF 2019). Some of those health threats will be severe but less transmissible, as was the case with MERS; some will be highly transmissible but low

severity, as with Zika. The Covid-19 outbreak was marked by high severity and high transmissibility, and some future health threats will surely resemble the one posed by the virus that causes Covid-19.

The following Chapter discusses policy options for the region by focusing on improving the data systems as a part of long-term public health reforms.

CHAPTER 7. FORWARD LOOK: WHAT EMPIRICAL EVIDENCE SAYS ABOUT THE USES AND MISUSES OF PUBLIC HEALTH DATA

Main takeaways

- *Overhauling data systems as part of health system reforms is an urgent area for action for the MENA region.*
- *High-quality, reliable, and timely data that can be linked across databases and across time, generate tremendous benefits for health systems in general and for a country's pandemic response in particular.*

Improving the existing health systems in MENA is a comprehensive task. Describing them in detail goes beyond the scope of this report. While Haldane and others (2021) provide high-level guidance for policy consideration, Duran and Menon (2020) discuss MENA-specific policy priorities. These priorities, which vary by country, include: accelerating reforms to improve the level and distribution of health financing, and physical and human resources; improving the flexibility and quality of services at community, primary and hospital levels; proactively involving the private sector; and improving surveillance capacity and integrated health information systems. Yet, what is common across MENA countries is the lack of reliable, high-quality digital data to inform transparent and accountable decision-making. That such data are essential to health and other public service delivery is an overarching lesson from the pandemic. This means it is urgent for the region to overhaul data systems as part of health systems reform, and to encourage a culture of openness and data use to inform policy actions. In an uncertain environment with the potential for new mutations of the coronavirus that further threaten lives and livelihood, data are becoming even more relevant.

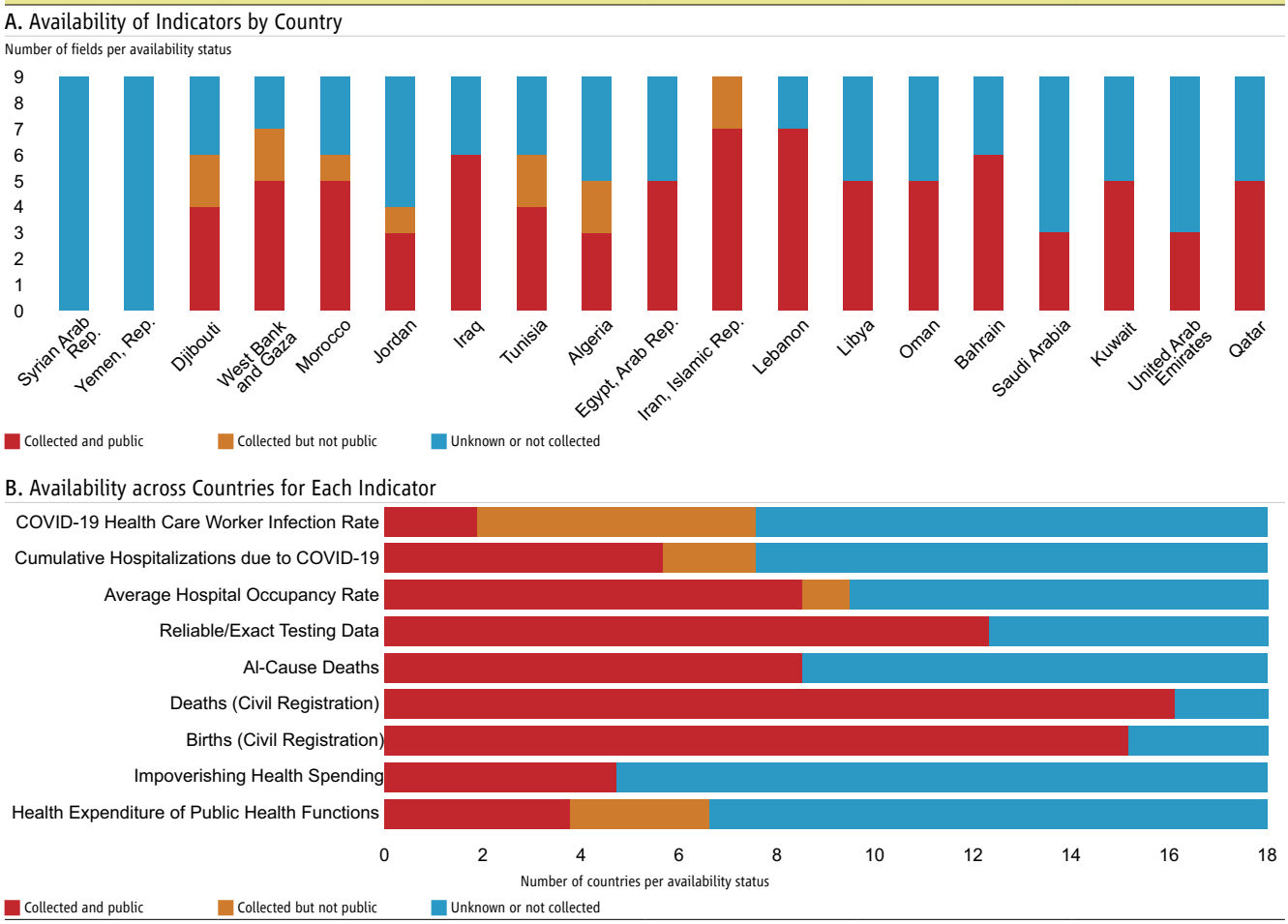
Figure 7.1 documents the difficulty of finding and accessing commonly used indicators to assess pandemic response of countries in the region. The figure shows that many indicators are either not publicly available or not collected, and in many cases the authors of this report were unable to verify which was the case.

While researching the availability of a variety of data related to Covid-19 across MENA countries, nine indicators were collected for 18 countries. The selected indicators provide basic information about key aspects of public health and about the conditions facing frontline health workers during the pandemic. These indicators included health system data (such as health worker infection rates and hospital occupancy, spending on public health functions such as contact tracing) and population-level information (such as the total number of births and deaths, and the percentage of households that incurred catastrophic levels of spending in response to an emergency).

The top panel shows the availability of indicators by country. The bottom panel shows availability across countries for each indicator. Only about half of the time, was the data found to be publicly available. Some types of data were collected, but not publicly available. In many cases, it was not possible to ascertain whether the data was or was not available. This shows that even if data is collected, it is often difficult to find and access.

What is needed are high-quality, reliable, and timely data that can be linked across databases and across time. This would generate tremendous benefits for the health system in general and a country's pandemic response specifically.

Figure 7.1. Data Availability Assessment for MENA



Note: The fields in Panel B are key to a better understanding of the spread, severity and impact of Covid-19 in countries and can be used to conduct comparisons. This assessment aims to determine the status of collection and public availability of these fields per country in the MENA region. Data is either collected and publicly available, collected and not publicly available, or not collected/collection status. Panel A lists the availability/status of nine fields for each country. Panel B lists the availability status for each field by country.

When trying to understand how better data and information flows could support a country's healthcare system during a viral outbreak, it is important to rely on peer-reviewed research that establish causal links. The body of research on Covid-19 is nascent, and there is a shortage of rigorous causal studies on the benefits of data use in responding to the pandemic. However, policymakers can draw on the larger body of existing evidence on better information sharing, data use, and health outcomes. This section will summarize some of this evidence and briefly review practical considerations for improving data collection and sharing in the health system.

Evidence: The Benefits of Timely, Reliable Digital Data. Under the right conditions, there can be great benefits to digitizing, sharing, and linking health data. Many case studies based on clinical practice and ongoing policy innovations have been compiled (see Table 7.1). Health data can be classified into five categories with corresponding benefits: individual health records; facility, equipment, staffing, and capacity data; physician and staff data; procurement and supply chain data; and aggregate data and public-use datasets. This section focuses on academic studies that establish a causal relationship between an improved data system and benefits to health services. Only a few compelling research studies are cited.

Table 7.1. The Many Roles of Data in Modern Health Care Systems

Category	Data sources	Data use	Sample application: Covid-19 vaccination effort
Individual health records	Health insurance records, provider records, health ministry data submitted by private or public providers, vaccine and other medical registers, private companies (for example, fitness tracking apps)	Track individual health and health care utilization, transfer patient information between providers; verify morbidity, birth, and mortality data; match blood or transplant donors and recipients	Vaccine coverage rates, real-time information on projected vaccine demand
Facility equipment, staffing, and capacity data	Health ministry regulatory data reported by facilities, facility surveys, licensing records, private companies (such as facility web ratings)	Allocate resources and staff (especially public facilities); administer licensing; set medical training requirements and policies	Up-to-date knowledge of available vaccination slots, cooling and storage capacity
Physician and staff data	Health ministry regulatory reporting by facilities, licensing records, patient satisfaction surveys, hospital surveys, insurance records	Monitor provider performance and set incentives; track and project local and regional availability of medical specializations	Mobilization capacity for vaccine drives, first-responder burnout risk
Procurement and supply chain data	Regulatory data on pharmaceutical prices and distribution, licensing records, pharmacy and dispensary surveys, pharmaceutical industry surveys	Track supply levels, prices; direct supplies and project bottlenecks; cost control	Availability and distribution of vaccine doses and materials
Aggregate data and public-use datasets	Birth and death registries, national health surveys, de-identified data extracted from centralized records (for example at the health ministry) or decentralized records (such as from at health insurers)	Create panel data to estimate policy effects and watch health trends; create dashboards and share up-to-date information to promote accountability and transparency	Research on vaccine effectiveness and side effects, effectiveness of policies to increase take-up, up-to-date information on vaccination coverage

Tracking patients and their health. The most granular health data collection is at the level of the individual patient, and much of the research on digitized health record systems has focused on whether such systems can improve individual care (Atasoy, Greenwood, and McCullough 2019). In the context of the public health response to the Covid-19 pandemic, complete digitized records linkable via a unique ID, can be particularly useful for tracking cases to, for example: avoid duplication of diagnostics and testing or treatment; establish quarantine requirements; and provide timely aggregate case data.

Evidence from India shows that patient tracking through a biometric identification system significantly improves adherence to tuberculosis treatment by recording whether the patient picked up the medication and by generating automatic alerts to the health care provider when a dose is missed, which increased home follow-up by providers (Bossuroy, Delavallade, and Pons, 2019). Botswana's HIV/AIDS Rapid Information Management System uses similar uniquely identified patient data to support home follow-up, which significantly increased adherence and patient retention, and boosted the total number of patients in treatment (Farahani and others, 2014). In both countries, these health information systems also improved disease tracking by reducing inflated or duplicate patient counts. In the tuberculosis study, a comparison of different data sources suggested that, in absence of biometric devices, up to 20 percent of declared patients are

duplications. The Botswana system also provided several years of longitudinal data on indicators such as medication usage, health outcomes, and mortality, which improved treatment protocols and enabled in-depth research (Farahani and others 2014). Studies on the effectiveness of antiretroviral therapy against AIDS-related mortality in sub-Saharan Africa are rare because of the widespread underreporting of deaths and the mislabeling of the cause of death. For example, it is estimated that Botswana's Registry of Births and Deaths failed to count 20 percent of all deaths in 2006-2010 (Stoneburner and others 2014).

At the health system level, unique IDs have also played a crucial role in enabling better data linkage across benefit systems and in improving citizen's access to health care. In Thailand, the government's ID program, population register and shared interoperable databases across three public schemes, helped implement universal health coverage in 2001, reducing the uninsured to 5 percent of the population. The system also facilitated verification of vital statistics, maintenance of disease registry, and tracking of vaccination rollouts (Tangcharoensathien and others 2014; ID4D 2018). All three are vital components of a country's pandemic response that can be quickly adapted to address an outbreak of novel diseases such as Covid-19. If a national ID system is not in place, a dedicated health ID could take on many of the same functions (ID4D, 2018).

Monitoring and information sharing with the public. Well-stocked, well-functioning health facilities that patients trust, are a prerequisite for a successful pandemic response (see Box 7.1). Up-to-date facility- and provider-level data play an important role in holding providers and policymakers accountable and in assuring quality of care. To measure such important data, for example, the Service Delivery Indicators (SDI) initiative in Africa fields comprehensive surveys on quality indicators in health and education, providing facility-level measures of service quality, utilization, and performance. So far, 13 countries in sub-Saharan Africa have taken advantage of this tool to get a detailed understanding of service delivery, a first step toward identifying bottlenecks or taking corrective action.

Real-time data can support monitoring and quality assurance efforts even more effectively, for example, by helping managers monitor attendance. In randomized studies in India, biometric check-ins for health facility staff increased provider performance by 15-to-17 percent, which significantly improved patient outcomes (Bossuroy, Delavallade, and Pons 2019; Dhaliwal and Hanna 2017). Physician attendance in rural clinics increased by 75 percent in the Punjab province of Pakistan after health facility inspectors were equipped with a phone app and a dashboard that flagged high staff absences to supervisors (Callen and others 2020). These findings come with caveats, which underscore how information is only as good as the actions based on it. In India, officials were reluctant to use the information about absenteeism to reprimand doctors, meaning that the effect of the program was more pronounced on lower-level staff (Dhaliwal and Hanna 2017). In Punjab, the program had only short-lived effects on inspection rates, which fell far short of the envisioned rate of monthly visits (Callen and others 2020). This suggests that monitoring is ineffective if the incentives to do so are lacking or there is no capacity for enforcement.

When government institutions are weak, community monitoring can at least partially substitute for official oversight. In an experimental study in Uganda, communities were provided with report cards on the performance of their local healthcare facilities and were encouraged to develop a monitoring plan. As a result, wait times, inventory stock-outs, and absenteeism at the clinics decreased, while cleanliness and equipment usage increased, yielding much higher utilization and better health outcomes (Björkman and Svensson 2009). However, a crucial prerequisite for effective community monitoring is access to information about performance, and such data is often scarce. Private efforts that utilize mobile technology have recently begun to help fill this gap. In Uganda, the SMS-based health facility tracking program mTRAC—

Box 7.1. The Spread of Information, the Public's Response to Policy Measures, and the Role of Trust in a Crisis

When an epidemic emerges, the success of the public health response depends crucially on the availability and spread of information and the response of individuals to policy measures. Clear, unbiased, and timely gathering and sharing of data is essential.

In times of crisis, individuals are highly susceptible to information that propagates through informal social networks. This can be beneficial when effective public health information gets shared, as happened in India, where one experimental study found that a video message by Nobel prize winner Abhijit Banerjee improved symptom reporting, social distancing, and hygiene by those who received the message and those who did not (Banerjee and others 2020). But social network sharing can also have more ambiguous effects; for example, during the SARS outbreak in Taiwan in which 312 individuals were infected, peer effects contributed to a precipitous drop in health facility use that outlasted the disease and occurred even in locations that did not have cases (Bennett, Chiang, and Malani 2015). As discussed earlier, a similar effect occurred during Covid-19, when mobility data showed that in-person contacts significantly declined in some areas even before formal policies were in place.

Important factors in the public response appear to be trust in the message and solidarity with the community (Brodeur and others 2020). A second text messaging experiment in India that did not feature a well-known public figure did not have the same impact as the Banarjee video (Bahety and others 2021). In Europe, areas with greater levels of trust in government and a stronger civic culture exhibited higher compliance with social distancing policies such as lockdowns (Bargain and Aminjonov 2020; Durante, Guiso, and Gulino 2021).

Political leadership can have an outsized and, depending on the messaging, detrimental influence on individual behavior. Evidence from the United States showed that political affiliation with the Republican party and the consumption of politically right-leaning news channels were associated with lower social-distancing compliance and worse health outcomes (Allcott and others 2020; Painter and Qiu 2021; Simonov and others 2020; Bursztyn and others 2020). These findings are even more disquieting given that U.S. academics have led efforts to share information freely with the public in real time—for example a Covid-19 dashboard by Johns Hopkins University (Dong, Du, and Gardner 2020)—and that Covid-19 vaccine research was supported by huge tax-funded investments by the U.S. federal government (Frank, Dach, and Lurie 2021).

Brazil is an example of a country where exemplary efforts to base policy on evidence were undermined by misinformation and lack of leadership during the pandemic. Evidence from Brazil has shown in the past that its municipal-level policymakers (mayors) value rigorous evidence and are exceptionally open to translating such evidence into policy change (Hjortand others 2021). Brazil was also the first country to field a nationwide serological survey, which was conducted four times between May and August 2020. It revealed local and ethnical disparities in seroprevalence in the population (Hallal, Hartwig, and others 2020; Hallal, Horta, and others 2020; World Bank 2021a). However, the academic leads of the study also report that "the sample fell short" due in part to a "lack of coordination between the Ministry of Health (which commissioned the study) and the city and state governments." as well as "the rapid spread of disinformation through social media characterizing the interviewers as swindlers, or of even being part of a plot to spread the virus." The report said that "in 27 cities, interviewers were arrested and in eight cities the tests were destroyed by local police forces" (Hallal, Hartwig, and others 2020). All the while, the country leadership publicly dismissed the risks of Covid-19, with possibly deadly consequences (Ajzenman, Cavalcanti, and Da Mata 2020; Cabral, Ito, and Pongeluppe 2021).

An important lesson is that reliable and unambiguous information sharing, and messaging, are even more important during a public health crisis. Political leaders and other trusted public figures need to unequivocally reinforce public health measures. It requires time and effort to build both public trust and the data capacities, that are necessary for an optimal crisis response.

which surveys facilities but also allows the public to submit anonymous complaints—provides patients, providers, and the government with real-time health information (Unicef 2021; SDSN TReNDS 2018). The mPedigree text messaging program, used in Nigeria and elsewhere, employs scratch panels with unique codes on medication packaging to allow buyers to verify the source of a drug and identify counterfeit products (BBC 2013).

Once in place, such monitoring systems have the potential to be repurposed quickly in times of crisis. For instance, a case study reports that mTRAC has nearly halved the response time to disease outbreaks such as the 2012 Ebola outbreak, helping health providers to receive information and implement measures such as quarantines more quickly. Public-private collaborations seem a promising means to quickly collect data on epidemic outbreaks: major phone companies were able to implement contact tracing remarkably quickly during the Covid-19 outbreak, with Apple and Google releasing related documentation by April 2020 (Apple 2020).

Public health specialists have called for more decisive steps by governments to collaborate with network operators and location data services to help fight the pandemic (Oliver and others 2020). Exposure, contact, and location data over time, could be used to track citizens' behavioral responses to measures such as curfews or provide estimates of the reproduction number, R, which measures how infectious a disease is. Saudi Arabia deployed such a data strategy quite successfully. The Kingdom used its existing Health Electronic Surveillance Network, launched in 2012, to track laboratory tests and expanded the functionality of existing health apps (called Mawad and Sehhaty) to allow users to conduct symptom self-checks and book appointments at Covid-19 clinics and testing sites. It also launched new apps to support contact tracing and social distancing, including Tabaud, which follows the Apple/Google standards and alerts individuals if they were exposed to someone with Covid-19 (Hassounah, Raheel, and Alhefzi 2020).

Guiding the allocation of human capital, supplies, and resources. A core function of a country's health system is the allocation of resources. The rapid assignment and distribution of resources—whether vaccine appointments, hospital beds, or oxygen tanks—also play an important role in the pandemic response.

The health sector often requires centralized intervention to improve the allocation of resources and match supply and demand for health services. Such interventions can be very successful: Alvin Roth was awarded a Nobel prize in 2012 (with Lloyd Shapley) for applying the theory of "two-sided matching" to many health sector allocation challenges, including allocating medical specialists to different locations and the pairing organ donors with recipients (Roth 1991; Roth and Peranson 1999; Roth, Sönmez, and Ünver 2005). Researchers have recently discussed how similar methods can help allocate rationed resources, such as ventilators and antiviral medications, during the Covid-19 (Pathak and others 2021). An important prerequisite for all these applications is the collection and sharing of accurate data on demand and supply for a given resource.

However, in low- and middle-income countries, even basic information is often scarce or unreliable, and where data is available, it reveals large inefficiencies. For example, the SDI data in Africa on facility and provider case load showed that utilization of health services varied widely and seemingly without clear patterns (Andrews and others 2021 and Gatti and others 2021)—there might be underutilization in one facility and simultaneous excessive wait times for patients in another. Even basic survey or administrative data collection could reveal such issues and help policymakers better allocate health resources. In very resource-strapped settings, highly targeted data collection can fill gaps in nationally-representative data. For example, in Yemen, the World Bank (along with other multinational organizations) is currently

using high-frequency phone surveys, geospatial analysis, and social media scanning techniques to measure access to healthcare and target interventions.

Improving Data Systems. Beyond supporting a country's pandemic response, well-designed data systems can improve a country's healthcare system as a whole. Information sharing in healthcare is particularly important for two reasons. First, for many infectious diseases, a person's illness—and the care he or she receives—can affect many others. Tracking cases and health outcomes, and transparently monitoring prevention, help control disease outbreaks and increase the public's trust in the healthcare system and the government. Second, the nature of illness and healthcare is that it is difficult for patients and outside observers to know whether patient care is appropriate and cost-effective. Monitoring performance across many cases and over time is vital to a well-functioning healthcare sector.

Cost-saving through better oversight means that upfront investments in data systems frequently more than pay for themselves (World Bank 2018). For example, a recent study from India used information from 1.6 million insurance claims combined with patient surveys, to look at the effect of changes in health insurance reimbursement rates on the behavior of private hospitals. It revealed that hospitals not only increased revenue by manipulating claims coding to increase reimbursements for more lucrative services, they also illegally charged patients (Jain 2021).

A successful health data system balances the interests of all stakeholders and combines ease of use, high data quality and accuracy, with strong data security and privacy protection features. Many countries have crafted unified digital strategies that lay out these and other principles, such as India's "Digital India" program (https://www.digitalindia.gov.in).

Tools such as biometric IDs (fingerprint or iris scans) can speed up shift check-ins by providers or patient-record callups. More generally, automated data collection and interoperability of databases that allow data sharing—such as between primary care providers and specialists or pharmacies—make systems easier to handle and enable broader use. Data systems now are often extremely fragmented. For example, there are more than 200 health information applications in the Ethiopian health sector, and only about 40 percent of them share data with the health ministry (World Bank 2021a).

Data sharing also permits more cross-checks: a prescription written by the doctor and filled by the pharmacist, linked to the same ID, allows verification of the patient's identity and diagnosis from two independent sources. If a vaccine is scanned both at the dispensary and again when administered to a child, the dose, provenance, and recipient can be automatically confirmed.

Such cross-checks could improve the quality of aggregated indicators. Misreporting is a well-known issue in global health and especially prevalent when there are performance-based incentives for healthcare providers. For instance, when researchers compared officially reported vaccines against diphtheria, tetanus and whooping cough (referred to as DTP3) with survey evidence across 41 African countries, they found significant over-reporting of vaccinations. The researchers said the discrepancies between actual and reported immunizations were in part due to the incentives for immunizations provided by the Global Alliance for Vaccines and Immunization (GAVI): in countries that received GAVI payments, the number of children reported in national administrative data as having received the vaccine was almost twice as high the number of vaccinated children found in surveys of the same populations (Sandefur and Glassman 2014; Lim and others 2008). A robust data system should also consider the incentives of those who provide the data and make data accuracy an explicit design objective.

Along with the benefits from universal ID and data sharing systems come risks that require strong protection against misuse. In Venezuela, for example, fingerprint-based IDs, initially intended to support voter identification, have become a requirement for buying basic goods, including medicine, and advocacy organizations have reported that some sellers refuse to serve LGBTQ individuals or non-citizens (World Bank 2021a).

Individuals whose sensitive health data is captured must be protected both from exclusion via ID or other requirements, and from unauthorized access to their data. An ID system can be problematic in settings where individuals do not trust in its benevolent use by the authorities and forego signing up. The rapid management information system in Botswana, for example, defines user categories—doctors, pharmacists, laboratory staff, and program administrators—each of which has a different level of access and can see only certain types of data (ID4D 2018). Such restrictions should also be enforced with respect to branches of the government that use the data for non-health purposes.

Finally, any good health information management system should allow for aggregation and de-identification of the data so that the public, as well as academic researchers, can access, view, and use it for analysis. These uses need to be underpinned by a legal framework that supports such transparency, while establishing strong physical, privacy, and ethical protections (Cole and others 2020). Moreover, upfront investment in both technical infrastructure and local expertise may be needed to ensure the successful management of the system. In fact, many initiatives and tools are already available in the public domain for these purposes, supported by most major international organizations, such as the MENA-OECD Government Program, which has issued a digital governance position paper (OECD 2017).

References

Abu Baker Farag, Elmoubasher, Mohamed Nour, Ahmed El Idrissi, Jaouad Berrada, Aya Moustafa, Minahil Mehmood, Mahmoud H. Mahmoud, Ahmed M. El-Sayed, Farhoud Alhajri, Mohammed Al-Hajri, Osama Ahmed Hassan, Hamad Al-Romaihi, Mohamed Al-Thani, Salih A. Al-Marri, Marion P.G. Koopmans and Mohamed Haroun Ismail. 2019."Survey on implementation of One Health approach for MERS-CoV preparedness and control in Gulf Cooperation Council and Middle East countries." *Emerging Infectious Diseases* Volume 25, No. 3. https://doi.org/10.3201/eid2503.171702.

Aggarwal, Shilpa, Rebecca Dizon-Ross, and Ariel D. Zucker. 2020. "Incentivizing Behavioral Change: The Role of Time Preferences." *Working Paper 27079. National Bureau of Economic Research.* https://doi.org/10.3386/w27079.

Agha, Leila. 2014. "The Effects of Health Information Technology on the Costs and Quality of Medical Care." *Journal of Health Economics* Volume 34: 19–30. https://doi.org/10.1016/j.jhealeco.2013.12.005.

Ahmad, Omar B., Cynthia Boschi-Pinto, Alan D. Lopez, Christopher JL Murray, Rafael Lozano, and Mie Inoue. 2001. "Age Standardization of Rates: A New WHO Standard". *Geneva: World Health Organization*: 9, No. 10.

Aitken, Tess, Ken Lee Chin, Danny Liew and Richard Ofori-Asenso. 2020. "Rethinking Pandemic Preparation: Global Health Security Index (GHSI) Is Predictive of COVID-19 Burden, but in the Opposite Direction." *The Journal of Infection* Volume 81, no. 2: 318–56. https://doi.org/10.1016/j.jinf.2020.05.001.

Ajzenman, Nicolas, Tiago Cavalcanti and Daniel Da Mata. 2020. "More than Words: Leaders' Speech and Risky Behavior During a Pandemic." CEPR Discussion Paper 14707.

Alesina, Alberto, Arnaud Devleeschauwer, William Easterly, Sergio Kurlat, and Romain Wacziarg. 2003. "Fractionalization." *Journal of Economic Growth* 8: 155–194. https://doi.org/10.1023/A:1024471506938.

Aljadeed, Rana,Yazed AlRuthia,Bander Balkhi, Ibrahim Sales, Monira Alwhaibi, Omar Almohammed,Abdulaziz J. Alotaibi, Ali M. Alrumaih and Yousif Asiri. 2021. "The Impact of COVID-19 on Essential Medicines and Personal Protective Equipment Availability and Prices in Saudi Arabia." *Healthcare* 9, No. 290. https://doi.org/10.3390/healthcare9030290.

Allcott, Hunt, Levi Boxell, Jacob Conway, Matthew Gentzkow, Michael Thaler and David Yang. 2020. "Polarization and Public Health: Partisan Differences in Social Distancing during the Coronavirus Pandemic." *Journal of Public Economics* Volume 191: 104254. https://doi.org/10.1016/j.jpubeco.2020.104254.

Andrews, Kathryn Gilman, Ciro Avitabile and Roberta Gatti. 2019. "Domestic Government Spending on Human Capital: Cross-Country Analysis of Recent Trends". *World Bank Policy Research Working Paper No. 9033*. https://ssrn.com/abstract=3485916.

Andrews, Kathryn, Ruben Conner, Roberta Gatti, and Jigyasa Sharma. 2021. "The Realities of Primary Care: Variation in Quality of Care Across Nine Countries in Sub-Saharan Africa." *World Bank Policy Research Working Paper No. 9607.*

Apple. 2020. "Privacy-Preserving Contract Tracing." https://covid19.apple.com/contacttracing.

Arezki, Rabah, Daniel Lederman, Amani Abou Harb, Nelly El-Mallakh, Rachel Yuting Fan, Asif Islam, Ha Nguyen and Marwane Zouaidi. 2020. "How Transparency Can Help the Middle East and North Africa." *Middle East and North Africa Economic Update (April), Washington, DC: World Bank.* Doi: 10.1596/978-1-4648-1561-4.

Atasoy, Hilal, Brad N. Greenwood and Jeffrey Scott McCullough. 2019. "The Digitization of Patient Care: A Review of the Effects of Electronic Health Records on Health Care Quality and Utilization." *Annual Review of Public Health* Volume 40, No. 1: 487–500. https://doi.org/10.1146/annurev-publhealth-040218-044206.

Aurora, Rahul K., Abel Joseph, Jordan Van Wyk, Simona Rocco, Austin Atmaja, Ewan May, Niklas Bobrovitz, Jonathan Chevrier, Matthiew P. Cheng, Tyler Williamson and David L. Buckeridge. 2021. "SeroTracker: A Global SARS-CoV-2 Seroprevalence Dashboard." *The Lancet Infectious Diseases* Volume 21, Issue 4: E75-E76. https://doi.org/10.1016/S1473-3099(20)30631-9 and https://serotracker.com/en/Explore.

Bahety, Girija, Sebastian Bauhoff, Dev Patel, and James Potter. 2021. "Texts Don't Nudge: An Adaptive Trial to Prevent the Spread of COVID-19 in India." *Center For Global Development Working Paper 585*. https://www.cgdev.org/publication/texts-dont-nudge-adaptive-trial-prevent-spread-covid-19-india.

Banerjee, Abhijit, Marcella Alsan, Emily Breza, Arun G. Chandrasekhar, Abhijit Chowdhury, Esther Duflo, Paul Goldsmith-Pinkham and Benjamin A. Olken. 2020. "Messages on COVID-19 Prevention in India Increased Symptoms Reporting and Adherence to Preventive Behaviors Among 25 Million Recipients with Similar Effects on Non-Recipient Members of Their Communities." *Working Paper 27496. National Bureau of Economic Research.* https://doi.org/10.3386/w27496.

Bargain, Olivier, and Ulugbek Aminjonov. 2020. "Trust and Compliance to Public Health Policies in Times of COVID-19." *Journal of Public Economics*, Volume 192: 104316. https://doi.org/10.1016/j.jpubeco.2020.104316.

Barrett, Ronald, Christopher W. Kuzawa, Thomas McDade, and George J. Armelagos. 1998. "Emerging and Re-emerging Infectious Diseases: The Third Epidemiologic Transition", *Annual Review of Anthropology*, Volume 27: 247–271, https://doi.org/10.1146/annurev.anthro.27.1.247, S2CID 2792275.

BBC. 2013. "Nigerian Texters to Take on the Drug Counterfeiters." *BBC News, Africa.* https://www.bbc.com/news/world-africa-20976277.

Bennett, Daniel, Chun-Fang Chiang and Anup Malani. 2015. "Learning during a Crisis: The SARS Epidemic in Taiwan." *Journal of Development Economics*, Volume 112: 1–18. https://doi.org/10.1016/j.jdeveco.2014.09.006.

Björkman, Martina, and Jakob Svensson. 2009. "Power to the People: Evidence from a Randomized Field Experiment on Community-Based Monitoring in Uganda." *The Quarterly Journal of Economics*, Volume 124, No. 2: 735–69.

Bloomberg LP. 2021. "Purchasing Managers Index".

Bobrovitz, Niklas, Rahul Krishan Arora, Christian Cao, Emily Boucher, Michael Liu, Claire Donnici, Mercedes Yanes-Lane, Mairead Whelan, Sara Perlman-Arrow, Judy Chen, Hannah Rahim, Natasha Ilincic, Mitchell Segal, Nathan Duarte, Jordan Van Wyk, Tingting Yan, Austin Atmaja, Simona Rocco, Abel Joseph, Lucas Penny, David A. Clifton, Tyler Williamson, Cedric P. Yansouni, Timothy Grant Evans, Jonathan Chevrier, Jesse Papenburg, and Matthew P. Cheng. 2021. "Global Seroprevalence of SARS-CoV-2 Antibodies: A Systematic Review and Meta-Analysis." *PLOS ONE* 16(6): e0252617. https://doi.org/10.1371/journal.pone.0252617.

Bossuroy, Thomas, Clara Delavallade, and Vincent Pons. 2019. "Biometric Tracking, Healthcare Provision, and Data Quality: Experimental Evidence from Tuberculosis Control." *Working Paper 26388. National Bureau of Economic Research*. https://doi.org/10.3386/w26388.

Boyd, Matthew J., Nick Wilson, and Cassidy Nelson. 2020. "Validation Analysis of Global Health Security Index (GHSI) Scores 2019" *BMJ Global Health*, Volume 5, no. 10: e003276. https://doi.org/10.1136/bmjgh-2020-003276.

Brodeur, Abel, David M. Gray, Anik Islam, and Suraiya Bhuiyan. 2020. "A Literature Review of the Economics of Covid-19." *IZA Discussion Paper 13411.* https://papers.ssrn.com/abstract=3636640.

Bursztyn, Leonardo, Aakaash Rao, Christopher Roth, and David Yanagizawa-Drott. 2020. "Misinformation During a Pandemic." *NBER Working Paper 27417*. https://papers.ssrn.com/abstract=3580487.

Cabral, Sandro, Nobuiuki Ito, and Leandro Pongeluppe. 2021. "The Disastrous Effects of Leaders in Denial: Evidence from the COVID-19 Crisis in Brazil." *Working Paper*, *SSRN*. https://papers.ssrn.com/abstract=3836147.

Callen, Michael, Saad Gulzar, Ali Hasanain, Muhammad Yasir Khan, and Arman Rezaee. 2020. "Data and Policy Decisions: Experimental Evidence from Pakistan." *Journal of Development Economics*, Volume 146: 102523. https://doi.org/10.1016/j.jdeveco.2020.102523.

Chisadza, Carolyn, Matthew Clance, and Rangan Gupta. 2021."Government Effectiveness and the COVID-19 Pandemic". *Sustainability*, Volume 13, No. 6: 3042. https://doi.org/10.3390/su13063042.

Cole, Shawn, Iqbal Dhaliwal, Anja Sautmann, and Lars Vilhuber. 2020. "Handbook on Using Administrative Data for Research and Evidence-Based Policy." *Cambridge, MA: Abdul Latif Jameel Poverty Action Lab (J-PAL)*. https://www.hbs.edu/faculty/Pages/item.aspx?num=59582.

Crosby, Sawyer, Joseph L. Dieleman, Samantha Kiernan, and, Thomas J. Bollyky. 2020. "All Bets Are Off for Measuring Pandemic Preparedness." *Think Global Health.* https://www.thinkglobalhealth.org/article/all-bets-are-measuring-pandemic-preparedness.

de Walque, Damien, Jed Friedman, Roberta Gatti, and Aaditya Mattoo. 2020. "*How Two Tests Can Help Contain COVID-19 and Revive the Economy*". *Research and Policy Briefs, No. 29. World Bank, Washington, DC.*

Dhaliwal, Iqbal, and Rema Hanna. 2017. "The Devil Is in the Details: The Successes and Limitations of Bureaucratic Reform in India." *Journal of Development Economics,* Volume 124: 1–21. https://doi.org/10.1016/j.jdeveco.2016.08.008.

Dong, Ensheng, Hongru Du, and Lauren Gardner. 2020. "An Interactive Web-Based Dashboard to Track COVID-19 in Real Time." *The Lancet Infectious Diseases*, Volume 20, No. 5: 533–34. https://doi.org/10.1016/S1473-3099(20)30120-1.

Drazen, Allan. 2000. "Political Economy in Macroeconomics." *Princeton University Press*. ISBN: 9780691188003.

Duran, Denizhan and Rekha Menon. 2020. "Mitigating the Impact of COVID-19 and Strengthening Health Systems in the Middle East and North Africa." *World Bank, Washington, DC.*

Durante, Ruben, Luigi Guiso, and Giorgio Gulino. 2021. "Asocial Capital: Civic Culture and Social Distancing during COVID-19." *Journal of Public Economics*, Volume 194: 104342. https://doi.org/10.1016/j.jpubeco.2020.104342.

Eastern Mediterranean Health Observatory. 2019."Availability of selected essential medicines in public and private health facilities." *World Health Organization Regional Office for the Eastern Mediterranean*. https://rho.emro.who.int/Indicator/TermID/85.

Egyptian Ministry of Planning and Economic Development. 2021. "National Accounts Data". https://mped.gov.eg/Analytics?id=61&lang=en.

El-Saharty, Sameh, Heba Nassar, Sherine Shawky, Amr Elshalakani, Mariam Hamza, Yi Zhang, and Nahla Zeitoun eds., 2021. Achieving the Demographic Dividend in Egypt: Choice, not Destiny. Washington, DC. The World Bank.

Farahani, Mansour, Anusha Vable, Refeletswe Lebelonyane, Khumo Seipone, Marina Anderson, Ava Avalos, Tim Chadborn, Hailu Tilahun, Danae Roumis, Themba Moeti, Godfrey Musuka, Lesego Busang, Tendani Gaolathe, Kolaatamo C S Malefho, and Richard Marlink. 2014. "Outcomes of the Botswana National HIV/AIDS Treatment Programme from 2002 to 2010: A Longitudinal Analysis." *The Lancet Global Health*, Volume 2, No. 1: e44–50. https://doi.org/10.1016/S2214-109X(13)70149-9.

Flaxman, Seth, Swapnil Mishra, Axel Gandy, H. Juliette T. Unwin, Thomas A. Mellan, Helen Coupland, Charles Whittaker, Harrison Zhu, Tresnia Berah, Jeffrey W. Eaton, Mélodie Monod, Imperial College COVID-19 Response Team, Azra C. Ghani, Christl A. Donnelly, Steven Riley, Michaela A. C. Vollmer, Neil M. Ferguson, Lucy C. Okell, and Samir Bhatt. 2020. "Estimating the Effects of Non-Pharmaceutical Interventions on COVID-19 in Europe." *Nature*, Volume 584: 257-261. https://doi.org/10.1038/s41586-020-2405-7.

Frank, Richard G., Leslie Dach, and Nicole Lurie. 2021. "It Was The Government That Produced COVID-19 Vaccine Success." *Health Affairs*. https://www.healthaffairs.org/do/10.1377/hblog20210512.191448/full/.

Fuller, James A., Avi Hakim, Kerton R. Victory, Kashmira Date, Michael Lynch, Benjamin Dahl, Olga Henao, and CDC COVID-19 Response Team. 2021. "Mitigation Policies and COVID-19-Associated Mortality–7 European Countries, January 23-June 30, 2020". *MMWR and Mortality Weekly Report*: 58-62. https://doi.org/10.15585/mmwr.mm7002e4.

Gatti, Roberta, Daniel Lederman, Ha M. Nguyen, Sultan Abdulaziz Alturki, Rachel Yuting Fan, Asif M. Islam, and Claudio J. Rojas. 2021. "Living with Debt: How Institutions Can Chart a Path to Recovery for the Middle East and North Africa." *Middle East and North Africa Economic Update (April),* Washington, DC: World Bank.

Gatti, Roberta, Kathryn Andrews, Ciro Avitabile, Ruben Conner, Jigyasa Sharma, and Andres Yi Chang. 2021. The Quality of Health and Education Systems Across Africa: Evidence from a Decade of Service Delivery Indicators Surveys. Washington, DC: World Bank. © World Bank. https://openknowledge.worldbank.org/handle/10986/36234.

Gatti, Roberta, Matteo Morgandi, Rebekka Grun, Stefanie Brodmann, Diego Angel-Urdinola, Juan Manuel Moreno, Daniela Marotta, Marc Schiffbauer, and Elizabeth Mata Lorenzo. 2013. "*Jobs for Shared Prosperity: Time for Action in the Middle East and North Africa*." Washington, DC: World Bank.

GHS Index News. 2020. "The U.S. and COVID-19: Leading the World by GHS Index Score, Not by Response". *Global Health Security Index*. https://www.ghsindex.org/news/the-us-and-covid-19-leading-the-world-by-ghs-index-score-not-by-response/.

Global Health Security Index. "About the GHS Index." Accessed July 30, 2021. https://www.ghsindex.org/about/.

Global Health Security Index. 2019. "GHS Index: Building Collective Action and Accountability." https://www.ghsindex.org/.

Haider, Najmul, Alexei Yavlinsky, Yu-Mei Chang, Mohammad Nayeem Hasan, Camilla Benfield, Abdinasir Yusuf Osman, Md Jamal Uddin, Osman Dar, Francine Ntoumi, Alimuddin Zumla, and Richard Kock. 2020. "The Global Health Security Index and Joint External Evaluation Score for Health Preparedness Are Not Correlated with Countries' COVID-19 Detection Response Time and Mortality Outcome." *Epidemiology & Infection*, Volume 148: E210. https://doi.org/10.1017/S0950268820002046.

Haldane, Victoria, Chuan De Foo, Salma M. Abdalla, Anne-Sophie Jung, Melisa Tan, Shishi Wu, Alvin Chua, Monica Verma, Pami Shrestha, Sudhvir Singh, Tristana Perez, See Mieng Tan, Michael Bartos, Shunsuke Mabuchi, Mathias Bonk, Christine McNab, George K. Werner, Raj Panjabi, Anders Nordström, and Helena Legido-Quigley. 2021. "Health systems resilience in managing the COVID-19 pandemic: lessons from 28 countries." *Nature Medicine*, Volume 27: 964-980. https://doi.org/10.1038/s41591-021-01381-y.

Hale, Thomas, Noam Angrist, Rafael Goldszmidt, Beatriz Kira, Anna Petherick, Toby Phillips, Samuel Webster, Emily Cameron-Blake, Laura Hallas, Saptarshi Majumdar, and Helen Tatlow. (2021). "A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)." *Nature Human Behaviour*, Volume 5:529-538. https://doi.org/10.1038/s41562-021-01079-8.

Hallal, Pedro C, Bernardo L Horta, Aluísio J D Barros, Odir A Dellagostin, Fernando P Hartwig, Lúcia C Pellanda, Cláudio José Struchiner, Marcelo N Burattini, Mariângela Freitas da Silveira, Ana M B Menezes, Fernando C Barros, and Cesar Gomes Victora. 2020. "Evolução Da Prevalência de Infecção Por COVID-19 No Rio Grande Do Sul, Brasil: Inquéritos Sorológicos Seriados." Ciência & Saúde Coletiva 25 (suppl 1): 2395–2401. https://doi.org/10.1590/1413-81232020256.1.09632020.

Hallal, Pedro C, Fernando P Hartwig, Bernardo L Horta, Gabriel D Victora, Mariângela F Silveira, Claudio J Struchiner, Luís Paulo Vidaleti, Nelson Arns Neumann, Lúcia C Pellanda, Odir A Dellagostin, Marcelo N Burattini, Ana M B Menezes, Fernando C Barros, Aluísio J D Barros, and Cesar G Victora. 2020. "Remarkable Variability in SARS-CoV-2 Antibodies across Brazilian Regions: Nationwide Serological Household Survey in 27 States." *Preprint. medRxiv*. https://doi.org/10.1101/2020.05.30.20117531.

Hassounah, Marwah, Hafsa Raheel, and Mohammed Alhefzi. 2020. "Digital Response During the COVID-19 Pandemic in Saudi Arabia." *Journal of Medical Internet Research*, Volume 22, No. 9: e19338. https://doi.org/10.2196/19338.

Health Financing and Governance Project, SHOPS Plus. 2018. "Health Trends in the Middle East and North Africa: A Regional Review of Health Financing and the Private Health Sector." United States Agency for International Development. https://www.hfgproject.org/health-trends-in-the-middle-east-and-north-africa/.

Hjort, Jonas, Diana Moreira, Gautam Rao, and Juan Francisco Santini. 2021. "How Research Affects Policy: Experimental Evidence from 2,150 Brazilian Municipalities." *American Economic Review*, Volume 111, No. 5: 1442–80. https://doi.org/10.1257/aer.20190830.

Huidrom, Raju, M. Ayhan Kose, James Lim, and Franziska L. Ohnsorge, 2020. "Why do Fiscal Multipliers depend on Fiscal Positions?" *Journal of Monetary Economics, Elsevier*, Volume 114(C): 109-125.

ID4D. 2018. "The Role of Digital Identification for Healthcare: The Emerging Use Cases." Washington, DC: Identification for Development, World Bank.

IMF Data. 2021. "Commodity Terms of Trade." International Monetary Fund. https://data.imf.org/?sk=2CDDCCB8-0B59-43E9-B6A0-59210D5605D2.

Islam, Asif Mohammed, and Daniel Lederman. 2020. "Data Transparency and Long-Run Growth." *Policy Research Working Paper No. 9493.* World Bank, Washington, DC.

Jain, Radhika. 2021. "Private Hospital Behavior Under Government Health Insurance in India." April, 43.

Johansson, M.A., Talia M. Quandelacy, Sarah Kada, Pragati Venkata Prasad, Molly Steele, John T. Brooks, Rachel B. Slayton, Matthew Biggerstaff, and Jay C. Butler. "SARS-CoV-2 Transmission From People Without COVID-19 Symptoms." *JAMA Network Open*. 2021;4(1):e2035057. doi: https://doi.org/10.1001/jamanetworkopen.2020.35057.

Karlinsky, Ariel, and Dmitry Kobak, 2021 "Tracking excess mortality across countries during the COVID-19 pandemic with the World Mortality Dataset." *eLife*, Volume 10: e69336. DOI: https://doi.org/10.7554/eLife.69336.

Keenan, Laura, Christian Lindmeier and Kurtis Cooper. 2021. "COVID-19 pandemic leads to major backsliding on childhood vaccinations, new WHO, UNICEF data shows". *World Health Organization News Release.* https://www.who.int/news/item/15-07-2021-covid-19-pandemic-leads-to-major-backsliding-on-childhood-vaccinations-new-who-unicef-data-shows.

Kleinberg, R. L., S. Pasltsev, C.K.E. Ebinger, D.A. Hobbs, and T. Boersma. 2018. "Tight oil market dynamics: Benchmarks, breakeven points, and inelasticities." *Energy Economics*, Volume 70: 70-83. https://doi.org/10.1016/j.eneco.2017.11.018.

Kruk, Margaret E, Anna D Gage, Catherine Arsenault, Keely Jordan, Hannah H Leslie, Sanam Roder-DeWan, Olusoji Adeyi, Pierre Barker, Bernadette Daelmans, Svetlana V Doubova, Mike English, Ezequiel García-Elorrio, Frederico Guanais, Oye Gureje, Lisa R. Hirschhorn, Lixin Jiang, Edward Kelley, Ephrem Tekle Lemango, Jerker Liljestrand, Address Malata, Tanya Marchant, Malebona Precious Matsoso, John G. Meara, Manoj Mohanan, Youssoupha Ndiaye, Ole F. Norheim, K. Srinath Reddy, Alexander K. Rowe, Joshua A. Salomon, Gagan Thapa, Nana A. Y. Twum-Danso, and Muhammad Pate. 2018." High-quality health systems in the Sustainable Development Goals era: time for a revolution." *The Lancet Global Health Commission*: e1196–252. http://dx.doi.org/10.1016/S2214-109X(18)30386-3.

Kurowski, Christoph, David B. Evans, Ajay Tandon, Patrick Hoang-Vu Eozenou, Martin Schmidt, Alec Irwin, Jewelwayne Salcedo Cain, Eko Setyo Pambudi, and Iryna Postolovska. 2021. "From Double Shock to Double Recovery: Implications and Options for Health Financing in the Time of COVID-19." *Health, Nutrition and Population Discussion Paper.* World Bank, Washington, DC: World Bank.

Lim, Stephen S., David B. Stein, Alexandra Charrow, and Christopher JL Murray. 2008. "Tracking Progress towards Universal Childhood Immunisation and the Impact of Global Initiatives: A Systematic Analysis of Three-Dose Diphtheria, Tetanus, and Pertussis Immunisation Coverage." *The Lancet*, Volume 372, No. 9655: 2031–46. https://doi.org/10.1016/S0140-6736(08)61869-3.

Martinez, Ramon, Peter Lloyd-Sherlock, Patricia Soliz, Shah Ebrahim, Enrique Vega, Pedro Ordunez, and Martin McKee. 2020. "Trends in premature avertable mortality from non-communicable diseases for 195 countries and territories, 1990–2017: a population-based study". *The Lancet Global Health*, Volume 8, Issue 4: e511-e523. https://doi.org/10.1016/S2214-109X(20)30035-8.

Mauro, Paulo. 1995. "Corruption and Growth." *The Quarterly Journal of Economics*, Volume 110, No. 3: 681–712. https://doi.org/10.2307/2946696.

McKinsey and Company. 2020. "Pharmaceuticals & Medical Products Practice: COVID-19 Exposes a Critical Shortage of Oxygen in Developing Countries." https://www.mckinsey.com/industries/pharmaceuticals-and-medical-products/our-insights/covid-19-exposes-a-critical-shortage-of-oxygen-in-developing-countries.

Miller, Amalia R., and Catherine E. Tucker. 2011. "Can Health Care Information Technology Save Babies?" *Journal of Political Economy*, Volume 119, No. 2: 289–324. https://doi.org/10.1086/660083.

National Healthcare Safety Network (NHSN). 2020."Current Hospital Capacity Estimates – Snapshot: COVID-19 Module Data Dashboard Sections." Centers for Disease Control and Prevention. https://www.cdc.gov/nhsn/covid19/report-patient-impact.html.

Nuclear Threat Initiative, Johns Hopkins Center for Global Health Security, The Economist Intelligence Unit. 2019. "2019 Global Health Security Index". *Global Health Security Index*. https://www.ghsindex.org/wp-content/uploads/2020/04/2019-Global-Health-Security-Index.pdf.

Nuclear Threat Initiative, Johns Hopkins Center for Global Health Security, The Economist Intelligence Unit. 2019. "GHS Index Report and Model." *Global Health Security Index.* https://www.ghsindex.org/report-model/.

OECD. 2017. "Benchmarking Digital Government Strategies in MENA Countries." *OECD Digital Government Studies.* Paris: OECD Publishing.

Oliver, Nuria, Bruno Lepri, Harald Sterly, Renaud Lambiotte, Sébastien Deletaille, Marco De Nadai, Emmanuel Letouzé, Albert Ali Salah, Richard Benjamins, Ciro Cattuto, Vittoria Colizz, Nicolas de Corde, Samuel P. Fraiberger, Till Koebe, Sune Lehmann, Juan Murillo, Alex Pentland, Phuong N. Pham, Frédéric Pivetta, Jari Saramäki, Samuel V. Scarpino, Michele Tizzoni, Stefaan Verhulst, and Patrick Vinck. 2020. "Mobile Phone Data for Informing Public Health Actions across the COVID-19 Pandemic Life Cycle." *Science Advances*, Volume 6, No. 23: eabc0764. https://doi.org/10.1126/sciadv.abc0764.

Omran, A. R. 2005. "The epidemiological transition: A theory of the epidemiology of population change" (PDF), *The Milbank Quarterly*, Volume 83, No. 4: 731–57. https://doi.org/10.1111/j.1468-0009.2005.00398.x,PMC 2690264, PMID 16279965, archived from the original (PDF) on 2013-04-12. Reprinted from The Milbank Memorial Fund Quarterly, 49 (4, Pt 1): 509–538, 1971.

Our World in Data. "Statistics and Research: Coronavirus (COVID-19) Vaccinations." https://ourworldindata.org/covid-vaccinations.

Painter, Marcus, and Tian Qiu. 2021. "Political Beliefs Affect Compliance with Government Mandates." *Journal of Economic Behavior and Organization, forthcoming (March)*. https://papers.ssrn.com/abstract=3569098.

Pathak, Parag A., Tayfun Sönmez, M. Utku Ünver, and M. Bumin Yenmez. 2021. "Fair Allocation of Vaccines, Ventilators and Antiviral Treatments: Leaving No Ethical Value Behind in Health Care Rationing." *Boston College Working Papers in Economics*, January. https://ideas.repec.org/p/boc/bocoec/1015.html.

Razavi, Ahmed, Ngozi A. Erondu, Ebere Okereke. 2020. "The Global Health Security Index: What Value Does It Add?" *BMJ Global Health*, Volume 5, No. 4: e002477. https://doi.org/10.1136/bmjgh-2020-002477.

Roth, Alvin E. 1991. "A Natural Experiment in the Organization of Entry-Level Labor Markets: Regional Markets for New Physicians and Surgeons in the United Kingdom." *The American Economic Review*, Volume 81, No. 3: 415–40.

Roth, Alvin E., and Elliott Peranson. 1999. "The Redesign of the Matching Market for American Physicians: Some Engineering Aspects of Economic Design." *American Economic Review*, Volume 89, No. 4: 748–80. https://doi.org/10.1257/aer.89.4.748.

Roth, Alvin E., Tayfun Sönmez, and Utku M. Ünver. 2005. "A Kidney Exchange Clearinghouse in New England." *American Economic Review*, Volume 95, No. 2: 376–80. https://doi.org/10.1257/000282805774669989.

Sandefur, Justin, and Amanda Glassman. 2014. "The Political Economy of Bad Data: Evidence from African Survey & Administrative Statistics." *The Center for Global Development Working Paper 373*. https://www.cgdev.org/publication/political-economy-bad-data-evidence-african-survey-administrative-statistics-working.

SDSN TReNDS. 2018. "Data Sharing via SMS Strengthens Uganda's Health System: A Case Study of MTRAC, Uganda." *New York: Sustainable Development Solutions Network,* United Nations. https://www.sdsntrends.org/research/2018/9/27/case-study-mtrac-sms-health-uganda.

Shahpar, Cyrus, Christopher T. Lee, Colby Wilkason, Marine Buissonnière, Amanda McClelland, and Thomas R. Frieden. 2019. "Protecting the World from Infectious Disease Threats: Now or Never." *BMJ Global Health*, Volume 4, No. 4: e001885. https://doi.org/10.1136/bmjgh-2019-001885.

Simonov, Andrey, Szymon K. Sacher, Jean-Pierre H. Dubé, and Shirsho Biswas. 2020. "The Persuasive Effect of Fox News: Non-Compliance with Social Distancing During the Covid-19 Pandemic." *Working Paper 27237. National Bureau of Economic Research.* https://doi.org/10.3386/w27237.

Smith, Katherine F., Michael Goldberg, Samantha Rosenthal, Lynn Carlson, Jane Chen, Cici Chen, and Sohini Ramachandran. 2014. "Global Rise in Human Infectious Disease Outbreaks." *Journal of the Royal Society Interface*, Volume 11, No. 101. https://doi.org/10.1098/rsif.2014.0950.

Stoneburner, Rand, Eline Korenromp, Mark Lazenby, Jean-Michel Tassie, Judith Letebele, Diemo Motlapele, Reuben Granich, Ties Boerma, and Daniel Low-Beer. 2014. "Using Health Surveillance Systems Data to Assess the Impact of AIDS and Antiretroviral Treatment on Adult Morbidity and Mortality in Botswana." *PLOS ONE*, Volume 9, No. 7: e100431. https://doi.org/10.1371/journal.pone.0100431.

Tangcharoensathien, Viroj, Supon Limwattananon, Walaiporn Patcharanarumol, and Jadej Thammatacharee. 2014. "Monitoring and Evaluating Progress towards Universal Health Coverage in Thailand." *PLOS Medicine*, Volume 11, No. 9: e1001726. https://doi.org/10.1371/journal.pmed.1001726.

The Economist. 2021. "COVID-19 Data: Tracking COVID-19 Across the World." https://www.economist.com/graphic-detail/tracking-coronavirus-across-the-world.

The Economist. 2021. "Modelling Covid-19's death toll." https://www.economist.com/briefing/2021/05/15/there-have-been-7m-13m-excess-deaths-worldwide-during-the-pandemic.

The Global Health Observatory. 2020. "UHC Index of Essential Service Coverage." *World Health Organization.* https://www.who.int/data/gho/data/indicators/indicator-details/GHO/uhc-index-of-service-coverage.

The Independent Panel for Pandemic Preparedness & Response. 2021."COVID-19: Make it the Last Pandemic." World Health Organization. https://theindependentpanel.org/wp-content/uploads/2021/05/COVID-19-Make-it-the-Last-Pandemic_final.pdf.

The New York Times. 2021. "India Covid-19 Death Estimates." https://www.nytimes.com/interactive/2021/05/25/world/asia/india-covid-death-estimates.html.

UNICEF. 2021. "MTrac: Using Innovations to Improve Healthcare." July 30, 2021. https://www.unicef.org/uganda/what-we-do/mtrac.

United Nations Department of Economic and Social Affairs. 2019. "United Nations World Population Prospects." United Nations. https://population.un.org/wpp/.

World Bank Data Analytics. 2021. "Understanding the COVID-19 Pandemic Through Data." World Bank. https://datanalytics.worldbank.org/covid-dashboard/#section-covid-19-case-data.

World Bank DataBank. 2021. "Health Nutrition and Population Statistics." World Bank. https://databank.worldbank.org/source/health-nutrition-and-population-statistics.

World Bank DataBank. 2021. "World Development Indicators." World Bank. https://databank.worldbank.org/source/world-development-indicators.

World Bank Group. Forthcoming "Overweight and Obesity in Saudi Arabia: Consequences and Solutions."

World Bank. 2016. "Global Monitoring Report: Development Goals in an Era of Demographic Change." https://www.worldbank.org/en/publication/global-monitoring-report.

World Bank. 2018. "Human Capital: A Project for the World." https://www.devcommittee.org/sites/dc/files/download/Documents/2018-09/DC2018-0012%20Human%20Capital%20Project%20.pdf.

World Bank. 2018. "Public Sector Savings and Revenue from Identification Systems: Opportunities and Constraints."

World Bank. 2021. "MENA Crisis Tracker," August 2, 2021. Washington, D.C: World Bank Group. http://documents.worldbank.org/curated/en/280131589922657376/MENA-Crisis-Tracker-December-16-2020.

World Bank. 2021a. "World Development Report 2021: Data for Better Lives." *World Development Report.* Washington: World Bank.

World Bank. 2021b. "Assessing Country Readiness for COVID-19 Vaccines: First Insights from the Assessment Rollout (English*)."* Washington: World Bank Group.

World Economic Forum. 2019. "Outbreak Readiness and Business Impact: Protecting Lives and Livelihoods across the Global Economy." *World Economic Forum White Paper.* http://www3.weforum.org/docs/WEF%20HGHI_Outbreak_Readiness_Business_Impact.pdf.

World Health Organization Regional Office for the Eastern Mediterranean. 2020. "Statement on COVID-19 by WHO's Regional Director for the Eastern Mediterranean Dr Ahmed Al-Mandhari." http://www.emro.who.int/media/news/statement-on-covid-19-by-regional-director-for-the-eastern-mediterranean-dr-ahmed-al-mandhari.html.

World Health Organization. "E-SPAR Public." Accessed July 29, 2021. https://extranet.who.int/e-spar/.

World Health Organization. "Spar: Strategic Partnership for Health Security and Emergency Preparedness (SPH) Portal." Accessed July 29, 2021. https://extranet.who.int/sph/spar.

World Health Organization. 2016. "Global Strategy on Human Resources for Health: Workforce 2030." https://apps.who.int/iris/bitstream/handle/10665/250368/9789241511131-eng.pdf?sequence=1.

World Health Organization. 2020. "WHO COVID-19 Dashboard." https://covid19.who.int/.

World Health Organization. 2021. "Global Health Expenditure Database." https://apps.who.int/nha/database.

World Health Organization. 2021. "Global Health Observatory." https://www.who.int/data/gho.

World Health Organization. 2021. "National Pulse Survey on Continuity of Essential Health Services During the COVID-19 Pandemic.: January-March 2021." https://www.who.int/teams/integrated-health-services/monitoring-health-services/national-pulse-survey-on-continuity-of-essential-health-services-during-the-covid-19-pandemic.

World Health Organization. 2021. "WHO COVID-19 Detailed Surveillance Data Dashboard." https://app.powerbi.com/view?r=eyJrIjoiYWRiZWVkNWUtNmM0Ni00MDAwLTljYWMtN2EwNTM3YjQzYmRmIiwidCI6ImY2MTBjMGI3LWJkMjQtNGIzOS04MTBiLTNkYzI4MGFmYjU5MCIsImMiOjh9.

World Health Organization. 2021."The True Death Toll of COVID-19: Estimating Global excess mortality." https://www.who.int/data/stories/the-true-death-toll-of-covid-19-estimating-global-excess-mortality.

Worldometer. 2021. "Coronavirus Cases." https://www.worldometers.info/coronavirus/.

Appendix

Appendix A1. Growth Adjustments and Covid-19 Test Positivity Rates

Table A1.1 shows the association between the Covid-19 test positivity rate and the World Bank's forecast of GDP per capita in the corresponding period. The dependent variables are the adjustment of growth forecasts for GDP per capita, comparing the April 2021 Macro and Poverty Outlook (MPO) numbers and those of the October 2019 MPO (before the pandemic). The difference between the two columns is that the dependent variable in regression (2) is the adjustment of GDP per capita forecast in 2021, in terms of GDP per capita in 2019; the dependent variable in regression (1) is the adjustment of GDP per capita forecast in 2020, in terms of GDP per capita in 2019.

The regression results show that, tourism receipts in total exports continue to affect the forecast of growth significantly and negatively, even after controlling for income level before the pandemic, forecast adjustment for 2019 growth in GDP per capita, health system score as of 2019, and export exposure as a share in GDP. The positivity rate has a significantly negative impact only on the forecast of growth in 2020. The impact of the positivity rate continued to be negative, but in a smaller magnitude and significance in the regression with forecast adjustment in 2021.

Table A1.1. Changes in GDP per Capita Forecasts and Covid-19 Test Positivity Rate

Variables	(1) adj 2020	(2) adj 2021
GDP per capita 2019 (log)	-0.52	0.586*
	(0.366)	(0.377)
Adjustment in 2019 GDP per capita growth	0.717**	0.968***
	(0.296)	(0.274)
Health Score	0.0378	0.0288
	(0.0333)	(0.0300)
Export in GDP	-0.0120	-0.0161
	(0.0116)	(0.0115)
Tourism receipts in total exports	-0.160***	-0.160***
	(0.0296)	(0.0226)
Positivity rate by the end of 2020	-0.0843***	
	(0.0307)	
Positivity rate by April 2021		-0.0152
		(0.0309)
Constant	-1.216	-11.31***
	(2.124)	(2.244)
Observations	127	133
R-squared	0.471	0.497

Source: Authors' calculations.
Note: The dependent variable in column (1) is the forecasted adjustment in GDP per capita in 2020, as a percentage of GDP per capita in 2019. The dependent variable in column (2) is the forecasted adjustment in GDP per capita in 2021, as a percentage of GDP per capita in 2019. The common independent variables in both regressions are log of GDP per capita in 2019, adjustment to growth in GDP per capita in 2019, Global Health Security Index score in 2019, export-to-GDP ratio (average of the values in 2017, 2018, and 2019), and tourism receipts in total exports (average of the values in 2017, 2018, and 2019). The accumulated Covid-19 test positivity rate by the end of 2020, calculated by 100 x ("total positive cases" / "total tests") is used in the first regression, and the accumulated test positivity rate by April 2021 is used for the second regression.

Appendix A2. Impact of Commodity Price Shocks on GDP Growth

Empirical evidence of the historical impact of export and import commodity prices on GDP growth across all countries globally between 1990 and 2019 are provided in Table A2.1. The export and import commodity price indexes capture the exposure to commodities and the changes of commodity prices. The estimation equation is:

$$Y_{it} = \alpha + \beta \times exppriceshock_{it} + \Upsilon \times imppriceshock_{it} + \delta \times MENA_i \times exppriceshock_{it} + \theta \times MENA_i \times imppriceshock_{it} + a_t + b_i + u_{it}$$

where y is real GDP growth rate. The first difference in the log of the IMF's country specific export price index and import commodity price index, respectively, are represented by *exppriceshock* and *imppriceshock*. In regression (2), we have also added interaction terms of a Middle East and North Africa (MENA) dummy and commodity price shocks, to distinguish the effect of commodity price shocks between MENA countries and the rest of the world. In regression (3), MENA dummies were replaced with three MENA country group dummies: The Gulf Cooperation Council (GCC), Developing Oil Exporters (DOE), and Developing Oil Importers (DOI). Major economies—including the United States, Russia, China, Japan, and India—are dropped from the regression because of endogeneity concerns.

Table A2.1 shows that export price shocks have a significantly positive effect on real GDP growth. More specifically, a 1 percent increase in the export price index is associated with an 0.09 of a percentage point increase in real GDP growth.

The effect of export price shocks on real GDP growth phased out when MENA and the rest of the world were separated, while import price shocks have a significant and negative effect on GDP growth in MENA, compared to the rest of the world. Zooming in on MENA, import price shocks have a significant and negative impact only on growth in developing oil importers, while export price shocks have a significant and positive impact only on growth in developing oil exporters, compared to the rest of the world.

Table A2.1. Impact of Commodity Price Shocks

Variables	(1) GDP growth	(2) GDP growth	(3) GDP growth
Export Price Shocks	8.825**	6.044	6.077
	(3.777)	(3.738)	(3.734)
Import Price Shocks	8.535	11.32*	11.55*
	(6.011)	(6.184)	(6.179)
GCC*Export Price Shocks			-1.965
			(8.363)
GCC*Import Price Shocks			1.291
			(15.24)
DOE*Export Price Shocks			23.93***
			(6.344)
DOE*Import Price Shocks			-146.7
			(137.2)
DOI*Export Price Shocks			43.67
			(43.65)
DOI*Import Price Shocks			-48.77**
			(20.40)
MENA*Export Price Shocks		7.500	
		(7.434)	
MENA*Import Price Shocks		-32.22**	
		(13.88)	
Constant	3.076***	3.072***	3.076***
	(0.691)	(0.691)	-0,694
Country & Year FE	Y	Y	Y
Observations	6,351	6,351	6,351
R-squared	0.103	0.103	0.105
Number of countries	176	176	176

Source: Authors' calculations.
Note: The dependent variable in each regression is real GDP growth. The first difference in the log of the IMF's country specific export and import commodity price index, respectively, are represented by Export Price Shocks and Import Price Shocks. The export and import commodity price indexes capture the exposure to commodities and the changes of the commodity prices. In regression (2), we have also added interaction terms of a Middle East and North Africa (MENA) dummy and commodity price shocks, to distinguish the effect of commodity price shocks between MENA countries and the rest of the world. In regression (3), MENA dummies were replaced with three MENA country group dummies: the Gulf Cooperation Council, developing oil exporters (DOE), and developing oil importers (DOI). Major economies—including the United States, Russia, China, Japan, and India—are dropped from the regression, due to endogeneity concerns.

▸ **Appendix A3.** Estimates of Truncated Long-Term Transitions prior to the Covid-19 Shock in MENA

The challenge is how to measure the "typical" transition from one state to another, when there is potentially a continuum of change in the initial conditions—namely, the level of development or GDP per capita. To measure the "typical" historical transition of MENA countries against peers over the same period, we use the initial level of development (proxied by GDP per capita) as the starting point to determine the peers. In so doing, we can compare the level of specific indicators for MENA countries today with those of the countries that had the same income level n years earlier (n=10 in this case, reflecting the sample years 2009–2019).

The basic setup of the econometric model is as follows:

$$Y_{c,t} = a + b * x_{c,t-10} + \varepsilon_{c,t} \qquad (1)$$

where Y is the proxy variable of interest (specifically, the economic, demographic, or epidemiological indicator); x is the log of the level of development, and $\varepsilon_{c,t}$ is the residual for country c at time t. By model construction, $\varepsilon_{c,t}$ measures the difference between the observed and expected levels of the specified indicator, where the expected level is the average indicator value across all countries that started with the same income level 10 years earlier. In other words, the residual $\varepsilon_{c,t}$ would capture the deviation of the indicator for country c at time t, from the average level of the indicator for all countries that started with the same income level 10 years earlier. A positive $\varepsilon_{c,t}$ indicates a higher-than-average level among peers, and a negative $\varepsilon_{c,t}$ indicates a level that is lower than average.

An extension of the above model, as specified below, can capture the change of an indicator in country c compared to its peers (countries that shared the same GDP per capita 10 years earlier).

$$\Delta Y_{c,t} = a + b * x_{c,t-10} + \varepsilon_{c,t} \qquad (2)$$

Similarly, by model construction, a positive $\varepsilon_{c,t}$ in equation (2) indicates a larger (faster) growth or smaller (slower) decline compared to peers, and a negative $\varepsilon_{c,t}$ indicates the reverse (smaller, thus slower, growth, or a larger decline relative to peers).

Appendix A4. The State of MENA's Public Health Systems on the Eve of Covid-19

This section empirically benchmarks MENA relative to peers with similar levels of development along with objective indicators and self-reported performance. This benchmarking allows an assessment of the extent of overconfidence of MENA's public health systems on the eve of the Covid-19 pandemic.

As discussed in Chapter 5, for both the Global Health Security Index (GHSI) (external assessment) and State Parties Self-Assessment Annual Reporting (SPAR) tool (self-report), we calculated a country's weighted average for each of four pillars of public health system readiness. We based the calculation on the relative weight of indicators in each pillar. We weighted the indicators using the GHSI expert weighting scheme (see Appendix Table A4.1). After calculating the weighted averages, we then regressed a country's score in each pillar on its level of development. After comparing the fitness of different functional forms, quadratic ordinary least squares (OLS) regressions were conducted for pillars 1, 2 and 3, and linear OLS regressions were conducted for pillar 4.

After benchmarking each country's performance in each pillar on its per capita income, we normalized deviations from the predicted scores by the regression's standard deviation. These normalized scores are shown in Table 5.1 Panel A and Panel B, respectively. We then color each cell in the two panels according to whether a country's actual value was above, within, or below its predicted score's 33 percent confidence interval. In other words, if a country's actual score in a specific pillar is 0.43 units of standard deviations below its predicted value, it was coded red (unfavorable); if within 0.43 standard deviations of the predicted value, it was coded yellow (neutral); and if within 0.43 standard deviations above, green (favorable).

We also performed this analysis with econometric regression and color-coded tables using principal component analysis scores rather than weighted averages, and the results were broadly similar.[23]

The contrast between the objective score deviations in Table 5.1 Panel A and the subjective score deviations in Table 5.1 Panel B is striking. In the subjective ratings (Panel B), only six out of 15 MENA countries rated themselves low enough to have any red deviations; while in the objective ratings (Panel A), Jordan is the only country that doesn't have a red rating.

We can capture the difference between how countries viewed themselves (their SPAR scores) and how they were assessed, by an external evaluator (their GHSI scores) in a single index: the number of standard deviations a country is from the predicted value in the SPAR for a given pillar, minus its deviations from the predicted value of its GHSI score. This index is color-coded in Panel C of Table 5.1. Where the difference is *positive*, a country is over-confident, because its self-evaluation was higher than the objective score. Where the number is *negative,* a country appears to be underconfident—that is, its performance in the objective score is better than its self-assessment. For that reason, negative numbers are shaded green (connoting humility, which we deem a positive characteristic) in panel C of Table 5.1, while positive numbers are shaded red.

Panel C of Table 5.1 shows the regional tendency toward overconfidence. In four pillars across 15 countries comparing subjective and objective deviations, MENA countries displayed over-confidence in 41 of 60 cells. Kuwait, Saudi Arabia, Libya, and Jordan stand out for having scores below zero (indicating greater humility about health system capabilities relative to income peers) in more than three pillars. Meanwhile, Qatar, the United Arab Emirates, Bahrain, Oman, Egypt, Algeria, and Tunisia appear to be over-confident in all four pillars. In short, the analysis above clearly shows a systemic disconnect between self-perception and external assessment of health system robustness in MENA before the Covid-19 pandemic.

The GHSI score was not an independent predictor of performance in the initial stages of the Covid-19 pandemic, however. For example, the United States and the United Kingdom were high performers in the GHSI but had among the worst Covid-19 death rates during 2020. Public health functions are only capabilities. Performance depends on how well leadership and management deploy those capabilities. In addition, because Covid-19 testing rates differ widely across countries—with less-developed countries having lower formal testing per capita than richer economies—it is difficult to draw strong conclusions from the reported case numbers.[24] With these caveats in mind, the GHSI provides a useful snapshot of a MENA region with limited pre-pandemic public health functional capacity and even further constrained public health reserve capacity.

[23] This exercise was limited by the impossibility of doing principal component analysis of pillar 4 of the SPAR because pillar 4 has only a single variable.

[24] Testing per capita during the Covid-19 pandemic tends to rise systematically with GDP per capita. See the World Bank's *MENA Crisis Tracker* weekly newsletter. The number of confirmed deaths from Covid-19 are not strictly comparable across countries. Furthermore, uneven public access to mortality data across countries, particularly for MENA countries, does not allow for comparisons of "excess deaths" in 2020 and 2021 relative to years prior to the outbreak.

Table A4.1. Variables Included in Each Thematic Pillar

Indicator	Weight in pillar
Pillar 1: Surveillance capabilities	
GHSI indicators	
4.5.2a) Evidence of national public health system monitoring and tracking of HCAIs	39.84%
2.2.1a) Evidence of ongoing event-based surveillance and analysis	13.36%
1.1.1c) National environmental surveillance for AMR residues/organisms	11.29%
2.2.2a) Electronic national and sub-national reporting surveillance system	8.91%
2.2.2b) Collection of ongoing/real-time lab data by electronic surveillance system	8.91%
1.2.1b) Laws/plans for surveillance & control of multiple zoonotic pathogens	5.00%
1.2.2a) Surveillance/reporting mechanism for zoonotic disease for livestock owners	5.00%
1.2.2c) Wildlife zoonotic disease surveillance	5.00%
1.3.1a) Updated national records of especially dangerous pathogen/toxin inventories	2.71%
SPAR indicators	
C12.1) Resources for detection and alert (of chemical events)	66.67%
C6.1) Early warning function: indicator-and event-based surveillance	33.33%
Pillar 2: Information sharing	
GHSI indicators	
2.4.1a) Mechanisms for ministries to share animal/human/wildlife surveillance data	29.39%
3.5.1a) Risk communication plan for specific use during a public health emergency	12.06%
3.1.2a) Mechanism to engage private sector in outbreak preparedness/response	10.69%
4.4.1a) Existence of system for communication during a public health emergency	9.92%
4.4.1b) Inclusion of public and private sector in healthcare communication system	9.92%
2.2.3a) Availability of de-identified health surveillance data on disease outbreaks	7.30%
3.5.2a) Government use of media platforms to share info on public health emergencies	6.03%
3.5.2b) Inclusion of different population & sector needs in risk communication plan	6.03%
2.2.5a) Common usage of electronic health records	2.43%
2.2.5b) Public health system access to individual electronic health records	2.43%
2.2.5c) Existence of data standards for health record data comparability	2.43%
1.2.1c) Cross-ministerial department/agency/unit for zoonotic disease	1.36%
SPAR indicators	
C10.1) Capacity for emergency risk communications	25.00%
C4.1) Multisectoral collaboration mechanism for food safety events	25.00%
C3.1) Collaborative effort on activities to address zoonoses	25.00%
C2.2) Multisectoral IHR coordination mechanisms	12.50%
C2.1) National IHR Focal Point functions under IHR	12.50%

Table A4.1. Variables Included in Each Thematic Pillar (continued)

Indicator	Weight in pillar
Pillar 3: Health system capacity	
GHSI indicators	
1.6.1a) Immunization rate for humans (measles/MCV1)	17.30%
4.2.1a) Existence of MCM stockpiles or procurement agreements for emergency access	10.19%
4.2.2a) Plans for dispensing MCMs for national use during a public health emergency	10.19%
4.2.3a) Plan to receive foreign health personnel during a public health emergency	10.19%
2.1.1a) Capacity of national lab system to conduct 5 or more WHO core tests	9.11%
4.1.2a) Hospital beds per 100,000 people	7.89%
4.1.2b) In-country capacity to isolate patients with highly communicable diseases	7.89%
4.3.1b) Access to skilled birth attendants (% of population)	5.59%
4.1.1c) Updated health workforce strategy to address human resource shortfalls	5.26%
4.1.1a) Doctors per 100,000 people	5.26%
4.1.1b) Nurses and midwives per 100,000 people	5.26%
1.1.1b) Capacity of national lab/lab system to test for AMR priority pathogens	4.75%
1.3.1e) Capacity to conduct tests for anthrax/Ebola without culturing live pathogens	1.14%
SPAR indicators	
C7.1) Human resources for the implementation of IHR capacities	37.50%
C1.3) Financing mechanism and funds for timely response to public health emergencies	12.50%
C5.3) Access to laboratory testing capacity for priority diseases	12.50%
C9.1) Case management capacity for IHR relevant hazards	12.50%
C9.2) Capacity for infection prevention and control and chemical and radiation decontamination	12.50%
C8.3) Emergency resource mobilization	12.50%
Pillar 4: Regular planning and readiness exercises	
4.5.1a) Plan to address routine and public health emergency PPE supply issues	25.03%
3.2.1a) Completion of biological-focused IHR exercise with the WHO in past year	21.41%
5.2.1a) Existence of public health emergency agreements with regional neighbors	20.16%
5.2.1b) Existence of animal health emergency agreements with regional neighbors	20.16%
1.1.1a) National plan for AMR priority pathogens	7.09%
3.1.1d) Existence of public pandemic influenza preparedness plan updated since 2009	6.15%
SPAR indicators	
C8.1) Planning for emergency preparedness and response mechanism	100%*

Data Appendix

Appendix Table B1. World Bank's Growth, Current Account and Fiscal Account Forecasts

	Real GDP Growth percent				Real GDP per capita Growth percent				Current Account Balance percent of GDP				Fiscal Balance percent of GDP			
	2019	2020	2021e	2022f	2019	2020	2021e	2022f	2019	2020	2021e	2022f	2019	2020	2021e	2022f
MENA	**0.4**	**-3.8**	**2.8**	**4.2**	**-1.3**	**-5.4**	**1.1**	**3.2**	**2.5**	**-1.5**	**2.0**	**2.5**	**-4.3**	**-9.9**	**-5.2**	**-3.3**
Middle-Income MENA	**-0.4**	**-2.7**	**3.0**	**3.6**	**-2.0**	**-4.2**	**1.4**	**2.1**	**-2.6**	**-4.5**	**-2.2**	**-1.4**	**-5.3**	**-8.0**	**-5.6**	**-5.1**
Oil Exporters	**-0.3**	**-4.2**	**2.8**	**4.2**	**-2.0**	**-5.8**	**1.0**	**2.4**	**4.6**	**-0.9**	**4.0**	**4.6**	**-3.6**	**-10.6**	**-4.7**	**-2.3**
GCC	**1.1**	**-5.0**	**2.6**	**4.7**	**-0.9**	**-6.6**	**0.3**	**2.4**	**6.5**	**0.9**	**5.1**	**5.7**	**-3.4**	**-11.4**	**-4.9**	**-1.9**
Qatar	0.8	-3.7	3.0	4.8	-1.0	-5.3	1.3	3.1	2.4	-2.5	3.1	4.0	1.0	-3.6	-0.9	3.0
United Arab Emirates	3.4	-6.1	2.7	4.6	1.9	-7.3	1.7	3.6	8.5	6.0	6.5	7.7	-1.0	-7.1	-1.3	-1.0
Kuwait	-0.6	-8.9	2.0	5.3	-2.2	-10.2	0.7	4.1	24.4	20.8	12.2	13.3	-9.5	-33.2	-24.4	-10.3
Saudi Arabia	0.3	-4.1	2.4	4.9	-1.3	-5.6	0.9	3.4	4.7	-2.3	4.8	5.0	-4.2	-11.1	-3.8	-2.2
Bahrain	2.1	-5.1	3.5	3.2	-2.4	-8.5	0.8	1.1	-2.4	-9.6	-4.2	-3.7	-9.0	-17.6	-8.4	-7.5
Oman	-0.8	-2.8	3.0	3.4	-3.7	-5.3	0.7	1.4	-5.5	-13.6	-5.0	-1.1	-6.1	-18.6	-2.8	1.8
Developing Oil Exporters	**-2.5**	**-3.0**	**3.2**	**3.3**	**-4.1**	**-4.5**	**1.6**	**1.7**	**0.0**	**-5.7**	**0.9**	**1.6**	**-4.1**	**-8.3**	**-3.9**	**-3.3**
Iran, Islamic Rep.	-6.8	3.4	3.1	2.4	-8.0	2.1	1.8	1.2	1.5	-0.3	1.4	1.5	-5.0	-6.9	-7.3	-6.9
Algeria	0.8	-4.9	3.9	1.8	-1.1	-6.6	2.2	0.2	-9.9	-12.3	-3.8	-2.7	-9.6	-11.7	-5.3	-5.5
Iraq	5.2	-15.7	2.6	7.3	2.9	-17.6	0.2	4.8	6.1	-6.3	4.4	5.5	1.4	-7.0	1.4	3.7
Developing Oil Importers	**3.3**	**-2.2**	**2.8**	**4.3**	**1.7**	**-3.8**	**1.2**	**1.5**	**-5.4**	**-3.5**	**-4.9**	**-4.4**	**-6.7**	**-7.6**	**-7.1**	**-6.8**
Lebanon	-6.7	-21.4	-10.5	..	-6.8	-21.0	-9.8	..	-21.2	-6.9	-10.1	..	-10.5	-3.3	-3.0	..
Egypt, Arab Rep.	5.6	3.6	3.3	5.0	3.5	1.6	1.4	3.1	-3.6	-3.1	-4.1	-3.8	-8.1	-8.0	-7.5	-7.2
Tunisia	1.5	-9.2	2.9	3.5	0.3	-10.1	1.9	2.6	-7.9	-6.0	-6.1	-7.5	-2.9	-9.4	-7.6	-5.7
Jordan	2.0	-1.6	1.9	2.2	0.6	-2.5	1.2	1.9	-2.1	-8.0	-11.3	-8.0	-4.9	-7.3	-5.8	-5.0
Morocco	2.6	-6.3	5.3	3.2	1.6	-7.4	4.0	2.0	-3.7	-1.5	-3.7	-3.5	-4.1	-7.6	-6.7	-6.6
West Bank and Gaza	1.4	-11.5	2.9	3.3	-1.2	-13.6	0.4	0.8	-10.4	-6.9	-7.5	-7.8	-4.7	-7.4	-7.5	-7.4
Djibouti	7.8	0.5	5.1	5.6	6.1	-1.0	3.6	4.1	28.9	11.6	-1.0	-0.5	-0.3	-1.7	-1.6	-1.3
Memorandum																
Libya	2.5	-31.3	66.7	..	1.0	-32.2	64.6	..	11.6	-46.4	-6.2	..	1.7	-64.4	-9.0	..

Sources: Authors' calculations based on data from World Bank *Macro and Poverty Outlook*, October 2021, as of September 24, 2021.
Note: e=estimate, f=forecast and NP=not presented. Data are rounded up to a single digit. Data for Egypt correspond to its fiscal year (July-June). Syria, Libya and Yemen are not included in the regional and sub-regional averages due to lack of data. Lebanon and Libya forecasts beyond 2021 are not computed, due to high uncertainty.

Appendix Table B2. Growth Forecast Adjustments by the World Bank

	Real GDP growth (October 2021–April 2021)			Real GDP growth (October 2021–October 2019)	
	2020e	2021f	2022f	2020e	2021f
MENA	**0.0**	**0.6**	**0.7**	**-6.5**	**-0.1**
Middle-Income MENA	**0.1**	**0.7**	**-0.1**	**-5.7**	**0.0**
Oil Exporters	**0.0**	**0.5**	**0.8**	**-6.3**	**0.5**
GCC	**-0.1**	**0.4**	**1.4**	**-7.2**	**-0.1**
Qatar	-0.5	0.0	0.7	-6.7	-0.2
United Arab Emirates	0.2	1.5	2.1	-8.8	-0.3
Kuwait	-3.5	-0.4	1.7	-11.4	-0.8
Saudi Arabia	0.0	0.0	1.6	-5.7	0.2
Bahrain	0.3	0.2	0.0	-7.2	1.2
Oman	3.5	0.5	-3.1	-6.3	-1.0
Developing Oil Exporters	**0.1**	**0.8**	**-0.3**	**-4.8**	**1.5**
Iran, Islamic Rep.	1.7	1.0	0.2	3.3	2.1
Algeria	0.6	0.3	-0.5	-6.8	1.7
Iraq	-3.8	0.7	-1.1	-20.8	-0.1
Developing Oil Importers	**0.0**	**0.6**	**0.3**	**-6.6**	**-1.8**
Lebanon	-1.1	-1.0	..	-21.7	-10.9
Egypt, Arab Rep.	0.0	1.0	0.5	-2.2	-2.7
Tunisia	-0.4	-1.1	0.9	-11.4	0.3
Jordan	0.2	0.5	0.0	-3.9	-0.6
Morocco	0.7	1.1	-0.5	-9.8	1.7
West Bank and Gaza	0.0	-0.6	0.1	-10.4	3.3
Djibouti	0.0	-0.4	-0.4	-7.0	-3.0

Sources: Authors' calculations based on data from World Bank *Macro and Poverty Outlook*, October 2021, as of September 24, 2021.
Note: Libya, Syria and Yemen are not included in the regional and sub-regional averages due to lack of reliable data. The changes are in percentage points.

Appendix Table B3. Selected Health Indicators in MENA and the Rest of the World by Income Groups circa 2019

Country	Domestic General Government Expenditure as % of GDP	Deaths by CDs per 100k	Deaths by NCDs per 100k	Deaths by NCDs per 100k (Age Standardized)	Pillar 1 - Surveillance Capabilities	Pillar 2 - Information Sharing	Pillar 3 - Health System Capacity	Pillar 4 - Regular Planning and Readiness Exercises
Algeria	4.09	61.31	374.72	445.80	11.68	1.22	26.18	0.00
Bahrain	2.43	14.11	242.54	644.30	51.45	21.74	42.34	7.09
Djibouti	1.15	279.25	386.43	610.90	0.00	6.03	17.06	0.00
Egypt, Arab Rep	1.42	55.18	490.58	733.80	5.00	26.61	35.22	45.12
Iran, Islamic Rep	3.98	35.57	357.52	445.70	56.51	14.78	47.93	7.09
Iraq	1.98	62.37	272.75	610.80	8.91	36.69	20.96	0.00
Jordan	3.83	28.61	227.55	441.20	65.03	24.13	44.34	54.81
Kuwait	4.40	13.88	155.46	324.40	52.54	52.35	52.59	20.16
Lebanon	4.18	30.64	488.56	526.90	29.49	43.94	56.19	20.16
Libya	3.83	41.59	300.34	479.00	6.68	29.39	38.44	7.09
Morocco	2.14	60.24	569.43	644.00	44.84	54.88	50.53	7.09
Oman	3.62	31.99	261.40	683.60	16.68	30.26	53.00	27.25
Qatar	1.86	7.93	123.16	650.10	39.84	10.90	61.14	0.00
Saudi Arabia	3.97	29.82	307.02	558.10	74.33	48.80	66.90	27.25
Syrian Arab Republic	1.61	55.76	393.57	633.50	-	-	-	-
Tunisia	4.18	41.28	496.53	462.50	5.00	9.92	34.21	0.00
United Arab Emirates	2.18	15.19	165.17	528.40	14.99	21.74	58.43	27.25
West Bank and Gaza	-	-	-	-	-	-	-	-
Yemen, Rep	0.50	175.77	293.65	717.10	0.00	6.03	12.31	0.00
Memo:								
High Income Countries	5.27	54.42	725.35	396.79	42.52	31.48	46.24	35.86
Middle Income Countries	3.06	147.46	517.74	607.39	36.23	30.30	41.00	30.98
Low Income Countries	1.27	357.20	309.36	663.74	18.62	29.41	32.74	25.76

Sources: World Health Organization, *Global Health Expenditure Database* (Domestic General Government Health Expenditure) and *Global Health Observatory* (Deaths by CDs and NCDs); Global Health Security Index (Pillar Scores); and World Bank staff calculations (weighted average pillar scores).
Note: Data for General Government Health Expenditure are as of 2018, except for: Libya, as of 2011; Syria, as of 2012; and Yemen, as of 2015. Deaths by CDs and NCDs are as of 2019, and Global Health Security Index scores are as of 2019. Income groups are represented by simple average of member countries. "-" means data are not available.

MIDDLE EAST AND NORTH AFRICA REGION ECONOMIC UPDATE OCTOBER 2021

OVERCONFIDENT: HOW ECONOMIC AND HEALTH FAULT LINES LEFT THE MIDDLE EAST AND NORTH AFRICA ILL-PREPARED TO FACE COVID-19

WORLD BANK GROUP