



# Excess Mortality and the Impact of COVID-19 in Egypt

*Paul Dyer*



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COVER IMAGE: Employees of Sokna funeral service company carry an empty coffin during a training amid the coronavirus disease (COVID-19) pandemic on the outskirts of Cairo, Egypt May 19, 2021. Picture taken May 19, 2021. REUTERS/Amr Abdallah Dalsh

## ABSTRACT

Over the COVID-19 pandemic, Egyptian data on confirmed cases and deaths remained strikingly low, particularly given rates in neighboring countries, high comorbidities within the population, and evidence of infection among many traveling from Egypt. Despite governmental assertions of limited viral spread, COVID-19 was prevalent across the country—as it was in nearly all countries—and it had led to an uncertain number of deaths.

While accurate counts in Egypt are unavailable, excess mortality analysis allows for a robust estimate of deaths associated with COVID-19. In this analysis paper, we describe a methodology and provide excess mortality estimates for COVID-19 deaths nationally and regionally, paying particular attention to urban and rural differences. Our analysis for Egypt suggests that over 2020 and 2021, nearly 263,000 deaths were associated with the pandemic, over 12 times the official COVID-19 death count. The analysis also shows Egypt saw early and high COVID-related mortality rates in some rural areas, while urban impact—particularly in Cairo—was limited.

Seeking to preserve the country's economic welfare, the Egyptian government sought to coexist with the virus but failed to implement a test and trace strategy, allowing targeted efforts to detect and eliminate viral spread. Deficient data also allowed for widespread misinformation, undermining physical distancing and vaccination efforts. In future epidemic responses, Egypt should emphasize data transparency and test and trace campaigns for targeted public health interventions, particularly in rural areas, while there is a broader need to reinvigorate efforts to improve rural access to quality healthcare.

## KEYWORDS

COVID-19 Response

Excess Mortality

Data Transparency

Urban-Rural Divides

Egypt

Middle East and North Africa

## INTRODUCTION

Public health officials across the world have struggled with accurately capturing the impact of the COVID-19 pandemic, both in terms of total cases and associated deaths. Initially, this was due to the newness of the disease, the frequency of asymptomatic cases, and its association with a long list of comorbidities (e.g., cancer, chronic heart disease, diabetes). With time, inaccuracies became associated with limited or insufficient testing and more general limitations on the capacity of healthcare systems to capture and document evidence of the virus's spread. Inaccuracy in confirmed COVID-19 cases and associated deaths remains a problem across the globe; however, several countries stand out in terms of the large difference between officially recorded cases and deaths and the real impact of the disease.<sup>1</sup> Egypt is one of these countries.

“**In internationally comparable terms, Egypt documented 4,646 confirmed cases and 223 deaths per million Egyptians, as compared to the global average of 83,235 cases and 841 deaths per million people.**”

By the end of December 2022, Egypt had officially recorded only 515,645 cases of COVID-19 and 24,802 deaths.<sup>2</sup> In internationally comparable terms, Egypt documented 4,646 confirmed cases and 223 deaths per million Egyptians, as compared to the global average of 83,235 cases and 841 deaths per million people.<sup>3</sup> Both are considered by the World Health Organization (WHO) to be significant undercounts.<sup>4</sup>

Even before the WHO and other international organizations published their undercount estimates, global health experts and journalists were raising concerns over the apparent inability of the Egyptian public health system to accurately track COVID-19 cases and related deaths. In several

instances, the Egyptian government was accused of actively obscuring information on the spread of the virus in the country, either to insulate the Egyptian economy from the shock of the pandemic, to limit public panic, or to spare officials from public criticism.<sup>5</sup> Authorities did little to counter this narrative in doubling down on their insistence that counts were accurate and in arresting or deporting several bloggers, public health specialists, and journalists.<sup>6</sup> At the same time, the Egyptian population widely rejected concerns about the virus, with many—including media stars and religious leaders—openly denying the risks COVID-19 poses or arguing Egyptians had a natural immunity to such outbreaks.<sup>7</sup>

Whether or not authorities engaged in active manipulation of the figures, their inability to accurately account for the disease's spread through the country limited the ability of public health specialists to counter that spread effectively, as well as to counter—with trustworthy data—the misinformation that spread throughout the country during the pandemic.<sup>8</sup> Moreover, uncertainty about COVID-19's impact within Egypt created an opportunity for the virus to spread more readily across borders, if not creating opportunities for mutations to generate additional variants.<sup>9</sup> Herein, Egypt is especially important within the wider Middle East and North Africa (MENA) and Africa regions, both in terms of population and its cultural and economic links with neighboring countries. As such, not documenting cases and deaths accurately during a global pandemic had impacts that spilled across borders.

This analysis paper represents an effort to more accurately assess the impact that COVID-19 has had in Egypt, at least in terms of deaths associated with the virus. The analysis highlights differences between official counts of the deaths associated with COVID-19 and estimates of excess mortality over the course of the pandemic; these estimates are based on differences between the total mortality in Egypt over 2020 and 2021 and statistical projections for this period, calculated

from past mortality trends in Egypt. In addition, the paper identifies patterns in the spatial dispersion of COVID-19 deaths across Egypt. Finally, the analysis seeks to determine drivers behind revealed patterns in pandemic-related deaths and suggests changes to improve Egypt's response to future epidemics.

## EGYPT'S POLICY RESPONSE TO COVID-19

Like policymakers across the globe, Egyptian officials struggled with an initial response to the virus, balancing the need for efforts that would slow the spread of the virus with a need to ensure the country's economic welfare. Officials were particularly wary because of Egypt's dependence on international trade and tourism, as well as the impact that any closures would have on the welfare of Egyptian workers, particularly those in the country's large informal labor market. Moreover, as the pandemic started, Egypt was still struggling to secure an economic recovery in the wake of the political unrest of the 2011 revolution and subsequent counterrevolution.<sup>10</sup>

“Like policymakers across the globe, Egyptian officials struggled with an initial response to the virus, balancing the need for efforts that would slow the spread of the virus with a need to ensure the country's economic welfare.”

Officials announced the country's first official case of COVID-19 on February 14, 2020; quite early in terms of the global spread of the virus and long before the WHO declared it a pandemic. This index case, an asymptomatic traveler identified at Cairo International Airport, was only followed by a second identified case at the beginning of March.<sup>11</sup> In early March, COVID-19 spread to many passengers on a Nile cruise ship, while other countries began reporting an increasing number of tourists returning from Egypt with COVID-19.<sup>12</sup> While this

suggested the disease was prevalent in Egypt, Egyptian policymakers were largely focused—at least publicly—on a strategy that would restrict COVID-19 to the country's borders or keep it contained among travelers.

Following a COVID-19 outbreak in a village in Dakahlia Governorate in mid-March 2020, the Egyptian government began implementing a series of rigorous strictures on mobility across the country, including a suspension on flights and public transport, a nighttime curfew, and school and public venue closures.<sup>13</sup> Most government offices were shuttered, and officials encouraged private businesses to allow home-based work where possible. These restrictions were intended to be temporary, allowing Egypt two weeks to limit transmission of the virus before reopening the broader economy, a common strategy during the early phases of the pandemic. However, as the number of confirmed cases and deaths grew, Egyptian officials extended these restrictions, at least through Easter and Eid al-Fitr holidays in the spring of 2020. Officials began easing restrictions on mobility by mid-May to limit the economic impact of the crisis. Aside from occasional curfews during subsequent waves, Egypt sought to “co-exist” with the virus, even opening its borders to tourists in a controlled manner over the summer of 2020.<sup>14</sup>

To improve their capacity to test and trace in a way that enabled this co-existence, Egypt purchased more COVID-19 tests; however, it sought out less expensive antigen tests that are less sensitive than PCR tests.<sup>15</sup> This may have limited doctors' ability to confirm cases accurately and undermined tracing and quarantine efforts. Egypt began vaccinating members of the public at the end of January 2021. In this regard, the country depended initially on the Sinopharm vaccine provided by China and the United Arab Emirates (UAE), although it would later receive significant doses of other vaccines through the COVAX initiative.<sup>16</sup> Despite efforts to push forward on vaccination, Egypt has only been able to fully vaccinate 36% of its population, with 48% of its population having received at least one injection, as the public health system faces ongo-

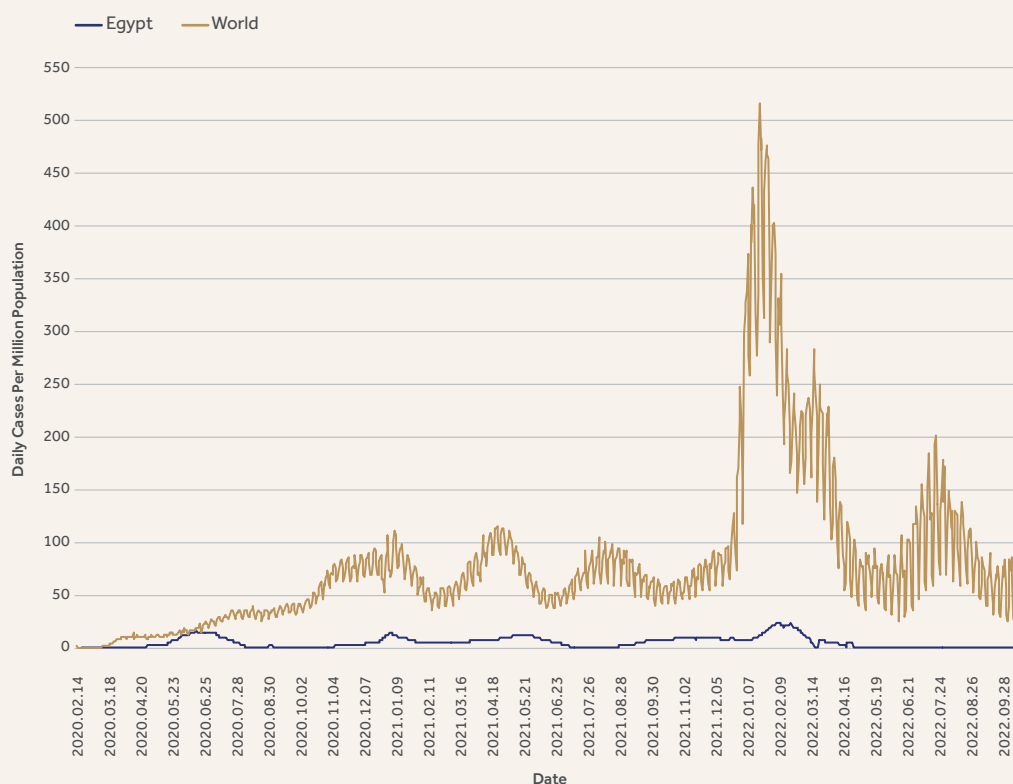


ing vaccine hesitancy and logistical challenges.<sup>17</sup> This compares to other low- and middle-income countries in the MENA region, where nearly 45% of the population has received at least one dose of the vaccine and 39.5% are fully vaccinated.<sup>i</sup> However, in lower middle-income countries overall, nearly 65% of the population has received at least one injection and 58% are fully vaccinated.<sup>18</sup>

“Egypt has only been able to fully vaccinate 36% of its population, with 48% of its population having received at least one injection, as the public health system faces ongoing vaccine hesitancy and logistical challenges.”

Official statistics in Egypt show that confirmed cases remained low after the initial identification of the disease, with growth accelerating in the summer of 2020. The country experienced periodic waves of COVID-19 over the following two years, with the pattern of confirmed cases following global trends in this regard, albeit on a scale much lower (as a share of total population) than seen in other countries or the world at large (figure 1). A similar pattern is found in the official death count associated with COVID-19. Notably, official counts of cases and deaths leveled off after August 2022; whether this was due to the country reaching ‘herd immunity’ as announced by the Minister of Health at that time, or diminished testing is uncertain.<sup>19</sup> No COVID-19 deaths have since been reported.

Figure 1: New Daily Cases of COVID-19 in Egypt and the World (per million population)



Source: Our World in Data, 2022.<sup>20</sup>

i. Based on calculations using Our World in Data COVID-19 database, overall, including high-income countries, the MENA regional averages amount to 49% having received at least one dose and 42% fully vaccinated.

From the beginning, official estimates of confirmed cases and deaths were suspect. Given Egypt's connectivity to the world through trade, travel, and tourism, one would have expected the country to see cases increase early on, particularly in urban areas and places frequented by tourists. One would also have expected the virus—with so many asymptomatic cases—to spread quickly given Egypt's population density and the nature of transportation between cities, towns, and villages throughout the narrow corridor along the Nile Valley where most of the country's population lives. Beyond these basic factors, one notes the relatively high level of specific health concerns and non-communicable diseases—from obesity to diabetes and heart disease—among the Egyptian population that early on were shown to be comorbidities with COVID-19.<sup>21</sup>

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Despite the number of factors that would predict high rates of infection, official messaging about COVID-19 in Egypt, including confirmed cases and deaths, seemed to suggest otherwise. During early stages, several foreign governments identified an increasing number of COVID-19 patients who had recently traveled to Egypt. A Canadian research team revealed a model suggesting that there were 6,000–19,000 cases in Egypt by early March, a time when there were only three official cases.<sup>22</sup> Government officials and Egyptian media responded to these claims defensively.<sup>23</sup> Later, both the Minister of Health and the Minister of Education and Scientific Research would admit that cases were much higher than had been confirmed through testing, with the Minister of Education and Scientific Research stating that Egyptian models put the number of cases at five times those officially confirmed.<sup>24</sup>

Official messaging continued to shift over the course of the pandemic, with much effort going into scientific

analysis of potential reasons why Egypt's experience with the virus would differ from that of Europe.<sup>25</sup> Such efforts and uncertainty in general are understandable given what little was known about the virus during early stages of the pandemic and the economic toll that incorrect information could have on a country. However, it seems—especially with excess mortality analysis offered in hindsight—COVID-19 was raging across Egypt, with government having little ability to trace its spread or capture the number of deaths that it had caused. Moreover, leaked military reports in late March 2020 underlined the government's understanding that sizeable outbreaks had been observed in Menoufia, Damietta, Alexandria, Minya, and Qena, suggesting the Ministry of Health was fully aware of the virus' domestic spread but was not reporting.<sup>26</sup>

## ESTIMATING EXCESS MORTALITY OVER THE COURSE OF THE PANDEMIC

The term 'excess mortality' is used by epidemiologists and public health experts to refer to the number of deaths during a crisis—an epidemic, a famine, a conflict—beyond what would be seen within the population under normal circumstances. In a context where it is impossible to accurately document the number of deaths from such a shock, excess mortality analysis allows for modeling accurate estimates of resultant mortality. While numerous approaches have been applied to such estimates, the approach that has gained the most recognition recently is that used by Karlinsky and Kobak in constructing their World Mortality Database, used to calculate national and global estimates of excess mortality during the COVID-19 pandemic, subsequently used by the WHO.<sup>27</sup>

For their analysis, Karlinsky and Kobak use periodic (weekly or monthly), nation-level mortality data from the 2015–2019 period to calculate predicted mortality for 2020 and 2021 using a linear regression model that accounts for the fixed effects of each period. This approach allows for predictions to account for seasonal changes in mortality such as might be seen during severe summer heat or winter cold. These modeled predictions, in turn, serve as a counterfactual to actual total deaths recorded within each country. The differ-

ence between the actual number of deaths in a country and predicted mortality (the counterfactual) provides an estimate of excess mortality for the period, the number of deaths beyond what would have been expected had the pandemic not taken place.<sup>28</sup>

Calculations of excess mortality under Karlinsky and Kobak's approach should not be interpreted as being limited to deaths only due to COVID-19. Rather, they should be interpreted as including deaths due to the pandemic more broadly. These would include COVID-19 deaths, deaths from disease and accidents that went untreated due to hospital overcrowding and mobility restrictions during the pandemic, and deaths from other natural and unnatural causes related in some way to the crisis.<sup>29</sup> Some included deaths might also be related to other concurrent shocks, such as heatwaves, natural disasters, or conflicts. Notably, excess mortality calculations might be negative. This would occur in cases where lockdowns and economic closures limited COVID-19 deaths while also limiting an otherwise normal number of accidental deaths and deaths associated with communicable diseases like influenza.

In this analysis of excess mortality in Egypt, we apply Karlinsky and Kobak's statistical methodology. However, we have refined the data in several ways. First, we use more recent monthly mortality data from Egypt's Central Agency for Public Mobilization and Statistics (CAPMAS), updating some preliminary data used by Karlinsky and Kobak.<sup>30</sup> Second, our analysis makes use of mortality data broken down by governorate and along urban-rural lines, where available, rather than depending solely on national data; this allows for a more detailed exploration of how the disease impacted different parts of Egypt, at least during the first year of the pandemic.<sup>31</sup> Finally, we have identified two points within the 2015–2019 monthly data wherein there are

sharp spikes in the number of total deaths that represent shocks themselves rather than normal trends in mortality over time. These include many deaths in August 2015 across Egypt due to a heatwave and a smaller spike in northern Sinai in November 2017 due to a mosque bombing. Accounting for these and revising the number of total deaths downward accordingly allows for our predicted mortality to reflect a more normalized trend.<sup>iii</sup>

## EXCESS MORTALITY IN EGYPT DURING THE COVID-19 PANDEMIC

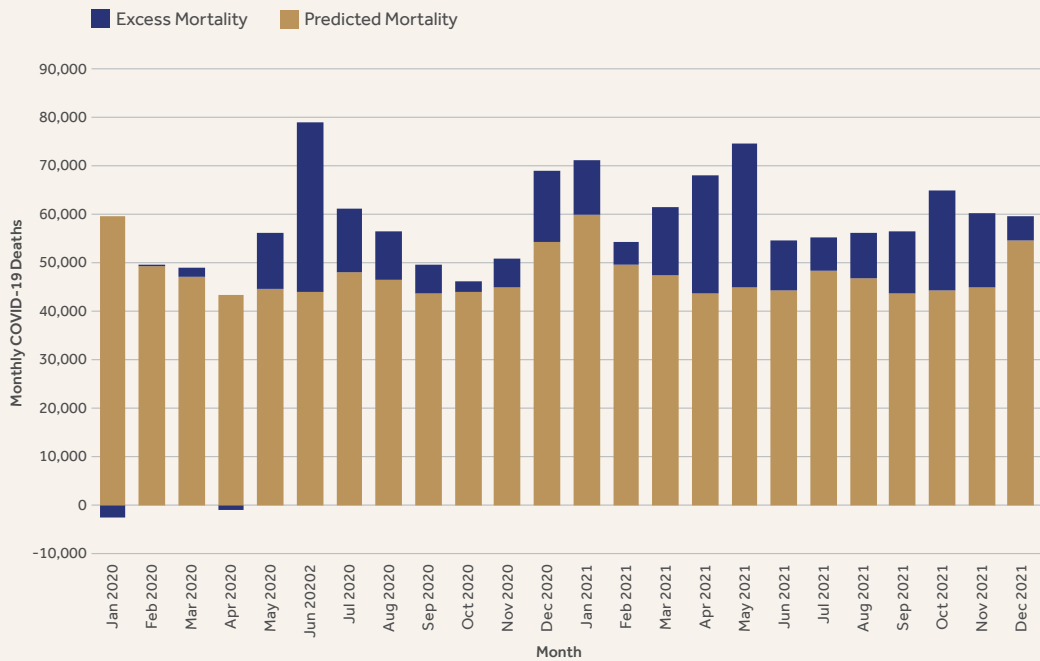
In their analysis of excess mortality in Egypt during the COVID-19 pandemic, Karlinsky and Kobak found that deaths associated with COVID-19 between March 2020 and the end of 2021 totaled just under 283,000. Our own national estimates are close to this, with excess mortality between March 2020 and the end of 2021 totaling nearly 263,000. These are close given our use of revised data for the 2015–2019 period used to calculate predications as well as updated mortality totals for 2020 and 2021 that were not available to Karlinsky and Kobak during their initial analysis.<sup>iv</sup> Taken together, the numbers suggest the total number of deaths affiliated with COVID-19 in Egypt by the end of 2021 was at least twelve times the official number of 21,752 documented at that time.<sup>31</sup>

The excess mortality documented at the national level tracks with international trends related to waves of COVID-19. Globally, we saw periodic waves of various COVID-19 variants move through national populations. Waves seen within Egypt's excess mortality data reflect these global trends, with notable outbreaks in the spring of 2020, winter of 2020–2021, spring of 2021, and fall of 2021 (figures 2 and 3). Herein, the absence of daily data blunts the ability to capture the detail available in reported COVID-19 data.

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- ii. Data for 2021 should have been made public from CAPMAS in December 2022, however, it had not been released at the time of writing.
  - iii. For the mosque attack in the Sinai in November 2017, we subtracted 305 deaths from the total, ensuring monthly deaths are in line with normal conditions for November. For the heightened death count during the August 2015 heatwave, accounting was more difficult due to deaths from the heatwave itself; in this case, we modelled predicted mortality rates for each governorate in Egypt for August 2015 using results from a linear monthly data regression from 2015–2019, including monthly fixed effects, to predict deaths in August 2015 had the heatwave not taken place.
  - iv. Comparing excess mortality to the official COVID-19 deaths in Egypt with those in comparable countries is difficult given the small number of countries that provide periodic mortality data that allow for the excess mortality analysis, given a correlation exists between a country's income status and the provision of population statistical information. For those 97 countries, excess mortality totals for the 2020–2021 period are only 1.5 times the official COVID-19 deaths. For available low- and middle-income countries (48 countries), excess mortality totals are 2.7 times official deaths. Compared with specific countries, Egypt is surpassed only by Uzbekistan (23 times) and Hong Kong (14 times).

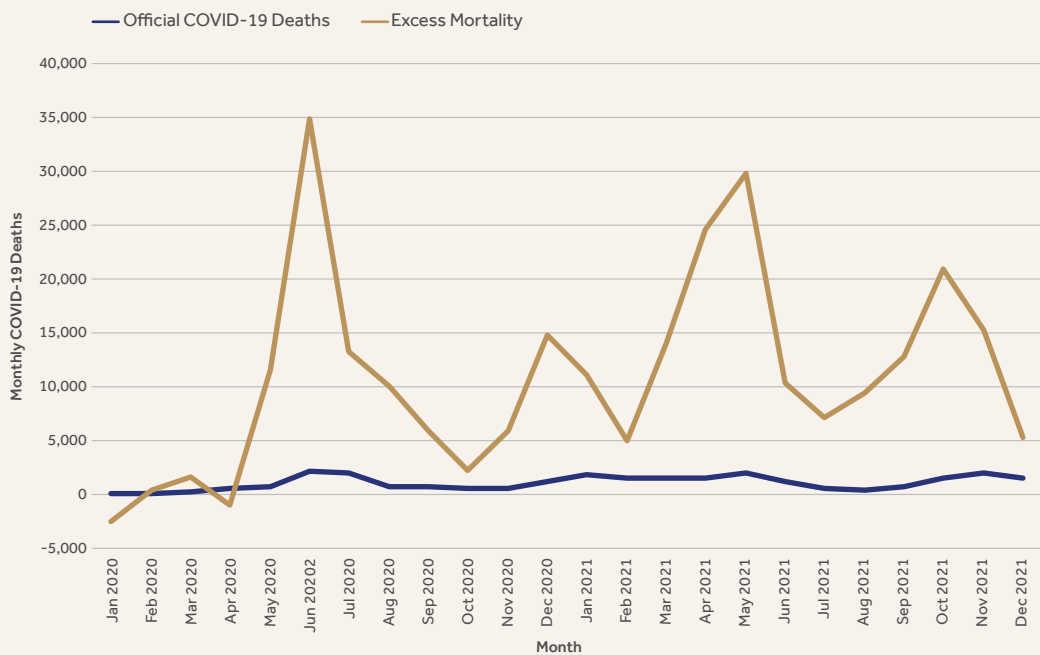


**Figure 2: Excess COVID-19 Mortality and Predicted Mortality in Egypt by Month over 2020–2021**



Source: Author's calculations using "CAPMAS' Egypt in Figures" reports for 2020 and 2021 and "Annual Bulletin of Births and Deaths Statistics" reports for 2015–2020.<sup>32</sup>

**Figure 3: Monthly Excess Mortality and Official COVID-19 Deaths in Egypt, 2020–2021**



Source: Author's calculations using Our World in Data, 2022 and "CAPMAS' Egypt in Figures" reports for 2020 and 2021 and "Annual Bulletin of Births and Deaths Statistics" reports for 2015–2020.<sup>33</sup>

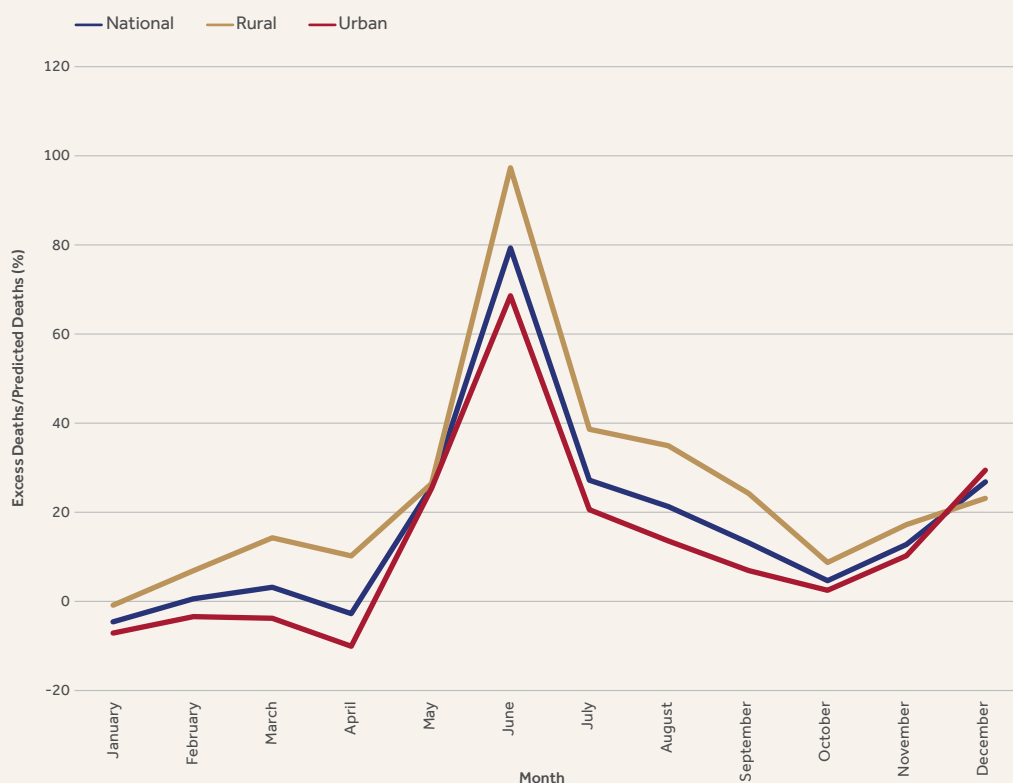
## Regional Differences in Excess Mortality During the Pandemic

One would expect COVID-19 cases and deaths in Egypt to be concentrated at least initially in Cairo, Alexandria, and other major urban areas, as well as tourism hotspots like Red Sea and Sinai resorts or Luxor and Aswan. It would be expected that confirmed cases would spread gradually to rural areas. In turn, associated deaths would be higher in urban areas than in rural areas, at least initially, with the caveat that the urban health services may be better able to provide COVID-19 patients with effective, lifesaving treatment. At least in terms of an initial increase in excess mortality around Luxor and Aswan (figure 4), this is true to a degree. However, an analysis of excess mortality in urban and rural areas more broadly suggests a contrary understanding in

just how early COVID-19 seems to have moved into rural areas of Egypt and how quickly this translated into associated deaths.

Overall, excess mortality increased slowly in urban areas in Egypt, remaining below predicted values for the first 3–4 months of the pandemic (figure 4). In Cairo—Egypt’s capital and largest city—excess mortality remained largely in line with predicted mortality through March 2020 and fell below predicted mortality (–9%) over April as social distancing efforts were put in place. In May and June, as officials began easing mobility restrictions, deaths increased precipitously in Cairo before being brought down to predicted levels over summer and autumn. Overall, in 2020, excess mortality in Cairo—at just over 10,800 deaths—was 11.7% of predicted mortality.

Figure 4: Excess COVID-19 Mortality as a Share of Predicted Mortality in Urban and Rural Egypt, 2020



Source: Author’s calculations using “CAPMAS’ Egypt in Figures” reports for 2020 and 2021 and “Annual Bulletin of Births and Deaths Statistics” reports for 2015–2020.<sup>34</sup>

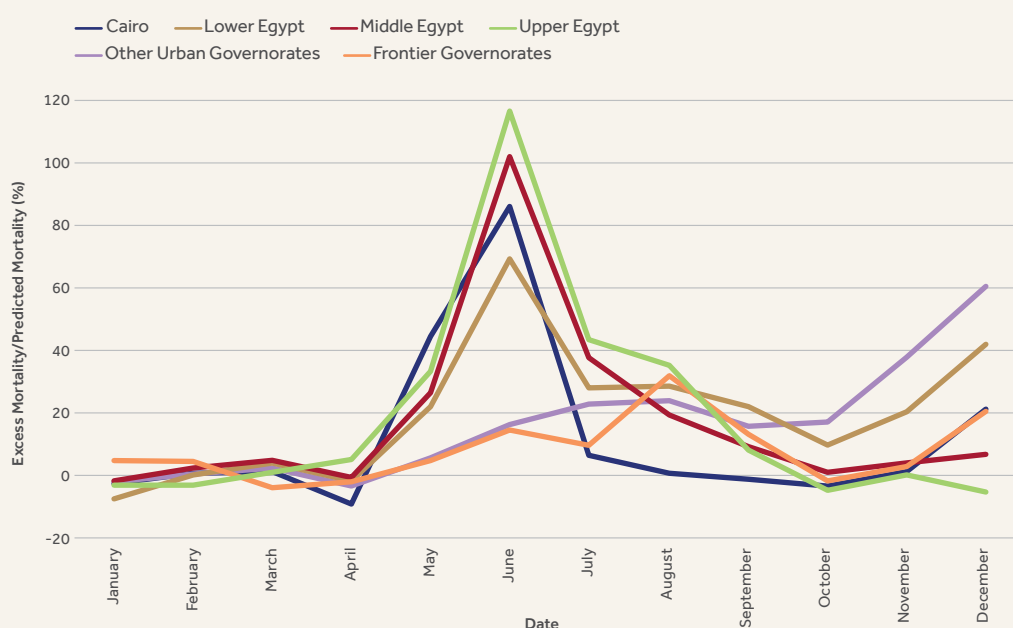
Other urban governorates like Alexandria, Suez, and Port Said saw a similar pattern in terms of excess mortality in the early phases of the pandemic, but they did not see the spike in excess mortality in early summer as seen in Cairo. The nearly 8,400 excess deaths seen in urban governorates outside of Cairo over the course of 2020 represented 16.3% of predicted mortality. In the urban areas of Luxor and Aswan, as well as coastal resort areas like South Sinai and the Red Sea, which generally host large numbers of tourists, there was a pronounced spike in excess mortality in January and February 2020, with gradual declines afterward.

As a whole, rural areas saw significant excess mortality, beyond predicted values, beginning in February 2020, when excess mortality was 7% higher than predicted values. Throughout urban and rural areas, there was a surge in excess mortality as Egypt shifted into its co-existence strategy and reopened the public sphere, and both urban and rural areas followed similar trends after this point. However, at least as a share of predicted mortality, excess mortality in rural areas remained higher than in urban

areas until the end of 2020. In total amounts, by the end of 2020, urban areas in Egypt had seen just over 45,000 excess deaths, while rural areas had seen over 50,000.

When looking at rural excess mortality, there are two regions that stand out. In rural areas of Lower Egypt, excess mortality was 6% higher than predicted mortality in February 2020 and 14% higher in March 2020, suggesting that large numbers living in these areas were infected early during the pandemic. These findings are driven by excess mortality findings in Gharbia and Behera, where excess mortality was higher than predicted in January 2020. Similar outcomes are found in Middle Egypt, where excess mortality was 10% higher than predicted mortality in January 2020. Most notably, excess mortality in rural Asyut was nearly 90% higher than the predicted mortality in January 2020, suggesting an early and uncontrolled outbreak in this area. In each of these rural areas, large and early expressions of excess mortality are matched to a large degree by negative excess mortality in urban areas within these governorates.

Figure 5: Excess COVID-19 Mortality as a Share of Predicted Mortality by Region in Egypt, 2020



Source: Author's calculations using "CAPMAS' Egypt in Figures" reports for 2020 and 2021 and "Annual Bulletin of Births and Deaths Statistics" reports for 2015–2020.<sup>35</sup>

## Uncovering Obscured COVID-19 Deaths

Excess mortality calculations are drawn in part from official Egyptian mortality records of total mortality for the period (figure 5). As such, COVID-19 deaths—both those officially documented as such, and those deaths determined to be for other causes—are included in official total mortality records. The low number of official COVID-19 deaths poses questions about how doctors and public health experts addressed COVID-19 as a cause of death against likely comorbidities. Through 2020, with only 7,631 official COVID-19 deaths in Egypt, our estimates of excess mortality suggest that there were 105,580 deaths due mostly to COVID-19 or COVID-19's effect on comorbidities.<sup>36</sup>

“According to official mortality records, deaths associated with “infectious and parasitic diseases” nearly doubled between 2019 and 2020 after declining gradually over previous years.”

In this regard, Egyptian cause-of-death mortality data for 2020 is telling. According to official mortality records, deaths associated with “infectious and parasitic diseases” nearly doubled between 2019 and 2020 after declining gradually over previous years. This increase of 16,741 deaths likely captures official COVID-19 deaths and cases of COVID-19 that were diagnosed as other infections or not specified. Deaths where the cause of death was not indicated or not classified elsewhere grew by 13% (7,173) over this period. Also, deaths associated with “diseases of the circulatory system” rose by 14% (43,909) and “diseases of the respiratory system” increased by 53% (27,744). While deaths attributed to these causes have been growing in Egypt in recent years, natural rates of increase have not been close to rates of growth documented over 2020. Together, the above causes led to an additional 95,567 deaths, or most of the excess mortality observed over 2020.<sup>37</sup>

Overall, most COVID-19-related deaths in Egypt, as elsewhere, affected Egyptians with existing co-

morbidities, such as lung disease, heart disease, and diabetes, with the cause of death being determined by doctors to be the overall comorbidity rather than COVID-19 or secondary infections associated like pneumonia. As such, doctors and local public health officials chose to document these deaths as being caused by their comorbidities rather than the active infection.

## UNDERSTANDING EXCESS MORTALITY RESULTS IN EGYPT

The excess mortality analysis above suggests that deaths associated with the COVID-19 pandemic in Egypt far exceeded the deaths officially associated with COVID-19 by Egyptian public health officials. More importantly, the analysis suggests the disease was present in Egypt earlier than public health specialists had thought and more widely distributed, even at early stages. Data from rural areas, particularly several specific rural areas in Lower and Middle Egypt, provide reasonable evidence that COVID-19 had found its way into the population as early as January 2020 and associated deaths remained high in rural areas throughout the pandemic, at least through 2020.

This rural spread ran counter to the official narrative in Egypt and the assumptions of many international health specialists. In early stages of the pandemic, Egyptian authorities focused largely on foreign tourists as the source for new cases of COVID-19 and sought to manage the expansion of the virus from this source into other parts of the country. At the same time, the apparent ability of authorities to limit the worst impacts of the pandemic in Cairo, Egypt's urban center, may have blinded authorities and much of the population to the risks posed by the emerging pandemic. By early March, however, COVID-19 and associated deaths were widespread, whether one looked at touristic areas or rural areas that attracted few international travelers. And—as suggested by leaked military documents described above—the country's leaders were aware of this spread, perhaps having decided that the panic that public

awareness might engender would be a bigger economic and public safety problem than the virus, of which little was known at that early stage.

Understanding drivers behind the initial transmission of the virus in rural areas of Egypt is a speculative exercise. Early and sustained excess mortality in rural areas of Lower and Middle Egypt, regions lacking the tourist industry found in Upper Egypt and Egypt's main cities, suggests that the initial spread of the virus went largely unobserved by Egypt's public health specialists. Given the low excess mortality in urban areas in Lower and Middle Egypt, these trends might reflect an effort by people to leave urban areas to avoid lockdowns and, ironically, infection. This is reinforced by the negative excess mortality figures seen in nearby urban areas.

“Throughout Egypt, the marked increase in excess mortality in the late spring and summer of 2020 was aligned with the policy decision to “co-exist” with COVID-19...”

On the other hand, early cases in Asyut, Behera, Gharbia, and Suhag also may reflect the return of migrant workers—who have historically come from these regions in large numbers.<sup>38</sup> Migrant workers were returning in large numbers, even before the pandemic, as businesses and government agencies in Arab Gulf states shed foreign workers in the wake of a decline in international oil prices that began in 2015.<sup>39</sup> Given the early cases of COVID-19 documented in Gulf countries, Egyptian workers likely returned home with COVID-19—possibly asymptomatic—very early in 2020. Over the course of the spring of 2020, nearly a million Egyptian workers were thought to have returned from abroad.<sup>40</sup>

Understanding the persistence of excess mortality in rural areas in Egypt is likely found in the country's health infrastructure and differences in

access to quality healthcare. While Egypt offers subsidized health care to all, designed to benefit the country's poor, the system has long suffered from structural challenges that have created an urban bias in health care provision, leaving the rural poor with limited options.<sup>41</sup> University hospitals offering free care are found in cities. While most villages have a small public clinic, these are often underfunded and understaffed, easily overwhelmed in the context of a new and widespread disease requiring new medicines and equipment like ventilators. In contrast, urban residents—particularly in Cairo—have been able to access a variety of healthcare options, including the best hospitals—generally university and military hospitals—in the country. Even when these institutions came under pressure at the peak of COVID-19 outbreaks, they were able to deliver patients the best treatment available at any time during the pandemic. More broadly, Egypt's short efforts at social distancing proved more relevant to dense urban areas than rural areas. Strictures regarding public events, public transport, university closures, and formal sector work closures impacted large shares of the urban population, at least through the spring of 2020, helping to limit the spread of the virus. Notably, given the concentration of ministries and government offices within the capital, the temporary closure of government offices had a larger impact on the spread of the virus in Cairo than in other cities and towns. Throughout Egypt, the marked increase in excess mortality in the late spring and summer of 2020 was aligned with the policy decision to “co-exist” with COVID-19 as the spread of the virus proved increasingly persistent and its economic impacts proved increasingly costly.

## IMPLICATIONS AND RECOMMENDATIONS

The Egyptian government has long governed with a decidedly patriarchal view of its people, one that combines concerns over panicking the population with wariness about letting the state look weak. Often, this comes with a defensiveness when



faced with international criticism, wherein government and the public often respond with stubborn resistance to data and external advice out of concerns with sovereignty and national pride. This seems to have been reflected in the broader Egyptian response to COVID-19; even as China, Europe, and the United States saw cases and associated deaths grow steeply, Egypt positioned itself as uniquely resistant and immune to the coming onslaught.

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At the same time, one should remember how uncertain the situation was globally in early spring of 2020, when little was known about COVID-19 and its broader effects. In this regard, Egyptian policymakers might be forgiven for attempting to ease popular concerns about the virus, particularly given the country's unique economic challenges. Importantly, over the long run, there proved few success stories globally in the fight against COVID-19, and Egypt is not alone in having struggled with the spread of the disease and related deaths.

This understanding, however, should not serve as an apology for policy failures in Egypt over the course of the pandemic or the inability of officials to fully understand the scope of COVID-19's impact in Egypt. The inability of officials to provide Egyptians with accurate measures of cases and deaths undermined the ability of public health specialists to effectively counter the spread of the disease, particularly among marginalized poor and rural communities. Moreover, the lack of

accurate data on cases and deaths fueled rumor and misinformation across Egypt, leading Egyptians to take more risks and lessening compliance with initial efforts to stall the disease's spread through social distancing or taking up vaccines when they became available.

Given the connectivity of the global community and expected public health impacts from global warming, the world will likely face an increasing number of disease outbreaks and epidemics or pandemics in coming years. Egypt's experience with COVID-19 and its mortality impact suggest three broad areas for policy changes that will help prepare it to face future episodes and ensure that its policy approach to these episodes is more effective:

- **Reforming Rural Healthcare:** COVID-19 exposed the existing fragilities of Egypt's medical system, particularly the efficacy of rural healthcare. Reforming the delivery of healthcare in a way that ensures more equitable access to primary care has long been set as a priority for the Egyptian government (and donors).<sup>42</sup> However, little progress has been made since the late 1990s in realizing these improvements. In addition to supporting broader improvements in rural healthcare, public health authorities must ensure that their disease monitoring capacities reach all corners of the country, and they have the means to rapidly bolster the capacities of rural clinics given identified outbreaks (e.g., mobile hospitals). This recommendation is not put forward lightly: healthcare investments and reform, particularly in rural areas, are costly and complicated, coming at a time where Egypt's resources are under intense budgetary strain. However, such efforts would fundamentally improve the lives of millions of Egyptians now and in the event of another pandemic.

v. As a lower middle-income country like Egypt, Vietnam is a potent example. Seeking to maintain an open economy through the pandemic, Vietnam worked with local laboratories to develop local capacity to test for the virus and built significant capacity to do so, testing over 880 out of every 1,000 people in the country. This allowed authorities to identify narrow geographical outbreaks and implemented targeted, short-term lockdowns to limit the spread of the virus. In contrast, Egypt only tests 55 out of every 1,000 people, giving authorities little ability to track and trace viral outbreaks.

- **Testing and Tracing:** While all countries eventually succumbed to widespread outbreaks of COVID-19, the countries that proved successful at stemming initial waves of the virus and limiting deaths either imposed stringent social distancing mandates (e.g., New Zealand) or maintained an open economy while testing and tracing vigorously (e.g., South Korea, Vietnam).<sup>v</sup> While costly and logistically complex, careful testing and tracing efforts allowed governments to maintain narrow closures where needed while limiting the pandemic's impact on employment. For future epidemics, Egypt's ability to follow this approach would be aided by investments in public or private laboratories and a localized capacity for developing new tests, either within Egypt or in cooperation with neighboring countries. Given the costs associated with improved testing and tracing capacity, building this capacity should be a priority area for donor support.
- **Data Transparency:** Egypt is not alone among countries wherein government officials resisted providing the population with a full understanding of the spread of epidemics and the mortality associated with them. South Korea, for example, followed such a strategy with Middle East respiratory syndrome (MERS) in 2015.<sup>43</sup> In the long run, South Korean authorities found that combatting the spread of a disease without data transparency allowed for the spread of misinformation in a way that undermined public safety measures and compliance with social distancing rules, enabling the spread of the disease. Developing the capacity to accurately track the disease and communicate this data to the population helps build citizen trust in government and the information authorities provide, ensuring that people are working in concert to help combat the spread of disease.

## APPENDIX

Table 1: Excess COVID-19 Mortality in Egypt by Governorate and Urban-Rural Areas, 2020.

			Month											
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Urban Governorates	Cairo	Urban	-2.9	0.6	1.1	-9.4	44.5	86.5	6.4	0.4	-1.5	-3.6	1.0	21.0
		Rural	..	..	..	..	..	..	..	..	..	..	..	..
		Total	-2.9	0.6	1.1	-9.4	44.5	86.5	6.4	0.4	-1.5	-3.6	1.0	21.0
	Alexandria	Urban	5.0	8.0	8.7	2.2	11.4	19.0	29.2	33.8	23.8	27.0	49.0	80.5
		Rural	-91.0	-89.3	-93.2	-91.5	-95.5	-89.4	-85.6	-90.0	-91.4	-91.9	-86.4	-92.3
		Total	-2.0	1.3	1.3	-4.4	4.1	11.5	21.4	25.3	16.4	18.7	39.4	67.0
	Port Said	Urban	-9.0	-10.8	8.2	10.9	-5.4	21.3	18.5	14.4	8.5	17.4	34.3	30.4
		Rural	..	..	..	..	..	..	..	..	..	..	..	..
		Total	-9.0	-10.8	8.2	10.9	-5.4	21.3	18.5	14.4	8.5	17.4	34.3	30.4
	Suez	Urban	0.3	2.1	3.9	-13.9	30.1	54.3	43.8	22.8	11.5	-1.7	19.9	44.3
		Rural	..	..	..	..	..	..	..	..	..	..	..	..
		Total	0.3	2.1	3.9	-13.9	30.1	54.3	43.8	22.8	11.5	-1.7	19.9	44.3
Lower Egypt	Demietta	Urban	-8.2	-11.1	-6.9	-12.2	-5.2	1.7	1.3	28.5	19.9	25.5	20.3	33.2
		Rural	-16.0	5.0	34.6	17.6	31.5	35.8	17.1	29.0	25.7	22.1	43.6	26.3
		Total	-11.0	-6.1	5.2	-3.3	5.2	11.2	5.8	28.7	21.5	24.5	26.5	31.0
	Dakahlia	Urban	-12.9	-4.4	-12.3	-15.1	-5.0	13.9	26.2	28.7	32.3	9.1	17.7	34.0
		Rural	-3.4	9.7	9.0	13.3	18.6	50.4	36.7	45.3	35.3	18.1	17.4	25.3
		Total	-7.8	3.1	-1.4	-1.1	6.6	31.5	31.5	36.9	33.8	13.5	17.5	29.5
	Sharkia	Urban	-6.1	4.0	8.0	0.6	39.3	113.7	56.1	43.0	36.0	23.8	37.1	76.9
		Rural	-7.7	-0.6	6.6	-3.4	8.6	84.5	2.6	10.3	4.5	-5.7	3.3	20.7
		Total	-7.2	1.0	7.1	-2.0	19.9	95.7	21.8	22.2	16.0	4.9	15.4	39.9
	Kalyoubia	Urban	-6.8	0.1	1.8	-1.5	76.5	158.4	25.9	14.8	6.9	1.4	8.5	30.7
		Rural	-6.4	3.9	15.3	4.7	61.4	170.6	24.6	8.7	9.8	-1.5	3.1	15.1
		Total	-6.6	1.9	8.2	1.4	69.5	163.9	25.3	12.0	8.2	0.0	5.9	23.1
	Kafr El-Sheikh	Urban	-7.0	0.4	-4.5	-4.6	3.4	44.9	28.6	59.7	46.2	28.7	52.7	74.7
		Rural	-7.6	-3.1	7.4	3.8	7.9	24.4	25.3	38.6	40.3	11.2	21.8	52.6
		Total	-7.3	-1.6	2.2	0.0	5.9	33.7	26.8	48.0	43.0	19.3	35.8	62.7
	Gharbiah	Urban	-16.7	-8.6	-11.9	-22.3	2.6	30.1	28.9	18.0	11.8	1.4	17.3	36.4
		Rural	1.2	15.3	21.8	13.3	34.3	75.1	49.2	47.2	35.6	17.0	38.0	64.1
		Total	-7.8	3.0	4.1	-6.2	17.0	50.4	38.2	31.7	22.6	8.6	26.8	49.5
	Menoufia	Urban	-3.7	-7.0	-2.4	-14.4	12.4	71.6	27.5	11.0	10.5	7.3	15.3	63.3
		Rural	-7.0	-1.4	13.0	11.3	52.8	111.3	28.4	30.8	13.5	12.0	21.6	50.0
		Total	-5.6	-4.0	5.4	-1.8	32.4	90.6	27.9	20.6	12.0	9.6	18.4	56.4
	Behera	Urban	-24.9	-23.4	-23.9	-27.5	-12.6	-1.9	3.6	11.1	-2.1	-11.5	3.8	34.1
		Rural	4.1	16.1	25.3	22.3	40.1	93.4	63.8	68.9	55.4	33.7	53.0	71.6
		Total	-8.7	-2.2	1.3	-2.5	14.0	43.2	33.4	40.1	25.9	10.9	28.9	53.6
Ismailia	Urban	-12.2	-2.6	-4.6	-4.9	-0.6	38.4	10.9	-1.3	8.1	0.4	6.0	25.6	
	Rural	-27.9	-11.0	18.2	-1.6	33.1	92.7	38.8	35.5	14.4	21.1	47.5	59.3	
	Total	-16.9	-5.0	1.2	-4.0	7.6	51.5	17.6	7.2	9.5	5.3	17.0	34.7	

Table 1 (Continued)

			Month											
			Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.
Middle Egypt	Giza	Urban	1.7	6.9	9.7	6.4	75.2	134.4	21.9	13.3	13.5	8.9	15.2	33.2
		Rural	-8.3	-2.0	4.6	2.9	32.6	123.2	12.4	1.5	-0.8	-12.9	-8.2	-4.4
		Total	-1.2	4.4	8.3	5.4	63.7	131.4	19.3	10.1	9.6	2.8	8.7	22.3
	Beni Suef	Urban	-10.0	-7.5	6.4	-11.0	10.7	94.1	62.7	12.3	3.8	4.7	10.1	20.0
		Rural	-6.6	-1.8	7.5	8.9	-1.0	116.1	47.7	19.2	14.7	1.4	4.8	0.5
		Total	-7.8	-3.9	7.1	0.7	3.8	106.9	53.8	16.3	10.1	2.8	6.9	8.1
	Fayoum	Urban	-6.4	-4.1	-33.1	-14.7	31.7	138.7	38.3	8.9	-7.8	0.3	-29.8	9.6
		Rural	-6.8	2.9	22.6	13.0	40.6	159.7	28.3	28.4	15.9	2.5	15.2	11.0
		Total	-6.5	0.3	-2.6	0.0	36.5	149.6	33.6	19.0	4.1	1.6	-6.5	10.5
	Menia	Urban	1.9	9.5	3.7	-3.2	9.5	85.2	71.3	23.2	4.8	-4.2	8.8	4.5
		Rural	-3.2	2.6	4.2	9.6	19.2	102.6	72.1	32.4	16.2	2.7	-1.9	-3.8
		Total	-1.6	4.9	4.0	5.0	15.6	96.2	71.8	28.9	11.9	0.1	2.0	-1.0
	Asyut	Urban	-71.4	-73.6	-75.3	-77.1	-66.1	-28.2	-42.4	-65.2	-72.5	-70.9	-74.0	-75.2
		Rural	89.8	110.2	123.5	115.9	127.8	262.5	166.2	178.6	139.0	114.9	121.5	84.0
		Total	1.1	4.1	1.0	-6.5	7.5	81.7	37.5	20.7	3.6	-0.7	-0.5	-9.0
	Suhag	Urban	-13.9	-22.8	-11.8	-31.6	-12.3	55.6	31.2	8.3	-9.4	-12.0	-10.0	-20.7
		Rural	4.1	6.8	11.2	-5.1	0.1	53.4	30.1	38.3	24.7	1.6	12.7	5.3
		Total	-1.1	-1.9	4.0	-13.6	-3.8	54.1	30.5	28.1	13.6	-2.9	5.5	-2.7
Upper Egypt	Qena	Urban	15.1	1.8	14.5	5.4	31.6	122.3	90.4	60.7	17.5	13.2	4.4	7.4
		Rural	-0.9	-6.9	-1.6	2.8	-5.8	54.6	27.6	21.6	0.0	-18.3	-6.0	-7.2
		Total	3.1	-4.6	3.1	3.6	5.3	76.1	46.7	33.3	5.2	-9.0	-3.0	-3.1
	Aswan	Urban	16.8	11.4	0.7	-4.3	67.0	138.4	52.1	40.8	13.6	7.0	8.0	12.6
		Rural	-15.1	-11.9	-4.9	-3.3	4.0	119.7	40.2	42.5	10.9	-7.4	2.2	-28.8
		Total	4.6	3.9	-1.1	-4.0	47.5	132.6	48.5	41.3	12.9	3.2	6.4	-0.7
	Luxor	Urban	4.0	15.9	7.3	23.8	96.1	121.1	18.2	11.8	5.6	-0.3	5.5	0.9
		Rural	-32.4	-18.1	-19.5	-11.6	44.1	188.8	45.2	38.8	23.0	-5.1	-0.8	-26.9
		Total	-22.3	-8.4	-3.1	19.9	88.9	224.4	30.0	32.9	9.0	-4.4	-1.1	-16.0
Frontier Governorates	Red Sea	Urban	10.3	-9.1	-11.5	-16.7	-1.2	7.3	1.4	9.6	-13.3	-14.8	-27.5	-5.8
		Rural	..	..	..	..	..	..	..	..	..	..	..	..
		Total	10.3	-9.1	-11.5	-16.7	-1.2	7.3	1.4	9.6	-13.3	-14.8	-27.5	-5.8
	Wadi Gadid	Urban	-17.2	-20.8	-26.3	-21.5	-8.7	10.2	49.8	151.5	18.3	-2.0	-2.8	-0.9
		Rural	11.0	-3.8	12.9	24.7	64.7	67.8	103.1	119.2	152.3	6.6	10.9	51.8
		Total	-8.7	-15.9	-16.2	-10.8	8.0	25.1	65.2	142.0	45.7	0.1	0.5	13.7
	Matrouh	Urban	36.0	49.1	23.2	34.1	19.8	39.5	15.9	61.3	31.4	31.1	52.1	90.9
		Rural	-86.0	-87.4	-82.5	-92.5	-86.8	-81.5	-94.2	-95.4	-88.9	-91.0	-90.5	-89.4
		Total	11.9	16.0	3.2	5.0	-2.1	16.1	-10.4	16.9	3.6	3.7	20.5	52.7
	North Sinai	Urban	-2.1	25.1	7.2	8.1	16.3	24.6	22.4	23.5	26.5	-0.9	11.9	11.4
		Rural	-27.7	11.1	19.6	56.9	268.4	54.8	438.5	97.0	1172.7	169.2	17.9	145.1
		Total	-6.6	22.9	8.8	12.5	25.6	26.9	41.4	27.7	49.1	6.1	12.8	21.1
South Sinai	Urban	15.6	-7.6	-21.9	-13.9	1.6	-13.7	-16.2	6.6	5.7	-9.6	0.1	-13.2	
	Rural	..	..	..	..	..	..	..	..	..	..	..	..	
	Total	15.6	-7.6	-21.9	-13.9	1.6	-13.7	-16.2	6.6	5.7	-9.6	0.1	-13.2	

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## ABOUT THE AUTHOR

Paul Dyer is a nonresident fellow at the Middle East Council on Global Affairs. He has over 20 years of research and policy analysis experience on governance and economic development issues in the Middle East and North Africa (MENA) region.

Dyer's work has focused on labor market policy and youth development, small and medium enterprise development, the promotion of access to finance, and broader issues of economic inclusion. Recently, he has worked on conflict resolution and post-conflict recovery in Libya, Syria, and Yemen, with attention to rebuilding institutional capacity; as well as the MENA region's policy response to the COVID-19 pandemic.

In this capacity, Dyer has worked with the World Bank Group, the Islamic Development Bank, the International Labour Organization, and many government agencies and non-governmental organizations in the MENA region. He has published widely, contributing to numerous reports and edited volumes on economic development in the MENA region, as well as implementing several long-term impact evaluations.

In the past, Dyer served as managing associate at Maxwell Stamp, Inc. and knowledge program manager at the Silatech Foundation in Qatar. He was also a fellow at the Dubai School of Government and extended-term consultant at the World Bank. Dyer co-managed the Middle East Youth Initiative, a research initiative focused on understanding institutional barriers to youth economic inclusion in MENA and programmatic solutions to persistent challenges in terms of employment, entrepreneurship, and social development. He also was a founding advisor to the Taqueem Initiative, evaluating youth employment programs in the MENA region.

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**MIDDLE EAST COUNCIL ON GLOBAL AFFAIRS**

Saha 43, Building 63, West Bay, Doha, Qatar

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