

# Impact of Crises on Official Statistics: A Case Study of Environmental Statistics at Statistical Centre for the Cooperation Council for the Arab Countries of the Gulf during the COVID-19 Pandemic

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**Abstract**—The crisis of COVID-19 posed enormous challenges to the statistical providers. While official statistics were disrupted by the pandemic and related containment measures, there was a growing and pressing need for real-time data and statistics to inform decisions. This paper gives an account of the way the pandemic impacted the operations of the National Statistical Offices (NSOs) in general in terms of data collection and methods used, and the main challenges encountered by them based on international surveys. It highlights the performance of the Statistical Centre for the Cooperation Council for the Arab Countries of the Gulf, GCC-STAT, and its responsiveness to the pandemic placing special emphasis on environmental statistics. The paper concludes by confirming the GCC-STAT's resilience and success in facing the challenges.

**Keywords**—NSO, COVID-19, pandemic, National Statistical Offices.

## I. INTRODUCTION

THE challenge created for the NSOs by the outbreak of the COVID-19 pandemic was unprecedented. Issues of missing data or data gaps are familiar to NSOs, but the COVID-19 crisis created a new challenge: discontinuity of the statistical process and operations. Data collection was threatened due to the measures taken to contain the pandemic such as the lockdowns that disrupted households, businesses, and even financial markets [1]. The crisis of the outbreak of COVID-19 has imposed challenges on NSOs as it hindered the production of statistics and disrupted censuses and surveys in particular. The response by NSOs varied according to their capabilities and resources which highlighted certain disparities between high-income and low-middle income countries. A survey by UNSD and the World Bank conducted in four different rounds to closely monitor the impact of the pandemic on NSOs showed that till May 2021, NSOs were still affected by the pandemic in different degrees. Other surveys concurred with the findings of the UNSD/World Bank survey [2]-[4].

The crisis tested the GCC-Stat, Statistical Centre for the Cooperation Council for the Arab Countries of the Gulf, as it did with all the other NSOs around the world. GCC-Stat responded promptly and effectively to the situation. The technical infrastructure was already in place which enabled the continuation of operations during office closures and

lockdown. Collection of data continued using non-traditional methods such as satellite images and stations measuring environmental factors. Thus, the publication of data was not interrupted and continued in both streams, online and printed according to the release calendar. The flow of environmental statistics was facilitated by the use of technologies in the field. The crisis proved GCC-STAT to be a resilient one.

## II. IMPACT OF COVID-19 ON NSOS

Official statistics were disrupted by the pandemic. In some areas, there was 'statistical darkness' as in the case of some aspects of the economy. For instance, with the suspension of air transportation [5], there were no statistics to record. New activities emerged and new patterns evolved, and the statistical tools for the accurate measurements were not in place to cope with dynamics and the rapid changes. One example to note here is households' spending patterns that are linked to Consumer Price Inflation (CPI) [6]. In a wider context, certain economic activities surged such as delivery services while others declined or stopped such as movie theatres. These changes were challenging to statisticians because the norm of related weights, e.g. CPI basket, are adjusted once a year [3]

Compiling data became more difficult for NSOs. This was a consequence of lockdowns, closure of offices and social distancing rules. Though NSOs were still able to organise surveys, administering the surveys was a challenging task. Recognising the challenges, the World Bank in collaboration with the United Nations Statistics Division (UNSD) conducted a web survey for NSOs to collect information on the impact of the pandemic on statistics related operations in 2020. The survey was launched in May in its first-round which was followed by the other two rounds in July and October of the same year and the fourth one in May 2021. Results in the fourth round showed that in May 2021 about 32% of offices were still totally or partially closed, a notable rise compared to the downward projection reported in round 3 in October 2020, Fig. 1. 18% of offices required their staff to work fully from home and 51% of staff worked partially from home, Fig. 2 [7].

The most affected part of NSOs' work was surveys and censuses. Face-to-face interviews have always been recognized as a tool for data collection used by most if not all NSOs. However, during the pandemic, this tool was disrupted or stopped. The reason for this was the social distancing,

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closures, and lockdowns. In the NSOs survey by the World Bank and UNSD [5], 68% of the NSOs in the fourth round indicated that they stopped the face-to-face interviews fully at

certain points of the crisis, Fig. 3. The percentage of offices that reported the partial suspension of face-to-face interviews was 90% in the fourth round.

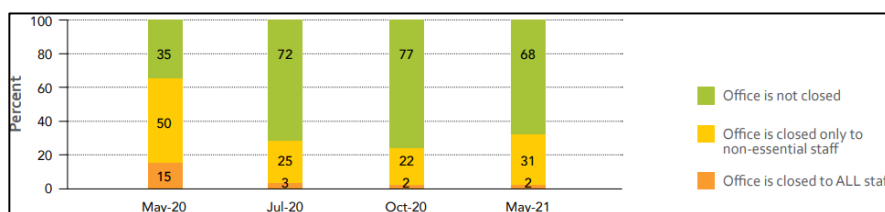


Fig. 1 Main offices closed as a consequence of the pandemic [7]

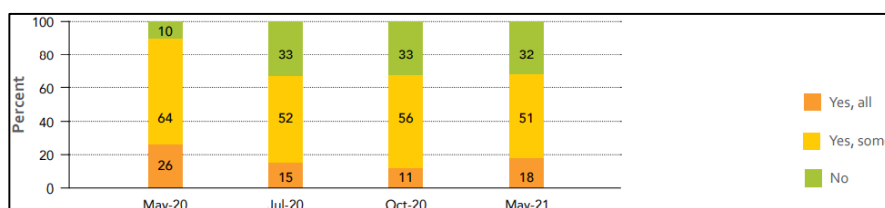


Fig. 2 Staff instructed to work from home [7]

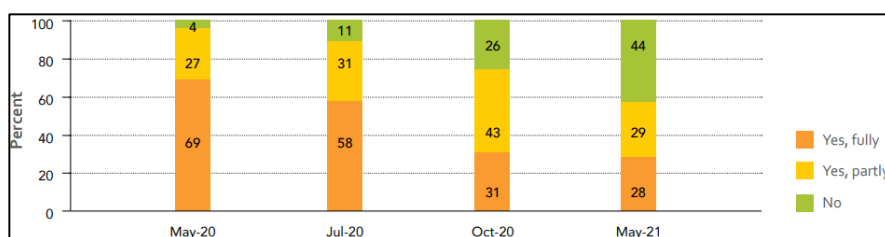


Fig. 3 Percentage of offices that stopped the face-to-face data collection [7]

The fourth round of the World Bank/UNSD survey in [8] yielded results that were less optimistic than those obtained in the previous round in October 2020. The most affected type of operations was the surveys and censuses. Surveys were affected negatively or delayed in 81% of NSOs in middle- or low-income countries. The overall results of the survey highlighted the disparities and inequalities between NSOs in high-income countries and those in low- and middle-income countries. Results revealed that NSOs in low- and middle-income countries face the most challenges in their statistical operations and that they have a dire need for assistance in terms of technology, finance and capacity building. For example, in the first round of the survey, all low-income countries responding to the survey reported that their ability to meet the international statistical requirements was affected by the pandemic while 48% of high-income countries reported that they were not affected. The inability to meet the international reporting requirements would eventually affect the achievement of SDGs if the challenges persisted [9]

NSOs had to resort to alternative data collection methods other than face-to-face interviews. To this end, new protocols had to be put in place including the Personal Protective Equipment (PPE). For the NSOs that continued the practice, resistance from the respondents hindered the process. It has been reported that respondents refused to talk to statisticians in

door-to-door interviews, did not open the doors to them or that statisticians were not allowed to enter houses. This affected the response rates and reduced the accuracy of the household surveys [3]. Business surveys were also difficult to organize. For example, in some situations, certain goods were not available for sale. The sample of outlets still open for business with others being closed constituted an inadequate sample size for statistics. The difficulty of measuring international travel remains a striking example in this area.

Containment measures are taken by countries also resulted in delays of the operations of NSOs and rescheduling processes and consequently missing previously set deadlines. Lower rates of response or the absence of any response were the main issues. Statistical agencies decided to postpone less frequent data collections such as censuses. Nonetheless, keeping up with short term indicators proved to be challenging due to quarterly the rapid dynamics of changes resulting from the pandemic. This created outliers in data in time series or even a level shift as is the case in the economic time series for most of the Organization for Economic Co-operation and Development (OECD) countries in the first two quarters of 2020 [4].

The findings of the International Labour Organization (ILO) [10] concurred with the results of the World Bank and UNSD surveys [7]. The ILO surveyed that massive challenges were

faced in the process of compilation of statistics related to the labour force. For example, 46.6% of countries that planned to conduct the Labour Force Survey in 2020 suspended the interviews. Among these, countries in Africa and the Arab states had the highest percentage of suspensions. The majority of them were not able to recover the interviewing process leaving them with a gap in the data needed for time series. The alternative resorted to as a substitute to face-to-face interviews was telephone interviewing (Fig. 4). 40 out of 97 reported the intention to conduct the LFS remotely using the telephone. Nevertheless, this solution was not obstacle-free. Another challenge was reported: the unavailability of contact details of a sufficient sample size. This has led about one-quarter of countries participants in the survey to reuse old samples. The pandemic has made it difficult to obtain data on populations of special interest such as displaced groups internally or migrants. Lockdowns have resulted in the mass migration of labour, which raises the issue of authenticity of labour statistics as an example [10].

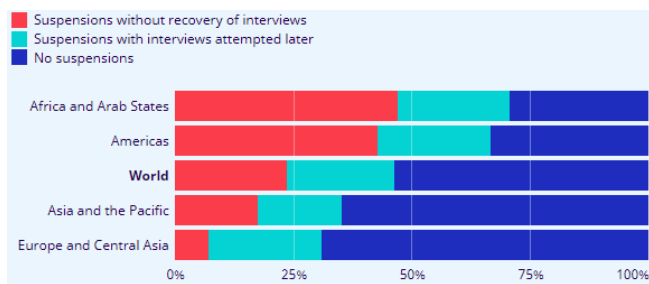


Fig. 4 Suspensions of Labor force survey interviews in 2020 and subsequent attempts to recover these [10]

The study of UNCEC in July 2020 involved NSOs in the Caucasus, Eastern Europe and Central Asia and investigated the practices of NSOs in adapting to the crises imposed by the pandemic. Results showed that while 22 out of the 25 participating offices were conducting surveys, 20 of them switched to remote methods such as telephone interviews and online surveys. Several difficulties were encountered in conducting surveys as shown in Fig. 5 with a lack of technical skill on the part of the respondents at the top [11].

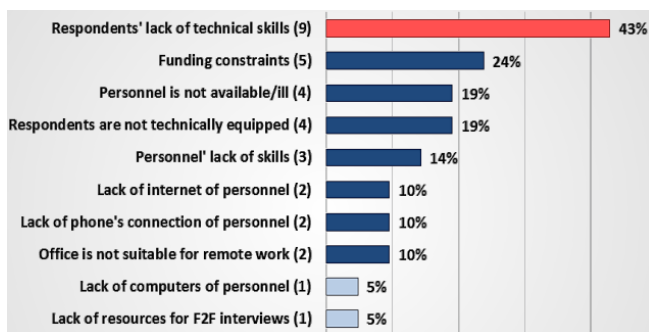


Fig. 5 Survey taking difficulties in the pandemic [11]

The pandemic has impacted the statisticians' preferences concerning survey methods or tools. References reflected the

challenges manifested in Fig. 5. With precautions surrounding face-to-face interviews, and with technical hindrances related to skills and equipment, phone surveys were the preferred choice.

Obstacles in conducting surveys were only one aspect of the challenge. Another issue of concern was funding. Government funding decreased since the beginning of the pandemic in 48% of the 118 countries participating in the fourth round while the funding by donors and other sources was reported to decrease in 29% of them. This decrease in funding affected the NSOs ability to upgrade or to improve their ICT infrastructure [5] to cope with demands of the arising situations that required tools and preparedness to work and to collect data online.

### III. GCC-STAT'S PERFORMANCE DURING THE CRISIS

GCC-STAT is the Statistical Centre for the Cooperation Council for the Arab Countries of the Gulf. It was established in June 2011 to act as an official pool of data and statistics for the six-member states: Sultanate of Oman, Kingdom of Saudi Arabia, United Arab Emirates, Kingdom of Bahrain, State of Kuwait and State of Qatar. The pandemic has been a test for resilience for NSOs, GCC-STAT included. Since March 2020, GCC-STAT, headquarters is located in Muscat, Oman, has abided by the containment measures as per the decisions of the Supreme Committee with regards to lockdowns, total or partial office closures and others. NSOs of the member stated also underwent similar conditions in their respective countries. However, GCC-STAT has successfully managed to adapt to the emerging situations. A main contributing factor is an infrastructure that was already in place, which enabled GCC-STAT staff to work from home after the lockdown. For example, remote desktop for working online and updated the data on a daily basis and IT staff available during the day to assist statisticians when they upload data through the portal to ensure it uploads it correctly in a suitable place.

The need for real-time statistics was recognized and in response, a platform for COVID-19 statistics was created on the GCC-STAT [12].

The GCC-STAT leadership continued to have a dialogue with the staff. Consequently, staff felt connected to the organization and efforts were coordinated and directed towards achieving the targets. There was close collaboration with other partners as data providers, mainly the national offices in the member countries. This facilitated production of information and issuance of COVID-19 related publications meeting scheduled deadlines in the GCC-STAT calendar and responding to the urgency to avail data about the pandemic. In this context, GCC-STAT published the report 'One Year into the Pandemic in GCC Countries' in January 2021 providing detailed statistics on COVID-19 statistics and giving an account of its social, health, economic and environmental impact on the GCC countries after one year of the pandemic [13], [14]. GCC-STAT also kept track of the accomplishments in the area of Sustainable Development Goals in the member states. Readings of statistics published indicated that GCC countries are moving towards achieving the desired goals

[15]-[17]. The publication by GCC-Stat focused only on the economic impact of COVID-19 on the statistical offices based

on the results of the survey that was carried out by UNSD and the World Bank [7].

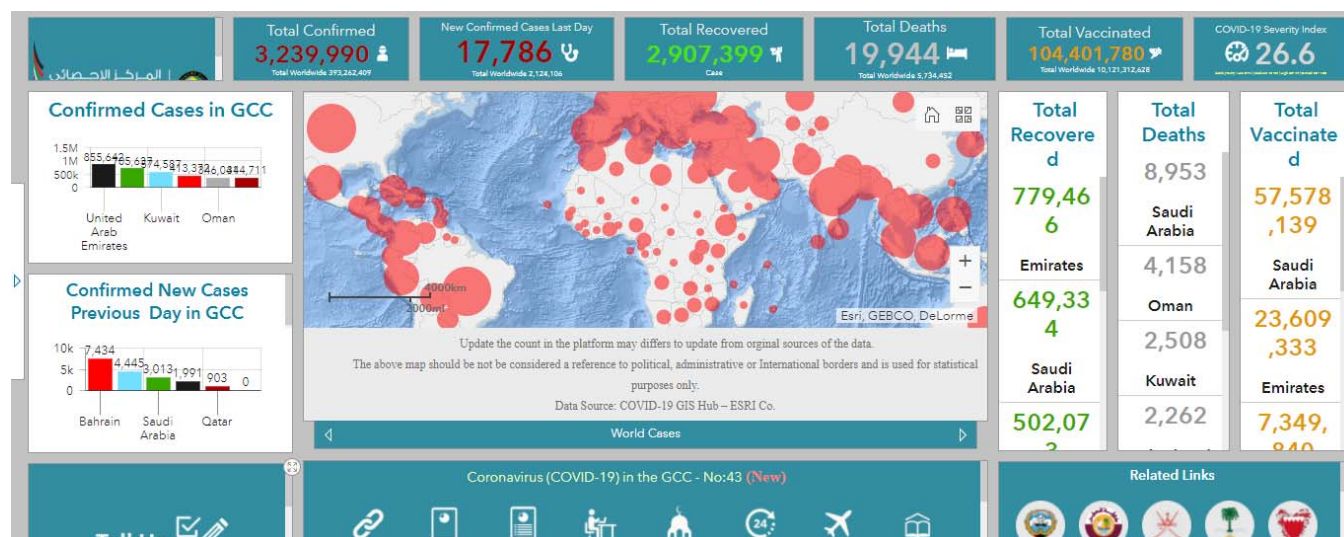


Fig. 6 Coronavirus Pandemic Counts Map (COVID-19) for the Cooperation Council for the Arab Countries of the Gulf [12]

GCC-STAT and partner NSOs in member states employed non-traditional methods such as satellite images, sensor data and weather stations for obtaining environmental data to monitor indicators such as emissions, air quality and any relevant changes. A publication on Air Quality was released in April 2020, in the month following the lockdowns [18]. The close coordination between GCC-STAT and NSOs in member countries facilitated data collection despite the challenges of COVID-19 as it provided statistics on individual member countries in several air quality variables. The report also gave an account of the status of air quality indicators in some European cities after the lockdown to shed light on the issue from a global perspective. In addition to statistics, satellite images were used as a tool for data collection to track the Nitrogen Dioxide (NO<sub>2</sub>) concentrations [18]. Another publication was released in April 2020 on Extreme Events and Disasters [19]. This publication is connected directly to Topic 4.1.1 which reflects the commitment of GCC-STAT to achieving the SDG as set by the United Nations. The report highlighted the effect of air pollution by particles and the spread of viruses in the population within the context of the current crisis of the COVID-19 pandemic. It provided an analysis of the dissemination of COVID-19 in Italy about exceeding limits of Particular Matters (PM10). It provided insights to GCC-STAT staff and partner NSOs on the calculations of PM10 and NO<sub>2</sub> to provide reliable statistics to inform decision making in the time of crisis [19], [20].

The Weekly Summary continued to be published and posted. The number of weekly summaries published since the outbreak of COVID-19 in March 2020 was 134 with the total number of weekly summaries up to date being 185. Weekly summaries [21] reported the status of environmental data in the GCC countries. Number of summaries on environmental data since March 2020 was 10. Other publications also continued and those included *Waste Statistics in GCC*

*Countries in January 2022, The Impact of Corona (COVID-19) Pandemic in the GCC Countries on the Health, Social, Economic and Environment Aspects in December 2021, How COVID-19 is Changing the World in April 2021, Biodiversity Statistics in the GCC Countries in May 2021, Water Statistics in the GCC Countries in February 2021 [22].*

#### IV. RECOMMENDATIONS

In addition to the fact that the crises revealed the disparities between NSOs in countries of different levels of income, it shed a light on the support that NSOs mostly require for future action as a lesson to be learned from this experience the pandemic. UNCEC's survey has identified areas where support is needed. Results showed that the technical issues were in the lead such as the equipment, software and expertise. Findings of UNSD/World Bank survey showing that 90% of low-and middle-income countries faced difficulties in reporting statistics is a manifestation of lack of resources and limited technical capacities of these countries which consequently calls for action in terms of support needed.

There are certainly lessons learned from the crisis which has exposed the NSOs' capacities and abilities. The crisis of COVID-19 has proved that the successful NSOs are those that possessed the adequate infrastructure that enabled them to shift to teleworking, were able to prioritize tasks, kept connected to other providers and policymakers [23]. However, there are still recommendations to be made for better preparedness in the future:

1. International effort is needed to assist NSOs in low- and middle-income countries in terms of funding, equipment, technical expertise and training.
2. NSOs need to modernize and strengthen programs of data collection.
3. It is important to not rely on face-to-face interviews as a

data collection tool, and to encourage the use of non-traditional tools like online forums, focus groups, and online interviews.

4. Enhancing systems and policies for real-time engagement and communication between statisticians/NSOs and policymakers would result in the provision of real-time statistics needed for prompt responses and quick decision making especially in the times of crises.
5. The promotion of data sharing among statistic producers is necessary. Data producers should not work in isolation, but collaborate with each other to achieve integration and not to overlap.

#### V. CONCLUSION

The challenges posed by the pandemic on NSOs as shown by international surveys extended to the different areas of data collection, compilation, funding and technical expertise. Examining the performance of GCC-STAT during the pandemic in terms of data production and publication shows that GCC-STAT was able to cope with changing situations imposed by the pandemic. Statistical operations and publications were not interrupted as a result of the technical preparedness, close collaboration with partners, proper funding and employing non-traditional data collection methods.

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