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Letter to the Editors

COVID-19: Unprecedented Situation, Unprecedented Official Statistics

The COVID-19 outbreak dominated the beginning of 2020. Almost every country and every socio-economic sector is facing this unique situation. Official statistics need to confront new challenges, both internally and externally. Internally, every National Statistics Office (NSO) needs to protect their workers, reorganize their way of working, and ensure the regular statistics production. Externally, NSOs are called to make a statistical description of an unprecedented complex reality.

The aim of an NSO is not only to produce official statistics but also to provide a realistic 'picture' of our world, even in times of crisis. However, an official statistics system should not limit itself to those standard tasks. NSOs should provide and participate to the production of data and information on COVID-19. For instance, the United Nations Statistics Division is actively recommending guidelines, sharing experiences and collecting data for COVID-19 (United Nations Statistics Division 2020). However, under the threat of COVID-19 many countries are considering official statistics as a non-essential service (Cheung 2020a). Are official statistics a non-essential service?

The aim of this letter is: (1) to analyze the role of NSOs during the COVID-19 health crisis, (2) to summarize challenges and opportunities lying ahead, (3) to trigger the discussion about the role of NSOs.

For the sake of simplicity, let us distinguish between two different temporal phases of the COVID-19 epidemic. The first phase is predominated by health crisis and lockdown. This phase affects the population. The second phase starts when the health crisis is under control (IAOS 2020). Once the lockdown has been revoked, the country is facing a new socio-economic situation that was completely unpredictable in January 2020. This last phase is full of challenges and opportunities for NSOs.

During lockdown, citizens are reading or listening to the figures of new COVID-19 cases and daily deaths. These numbers are unreliable, not harmonized and scarce. They do not provide a secure starting point to understand the situation, nor do they help in making proper decisions. What drives the production of these figures – cases and deaths of COVID-19 – is a medical objective. These figures are necessary to diagnose and care for patients. Nevertheless, we also need figures to better understand the spread of COVID-19. We need figures to help implement the lockdown only when and where lockdowns are necessary. After the health crisis, we will need statistics to help us fully understand the new socio-economic situation and the details of the economic recession. We need reliable figures to plan for the future.

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1. Official Statistics During the Health Crisis

Under the threat of COVID-19, the priority of NSOs is the health of its workers. The second priority is to describe the country's situation based on statistical methodology and data collection. Policymakers and citizens need official statistics to make informed choices to manage the health crisis.

In the media, two figures are predominant: number of deaths and number of cases of COVID-19. From the point of view of an NSO, these data are produced by the health system and they are administrative data. We can call these figures "medical figures". We can consider the production of these data as a side effect of the excellent work conducted by doctors and nurses who care for COVID-19 patients. The aim of medical figures is not to describe the spread of COVID-19 or the overall socio-economic implications of the outbreak. Unfortunately, figures produced by health authorities cannot provide crucial information. We need to know how, when and why COVID-19 spreads among the population. For instance, we need to know how many asymptomatic carriers of COVID-19 there have been in our country. Only a scientific random sample could give us this information (see Ioannidis 2020; Di Gennaro Splendore 2020; Alleva et al. 2020).

Moreover, since medical figures – the number of deaths and cases of COVID-19 – are not produced by or on behalf of the NSO, the NSO cannot assess the quality of these data. While not referring to COVID-19, Radermacher (2020) has proposed that the statistical system could take on the assessment, management and certification of data. For instance, the German Federal Statistical Office declared that it does not collect real-time data on the outbreak. When looking for data on COVID-19, citizens are redirected to a different webpage. Interestingly, COVID-19 is not present on the webpages of several NSOs (Figure 2 in Misra et al. 2020).

An important issue about the number of deaths of COVID-19 is the interpretation of the main cause of death. From this perspective, figures of COVID-19 deaths are problematic. To make an analogy, if you have the flu and a train runs you over, you would have died because of the train not because of the flu. The number of COVID-19 deaths should only indicate the number of deaths for which COVID-19 is the main cause of death. Instead, different countries apply different definitions and different criteria. Often, various regions within the same country apply different criteria. Normally, the national statistical systems work on metadata and harmonized definitions. Italy, Ecuador and the United States (CDC 2020) report COVID-19 deaths where the main cause of death is not COVID-19. The media compares deaths in 2020 with previous years' deaths. These are unreliable data, as demographers well know. To have a comprehensive analysis of these data we should include an analysis of age groups.

If you do not take a blood test, then you are not identified as having, for example, high cholesterol. The number of cases of COVID-19 depends on how many people were tested in each country and also how they were tested. Availability of testing and different types of tests should be reflected in the statistics. Likewise, data should include people in hospitals, asymptomatic cases and people who came in contact with infected people. The number of COVID-19 cases we have today is not a reliable measure of how many people are infected by the disease. These numbers are useless both for comparison among countries and over time. The figures of COVID-19 cases we have are an underestimation of true figures.

Because of this underestimation of the number of COVID-19 cases, in the media, we find systematic overestimations of the Case Fatality Rate (CFR). Since the majority of countries do not test the whole population, figures are greatly biased. If you cannot measure the main variable of the health crisis, you cannot manage the crisis and its implications.

Due to their data collection capacity, infrastructure and experience, NSOs could support and help health authorities by producing reliable data. Statistical systems should provide data collection support, quality control of figures and appropriate communication of statistics. The NSOs could be matching COVID-19 cases with socioeconomic aspects (like gender, age, income, etc.), previous medical problems, address (GPS), and so on. Having those multivariate data could give the possibility to use more sophisticate statistical models. Statistical systems are key to implementing real-time standardized reporting of the results and disaggregated data, and thus help assess the implications of COVID-19.

How can we acquire information on COVID-19? To the best of our knowledge, there are only two possibilities to obtain this information: either via a census of the population or via a random sample representative of the population. In most countries, a census is not practicable. We need a random sample representation of the population. Different sample designs and different possibilities can be implemented. Every person in the sample who is tested for COVID-19 also needs to answer a questionnaire. The questionnaire would include questions about the clinical evaluation, socio-demographic characteristics, personal characteristics, housing characteristics, and lifestyle of the individual. Additional relevant information can be obtained – in many countries – through administrative registers.

Who can access more information on COVID-19? NSOs are expert institutions on population, sampling and data collection. They are in charge of censuses, employment surveys, as well as many other surveys. The collaboration between NSOs and National Health Systems at the national level could guarantee the necessary expertise to implement a random sample of the population under the threat of COVID-19. As a result of the preparation for the Population and Housing Census, every NSO is ready to investigate its own population. Between the years 2020 and 2021, almost all NSOs in the world will implement the Census of Population and Housing. It is likely that almost all NSOs already have the master frame ready to prepare the census. This could serve as a starting point to implement a random sample. Between 2005 and 2014, more than six billion people around the world – more than 90% of the world's population – were enumerated by population censuses. Only 21 countries did not conduct a census (United Nations Fund for Population Activities 2016).

The United Nations Fundamental Principles of Official Statistics, states that: 'Official statistics provide an indispensable element in the information system of a democratic society, serving the government, the economy and the public with data about the economic, demographic, social and environmental situation' (United Nations 1994). Heinrich Bruengger, former Director of the Statistical Division of UNECE, explains the same principle as follows: 'The purpose of official statistics is to produce and disseminate authoritative results designed to reliably reflect economically and socially relevant phenomena of a complex and dynamic reality in a given country' (Bruengger 2008). The mission of the NSOs is to inform us, the people. Lockdowns in many countries are very restrictive: presently we are experiencing restriction of freedom of movement and restriction of economic freedom. The necessity of such strict measures is why decision-makers and citizens need reliable information about COVID-19. 'In a democratic society

the independence of official statistics has the same status as the freedom of speech for the citizens.' (Jeskanen-Sundström 2007, 1).

To recapitulate, the NSOs during the crisis could:

- help with data collection regarding the crisis,
- explain, manage and/or certify data and statistics, and
- support a random sample representative of the population to identify the spread of the outbreak.

2. Official Statistics After the Health Crisis

In this section, we revisit the unprecedented challenges and remarkable opportunities posed by the health crisis to NSOs.

If we consider the tourism sector or airline companies, we immediately realize that the figures in the next official statistics will be much lower than what we expected in December 2019. By now, our forecasts for 2020 have lost all their meaning. For example, can the price of a flight ticket serve to calculate the inflation? Many services, such as package holidays and sports event tickets are no longer on the market. As of today, we do not know the price of several products. Inaccurate statistics lead to wrong decisions concerning measures to support the economy. Despite all the difficulties, NSOs need to provide accurate and reliable statistics. Therefore, it is necessary to bridge statistical gaps between present data and post-COVID-19 data to understand all the economic implications of the pandemic.

(1) Below are a few examples of the impact that the COVID-19 crisis has had on the bodies of official statistics. Almost all areas of statistical production have problems, each presenting different levels of criticality.
   - Response rates to surveys might decrease. For example, in some cases, survey interviews were canceled for several weeks (Istat Italy 2020),
   - Official statistics originating from past economic interrelations are no longer valid. The estimation procedures cannot provide reliable results in this special circumstance. Therefore, real data are all the more important for evaluating the present situation. The values under COVID-19 in the time series are informative outliers and not atypical values (Eurostat 2020),
   - Governments decided on massive amounts of social benefits and unprecedented subsidies for production. The classification and reporting of these new economic policies need to be understood and coordinated (Eurostat 2020), and
   - The postponement or cancellation of some releases and publications is also problematic. For instance, the 2020 Population and Housing Census will be shifted (Cheung 2020b). Some NSOs advise possible rescheduling of the release calendar (INE Spain 2020; NSO Malta 2020).

(2) However, this crisis offers a number of opportunities for NSOs:
   - As of today, up-to-date and short analyses are more appreciative and useful than large studies. The latter provide relevant but overdue insights. In order to provide information that supports decision-makers and citizens, official

statistics need to be as reactive as possible with regard to the present situation and real evolution of social and economic dynamics caused by the COVID-19 pandemic. Is the quarterly GDP enough? A higher frequency release for the GDP and other socio-economic indicators, in this significant crisis, could be an extra tool to help decision-makers and citizens,

- Adequate granular sources different from traditional ones can help pinpoint emerging concentrations of needs. Additionally, they can measure extra-ordinary changes in real-time. Already before the COVID-19, we could read: 'Official statistics are fundamental to democracy. With increasing demands for more relevant, frequent and rich statistical information, and declining resources, national statistics offices are continually looking for more cost-effective ways in the production of official statistics' (Tam and Kim 2018),
- Social distancing gave the definitive impulse to pass from CAPI (Computer-assisted Personal Interviewing) to CAWI (Computer-Assisted Web Interviewing). The NSOS had already questioned CAPI or PAPI (Paper Assisted Personal Interview), and were slowly moving to CATI (Computer-Assisted Telephone Interviewing). Nevertheless, this could be the moment to implement CAWI. This is only one aspect of digitalization that NSOs need to face moving forward. In addition, it would be the right moment to use machine learning and web-scraped data (e.g., in the case of on-line prices),
- In a time of crisis, fake news is especially insidious and often faster than real news. Statistical Offices should manage and certify the quality of statistics produced from outside sources in order to include them in official statistics (Radermacher 2020),
- NSOs are in the best position to meet policymakers' rising demand for information about health services. This information will be crucial to effectively manage the consequences of the epidemic, forecast and set up a system of prevention and quick response, and
- Finally, this is the appropriate moment to shift the attention of official statistics from offer to demand.

These challenges can be an opportunity to reinvent and reinforce the role of NSOs all over the world. New tools and strategies should be ready for the next pandemic, the climate crisis or economic recession.

3. Moving Forward

The prolonged lifespan of the COVID-19 pandemic provides NSOs with challenges that could not have been predicted in January 2020. This unprecedented situation is described by unprecedented official statistics and probably by the unprecedented quality of official statistics. Statistical Offices have to collaborate sharing experiences and ideas among themselves (United Nations Statistics Division 2020). So far, few countries and few NSOs have had the capacity to singlehandedly tackle these new issues, challenges and opportunities.

During the health crisis – or any another crisis – NSOs have the chance to share their expertise in sampling design, data collection and data quality. These assets are crucial to fully understand all the details of the crisis and its implications. After the crisis, the world

will face a large and deep socio-economic recession with an unforeseen and unpredicted lack of data and information. Official statistics have a key role for decision-makers and citizens. The NSOs have exceptional challenges and extraordinary opportunities to redesign their roles and their tools.

The COVID-19 crisis can convert official procedures, and inflexible routines in up-to-date analysis, modeling, experimental statistics, digitalization, and complementary adequate granular sources. More than ever, statistical infrastructure and methodological expertise represent a vital resource. Information is critical for political and economic decisions. Statistical systems must provide reliable statistics to manage the crisis, but they also need to learn from the crisis.

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