Joint Task Force on Environment Statistics and Indicators
Data Needs, Statistics, and Indicators on Environment and Health in response to COVID-19 Pandemic
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1. A pandemic such as COVID-19 requires support from data analysts and statisticians to assist policy-makers and committees with responsibility for advising the government on the actions necessary to contain the impact of the virus. The scale and trend of the problem need to be established in reliable statistics and more disaggregated data are required on persons contracting the virus to inform a more targeted response. Data are needed on the impact of the pandemic on government finances, enterprises, households, employment, lifestyles, wellbeing, and the natural environment.

2. COVID-19 required national statistical offices to compile new statistics based on real-time and short-term data. Typically creating a new data collection is onerous and takes time for successful planning. In a pandemic, National Statistical Offices (NSOs) need a more agile and inter-agency approach to provide the required information in a timely manner. An example is working with the agencies collecting COVID-19 test results to data quality check, standardise, and disseminate them to general and specialised users. Adding additional questions to existing monthly enterprise and ongoing household surveys are examples of where data could be collected quickly by making use of existing data collections.

3. As time progressed during the COVID-19 pandemic, the data needs and quality checks became more complex. The raw data needed more management in terms of revisions as inconsistencies became more identifiable. The daily time series needed to become more defined in terms of factors such as when the classification date related to: when a person showed symptoms; when the test was taken; when the result of the test was available etc.

In the early stages of the pandemic when health resources were being mobilised there were at times delays of a few weeks between showing symptoms, getting a test, and getting results. Inconsistencies in the daily reporting are readily visible in international dashboards reporting on the pandemic. Even basic criteria such as getting the data to be reported on a standard time basis, e.g. midnight to midnight, are challenging in the middle of a crisis with health care staff concerned for their own health as well as the health of the patients.

Some deaths before the known start of the outbreak, that were due to the virus, may have been incorrectly classified to other causes. Deaths in January and February needed review so that the start of the pandemic was accurately reported e.g. deaths attributed to pneumonia. Failure to properly classify data according to strict criteria resulted in occasional spikes in time series graphs if a batch of cases from previous weeks or months were reported late by a hospital or nursing home and then classified to the date that they were reported. Statisticians have the skills to create consistent time series that would be more useful for accurate reporting of the R rate and for future post-COVID analyses.

Other disaggregation criteria such as geocoding and whether the cases occurred among persons living in private households or communal homes are important in understanding how the disease was spreading and identifying work-based and socialising clusters that could help to explain sudden increases in the number of cases and fatalities. Ideally core data, such as date of birth and any unique personal number used for interactions with public authorities, would be collected so as to reduce the data collection burden in a time of crisis while creating the means for NSOs to compile accurate

statistics under the data access powers given to them by statistical legislation. These data classification and standardisation requirements meant that NSOs needed to be involved in the data capture, management, and reporting from as early a stage as possible.

4. Dissemination requirements for the pandemic were less detailed and technical than standard statistical outputs. They needed to be more visual and immediate. International organisations set up dashboards that showed daily data and allowed users to examine country level time series. The dashboards allowed a mixture of basic data such as the number of daily cases and cumulative numbers as well as more statistical information such as indices of cases and deaths in relation to population numbers. These dashboards have been successful in communicating a lot of information very quickly and have possibly become a new standard for international statistical bodies.

5. Traditionally statistical offices are often not much involved in health statistics. This can mean that new communication channels and committees and trust-building needed to be established between NSOs and health agencies. NSOs typically have well-established data protection procedures given that they collect a broad range of confidential and personal data. The creation of anonymised microdata research files for more in-depth research by subject-matter specialists is something many NSOs were already involved in for business and demographic data.

In Ireland access to hospital health microdata for researchers is typically approved by health agencies and involves a slow and lengthy process including assessment by ethics committees etc. An NSI's well-established practices could achieve the same protections in a much more-timely manner as well as transferring much of the necessary burden of data protection from overly stretched health agencies. In Ireland, the statistical office has taken on this go-between role between the compilers of the raw data and the health research community. A legacy of COVID-19 may be that NSOs and health bodies will work more closely together in the future on a broader range of health topics.

6. The pandemic created new needs for statistics on how the economy and society was responding to it. The timeliness of the data was critical. An important indicator was whether people were moving around less and reducing contact with other persons to reduce their exposure risk. Traffic counters and road fuel sales were two possible data sources to measure this. Other indicators such as number of passengers on public transport and on international flights were needed to complete the picture. At a later stage mobile phone apps were developed to assist with contact tracing and this technology opened new data analyses options.

Traffic counters can be used to produce point estimates on road activity by type of vehicle and by direction of travel. They are located at a limited number of points and the general reduction in traffic during the early stages of the pandemic meant that more direct routes sometimes became faster than circular routes. Revenue authorities collect excise duty on fuels when they are released from warehouses for distribution and sale. These duties provide important funding to government and they are reported to government finance ministries. The CSO requested access to these data. We received monthly quantities of clearances of autodiesel, unleaded petrol, marked gas oil, and kerosene within four weeks of the end of the monthly reporting period. The road fuel excise clearances were broadly consistent with the traffic counter information and the clearances had the advantage of giving one overall national figure on trends in use of road transport fuels.

7. Environmental agencies were interested in measuring whether the slowdown in economic activity had an impact on the natural environment. Changes in travel, work, and consumption patterns had the potential to result in improved air quality. Lockdowns had the potential to reduce the number of visits to nature areas resulting in less-disturbed habitats especially in the Spring when many some species were building nests on the ground.

Air quality monitoring stations typically detect changes in air pollution associated with traffic volumes and emissions from the use of solid fuels for domestic heating. The pandemic reduced the pollution peaks in urban areas during rush-hours.

As people spent more time at home, there was the potential for a substantial increase in the volume of domestic recyclable and compostable waste. In contrast non-domestic waste generation was likely to decrease substantially especially from the services sector. Waste data can be more difficult to collect on a sub-annual basis. NSOs could collect summary data on a monthly basis directly from the waste collection or waste treatment companies if there is sufficient data need.

8. There may be longer-term changes arising from the pandemic such as an increase in working from home, reduced commuting, and reduced demand for office space that could result in more accommodation being built in city centres e.g. https://www.thejournal.ie/google-not-leasing-the-sorting-office-5198427-Sep2020/

9. A person's underlying health is an important factor in the impact that the virus will have on their health. Since mid-March 2020 there have been changes in the type of physical exercise being undertaken towards that which does not require group activity as people realised the importance of being in good health. There was a decrease in exercise activity that required access to sports facilities and in team sports. These activities are an important part of our wellbeing and changes in them and their impact on our mental health need to be measured including the mental health impact of any restrictions to our access to nature.

10. Environment statistics and indicators have tended to be specialised focusing on areas such as emissions, waste generation, energy consumption, environment accounts, etc. There is a lack of statistics on the social and health side such as socio-economic, demographic, and household environment statistics. Ambient and indoor air quality and their relationship to a person's health have not generally been analysed by NSOs. Factors influencing environmental behaviours are under-explored. Willingness to segregate waste and transition from using solid and less polluting fuels is not the subject of any international data collections. There is a need to work with colleagues in social and business statistics to have more environment-related questions included in household and enterprise surveys.

With the pandemic very much with us heading into the Winter months, topics such the energy efficiency of dwellings and indoor air quality will become more relevant to measuring the impact of the virus on our quality of life, health, and on the state of our environment.

11. Conclusions

- In any pandemic or emergency lasting any length of time, there is a need for data to understand the scale and trend of the event. The longer the event lasts the more difficult it becomes to manage the data in a consistent manner and to have statistics that are comparable with other countries. These are among the basic skills of a statistical office: defining a methodology; adhering to standard classifications; organising data collection; agreeing how to deal with exceptions; and making non-confidential data available in a timely and democratic manner.

- In a new crisis such as COVID-19, there is an urgent need to make detailed sensitive microdata available to specialised researchers so that government can benefit from a fully-informed analysis of the data and that knowledge can be shared internationally. An NSO has the

experience and legal foundation to be a bridge between data owners and approved researchers while ensuring that all GDPR requirement and protocols are adhered to so as to protect the rights of the persons in the microdata file and their families.

- An NSO can add short modules to existing household and business surveys to collect required information on how people and enterprises are being affected by and responding to the pandemic. Processing of the results of these modules can be prioritised and any necessary caveats around data quality made clearly visible in timely statistical reports.

- An NSO has the experience to review and revise the time series data to ensure that it represents an accurate picture of the level and trends of the disease. An NSO also has an understanding of how necessary it is to have correct time series trends and disaggregations.

- International statistical recommendations such as the United Nations Fundamental Principles of Official Statistics provide a foundation of trust for users of the data disseminated by NSOs.

- The basic procedures to respond to a crisis are best developed when they are not needed so that they are in place if the need arises. These include having established practices in obtaining access to confidential administrative microdata, protecting it by controlling access rights within the NSO, and using unique identifiers to be able to add substantial value by integrating survey and administrative microdata. An additional complication arose with COVID-19 in that researchers had to be given offsite access thus requiring even tighter agreements on how the data could be used.

12. Data examples

Fuel excise clearances
https://www.cso.ie/en/releasesandpublications/er/fec/fuelexciseclearancesaugust2020/

Traffic count data
https://www.tii.ie/roads-tolling/operations-and-maintenance/traffic-count-data/

Air transport passenger numbers
https://www.cso.ie/en/releasesandpublications/er/as/aviationstatisticsquarter22020/

Transport bulletin
https://www.cso.ie/en/statistics/transport/transportbulletin/

COVID-19 information hubs
https://www.cso.ie/en/releasesandpublications/ep/p-covid19/covid-19informationhub/
https://covid19ireland-geohive.hub.arcgis.com/

Social impact of COVID-19 survey
https://www.cso.ie/en/statistics/socialconditions/socialimpactofcovid-19survey/

Business impact of COVID-19 survey
https://www.cso.ie/en/statistics/multisectoral/businessimpactofcovid-19survey/

Environmental Protection Agency report
http://www.epa.ie/pubs/reports/research/sss/CTC%20SSS%20SOER%20COVID19%20v%2014%20Aug.pdf

Air quality stations

https://airquality.ie/stations

Domestic building energy ratings

https://www.cso.ie/en/statistics/climateandenergy/domesticbuildingenergyratings/

Researcher access to anonymised COVID-19 microdata

https://www.cso.ie/en/aboutus/lgdp/csodatapolicies/dataforresearchers/rmfapplicationprocedure/