Report of the Special Meeting of UNCEBTS on the Impact of COVID-19 on Business and Trade Statistics

16-18 June 2020

Introduction

1. The United Nations Committee of Experts on Business and Trade Statistics (UNCEBTS) held an online Special Meeting on the Impact of COVID-19 on Business and Trade Statistics during 16-18 June 2020.

2. During the Special meeting, the UNCEBTS shared experiences in ensuring continuity in the production and dissemination of standard business and trade statistics as well as in the design and implementation of innovative data solutions to respond to the new user needs posed by the COVID-19 crisis. The UNCEBTS also reflected on which changes in the NSOs' programmes in business and trade statistics were likely to be implemented on a permanent basis post COVID-19.

3. This report presents the main conclusions from the Special meeting of the UNCEBTS on the impact of COVID-19 on Business and Trade Statistics. Annexes 1 to 3 include the summary of the discussion on sessions 1 to 3 respectively. The list of participants is included in Annex 4.

Main Conclusions

4. The UNCEBTS recognized that the statistical community has responded to COVID-19 with a multitude of initiatives to ensure continuity of the statistical programmes and to respond to new user needs. These initiative include: implementing remote working arrangements for staff, including secure access to confidential data; communicating with respondents to encourage cooperation; leveraging existing data sources in new applications; accessing new data sources, including administrative data, Open Data, and Big Data; prioritizing timeliness of data; engaging in new public and private partnerships to leverage the data available; innovating new surveys and data products to respond to users' needs; lighter governance within the NSO to fast-track creation of special task teams and new data products; and communicating the quality and limitations of experimental data. The use of ICT solutions plays a critical role in ensuring business continuity during the crisis and provide remote and secure teleworking arrangements for the longer-term. NSOs also recognize new capacity building needs for their staff, including training in data science, ICT and Big Data capabilities, and new methods for imputation, among others.

5. The main conclusions of the Special meeting are organized around seven main themes that repeatedly came up during the discussion. These themes are presented below.

A. New NSOs Statistical Business Model and Data Stewardship

6. The UNCEBTS noted that the NSOs had to partially reshape their statistical business model during this crisis to respond to new user demands for more timely, integrated and multi-dimensional statistics that are coherent and granular. New data sources have been utilized and integrated with traditional data collection methods, new partnerships and networking have been developed, more attention was given to communication with the users to understand their data needs and to explain the quality of the data generated, and more efforts were made to provide a coherent and integrated picture on the economy, society and the environment. The Statistical Business Register (SBR), where available, has played a pivotal role in the process of data integration to ensure the consistency between standard official statistics affected by data collection temporary failures and new statistics based on innovative data sources. Furthermore, it was observed that many NSOs are converging towards to a common new business model in the production of official statistics rooted in the SBR and opened to integration of data from multiple data sources. The NSOs are strongly encouraged to keep the momentum in mainstreaming their work into their government's digitalization strategies.

7. The risk propensity of NSOs has increased during this time of crisis, in terms, for example, of relaxing standard survey deadlines and data collection techniques and publishing experimental datasets that they previously may have been reluctant to release. With the appropriate communication and transparency and relying on existing quality frameworks to explain experimental data, NSOs have been able to maintain their credibility and trust.

8. In some countries, the COVID-19 crisis has highlighted the important role of NSOs as data stewards in the new data ecosystem, producing reliable experimental data, integrating data, being transparent about the quality and limitations of experimental data, and providing independent and competent guidance on the new data ecosystem; in this regard, it is important to discuss what means quality for the experimental data. The UNCEBTS noted that although its focus in on business and trade statistics, solutions should not be domain specific but part of an overall integrated approach to statistics. NSOs will benefit from recommendations at the international level on a new and more resilient and responsive statistical business model and a nimbler and interactive management and governance architecture of NSOs.

9. Some NSOs may have received some emergency funding during the crisis, while others may be facing budget cuts. Communication of the importance of official statistics during the crisis and post-crisis to all external users and policymakers will be critical to securing funding to strengthen statistical systems. Furthermore, this may be the moment to request changes to regulations related to the statistical system, especially in terms of more flexibility on data sharing, data access, and data confidentiality.

10. COVID-19 has accelerated the changes that some NSOs have already designed and partially put in place, and has pushed other NSOs to explore new solutions. The challenge moving forward is to sustain the changes and retain the new working methods and data solutions that were proved successful. NSOs must analyze several data sources and statistics used during the pandemic with the aim to determine what will be useful and relevant in a Post-COVID scenario

B. New Methods and Data Solutions

11. The UNCEBTS discussed how NSOs have modified data collection and processing practices in business and trade statistics in light of the crisis. In particular, survey collection methods have transitioned to new modes using telephone (CATI) or web-based (CAWI) in order to reach businesses that may be temporarily closed. Crowdsourcing was another new technique which does not involve a survey sample but rather putting questions on the NSO's website and partnering with business associations to encourage responses. New questions to existing business surveys and/or new business surveys have also been implemented, asking information on the effect of COVID-19 on the businesses, voluntary or mandatory shut down, effects on the labour force and furloughs, measures businesses have implemented to protect the health and safety of employees and customers, government assistance that the businesses have received, how business models or business operations have changed, businesses' expectations of how they will be affected moving forward, and their plans to recover. Big data were used to estimate real-time data. Finally, business pulse surveys were implemented in many countries to capture changes in business conditions during the Coronavirus pandemic.

12. Standard imputation methods and seasonal adjustments techniques had to be revisited to adapt to the new reality of the pandemic; however, these techniques will depend on the available information of each country. Countries expressed the need to share practices and develop reference methods. In countries where the large part of employment is located in the informal sector, business surveys will need to be linked with households surveys for data collection on small and informal businesses that usually suffer the most from the COVID-19 crisis. And in the countries that have implemented government stimulus packages, the NSO faces the challenge of distorted incentives that these packages have on the behavior of businesses, in order to accurately evaluate the impact of COVID-19 on businesses operations.

13. The UNCEBTS also recognized that the importance of understanding how the recent events are shaping the economic landscape in order to anticipate what statistical data become a priority: short-term shifts in business models may prove to be longer-term phenomena (e.g. businesses moving to online presence) and may imply more permanent changes to data collection methods, classifications and conceptual frameworks. Also, during the COVID crisis it was important to understand the relevant supply chain dependencies within the country and across countries. The supply chain of medical products such as personal protective equipment was particularly important to ensure adequate supplies. Econometric models are useful tools for NSOs to respond to new users' needs; they that could be shared and made available to NSOs to help them in responding to forecast the impact such crises.

14. Geo-spatial data combined with economic, demographic and social well-being data is increasingly proving to be a successful way of providing a coherent view to users. The integration of economic and social well-being indicators should be carried forward.

15. The crisis has also accelerated the use by NSOs of new data sources in statistical production. NSOs have been agile in adopting new data sources, especially in cases in which the NSO had previous engagement with the data providers or had previously explored the new

sources. Some NSOs made successful arrangements with existing data sources to receive more granular and more timely data. New data sources that NSOs have been able to utilize include real-time/monthly/quarterly tax data, aggregated tax data at the industry level, aggregated bank transaction data; aggregated debit card data; air emissions data; the Google Mobility Index; air traffic data; web scraping data on prices and sales in online marketplaces; and electricity consumption data by enterprises in the manufacturing sector; among others. Some NSOs were also able to combine data from the statistical business register from the data obtained from previous economic censuses, in order to provide a broader picture of the national economy. Moving forward, NSOs can focus on incorporating the new data sources that proved most reliable during the crisis (including web-scraping and scanner data, data from public utilities, data from mobile operators) into regular statistical production.

16. It was observed that NSOs have proved themselves to be resilient and innovative in terms of managing the temporary loss of data collected through direct reporting with alternative data sources, and of creating new and experimental statistics. The challenge moving forward will be to maintain this creative spark and retain the new working methods, such as creation of ad-hoc committees and lighter governance models, that have proved successful.

17. Post-COVID-19, NSOs will continue assessing the quality of experimental statistics and models used during the crisis and these lessons learned should be documented at the national level and shared at the global level. Also, it is important to delineate the new boundary of the official statistics with respect the experimental ones. The integration and coherence of statistical information should be a continued effort by the NSOs post COVID-19. In particular the UNCEBTS should continue its efforts in the integration of business and trade statistics rooted in the SBR and their links with the environment and well-being. Also, the UNCEBTS could provide the venue where examples of alternative data sources used for business and trade statistics are collected and shared among countries.

C. Integrated Statistical Business Registers as the backbone of new NSOs' business model

18. Data production frameworks rooted in integrated systems and extended SBRs have proven to be more agile and responsive during this time of crisis and will continue to be so moving forward. The important role of the SBR as a tool for micro-data linking and for providing more granular and more timely data has been proven, especially when compared to competing private data providers.

19. The UNCEBTS discussed how SBR supported by micro data linking techniques should be considered core tools for producing business and trade statistics supported by longitudinal databases that integrate firms with the labor market at various levels of granularity. In addition, the use of linked employer-employee datasets (LEED) by some NSOs have allowed linking the impact directly on employment. Globalization, digitalization, and local/regional impacts on businesses are likely to be important policy themes moving forward and granular, more detailed data on these phenomena should be included in the SBR to the extent possible.

D. Responding to new user needs

20. NSOs were challenged to provide more timely and more granular data to monitor policies on a real time basis. The UNCEBTS noted that the statistical system needs to better integrate microdata on businesses and employment with macro-data indicators, and not only economic information but also the impact on well-being, including social and environmental indicators. Many NSOs and international organizations have created special data hubs combining different datasets on COVID-19 that have proved successful and should continue in the future.

21. Post-COVID-19, users will likely continue to demand more granular data on people (e.g. gender, age, income groups etc.), firms (e.g. types of firms) and places (e.g. geospatial disaggregation). The measurement of the economic, social and environmental impact of COVID will continue to be a priority together with the measurements of the economic losses by economic sectors, the effect of COVID-19 on employment, what types of jobs will be available, the skills needed, the local/regional effects of structural changes to the economy, impact on different demographic groups, the informal economy, understanding the exposure of certain firms to global value chains and vulnerable supply chains, among others. Additionally, granular information can provide some insights about the effects of COVID-19 on the Small and Medium Enterprises (SMEs) at geographical level, as well as offering information about the number of businesses that are going digital by adopting or accelerating the digital transformation

E. Collaboration and partnerships

22. Strengthening partnerships and building ad hoc agreements with data providers has proven to be key to producing new data products during the crisis. New partners from the public and private sectors have reached out to NSOs to cooperate and provide data as a public good in this time of crisis.

23. Post COVID-19 NSOs should build and capitalize on these new partnerships and cooperation moving forward. Big Data sources that have seemed promising include scanner data; financial transactions data; electricity usage data; vessel tracking or port-of-call data; satellite positioning data; road traffic data; open data on airport departures and number of airline passengers, among others.

F. Role of international agencies

24. The UNCEBTS noted that international organizations have a role in establishing a continued dialogue and networking on the lessons learned and in facilitating sharing of country experiences and best practices on a regular basis through meetings and webinars, both at the international and regional level. Moving forward, NSOs will benefit from international recommendations and guidance on building new statistics, experimental statistics, using new data sources and new data methods.

25. International Organizations could play a role moving forward in providing a platform for networking and knowledge sharing and a central repository on themes such as accessing and using new data sources; showing the relevance of new indicators based upon national best practices; sharing experiences in the set up and maintenance of a more integrated statistical

production system rooted in the SBR; identifying the specific Open data and Big Data sources that have proven useful; establish communication and outreach to further legitimize the needs and requests by NSOs to access this kind of data; imputation methods used for non-response, delays in responses, and other data gaps; and communication with respondents and users. International organizations could also work towards providing access to Open Data and Big Data sources and explore collecting data from MNEs at the global level.

G. Role of the UNCEBTS

26. The UNCEBTS provides a unique forum to share experiences, discuss and advance methods and practices in business and trade statistics. Thus, it can play an important role to accelerate positive change post COVID-19 in the perspective of supporting NSOs in the design and implementation of more agile, flexible and resilient statistical production systems.

27. The UNCEBTS discussed how national and international cooperation on improving SBRs, microdata linking, and providing capacity building will prove to be of fundamental importance and an essential workstream for the work program of the UNCEBTS. It should also strive to keep the dialogue open with the data providers, partners, and data users about their needs from, and their possible contributions to the works of the NSOs, and overall communicate the lesson learned through this crisis that business and trade statistics are important in their own right and for informing policies.

28. The impact of the discussion during this Special meeting on the work programme of the UNCEBTS will be discussed at the 3rd Meeting of the UNCEBTS (29 September- 1 October 2020).

Annex 1 Summary of Discussion on Session 1 - Ensuring Continuity

General

- The changes made to our statistical business model in response to informing the impact of COVID 19 may become permanent: to ensure our statistical systems are resilient and responsive to the new user demands for timely, integrated and multi-dimensional statistics that are coherent and granular.
- Need to harness the lessons learned: through more regular dialogue between national statistical agencies related to innovations in methods, data, data quality, technology, communication, management and institutional collaboration to meet the new demands for statistics and data steward related services. NSOs have put considerable efforts to adapt to the new user demands during the COVID-19 pandemic and were able to use alternative data sources to produce relevant and high frequency data. The sharing of lesson learned will accelerate the uptake of best practices.
- Importance of visioning: understanding how the recent events shape the economic landscape and what statistical data will be priority, e.g. short-term shifts in business models may prove to be longer-term phenomena (e.g., businesses moving to online presence) and may imply more permanent changes to data collection methods, classifications and conceptual frameworks. Also there is the need to understand relevant supply chain dependencies within the country and across countries was particularly important during the COVID crisis, e.g. the supply chain of medical products such as personal protective Equipment (PPE), textiles, automotive, aeronautics, tourism, etc.
- The statistical community has responded to COVID-19 with a multitude of initiatives: implementing remote working arrangements for staff; ensuring remote access to confidential data; communicating with respondents to encourage cooperation; leveraging existing data sources in new applications; accessing new data sources, including administrative data, Open Data, and Big Data; prioritizing timeliness of data; engaging in new public and private partnerships to leverage the data available; innovating new surveys and data products to respond to users' needs; lighter governance within the NSO to fast-track creation of special task teams ("tiger teams") and new data products; and communicating the quality and limitations of experimental data.
- The National Statistical Offices have responded rapidly to the current user's demands; nevertheless, there are still some challenges that are difficult to answer for the moment (e.g., technological, methodological, and conceptual such as the change of the business models).
- Nowadays, it is more relevant to dispose of granular information to know the impacts of COVID-19 on the Small and Medium Enterprises (SMEs) at geographical level. It was also commented that several businesses are going digital by adopting or accelerating the digital transformation.

Communication

- The COVID-19 crisis has also presented opportunities to the statistical community engaging with and responding to users and policymakers more directly: releasing experimental datasets that meet the data quality standards of relevance and timeliness over accuracy; leveraging partnerships with external entities; and an opportunity to restructure the release of statistics to provide a more coherent and integrated picture on the economy, society and the environment.
- The statistical system needs to provide a coherent view of the impact of COVID-19: (and other crises and events) integrating microdata on businesses and employment with macro-data indicators, and not only economic information but also the impact on well-being, including social and environmental indicators.

SBR

- The important role of the SBR as a tool for micro-data linking and providing more granular and more timely data has been proven, especially when compared to competing private data providers: ability to apply micro-data linking at the enterprise level to provide highly granular and timely data on the impact of the crisis on businesses. In addition, the use of linked employer-employee datasets (LEED) by some NSOs have allowed linking the impact directly on employment.
- Globalization, digitalization, and local/regional impacts on businesses are likely to be important policy themes moving forward and granular, more detailed data on these phenomena should be included in the SBR to the extent possible.

Data stewardships

- The COVID-19 crisis has highlighted the important role of NSOs as data stewards: producing reliable experimental data, being transparent about the quality and limitations of experimental data and providing a stamp of approval as an independent and competent statistical authority. The data quality framework provides a clear tool for understanding what is required by the users (e.g. timeliness vs accuracy).

Collaboration and partnerships

- NSOs have been able to quickly build both public and partnerships with external entities through new instruments: collaboration was based on data access under mutual agreements and memorandums of understanding because there was insufficient time for legislation while protecting data security and confidentiality. Looking towards the future, NSOs would benefit from formalizing the legal access to the new data sources identified during the crisis that are deemed relevant for the longer-term.

Methods

- NSOs faced trade-offs in producing more timely data: Many have relaxed some quality control measures or suspended some standard products in order to focus on producing more timely (infra-annual or even real-time) data in response to user needs, while maintaining accountability and credibility by being transparent about data quality and clearly communicating new data products and sources to users and their fitness for purpose. In

addition, data users have proven to be sophisticated enough to understand the limitations of experimental data. It is important to discuss what means quality under the experimental statistics framework.

- Standard imputations that are based on historical data are no longer appropriate. New methods for imputation include using movements in data on similar categories of commodities or neighboring entities; however, this will depend on the available information of each country. Therefore, it is important the exchange of experiences on the use of the imputation methods.

Data

- Being able to access non-survey data and alternative data sources has been critical: Building public and private partnerships to access new data has proven to be very beneficial. Big Data sources that have seemed promising include scanner data; financial transactions data; electricity usage data; vessel tracking or port-of-call data; satellite positioning data; road traffic data; open data on airport departures and number of airline passengers, among others.

Technology

- The agility and resilience of IT networks has been crucial to implementing remote working arrangements for staff and ensuring access to confidential data. Moving forward, IT capabilities and improvements will be a priority.

Role of international and regional agencies

- The provision of a platform for networking and knowledge sharing and a central repository: of on accessing and using new data sources; identifying the specific Open data and Big Data sources that have proven useful; imputation methods used for non-response, delays in responses, and other data gaps; and communication with respondents and users. International organizations could also work towards providing access to Open Data and Big Data sources when possible (such as UNSD's AIS real-time vessel tracking data, available at: https://comtrade.un.org/data/monitor

Annex 2 Summary of Discussion on Session 2 – Data Solutions

Examples of data solutions

- Survey collections: to transition to new modes of collections using telephone (CATI) or web-based (CAWI) in order to reach businesses that may be temporarily closed. Crowdsourcing is another new technique which does not involve a survey sample but rather putting questions on the NSO's website and partnering with business associations to encourage responses.
- New questions to existing business surveys and/or new business surveys have been implemented: asking information on the effect of COVID-19 on the businesses, voluntary or mandatory shut down, effects on the labour force and furloughs, measures businesses have implemented to protect the health and safety of employees and customers, government assistance that the businesses have received, how business models or business operations have changed, businesses' expectations of how they will be affected moving forward, and their plans to recover.
- From first phase, intermediate to post COVID: from measurement of the health emergency posed by COVID-19, NSOs efforts focus to measure longer term impact of the pandemic through businesses' expectations, business sentiment, and businesses' plans to recover from COVID-19. NSOs acknowledge that government support programs may be masking the real economic effects of COVID-19 on businesses and should keep this in mind when designing new surveys or adding new questions to existing surveys in the future. Sharing experience in the new surveys to measure the impact of COVID-19 on businesses was considered very useful.
- Measuring the impact/pulse of COVID-19 differentiated by large, medium, small enterprises and informal sector is paramount: various SBR frames and collection techniques are to be applied to measure the impact/pulse on business and trade activity. For household enterprises Some NSOs have reported success using a combination of establishment and household surveys.
- The quality of experimental datasets has not been fully tested yet and will become more apparent in the coming months. NSOs can leverage their existing quality frameworks to explain differences in quality and coverage and response rates among different data sources.

NSO new business model

- The risk propensity of NSOs has increased during this time of crisis, in terms of relaxing survey deadlines and publishing experimental datasets that they previously may have been reluctant to do. With the appropriate communication and transparency and relying on existing quality frameworks to explain experimental data, NSOs have been able to maintain their credibility and trust.
- NSOs have found that they are very much trusted during times of crisis. They have also been able to rely on this trust when partnering with new entities (e.g., the Tax Authority) in describing how the data will be used and anonymized.

- The crisis has accelerated the use by NSOs of new data sources in statistical production. NSOs have been agile in adopting new data sources, especially in cases in which the NSO had previous engagement with the data providers or had previously explored the new sources. Some NSOs made successful arrangements with existing data sources to receive more granular and more timely data. New data sources that NSOs have been able to utilize include real-time/monthly/quarterly tax data, aggregated tax data at the industry level, aggregated bank transaction data; aggregated debit card data; air emissions data; the Google Mobility Index; air traffic data; web scraping data on prices and sales in online marketplaces; and electricity consumption data by enterprises in the manufacturing sector; among others. Some NSOs were also able to combine data from the business register from the data obtained from previous economic censuses, in order to provide a broader picture of the national economy.
- The NSOs must review new alternative data sources that can complement the traditional ones, as well as review the methodologies for generating experimental statistics. Besides, it is important to delineate the new boundary of the official statistics.
- The ability of NSOs to produce timelier statistics and respond rapidly by building ad hoc task teams to produce results should be maintained in the future.
- Combining economic and social well-being data with geospatial data is becoming increasingly more feasible and in higher demand and some NSOs are taking a lead role in this area, especially during the crisis.
- NSOs will have to modify some data processing practices and techniques. For example, the characteristics non-responding businesses in surveys can be based on cross-section instead of from time series. And in some developing countries where a large part of employment is located in the informal sector, business surveys will need to be linked with household surveys for data collection on small and informal businesses that usually suffer the most from the COVID-19 crisis. And in the countries that have implemented government stimulus packages, the NSO faces the challenge of distorted incentives that these packages have on the behavior of businesses, in order to accurately evaluate the impact of COVID-19 on businesses operations.
- Regarding the collection of information, NSOs have to analyze the continuity of several data sources and statistics with the aim to determine what will be useful and relevant.

<u>SBR roles</u>

- The important roles of the SBR in the production of timely and accurate economic statistics has been proven. The better the SBR, the easier it is to link it with new sources to produce new and more timely datasets. The SBR can contribute to a “rapid-response” option to NSOs for data collection in the face of unexpected shocks and new and urgent user demands.
- A well-functioning business register can offer better flexibility and coverage in survey design, in particular the special surveys designed to measure the impact of COVID-19 on businesses. In addition, the business register in some countries is capable of supporting surveys that are not fully dependent on direct reporting, because the non-responses can be easily estimated by close approximates that can be found in the business register.

- Data production frameworks rooted in integrated systems and extended SBRs have proven to be agile and responsive during this time of crisis and will continue to be so moving forward.

Partnerships

- New partners from the public and private sectors have reached out to NSOs to cooperate and provide data as a public good in this time of crisis. NSOs have also whetted the appetite of data users and policymakers for more timely data, which is likely to continue. Data respondents and data providers have been more willing during this time of crisis to share/report data as a public good. NSOs can hopefully work to maintain these new partnerships and cooperation moving forward.
- Many NSOs and international organizations have created special data hubs combining different datasets on COVID-19. The creation of these kinds of innovative dashboards and data hubs should continue in the future.

Role of international organizations

- International organizations could play a role moving forward in helping to gain access to data sources from large platforms and to establish communication and outreach to further legitimize the needs and requests by NSOs to access this kind of data.
- NSOs and international organizations could explore collecting data directly from multi-national enterprise groups.

Annex 3 Summary of Discussion on Session 3 – Pivot Post-COVID-19

Role of SBR

- National and international cooperation on improving SBRs will prove to be of fundamental importance and an essential workstream for the work program of the UNCEBTS.
- The SBR supported by micro data linking techniques should be considered core tools for producing business and trade statistics supported by longitudinal databases that integrate firms with the labor market at various levels of granularity
- The linking of the SBR with labor markets using tax records provides for the integration and joint analysis of outcomes of business and household sector through LEEDS databases.

Lessons learned and opportunities moving forward post-COVID19

- The crisis is emerging as a moment when the statistical community can improve data culture, data literacy, understanding what data mean, their fitness for purpose, and possible limitations.
- NSOs are being challenged to be more holistic and timelier and provide data on which policies working right now. The crisis has forced a more intense dialogue with users but has also given NSOs the opportunity to learn what users want and what is really going to help them at the given moment. NSOs can take the opportunity to maintain this more intense dialogue with users moving forward and maintain their relevance post-COVID-19.
- NSOs have shown themselves to be resilient and innovative in terms of creating new and experimental statistics. The challenge moving forward will be to maintain this creative spark and retain the new working methods, such as creation of ad-hoc committees and lighter governance models, that have proved successful.
- Post-crisis, NSOs will continue assessing the quality of experimental statistics and models used during the crisis and these lessons learned should be documented at the national level and shared at the global level.
- This may be the moment to request changes to regulations related to the statistical system, especially in terms of more flexibility on data sharing, data access, and data confidentiality.

NSO new business model

- During the crisis, NSOs accelerated up-take of new data sources, production of timelier and more granular data, dissemination of experimental statistics, and implementation of new surveys. NSOs should strive to maintain the momentum in these initiatives moving forward.
- NSOs should be more proactive in adapting business pulse surveys to capture relevant measures to address current user needs as they emerge.
- NSOs' agility in implementing new data collection mechanisms needs to continue moving forward.
- Strengthening partnerships and building ad-hoc agreements with data providers has proven to be key to producing new data products during the crisis. Post-COVID-19, such ad hoc agreements could be institutionalized.

- All countries are converging towards to a common new business model in the production of official statistics. The NSOs are strongly encouraged to keep the momentum in mainstreaming their work into their government's digitalization strategies.
- NSOs recognize new capacity building needs for their staff, including training in data science, ICT and Big Data capabilities, and new methods for imputation, among others.
- NSOs should invest in and reinforce the use of ICT networks, as they played a critical role in ensuring business continuity during the crisis and continue to provide remote and secure teleworking arrangements for the longer-term.
- Some NSOs may have received some emergency funding during the crisis, while others may be facing budget cuts. Communication of the importance of official statistics during the crisis and post-crisis to all external users and policymakers will be critical to securing funding to strengthen statistical systems.
- Moving forward, NSOs can focus on incorporating the new data sources that proved most reliable during the crisis (including web-scraping and scanner data, data from public utilities, data from mobile operators) into regular statistical production.
- LEED registries and micro-data linking have proven to be extremely useful for analysis of the impacts of COVID-19 on different population segments of the labour market (by firms, jobs, and location) at different levels of granularity and should be prioritized.
- LEED databases are superior to datasets that provide separate information about employee behaviour and outcomes, and about the performance of businesses They allow researchers to identify the effects of policy changes on both sides of the labour market — on employees (labour supply) and employers (labour demand).
- National and international collaborative arrangements and committees established to respond to COVID-19 and adapt surveys, design new surveys and approve new methods for imputation can be continued.
- Geo-spatial data combined with economic, demographic and social well-being data is increasingly proving to be a successful way of providing a coherent view to users. Additionally, Business Pulse surveys on business impacts and Social Pulse surveys on social well-being have been important tools to monitor impacts of COVID-19. The integration of economic and social well-being indicators should be carried forward through additional questions in household ICT surveys
- NSOs will continue to move toward a Data Stewardship role in terms of data integrity; building trust among respondents and users; increasing data literacy; and communication with data reporters, providers and users.
- Ethical considerations regarding the collection, analysis and dissemination of personal or confidential data will be even more important, given increased use of new data sources, including private data providers and Big Data.

<u>Longer-term impact on user needs</u>

- Moving forward, users will continue to demand more granularity on people, firms and places. Users will be very interested in the effect of COVID-19 on firm dynamics, employment, what types of jobs will be available, the skills needed, the local/regional effects of structural changes to the economy, impact on different demographic groups, and the informal

economy, among others. NSOs should strive to mainstream this additional level of granularity.

- Post-crisis, users and policymakers will also be focusing on the resilience of firms and individuals in terms of well-being, especially in light of the face that some firms and people are more exposed and vulnerable than others.
- The transmission mechanism of economic and social vulnerabilities is to be understood, including the exposure of firms to regional global value chains and vulnerable supply chains. Again, this calls for delineating the relationship between the progress of the corporate, small and medium size firms (labour productivity, growth in employment, firm survival) and that of its employees (wages, tenure).

Role of the UNCEBTS

- Continued focus on strengthening exhaustive SBRs and microdata linking and providing capacity building.
- Encourage NSOs to build a "rapid-response" solution based on the SBR and other ICT tools that can be easily adopted to meet new and changing user demands.
- Communicate the lesson learned through this crisis that business and trade statistics are important in their own right and for informing policies.
- Appeal to the NSOs to keep the dialogue open with the data sources, partners, and data users about their needs from, and their possible contributions to the works of the NSOs.

Role of international organizations

- IOs should establish a continued dialogue and networking on the lessons learned and facilitate sharing of country experiences and best practices on a regular basis through meetings and webinars, both at the international and regional level.
- IOs have a role in documenting at a global level the innovative measures that NSOs have taken during the crisis and to serve as an aide-mémoire and inspiration for future work.
- Moving forward, NSOs will benefit from international recommendations and guidance on building new statistics, experimental statistics, using new data sources and new data methods.
- NSOs will benefit from recommendations at the international level on a new and more resilient and responsive statistical business model and a nimbler and interactive management and governance architecture of NSOs.

Annex 4 List of Participants

Australia
Australian Bureau of Statistics
Mr. Branko Vitas
Mr. John Shepherd
Mr. Tom Joseph

Brazil
Brazilian Institute of Geography and Statistics (IBGE)
Mr. Alessandro de Orlando Maia Pinheiro

Canada
Statistics Canada
Ms. Daniela Ravindra

Colombia
DANE
Mr. Camilo Andrés Méndez Coronado
Mr. Horacio Coral
Mr. Juan Sebastin Ordoñez-Herrera
Mr. Juan Daniel Oviedo Arango
Mr. Miguel Torres
Ms. Paula Andrea Avendaño Santiago
Ms. Silvia Alejandra Hernández
Ms. Rodríguez María

Denmark
Statistics Denmark
Mr. Soren Andersen

Egypt
Central Agency for Public Mobilization and Statistics
Ms. Mennat Allah Mohamed
Mosaad Abou Hasswa

Ethiopia
Central Statistics Agency
Mr. Haile Zelealem Hailegiogis

France
INSEE
Ms. Pierrette Schuhl

Indonesia
Statistics Indonesia (BPS)
Ms. Radenroro Nefriana

Italy
ISTAT
Ms. Chiara Orsini
Mr. Stefano Menginello

Mauritius
Statistics Mauritius
Mrs. Gangamah APPADU
Ms. Aimee Cheung
Mr. Deepuk Bahadoor
Mr. Ramnath Chitranjan
Mr. S Cheung
Ms. Yasmin Cassimally

Mexico
INEGI
Mr. Arturo Blancas
Mr. Gerardo Durand
Mr. Hugo Hernandez-Ramos
Mr. Ricardo Gutiérrez Argüelles

The Netherlands
Statistics Netherlands (CBS)
Mr. Hank Hermans

South Africa
Statistics South Africa
Mr. Sagaren Pillay

Sri Lanka
Department of Census and Statistics
Mr. Shalindra Ranatunga
Ms. Uthayakumary Maheswaran

The State of Palestine
PCBS
Ms. Amina Khasib
Mr. Husam Khalifa
Mr. Saleh Al-Kafri

Sweden
Statistics Sweden
Ms. Cecilia Hertzman

Tunisia
NSO
Mr. Mohamed Hammami

United Kingdom
ONS
Ms. Alison Pritchard
Mr. Andrew Allen
Mr. Craig McLaren
Mr. Hussam Zalloum
Mr. Jonathan Athow
Dr. Kate Thorsteinsson

United States
BEA
Mr. Dennis Fixler
US BLS
Mr. David Talan
Mr. Kenneth Robertson
US Census Bureau
Ms. Carol Caldwell
Mr. William Davie Jr.

African Development Bank
Mr. Stephen Bahemuka

Asian Development Bank
Mr. Kaushal Joshi

Eurostat
Mr. Axel Behrens
Ms. Sophie Limpach

ILO
Mr. Manpreet Singh

IMF
Mr. Andrew Baer
Mr. Gregory Legoff
Mr. Kenneth Egesa

OECD
Mr. Nadim Ahmad

UNCTAD
Ms. Anu Peltola
Ms. Elena Botvina
Mr. Hilary Nwokeabia
Mr. Steve MacFeely

UNECE
Mr. Carsten Boldsen
Mr. Rami Peltola
Ms. Tihomira Dimova

UNIDO
Mr. Nelson Correa

UNSD
Mr. Stefan Schweinfest
Mr. Ivo Havinga
Ms. Ilaria di Matteo
Mr. Markie Muryawan
Mr. Hermanus Smith
Ms. Aida Diawara
Mr. Benson Sim
Mr. Htu Aung
Ms. Nancy Snyder
Ms. Shirly Ang
Ms. Tengjiao Sun
Mr. Zhiyuan Qian