United Nations Expert Group Meeting on Strengthening the Demographic Evidence Base for the Post-2015 Development Agenda

New York, 5-6 October 2015

Report of the Meeting

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Department of Economic and Social Affairs
Population Division

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1. BACKGROUND AND SCOPE OF MEETING

The post-2015 development agenda – the 2030 Agenda for Sustainable Development – offers a broad and ambitious set of goals and targets centred on people and planet. Both at the national and international level, development strategies, programmes and policies depend on the availability of reliable, robust, accessible and timely population data given that:

- Demographic data lie at the heart of the monitoring and evaluation of any development agenda, as population numbers are the common denominator used in constructing most indicators of human development (e.g., income per capita, literacy rates, poverty indicators, educational attainment, and life expectancy).

- Planning and managing effectively the needs of current and future generations requires, at a minimum, knowledge about the population today, their numbers, age and sex composition, spatial distribution and mobility patterns, as well as how such characteristics are changing over time.

- In order to achieve universal development, it is essential that the new monitoring framework goes beyond global and national averages and aggregate progress into disaggregated data with the ability to differentiate levels of achievement of relevant population groups.

In order to identify points of intervention for strengthening the demographic evidence base that would contribute to more relevant, effective, efficient and sustainable action-oriented development planning and monitoring, the Population Division of the Department of Economic and Social Affairs (DESA), United Nations Secretariat, convened an expert group meeting on "Strengthening the demographic evidence base for the post-2015 development agenda", which was held at the United Nations Headquarters in New York on 5-6 October 2015.

The meeting brought together experts involved with population data collection, compilation, analysis, dissemination and utilization to review how the most common sources of demographic data such as censuses, surveys, civil registration and vital statistics systems and administrative records meet the needs of the post-2015 development agenda. The experts reflected on new data sources available for more rapid and localized monitoring and how these new sources could complement more traditional data sources. The experts discussed the possibilities for the integration of multiple data sources available at different geographical scales and time periods to produce timely and robust estimates (including uncertainty ranges) on a wide range of indicators.

Core questions for each session included:

- What are the experiences and lessons learned from demographic data collection, compilation, analysis, dissemination and utilization within the context of the Millennium Development Goals (MDGs) and the United Nations Conferences and Summits relevant to population and development?

- What are the key challenges of existing data sources to fulfil the needs of the post-2015 development agenda (including in terms of baseline setting for the targets, frequency, timeliness and disaggregation of data available)?

- What are the recommendations on how to strengthen the demographic evidence base and what are the actions required to implement them in the following areas:

    o Principles and standards (e.g., quality and integrity, disaggregation, timeliness, transparency and openness, usability, protection and privacy, governance and independence, resources and capacities, and data rights);

- o Technology innovation and analysis (e.g., data innovation networks, systems for global data sharing, filling research gaps);

- o Capacity and resources (e.g., funding streams, investment needs, private sector participation, capacity development, and global data literacy); and

- o Governance and leadership (e.g., global partnerships and forums, coordination, data sharing).

Each substantive session consisted of presentations by experts and a discussion. During the closing session, a short summary of each thematic session was presented by the moderator of each session.

This report summarizes the main points from each session and highlights cross-cutting themes and recommendations. Materials from the expert group meeting can be accessed at the website of the Population Division, www.unpopulation.org, at the following location:
http://www.un.org/en/development/desa/population/events/expert-group/23/

2. SUMMARY OF SESSIONS

A. OPENING OF THE MEETING AND KEYNOTE ADDRESS

The meeting was opened by the Director of the Population Division, Mr. John Wilmoth. After welcoming all participants, Mr. Wilmoth stressed the relevance of demographic data for the new development framework. The post-2015 development agenda required the availability of reliable, robust, accessible and timely population data, both at the national and international level. Demographic data were essential to enable to monitoring and evaluation of any development agenda and to inform the planning and management of the needs of current and future generations. In order to achieve universal development, the new monitoring framework needed to go beyond global and national averages and aggregate progress into disaggregated data with the ability to differentiate levels of achievement of relevant population groups. He invited the experts to discuss how the most common sources of demographic data meet the needs of the post-2015 development agenda, and explained how the expert group meeting would contribute to the forthcoming session of the Commission on Population and Development, which would be held in April 2016.

As the chairperson of the forty-ninth session of the Commission on Population and Development, Ambassador Dr. Patricia Kasese-Bota introduced the work of the Commission and discussed its role in the context of the 2030 Agenda for Sustainable Development. The Population Commission, a functional commission of ECOSOC, advised and assisted on matters affecting or being affected by population change. Dr. Kasese-Bota noted that the forty-ninth session of the Commission would be an opportunity for Member States to engage in substantive deliberations on the theme of strengthening the demographic evidence base for the post-2015 development agenda, and the discussions, conclusions and recommendations resulting from the work of the expert group meeting were crucial for the preparations of the reports and the official deliberations of the Commission.

Ms. Francesca Perucci (Statistics Division/DESA) provided an overview of the Sustainable Development Goals (SDGs) Monitoring Framework discussions and the type of data and data sources that were needed for the new development agenda. Ms. Perucci explained how global indicators would provide the structure and inform the global political discussion, statistical development and communication and advocacy campaigns. The new framework contained four sets of indicators: indicators to review progress at the global level, national and subnational indicators and additional indicators for thematic monitoring. In order to ensure that these four sets of indicators were connected to each other and were closely linked to the national indicators developed by countries, it was necessary to focus on metadata and follow the internationally agreed standards. It was also envisaged to work extensively with estimates when data were not available. As of October 2015, the proposal of global indicators considered two indicators per target, with additional proposals in some cases, and stressed the importance of disaggregation based on characteristics of the population, where relevant. Ms. Perucci addressed the main challenges of the process: aiming for a limited number of indicators, covering every aspect of all targets, addressing issues of inequality, covering all groups of population and addressing policy priorities with easy-to-communicate indicators. Ms. Perucci emphasized the need for demographic data in the framework and the importance of strengthening national statistical systems, which would be central to the process.

Mr. Neil Fantom (World Bank) gave the keynote address. He highlighted in his presentation "Building a 'fit-for-purpose' demographic evidence base for the post-2015 agenda" the role of the World Bank both as a data user and data producer. Mr. Fantom briefly presented the World Bank's 2015 Global Monitoring report, the first flagship report since 1985 having focus on demography. Specifically, the report examined development in an era of demographic change and how demographic shifts would alter

the course of global development during the post-2015 period. He pointed out that monitoring the SDGs translated into indicators, data and statistics for policy and programme development and management, and highlighted the many expectations surrounding the monitoring of the SDGs, including a larger number of indicators, better timeliness, better accuracy and coverage, more disaggregation, and better access and openness, among others. Mr. Fantom addressed the challenges associated with ensuring reliable data sources in terms of cost, monitoring, scope, coverage, disaggregation and access, and provided five ideas to improve data sources: investing in civil and vital registration, leverage technology, combining sources, fixing the boundary problem and archiving, openness and metadata. He emphasized the importance of creating and strengthening partnerships among different institutions and seizing opportunities for cooperation in the context of the post-2015 agenda.

During the discussion, participants raised the challenge of users' access to old data that could be incomplete or not reliable. The role of big data in the demographic context was discussed and it was pointed out that big data at this stage were not relevant for social indicators, but rather were associated with economic and trade indicators. On census data, experts discussed the need to dedicate more resources to the analysis of census data, improve the quality of census data in developing countries, encourage ownership, as well as the possibility of stimulating countries to carry out censuses more often. The issue of baseline indicators was raised as a big challenge for the monitoring framework of the SDGs. With respect to data utilization, experts highlighted the value of encouraging utilization at the subnational and local decision making level.

B. LESSONS LEARNED FROM THE 2010 ROUND OF CENSUSES AND PLANNING FOR THE 2020 ROUND TO MEET THE POST-2015 AGENDA

In this session, four panellists took the floor to present the experience of their institutions or countries: Ms. Margaret Mbogoni from the Statistics Division/DESA, Mr. Benoit Kalasa from UNFPA, Mr. Andrew Mukulu from the Uganda Bureau of Statistics and Mr. C. Chandramouli from the Registrar General of India. The session was moderated by Mr. Patrick Gerland (Population Division).

Ms. Mbogoni (Statistics Division/DESA) informed the audience about the activities undertaken at the Statistics Division for the 2020 round of censuses, in particular the preparation of a handbook for censuses and the latest revision of the Principles and Recommendations for Population and Housing Censuses. She mentioned that a review of the 2010 World Census Programme showed that during the last census round, 214 countries or areas conducted a population and housing census, enumerating about 93 per cent of the world population. The largest number of censuses in the 2010 round took place in 2010 and 2011, when 43 and 63countries conducted population and housing censuses, respectively. In order to enhance the international comparability of information collected by population and housing censuses, the United Nations, through the development of international census guidelines, recommended a set of topics on which countries should collect data in their national censuses. These topics were included in the Principles and Recommendations for Population and Housing Censuses.

Turning to challenges, Ms. Mbogoni stated that the new development agenda posed enormous challenges for the statistical community to make it an effective framework under which progress towards the achievement of the SDGs could be closely monitored with appropriate statistical evidence. She mentioned that censuses alone were not suited to monitor the implementation of the 2030 Agenda with its 17 goals and 169 targets. She suggested the use of other sources such as demographic surveys and civil registration and vital statistics as complementary data sources. Ms. Mbogoni pointed out that the principle of "leaving no one behind"- where inclusiveness, equality, dignity and prosperity were major objectives of the SDGs - had important implications for data requirements. The SDGs demanded the monitoring of the targets not only at the national level, but also by subregion and by subgroups of populations (such as

persons with disabilities, indigenous people and migrants). While population and housing censuses were a well-established source of information that allowed the production of small area statistics or disaggregation of data by diverse population characteristics, the censuses took place only once in ten years. Ms. Mbogoni mentioned that monitoring and reporting on the progress of the SDGs would require large volumes of reliable and comparable data for the compilation of SDG indicators at both national and global levels and that significant and sustainable investments were needed in statistical capacity at all levels.

Mr. Kalasa (UNFPA) noted the major stake that UNFPA had in censuses. UNFPA was the second or third largest financial contributor to the organisation of censuses, and the areas of strategic interventions by UNFPA were advocacy and policy dialogue, technical assistance, capacity development, service delivery, direct financial support and facilitation of South-South and triangular cooperation. He mentioned that UNFPA intervened in the area of advocacy and policy dialogue to encourage the undertaking of censuses, fundraise, create motivation and political commitment to collect and use internationally comparable data as well as to ensure that international standards were met throughout the process. UNFPA also provided technical assistance and advice for planning, preparing, and carrying out the census, including dissemination and analysis activities. In the area of service delivery, UNFPA provided direct financial support; for example, to pay enumerators or to procure equipment or services for questionnaire data capture. He stated that, in particular, UNFPA contributed significantly to the capacity of National Statistical Offices (NSOs) to produce and release quality census data according to international standards. The challenges in this area were the weaker support for census dissemination and quality assurance of the census and a lack of analytical capacities in many NSOs that had not been successfully addressed. In the area of networking, he mentioned that the strong partnerships at national and regional levels were not present at the global level.

Turning to new opportunities and new challenges, Mr. Kalasa mentioned points related to moving from census and survey data to registry data, the challenges of mobility, the principle of "leaving no one behind", measuring and monitoring inequality, the architecture for effective census support, enhancing capacity for utilization of census data and training a new generation of population experts.

Mr. Mukulu (Uganda Bureau of Statistics) described a national experience with respect to lessons from the 2010 round of censuses and planning for the 2020 round. He stated that censuses were a major source of demographic and socio-economic data and that all countries of the Eastern African Community (Burundi, Kenya, Tanzania, Rwanda and Uganda) participated in the 2010 round. He underscored the attempt to define core questions and common census dates and the varying use of technology for census processes. Uganda undertook a population and household census in 2014. He commented on the use of census and other sources to carry out MDG evaluations. He pointed out that Uganda had not done MDG reporting at the subnational level, but that the country undertook a pilot MDG localisation survey in 2009. He emphasized that the baseline for the monitoring of SDGs should be derived from multiple sources.

Mr. Mukulu pointed out the challenge of limited coverage of indicators by censuses since censuses generate data for only a few of the indicators which needed to be monitored. He mentioned that indirect estimates of mortality derived from censuses were not suitable for monitoring because they provided information only once per decade. He pointed out the lack of consensus on definitions of some indicators (e.g., slum areas, urban areas) and the weak legal mandate for censuses. Mr. Mukulu made a number of recommendations from the use of technology to improve on timeliness, the better dissemination of census data, the localization of MDG monitoring, the use of available human resources and the increase in literacy of data users, and the production of user-targeted census products.

Mr. Chandramouli (Registrar General of India) talked about the experience of India, where the first census was conducted in 1872. He underscored the major challenges faced in the organization of

censuses, such as logistics, costs and inadequate capacity building. With respect to India, the large size of the population, the high number of ethnic groups, religions and languages and inaccessible terrains are particular challenges. Following a brief description of the process of conducting a census from house to house canvassing to data dissemination, Mr. Chandramouli noted that the Indian census was already among the most cost-effective censuses in the world with a per capita cost of only USD $0.40. Provisional results from the census were available within one month following the data collection, housing results within one year, final population census results within 18 months and all major results within two years of the census.

Mr. Chandramouli presented India's plans for a register-based census through on-going efforts to build a national population register in India combining socio-demographic and biometric individual information with dynamic updates based on civil and vital registration. He also mentioned an electronic data collection experience including a socio-economic and caste census that was successfully completed using handheld tablets with direct data entry, electronic data directly uploaded from the field, dynamic monitoring, field correction and instantaneous results. This improved method, he said, would lead to higher coverage, enhanced quality, optimized cost, savings in time and quicker dissemination of results.

The issues of funding and census cost were raised in the general discussion. Countries needed to budget their censuses and many countries were currently funding their own censuses. In response to a question on national capacity development, it was recognized that more needed to be done. The issue of technical assistance in the area of collection and analysis of censuses was addressed and it was noted that the pool of technical assistants was limited.

C. EXISTING SURVEY PROGRAMMES AND NEED FOR NEW SURVEY MODULES OR NEW THEMATIC SURVEYS DESIGNED TO "COUNT THE UNCOUNTED" IN SUPPORT OF MORE EFFECTIVE POLICY INTERVENTIONS

Panellists in this session reviewed the progress made with major international survey programmes over the past 20 years, as well as recent developments in more specialized data collection efforts. Ms. Sunita Kishor (ICF International) and Mr. Turgay Unalan (United Nations Children Fund) presented the experience of the Demographic and Health Surveys (DHS) and Multiple Indicator Cluster Surveys (MICS) programmes, respectively. Ms. Amy Tsui (Johns Hopkins University) presented the Performance Monitoring and Accountability 2020 survey programme (PMA2020), Mr. William Axinn (University of Michigan) highlighted the unique insights provided by international longitudinal surveys and Mr. Richard Bilsborrow (University of North Carolina) reviewed the needs and challenges posed by internal and international migration surveys. The session was moderated by Ms. Vladimíra Kantorová (Population Division).

Ms. Kishor (ICF International) described the experience of the Demographic and Health Surveys programme in which more than 320 surveys had been conducted in 90 countries since 1984. She reviewed how the collection of data had evolved over the years. Ms. Kishor identified the strict protocols used by the DHS programme as a key contributor to the high quality of the data in terms of reliability and comparability across countries and over time. She highlighted the fact that DHS surveys had been essential to monitoring a number of the MDGs, allowing the analysis of demographic- and health-related indicators (including using bio-markers) at the country level as well as equity across subpopulations (e.g., by geography, education or wealth).

She emphasized the importance of and commitment required for the public dissemination of results and data. The DHS programme, for instance, spent as much time facilitating the use of the collected data as it did collecting the data in the first place. All data were produced and publicly released

with the final report and widely disseminated on the DHS programme website, with more than 1.5 million data sets downloaded as of October 2015.

Ms. Kishor stressed that demands on survey programmes were likely to grow over the next 15 years and that standards would need to be set. The use of tablets and new technologies, for example, had to be appropriate to the local capacity and context. Evidence-based policymaking needed high-quality data that were standardized and easy to use. Data documentation needed to explain the sampling procedures, training of enumerators, the response rate, data cleaning, and the calculation of indicators. Another concern highlighted by Ms. Kishor was related to ethics, confidentiality and data security; for example, ensuring the storage and distribution of data without breaching the confidentiality of the data. She also pointed out that surveys were not elastic and that interviewers would have to be trained on how to collect data using many modules so that the quality of data did not suffer with longer and more complex surveys.

Mr. Unalan of the United Nations Children Fund (UNICEF) presented the experience of the Multiple Indicator Cluster Surveys (MICS) programme that has conducted 296 surveys in 109 countries over the past 20 years and provided data for 21 indicators used for the global monitoring of MDGs. He emphasized that the MICS programme was a country-led programme for which UNICEF provided technical support to conduct surveys and organized regional workshops on various steps of conducting surveys. While MICS were similar to DHS surveys, the specific feature of the MICS programme was standardized questionnaires collecting data for children under five years of age and their mothers and household data on children five years and over. Mr Unalan highlighted that MICS surveys were conducted at both national and sub-national levels and priority was given to data disaggregation. He explained how data collected by the MICS programme had been used to validate and complement administrative, census and other data.

Regarding the monitoring of SDGs, Mr. Unalan said that MICS programmes would prioritize child- and equity-related indicators. He reviewed the modular structure of MICS surveys and the methodological work on new modules and questions in progress, on topics such as child disability, social protection, victimization, water quality assessment, literacy tests and verbal autopsy. He also reported that preparations for the sixth round of MICS were underway and the full list and specifications of indicators for the SDGs would be needed before the start of new round of surveys.

Ms. Amy Tsui (Johns Hopkins University) provided an overview of PMA2020, a thematic survey programme focused on timely and frequent updates of family planning indicators as well as a broader range of health and development indicators. The PMA2020 surveys emphasized ownership, use and sustainability and ensured that in every country there were stakeholders who participated in the survey programme and used the data. She reported that one of the challenges of the PMA2020 surveys was collection of data at the subnational level, since every administrative unit requested data that pertained to its constituency. Currently, sample sizes ranged from 4,000 to 10,000 women. Since the start of the funding in April 2013, 21 surveys were conducted.

Ms. Tsui identified potential contributions of PMA2020 surveys for monitoring progress on a range of indicators under the SDGs. The PMA platform could also be used to include specific clusters of questions for monitoring purposes, since PMA2020 surveys have a multi-cluster design similar to other household surveys. Furthermore, the PMA platform could be useful for post-enumeration validation of censuses. In countries where civil registration systems do not cover the whole country, a sample vital registration could be included in the PMA2020 surveys. Ms Tsui highlighted that in PMA2020 surveys, data were collected using smart phones and a cloud-based architecture employing several automatic back-up options and online checking procedures. This technology enabled a quick production of two-page reports with results on key indicators.

Mr. Axinn (University of Michigan) provided insights from the perspective of various international longitudinal surveys. He said that individual-level, longitudinal data had proven to be an extremely powerful resource for science- and policy-related questions and topics (e.g., the dynamics of poverty over time or migration decision-making) and provided tools for evaluating cause and consequence. Challenges of longitudinal data were that such data were expensive and difficult to collect posed unique sampling design complexities, including the mobility of people and other causes of sample attrition, though the increasing use of cell phones made it easier to re-contact survey participants. Mr. Axinn noted that it made good sense to use longitudinal surveys to accomplish clear and specific goals and to integrate longitudinal studies with other forms of data, including censuses, household surveys, registration systems and social media data.

The last presentation in the session on surveys reviewed data on internal and international migration. Mr. Bilsborrow (University of North Carolina) said that while migration was largely neglected in the MDGs, in many countries the achievement of some of the MDGs was realized, in part, because of the movement of people and the financial benefits of remittances sent by migrants. Regarding the SDGs, Mr. Bilsborrow observed that migration was recognized in reducing inequalities within and across countries and was also mentioned with respect to human rights concerns. Therefore, demands for data on migrants and remittances would likely increase in the future. He mentioned that a number of countries had good data collection on internal migration, including through longitudinal studies. It was particularly difficult to collect data on international migration using existing sample surveys since the phenomena of international migration was relatively rare in most populations. Furthermore, to understand the process of international migration, data were needed both on migrants and non-migrants at the time when people decided to migrate.

In the general discussion, participants agreed that information was also needed on populations that were not included in typical household surveys, such as street children, and that there was a need to devise other techniques to cover under- or unrepresented populations. For example, UNICEF had conducted surveys among nomadic people in Somalia, but it was difficult to assess the quality of coverage. Participants also expressed interest to improve the data related to early adolescence and data for women beyond the reproductive years to measure mortality as well as violence against women.

Participants agreed that the efficient use of new technologies should be expanded for the production and analysis of survey data. The computerization of survey data collection has brought forth many different ways to make survey data collection more efficient and to collect new types of data. Ms. Kishor warned that while the use of tablets and new technologies for collection and analysis of data was growing fast, the DHS experience was that the use of technology did not necessarily beget better data if the enumerators could not handle the new technology. Regarding the use of smart phones for collecting the data in PMA2020 surveys, the issue of connectivity presented challenges to collecting data and uploading data in areas without connectivity. However, there were several back-up options for the smart phones which preserved the data until the enumerator could upload the data.

Participants identified as a key contribution the addition of GPS locations of surveyed households to survey microdata. Such information was essential to understand geographical locations of households and enabled creation of maps for specific indicators that would improve planning and monitoring at the local, regional and national level. Furthermore, GPS data were useful in updating sampling frames in countries where census data were outdated or in providing some information for inaccessible areas. DHS surveys now released all data sets with GPS locations. In the case of MICS surveys, Mr. Unalan reported that GPS information was available in countries where the national statistical agencies provided such data.

Participants agreed that international survey programmes needed to take into account national policy needs, and to be integrated as much as possible within national household survey programmes. One of the challenges highlighted was the need to consider national capacity to collect data since large-scale surveys often stretched the capacity of NSOs, especially when surveys were conducted simultaneously. The need for independent collectors of data who were capable of resisting political and other pressures was also stressed.

The scarcity of data on international migration was raised as a particular concern. Household surveys could be helpful but were not sufficient. Censuses could and should easily collect data to account for both birth place of people and recent migrants and their basic characteristics. Labour force surveys conducted in most countries at frequent intervals could provide a basis for including questions on international migration. Data on migration could be collected through sample surveys in countries where a large proportion of the population was influenced by migration. Mr. Unalan reported that MICS surveys collected data on where the father and mother of a child were living (in the module concerning child protection) and thus indirectly this question could be useful to obtain data on migration. Ms. Kishor reported that DHS surveys collected data on the previous residence of respondents, which were used in measuring internal migration.

In order to strengthen the contribution of household-based surveys to the post-2015 development agenda, participants prioritized the continued collection of internationally comparable data that could be disaggregated within countries. Such efforts required an increased cooperation among countries and coordination among international organizations. The collaboration of policymakers and academic institutions should also be reinforced, such as through the Commission on Population and Development and the Statistical Commission at the United Nations.

D. DEMOGRAPHIC EVIDENCE FROM CIVIL REGISTRATION SYSTEMS, HEALTH INFORMATION SYSTEMS AND OTHER ADMINISTRATIVE DATA SOURCES, INCLUDING INSIGHTS PROVIDED BY HEALTH AND DEMOGRAPHIC SURVEILLANCE SITES

This session provided an overview of register-based information systems, their current capacity to provide relevant demographic and health data, and recent developments in the field. Ms. Adriana Skenderi (Statistics Division/DESA) and Ms. Carla AbouZahr (independent consultant) focused on Civil Registration and Vital Statistics, Ms. Michelle Weinberger (Avenir Health) on service statistics for family planning, Mr. Frencel Tingga (Commission on Filipinos Overseas) on the estimation of the stock of overseas migrant workers, and Mr. Samuel Clark (University of Washington) on Health and Demographic Surveillance Systems. The session was moderated by Mr. Tom Moultrie (University of Cape Town).

Ms. Skenderi (Statistics Division/DESA) began the session by highlighting key trends in Civil Registration and Vital Statistics (CRVS) based on data from the Demographic Yearbook. The Statistics Division collected data on vital events through the Demographic Yearbook Vital Statistics questionnaire at the national level, although data were also disaggregated by urban/rural upon availability. National Statistical Offices (NSOs) were invited to provide information on the completeness of vital registration. For data on total births, reporting by NSOs of total deaths and births by age of mothers based on CRVS data had not improved, and were, as of the period 2010-2014, lower than during the 1995-1999 period. Data disaggregated by age (for example, births by age of mothers or deaths by age) tended to be less available than totals. For Africa, the number of countries that could produce nationally complete data on births and deaths had decreased over time. A similar problem existed for Latin America and the Caribbean. CRVS reporting in Asia remained relatively constant over the past 20 years. Ms. Skenderi reported that as of 2015, at least one-fourth of Asian countries were unable to provide CRVS data at all. For Oceania, there had been a marked decline in reporting of CRVS data over the most recent period.

Ms. AbouZahr (independent consultant) focused on "Health statistics and CRVS". She emphasized that causes of death by age and sex could be obtained from a good CRVS and that they were useful for public health purposes. This source of information was also amenable for studying geographic distribution and producing small area statistics on different causes of death. The data were "real time" and were available on a weekly basis for many European countries. These data could be used for policy purposes; for example, studying the effectiveness of a flu vaccination. MDG targets on health and causes of death were affected by a lack of cooperation among different line ministries, which has led to an over-reliance on household surveys that are not suitable to produce adult mortality estimates, particularly maternal mortality.

Ms. AbouZahr noted that improving CRVS was important for successful monitoring of the Sustainable Development Goal to ensure healthy lives and promote well-being for all at all ages. The disability component of healthy life expectancy was very complex to measure and there was growing interest in monitoring neonatal mortality, ending various types of epidemics (malaria, HIV, TB), deaths due to non-communicable diseases as well as deaths due to road accidents. For that purpose, a broad-based coalition would be needed to collect and compile these data. Linking registration to existing services with which citizens interacted – such as health facilities – could greatly increase registration completeness and quality. Ms. AbouZahr explained that the burden for registering the vital event should not be on the family, it should be done electronically by the government: CRVS systems should be foundational for individual identity systems with an increasing reliance on social media for generating information on vital events, use of electronic registries, mobile applications for notification of vital events by health workers and community informants, automated coding of causes of death, open source and integrated information and communications technology solutions for data compilation, analysis and dissemination, and verbal autopsy for community deaths using hand held devices and automated coding.

Ms. Michelle Weinberger (Avenir Health) presented an overview on service statistics for family planning. She said that service data had both strengths and weaknesses. The Family Planning 2020 (FP2020) initiative required better and timelier data (not just relying on extrapolation) and for that reason more research had been done on comparing service data to survey data. Compared to data from surveys, contraceptive prevalence estimates from public sector data tended to capture faster the uptake in a new contraceptive method, but service data also had some problems. Adjustments could be made based on what were "known" biases. Ms. Weinberger reported that the inclusion of service data in model-based estimates of contraceptive prevalence generally reduced uncertainty around estimates of contraceptive prevalence. Among the challenges of service statistics, Ms. Weinberger mentioned changes in reporting systems; for example, changes from paper-based to electronic reporting have made time series difficult to interpret. She concluded that service statistics could be helpful for smal area statistics as well as for informing national, regional and global estimates.

Mr. Frencel Tingga (Commission on Filipinos Overseas) reported on the estimation of the stock of overseas migrant workers. In the Philippines, data were maintained on foreign workers abroad (temporary) by sex, education, occupational grouping and country of destination. Data were also maintained on permanent migrants from the Philippines. Mr. Tingga reported that the NSO estimated that in 2013 there were 10.2 million Filipinos abroad (including temporary and permanent migrants). The NSO was in the process of developing a framework to count the flow and stock of overseas Filipinos and a technical group was established to provide inputs of data and methodology. Mr. Tingga stressed the importance of focusing on return migration, sharing data for harmonization purposes, and strengthening cooperation between users and producers of statistics. With respect to the challenges of computing the stock of overseas Filipinos, he noted that one option was to conduct surveys in destination countries. Another approach could be a mandatory registration of Filipinos abroad.

The last presentation by Mr. Clark (University of Washington) focused on health and demographic surveillance systems (HDSS). The strengths of HDSS included detailed descriptions of whole populations of the surveillance area with frequent updates monitoring all vital events and in/out migrations, and the ability to provide longitudinal data linked through time. A drawback was that very few HDSS followed people after they moved from the surveillance area, and re-identified people when they moved back. HDSS provided good relationship information on members of households as well as among people, households and places. Mr. Clark said that since HDSS interviews tended to take place two to three times per year, HDSS were helpful in capturing neonatal mortality and other fast-changing outcomes. Furthermore, verbal autopsies were standard in HDSS.

Mr. Clark reported that there was considerable heterogeneity between HDSS sites, with the average population size being around 80,000 people. There were currently two networks of HDSS: (1) the IN-DEPTH network (www.indepth-network.org) which had sites in 20 countries, mostly in Africa and Asia and that covered about 3 million people in total (and with two publicly available data repositories); and (2) the ALPHA network (www.alpha.lshtm.ac.uk) which had 10 member sites in Africa, mainly focused on HIV. In the context of the SDGs, Mr. Clark explained that HDSS could be used for exploring in-depth, causal linkages; triangulation and data amalgamation (i.e., building models to fill in or extrapolate data that were sparse); calibration and validation of big data; and "hands-on" training in data science analysis.

Participants discussed several issues related to register-based information. The first point involved incentives to improve the reporting of vital events, and how social media such as Facebook could be used. It was acknowledged that not only incentives could be used, especially for registering births, but that many disincentives still remained and would require some changes (e.g., fees, time or distance to registration centre, or requirements to bring witnesses). Whenever possible, social security schemes could serve as incentives for registering deaths. As to the use of social media to detect when various types of vital events occurred, some potential may exist for statistical purposes but there was also concern that vital events detected from Facebook would not have the same level of legal reliability.

Participants also discussed the evaluation of civil registration and methods used to measure the completeness of the coverage of vital events as assessed and reported by countries (currently self-reported by NSOs to the Statistics Division/DESA of the United Nations). The Statistics Division examined changes over time and across different variables to "assess" the validity of that information. There were no internationally-agreed standards to verify completeness but various demographic approaches could be used. It was emphasized that with regard to completeness of CRVS, very few countries had the numerators (births and deaths) or were familiar with approaches to estimate completeness (e.g., capture and recapture, indirect methods, etc.). Participants agreed on the need to strengthen CRVS systems and the role and contribution of the international community in this process, including in assessment of the coverage in a more standardized way. The use of capture-recapture methods was also mentioned as possible option to improve the accuracy of the population registers and the measurement of international migration.

Participants discussed the integration of administrative data sources and health management information to capitalize on existing routine information systems (for example DHIS2), to maximize the use of new technologies and to compensate for the weaknesses or biases of these data. One of the bigger challenges involved the integration of the information from the private sector that was often affected by different levels and standards of reporting. It was also noted that good quality service data could build a demand for a client-based system that gave nurses and doctors access to information at the local level that could, in turn, lead to further improvements in the data.

E. COMPLEMENTING TRADITIONAL DATA SOURCES WITH ALTERNATIVE ACQUISITION, ANALYTIC AND VISUALIZATION APPROACHES TO ENSURE BETTER UTILIZATION OF DATA FOR SUSTAINABLE DEVELOPMENT

In this session, four panellists provided an overview of how new sources of information were being used for detecting change over time and space, provide (near) real-time monitoring capabilities, study distribution patterns, serve as proxies for various socio-economic and demographic indicators, and a wide range of other applications. Mr. Alejandro M. Blei (New York University) showed how remote sensing and a network of city-based researchers can be used to monitor global urban expansion, Mr. Patrick Gerland presented on behalf of Mr. Manuel Garcia Herranz (United Nations Children Fund) an overview about crowdsourcing and the experience of UNICEF with uReport and mTrac applications, Mr. Robert Kirkpatrick (United Nations Global Pulse) provided examples on the use of big data for population-related issues based on the UN Global Pulse experience, and Mr. Emmanuel Letouzé (Data-Pop Alliance) showed how these new data sources can be integrated within population sciences. The session was moderated by Mr. Bruce Campbell (United Nations Population Fund).

In an opening presentation, Mr. Blei (New York University) highlighted the value and potential of remote sensing to monitor the growth of the urban footprint throughout the world, and especially for medium and larger urban areas. Since the vast majority of future population growth would be in urban areas, it was critical to plan appropriately urban development, land use at the fringe of urban areas, and public infrastructure development. Mr. Blei presented an on-going, multi-partnership effort to create and extend a city database combining geospatial information with demographic and socio-economic data. He explained how the NYU Stern Urbanization Project was using a stratified sampling approach to study a representative sample of more than 200 cities worldwide (out of 4,245 cities of 100,000 or more inhabitants in 2015). The project covered three phases: Phase I focused on the mapping and measurement of key attributes of global urban expansion: urban extent, average built-up area density, the fragmentation of the built-up area of the city by open spaces, and the compactness of the shape of city footprints around three time periods (1990, 2000, and 2014) based on the Atlas of Urban Expansion—the 2015 Edition (Angel and others, NYU, UN Habitat and Lincoln Institute 2015). Phase II focused on the mapping and measurement of urban layouts and their changes between 1990-2014 in the global sample of 200 cities and since 1900 in a representative sample of 30 cities. Phase III gathered a Land and Housing Survey through a network of local city researchers to obtain information first on regulatory situations and local practices for land ownership, property rights, land use and expropriation, and second on housing affordability and accessibility by type of residential plots and dwelling units in the city. Mr. Blei reported that the approach involved civil society participation through local municipal authorities, decision makers, and civic organizations and local researchers contributing local knowledge and survey-based qualitative information.

On behalf of Mr. Garcia Herranz (United Nations Children Fund), Mr. Gerland (Population Division) presented an overview on citizen reporting: namely, the use of crowdsourcing to collect information actively produced or submitted by citizens through mobile phone-based surveys, hotlines, user-generated maps, and other means. The approach relied on active volunteer participation to collect information and to validate information ("ground-truthing"). Recent examples included Wikipedia, Crisismappers and Ushahidi for humanitarian situations, Premise for food prices in real time, OpenStreetMap for mapping and Geo-wiki for land cover validation and collection of new GIS information, Zooniverse for various citizen science projects, and Designcrowd for crowd design, among others.

Mr. Gerland also reported on the recent experience of UNICEF with ICT innovations, especially through RapidPro, which was a global open source platform that enabled the creation and scale-up of free mobile phone and SMS applications for U-report (a youth engagement platform to elicit young people to

report on what matters most to them). Other examples included a service-based information system to assess and monitor school-level indicators (EduTrac) and a service delivery information system for local health workers to report on local challenges and weekly situation status on disease outbreaks and medicine supply (mTrac). Mr. Gerland reported that almost 30 million messages were sent or received through RapidPro since its launch in September 2014. The platform was used in more than 10 countries to strengthen the first 1,000 days in the continuum of care for mothers and children, and it was used in the 2014 Ebola response in West Africa by a consortium of UNICEF partners to connect frontline health workers with real-time information and support.

In the third presentation, Mr. Kirkpatrick (UN Global Pulse) presented examples of applications of big data to development and humanitarian challenges. Unlike conventional sources providing discrete snapshots of information, big data sources relied on sensors, electronic traces and by-products of ICT activities providing a rich and continuous stream of data on human behaviour such as "What People Say" (online news, social media, retail advertising, radio and television) and "What People Do" (online searches, mobile phone usage, transaction records, postal traffic). This source of information was abundant and provided a multidimensional recording of the flow of social dynamics, with potential to design continuous feedback. Mr. Kirkpatrick reiterated that social media could provide an effective means for real-time awareness about various issues within a given context and location, and be used to correct misperceptions or rumours (e.g., rumours about vaccinations). He warned that concerns remained on how to use this information safely and responsibly given that confidential information was not always validated.

Regarding mobile phone activity, Mr. Kirkpatrick said that aggregated and anonymized mobile phone activity data, alone or combined with other auxiliary information (such as remote sensing and census or survey data) were increasingly being used for a broad range of applications to study human behaviour, population distribution and mobility under various health and humanitarian situations, either for preparedness, disaster and crisis response, or real-time monitoring and prediction of socio-economic vulnerability or public health issues. He noted, though, a number of challenges to mainstream analytics adoption of big data. Thus far, few examples existed of successful implementation at scale, potential users were still facing systemic barriers (e.g., lack of data standards or best practices for sharing big data, few standards for anonymization of big data, inadequate regulatory environments balancing risk of misuse of data against risk of not using it for public good), and the scaling up was still slowed by limited institutional capacity to integrate big data into operations and lack of cross-sectoral visibility of current activities.

Mr. Kirkpatrick highlighted three key aspects big data would contribute to: (1) a measurement revolution through better, faster, less-costly tracking of specific SDG indicators, (2) an accountability revolution by virtue of the fact that Government played no role in either the collection of big data or the timing availability of insights derived from it, and (3) a management revolution by enabling accelerated learning and adoption of agile, efficient, adaptive processes. He illustrated how various types of big data could be used for real-time poverty monitoring for SDG 1 because of the ability of big data to detect change in days and weeks—to complement household surveys conducted every three to five years—and to identify situations or new areas that merited further study or programme shifting. Mr. Kirkpatrick also introduced a new initiative entitled Data for Climate Action in which major companies would make commitments to provide data sets available to researchers to make cities smarter and more sustainable.

The last presentation by Mr. Letouzé (Data-Pop Alliance) highlighted how demography and demographers participated in the "Data Revolution" conversation and provided examples of how big data could be used for SDG monitoring, such as local population estimates and mobility in post-earthquake situations and the construction of socio-demographic indicators using call data records as proxies. These new kinds of data (mobile phone calls information with GPS location, financial transactions, toll booths,

online traces; web content from social media, crowd-sourced and online content; physical and remote sensors) provided opportunities for the development and use of new measures and concepts, visualizations, and statistical machine learning, among others.

Mr. Letouzé explained how big data could serve four main functions: descriptive (e.g., mapping), predictive ('now-casting' or inference as well as forecasting), prescriptive (or diagnostic) by establishing causal relations, and discursive (or engagement) by shaping dialogue within and between communities. As practical ways to bring together data science and population science, he recommended to build on demographic approaches like learning from past mistakes in improving prediction and projection models, and modelling and correcting sample bias in non-sampled data.

In the general discussion, participants noted that crowdsourcing has been successfully used to improve local accountability (e.g., to log if a teacher or health worker was absent, or to monitor corruption). Concerns were raised about potential selection bias, and lack of representativity, but it was noted that such biases could be potentially identified and taken into account. It was also noted that biases were tolerable depending on the objective: if the objective was accountability and to report corruption, representativity was not as critical. Participants also noted that crowdsourcing was also about the motivation of participants and the sustainability of continuous community participation, and reliability of contents contributed remained an open question. It was agreed that the experience of UNICEF provided encouraging examples of routine data collection through service providers using such platforms for supply chain management of basic commodities.

Regarding the big data applications, participants raised questions about privacy and social issues, including who decided what was appropriate (e.g., addressing rumours about particular issues); representativeness (may or may not matter depending on objective); culturally-specific online behaviour (e.g., call patterns cannot be used as a universal proxy for economic situations in the same way everywhere). Overall, participants agreed that big data could complement "traditional" sources like censuses and surveys, but new policy frameworks were required to ensure good governance, accountability and responsible use. There was general agreement that big data could be useful for implementing some of the SDGs.

F. DATA DISAGGREGATION AND UTILIZATION CHALLENGES: PROSPECTS FOR THE INTEGRATION OF MULTIPLE DATA SOURCES TO PRODUCE ESTIMATES FOR DIFFERENT GEOGRAPHICAL SCALES AND TIME PERIODS

In this session, panellists presented their experiences with the use of multiple sources of digital data and challenges with their harmonization, disaggregation, and integration. Mr. Steven Ruggles (University of Minnesota) reflected on the experience of IPUMS, iDHS and TerraPopulus, Mr. Alex de Sherbinin (Columbia University) on the experience of CIESIN with GPW, GRUMP and other global socio-economic data products, Mr. Andrew Tatem (University of Southampton) on the experience of WorldPop in mapping population numbers, demographics and behaviours, and Mr. Mark Montgomery (Population Council) on the needs and challenges posed by the analytical use of multiple data sources. The session was moderated by Mr. Thomas Le Grand (Université de Montréal).

Mr. Ruggles (University of Minnesota) described three data integration projects associated with the International Public Use Microdata Samples (IPUMS) initiative. IPUMS was the world's largest archive of population data, containing individual-level microdata describing approximately three billion persons enumerated in 100 countries. The data were freely available to the research community and widely used with 70,000 registered data users from over 100 countries yielding 1,500 publications annually. As of October 2015, IPUMS was disseminating 2.5 terabytes of data per week and the volume

was growing rapidly. Mr. Ruggles emphasized that many of the variables contained in IPUMS were relevant to the SDGs. The data included information on infrastructure, such as water supply, sewage, toilets, electricity, mobile telephones and Internet, as well as building materials, educational attainment, literacy, school enrolment, disabilities, economic activities, unemployment, fertility histories and child mortality, among other topics important for sustainable development.

The first project Mr. Ruggles described was the IPUMS international census archive, called IPUMS-International. Since 1999, IPUMS-International had established memoranda of understanding with 104 different National Statistical Offices (NSOs). Considerable effort had been put into recovering historical censuses, which at times involved locating data tapes in poor-quality storage environments and taking measures to clean and restore the tapes so that the data could be read. Mr. Ruggles reported that at present, IPUMS-International contained information on 614 million people from 277 censuses taken in 82 countries since 1960. Roughly three-quarters of the countries and two-thirds of the samples were from developing regions; 17 least developed countries were represented in the collection. For most countries, IPUMS provided microdata for multiple census years. Sample densities were typically five to ten per cent of the national population, although sometimes smaller. Because most countries had multiple large samples, it was usually possible to use the data to analyse change over time at the sub-national level.

The second IPUMS project was the Integrated DHS series. This project aimed to facilitate analysis of Demographic and Health Surveys across time and between countries. At present, the data included 18 countries, but the project was expanding to include 41 African countries and 11 Asian countries. Mr. Ruggles explained that variables were coded consistently across countries and over time; web-based search and discovery tools enabled users to display variable availability across surveys; documentation was organized on a cross-survey, variable-specific basis; and researchers could merge files and create customized datasets using a web dissemination system, at no cost.

The third IPUMS project was Terra Populus, an initiative to integrate spatio-temporal data on population and the environment. Terra Populus included microdata on the characteristics of individuals and households, small area data (or vector data) on the characteristics of places defined by administrative boundaries, and raster data tied to spatial coordinates as from satellite imagery or planet models. Terra Populus allowed users to mix and match data from various formats and export it in the preferred format. For example, one could use the platform to attach information about the environmental and social context to population microdata. Alternatively, one could use the platform to rasterize area-level data, such as information on unemployment rates. In addition, one could use Terra Populus to produce an area-level summary of raster data, such as by aggregating precipitation measures by administrative level area. Mr. Ruggles explained that a major component of the Terra Populus project was to develop a world map in which the boundaries were consistent over time, which was necessary for analyses of change. In 2014, they disseminated a global map with integrated boundaries across time for the 1st administrative level of countries. In 2015, they released integrated 2nd administrative level boundaries for 40 countries and they expected to have a global map at the 2nd administrative level in 2016.

Mr. Ruggles concluded his presentation by emphasizing four points about the value of data integration. First, while acknowledging that data integration was expensive to carry out, he stressed that it saved money in the long run, reduced the potential for error and simplified replication. Second, he highlighted the benefits of centrally integrating administrative and survey data, especially data to be used for measuring progress on the SDGs. Third, he underscored the need for geographic units that were consistent over time in order to make sub-national estimates of change, as was called for with the SDGs. Fourth, he recalled that sub-national estimates of change were essential for identifying places where progress had stalled and more resources were needed.

Mr. Alex de Sherbinin (Columbia University) presented the experience of CIESIN in mapping population and poverty. He recalled the history of poverty mapping at CIESIN, which in 2003 was called upon by Jeffrey Sachs to be the mapping arm of the Millennium Development Project, a two-year process to develop the evidence base necessary to track progress on the MDGs. CIESIN worked closely with the Poverty and Hunger task forces, providing maps for reports and later producing data to aid in site selection for the villages that were included in the Millennium Villages Project. In collaboration with the World Bank, CIESIN produced a poverty atlas and CIESIN developed a collection of spatial poverty data. These initiatives included small area estimate data on poverty headcounts for 26 countries, a global map of infant mortality rates, and a global map of the percentage of children underweight, which utilized a combination of census and survey data from the Demographic and Health Surveys and Multiple Indicator Cluster Surveys, for example. CIESIN had plans to update these maps in collaboration with the World Bank. Mr. de Sherbinin explained that analysis of the poverty maps improved understanding of a number of spatial factors that influence the distribution of poverty, such as distance from roads and ports, high elevation zones, rainfall levels, and dryland ecosystems. For example, one analysis revealed that the poor were overrepresented in regions that were disadvantaged in terms of drought frequency or the length of growing seasons. There was the potential to further utilize the data to map climate vulnerability.

Mr. de Sherbinin then discussed CIESIN's Gridded Population of the World (GPW) data project. The project's first iteration occurred in 1995 and its most recent was released in 2015. CIESIN's approach entailed taking census data at the highest resolution possible and allocating the population enumerated in those areas into small grid cells. There was substantial variation in the resolution of the input data across countries. On average, the input data were scaled at 944 km2 in high-development regions and 3,500 km2 in low-development regions. The latest fourth iteration of the GPW incorporates information from the 2010 census or latest available geographic boundaries matching census cartography. There were approximately 12.5 million input units and the data are gridded at a resolution of 1 km^2. While the input census boundary files were not available to the public, the gridded data were free and openly available. Maintaining fidelity to the input data was a priority, thus no ancillary data were incorporated in the gridding procedure. The availability of minimally modelled data was especially important for certain types of analysis, such as analyses of land cover or access to roads, which would encounter endogeneity problems if covariates were used to create the population grid. Mr. de Sherbinin described plans to extend the GPW with the fourth version including three additional variables from the 2010 round of censuses: sex, age by five-year age groups, and urban/rural status. The fourth version would be released through the NASA Socioeconomic Data and Applications Center (SEDAC) later in 2015.

Mr. de Sherbinin concluded with several recommendations with respect to spatially-disaggregated data. He emphasized that spatial data frameworks supported multi-scale reporting across different administrative levels as well as across non-administrative units such as watersheds, climate zones, and disaster risk zones. In order to be most useful for these purposes, data should be reported at the highest resolution possible without violating confidentiality concerns. He recommended that data be disseminated freely in order to support research, discovery and information flows that could promote policies that reduce poverty. He called for population counts to be reported at the enumeration area level and all other census variables at the census tract or smaller census geographies in order to facilitate a range of population-based analyses important to the SDGs. To facilitate their integration and use, Mr. de Sherbinin recommended that census data include common identifying codes for census geographies and that spatial data files be disseminated in digital form. Documentation of changes in administrative areas from one census round to the next was vital for tracking progress towards SDGs over time. Mr. de Sherbinin recommended that ages be reported in single year age groups which would allow for grouping the age data as needed (e.g., as denominators for education statistics or for calculation of infant and child mortality and malnutrition rates). He further recommended that age reports not be truncated at advanced ages since it was increasingly important to be able to measure heterogeneity among the older population, especially given increasing longevity.

Mr. Tatem (University of Southampton) presented the WorldPop perspective on mapping population numbers, demographics and behaviours. He emphasized that population information was required for tracking progress on the SDGs. He explained that obtaining the necessary information on the population at risk often entailed linking population estimates with spatial data, but for many resource-poor countries, sub-national data on total population and the distribution and composition of the population were lacking. He noted that the WorldPop project started about 10 years ago to improve spatial demographic evidence base for low-income countries. The project produced freely-available, high-resolution census data, first by working closely with health departments and statistical agencies to obtain the finest detail, boundary-matched census data and then developing scalable methods and models for integrating ancillary data sources to complement and fill data gaps in the censuses.

Mr. Tatem explained that there were two general approaches to apportion the global population into small grid cells covering the earth: top-down approaches and bottom-up approaches. WorldPop adopted a flexible approach that could utilize a range of different input datasets, such as those describing human settlements, land cover, topography or night time lights, as well as open street maps and data from social media. WorldPop used machine-learning approaches to explore the relationships between population counts and information from the various ancillary datasets in order to model the population counts in each grid cell. Increasingly, high-resolution satellite imagery, processed using sophisticated image analysis techniques, were enabling the large scale mapping of built-up areas and individual buildings at fine spatial detail. These detailed global human settlements maps formed the basis for WorldPop global population mapping over the coming months, which would be carried out in collaboration with the Bill and Melinda Gates Foundation, the Joint Research Center of the European Commission, the World Bank and CIESIN. Mr. Tatem specified that the WorldPop code was open and he welcomed feedback and suggestions for improvements. Data could be accessed through the data portal on the WorldPop website and in the GoogleEarth engine.

In contrast to the top-down approaches to gridding population data, bottom-up approaches entailed building core data layers to model the presence of people in space. Computer vision and machine learning approaches could distinguish typologies of human settlement patterns from new generations of satellites or aerial photography. When combined with estimates of occupancy from ground surveys, the bottom-up approach to population size estimation and mapping could potentially circumvent the requirement for census data and thus offered a promising avenue in resource-poor regions where census data were unreliable, outdated or of coarse resolution. Mr. Tatem highlighted a project in Nigeria that was using the bottom-up approach to support vaccination planning and resource allocation efforts.

Mr. Tatem then described how WorldPop estimates of gridded population were being used together with other data sources to produce dynamic population maps. For example, integrating the data with mobile phone call data records, which were measured continuously, shed light on seasonal or even day-to-day variation in the spatial distribution of the population. Mr. Tatem said that disease elimination was one of the best uses of the integrated data. While traditional efforts at malaria control in northern Namibia entailed uniform spraying of DDT across geographies, the combination of transmission risk mapping integrated with mobility data had enabled bed net distribution to be targeted to the specific areas where malaria was concentrated. The result was a much improved use of resources for malaria control.

He emphasized several key points. First, in producing estimates for different geographical scales and time periods, the integration of multiple types of data to complement traditional sources was required. Second, while he conceded that novel datasets were prone to substantial biases, these new datasets had advantages over census data in terms of the frequency of measurement and spatial precision. Third, methods to account for biases and reporting uncertainties, as well as clear metadata and documentation to inform users, are important. Fourth, new data sources have great potential to complement traditional sources to build strong demographic databases that draw from both top-down and bottom-up approaches.

The last panellist, Mr. Montgomery (Population Council) presented an overview of the opportunities and challenges of integrating demographic and spatial data in order to track progress on the SDGs, in particular those related to urbanization in poor countries, decentralization of government responsibilities, governance and urban poverty and exposure to extreme events. He said that spatially-integrated data was the foundation of the data system. He underscored the huge potential offered by spatial data in the present day, stating that we were entering a new area with respect to their availability, accessibility and relevance to the SDGs. He pointed to the IPUMS, CIESIN and WorldPop data projects as highly valuable, each with exemplary documentation.

Mr. Montgomery highlighted the growing concern surrounding extreme events, such as floods and droughts, and noted that the risks associated with such events were recognized throughout the SDGs. He said that there was much for social scientists to support within the Hyogo and Sendai frameworks for disaster risk reduction and he offered his thoughts on what demographers could bring to the discussion. Mr. Montgomery observed that few demographers were using spatially-disaggregated data for poor countries on the issue of climate change and disaster risk reduction. With respect to natural disasters, EmDat was a good data source, but there were opportunities to improve. In Latin America, the DesInventar programme operating since the late 1980s had produced fine-scale spatial recording of disasters of various kinds based on media reports. He urged that demographers could contribute more to that area of research, but only if census data were fully disaggregated. In addition to censuses, Mr. Montgomery noted that the household surveys often used by demographers could provide place-specific information of risk exposures and behaviours in sampled locations. He noted further that longitudinal surveys could be integrated spatially if they were designed or retrofitted appropriately.

Mr. Montgomery offered the example of Peru, where the Demographic and Health Survey (DHS) records data for first order administrative regions. While useful for certain types of analysis, he said the first order units were less informative for analyses of access to roads or services because the geographic units were too large. In addition to administrative units, the Peru DHS made coordinates available, which enabled researchers to determine with much greater precision where the sampled population resided, thereby enabling analyses of access to roads. Integrating fine-scale census data from full microdata records for Peru enabled further demographic analysis. For example, one could assess the proportion of the population that was elderly in areas with poor access to roads.

Mr. Montgomery expressed his optimism that progress towards the SDGs could be analyzed on a sub-national basis. He stressed the need to mobilize development assistance for analysis and collection of population census data. He underscored the value of making public the jurisdictional boundary shapefiles and encouraged the publication of summary socioeconomic data by jurisdiction. Mr. Montgomery urged that the development and scientific conversation move away from the rural-urban dichotomy and instead focus on places, including specific cities, towns and villages. Lastly, he emphasized the need to link population data to spatial data and to link population researchers to remote-sensing, epidemiological and other spatially-informed researchers.

The general discussion addressed a variety of issues, including the characteristics of users of the spatial data products, notions of vulnerability and resilience, approaches to validate spatially-disaggregated population estimates and communicate their uncertainty, the preferred sizes of the spatial data units, and the potential to collect place-specific data through surveys fielded by mobile phone.

Regarding the characteristics of data users, Mr. Ruggles estimated that half of the users of IPUMS-International were researchers based in the United States. Approximately half were economists and another one-third were demographers. He clarified that no commercial use of the IPUMS data was allowed under agreements with the NSOs. Mr. Ruggles noted that some of the heaviest IPUMS-

International users were those at the NSOs who were using the IPUMS platform to access their own microdata.

On vulnerability and resilience, participants noted that there was no common definition for each of these terms. One suggestion was to consider the biological concept of homeostasis and think of a village like an organism. Was it possible to combine the various statistical indicators, imagery and behavioural indicators to come up with an indicator of vulnerability or resilience? Mr. Montgomery noted that from the demographer's perspective, the notion of resilience was rarely invoked at the level of individuals and families. He recalled that high-quality longitudinal studies had revealed the lack of resilience exhibited by children who experienced a shock in childhood that seemed to place them on a disadvantaged path well into adulthood. Mr. Bilsborrow suggested that the rich DHS datasets might be able to shed light on vulnerability and resilience.

With respect to validation, Mr. Tatem said that WorldPop made efforts to compare their gridded population estimates with others obtained using different approaches. He noted that figuring out how to effectively communicate uncertainty was a challenge that would take a long time to overcome. Participants agreed that the notion of uncertainty was difficult for many people to appreciate and that some public education might be necessary.

There was some discussion about the recommendation that census data be reported at the enumeration area level, as this area was defined solely for the purposes of data collection and had no other meaning. Mr. Montgomery offered that while fine resolution data may seem too small to be useful, the small area units could be constructed into other units that were useful to the researcher. Mr. de Sherbinin clarified that even though the census enumeration areas may not have been tied to a decision-making authority or administrative boundary, they could be useful for obtaining more precise estimates of the number of people at risk of flooding or needing water services, for example. Participants noted that it was also important to report results at the level of the decision-making government unit. These meso areas, such as cities or urban agglomerations, needed information as to their characteristics and thus researchers should keep in mind the needs of the standard planner. Participants also warned that, with respect to household surveys, there was a potential cost trade-off between the number and size of the units to geo-reference and the sample size. One had to consider whether it was worth it to add geocodes at the expense of sample size.

One concern in leveraging censuses and household surveys for tracking progress on the SDGs was that many countries were likely to have only one census and few nationally-representative household surveys during the implementation period. If countries were to load their censuses with SDG-related questions, it could compromise the quality of the census. Participants wondered whether using smart phones or SMS might offer an avenue to field surveys with quicker or more frequent results. Mr. Tatem said that there were already companies in Africa that would field questions via SMS for a fee, offering respondents free air time in exchange for their answers.

Overall, participants were enthusiastic about the potential offered by integrated data analysis for assessing progress towards the SDGs. Participants noted that the value of the information gleaned through integrated data was often greater than the sum of its parts.

G. ROLE OF EMPIRICAL OBSERVATIONS AND MODEL-BASED ESTIMATES WITH UNCERTAINTY FOR GLOBAL AND COUNTRY-LEVEL MONITORING

In this session, panellists presented on experiences producing model-based estimates for global and country-level monitoring: Mr. Colin Mathers (World Health Organization) presented the WHO experience with maternal mortality estimates and global health estimates, Ms. Danzhen You (United Nations Children Fund) reported on the UNICEF experience with child mortality estimates, and Mr. Adrian Raftery (University of Washington) offered an overview of his research on measuring and communicating uncertainty for population and health estimates. The session was moderated by Ms. Ann Biddlecom (Population Division).

Mr. Mathers shared the World Health Organization's experience with estimates of maternal mortality and other global health indicators. He first reviewed a list of global health estimates and reports emanating from the WHO and other United Nations sources, including the Population Division. He noted difficulties with synchronicity given differing reporting cycles. Mr. Mathers explained WHO's institutional roles regarding global health estimates: WHO was constitutionally mandated to establish and maintain epidemiological and statistical services, and to assist in developing informed public opinion on health matters. Recent reforms had defined as core functions the collection, analysis and dissemination of evidence on health trends and determinants, as well as setting targets, monitoring progress and measuring impacts. World Health Assembly mandates reinforced the mandates of WHO in target setting and monitoring.

Mr. Mathers reviewed the outputs of WHO's Global Health Observatory, noting that WHO used life tables from the Population Division as a basis for its own mortality estimates by cause. WHO also estimated trends in risk factors and disease burden (drawing on IHME to some extent). Global health estimates had to synthesize data from various sources to obtain comparable estimates. Often the input data were not comparable and required adjustment, and frequently data were sparse and modelling was required to fill in gaps. There was increasing demand for country-level estimates and time trends. It was necessary to incorporate improvements in methods, while maintaining stability and acceptance of modelling methods. Mr. Mathers noted the new GATHER initiative on reporting guidelines for global health estimates. He also described the consultation process with countries, where countries were given several weeks to comment on estimates or provide new data. In 2015, there was more interest than usual from countries due to the final assessment of MDG progress.

Mr. Mathers also described the process of producing maternal mortality estimates. Maternal deaths were rare events, and estimates could be politically sensitive. Difficulties arose due to sparse data, underreporting of events even in countries with good data, and definitional issues. Given the challenges of obtaining accurate and standardized direct measures of maternal mortality, the Maternal Mortality Estimation Inter-Agency Group (MMEIG), comprising the WHO, UNICEF, UNFPA, the World Bank and the Population Division/DESA, partnered with a team at three universities (the University of Massachusetts, Amherst, United States of America; the National University of Singapore, Singapore; and the University of California at Berkeley, United States of America) to generate internationally-comparable maternal mortality estimates with independent advice from a technical advisory group that included scientists and academics with experience in measuring maternal mortality. A Bayesian estimation method was used to account for errors in the data and balance the use of covariates for countries with little data while taking account of observed trends. However, countries sometimes objected to estimates that differed from unadjusted data or official statistics. There was currently interest among some countries in determining the analysis methods that WHO should use. Despite some controversies, the estimates were serving as a springboard for assessing and improving national level data.

Ms. You (UNICEF) described the work of the United Nations Inter-agency Group for Child Mortality Estimation (UN IGME), comprised by UNICEF, WHO, the World Bank and the Population Division, in producing consistent estimates of child mortality for all countries for global monitoring purposes. UN IGME work, which was guided by an independent Technical Advisory Group, encompassed estimation of neonatal, infant, and under-five mortality, methodological development, and country capacity building through regional workshops and country missions. A country consultation process was held annually to inform ministries of health and national statistical offices about forthcoming estimates, and to provide opportunity for feedback. The UN IGME estimates fed into several analytical reports prepared by UNICEF as well as MDG reporting. The estimates were used by some countries for advocacy and decision making. All data inputs and estimates were openly available on the website childmortality.org.

Ms. You described the UN IGME approach to measuring child mortality, which involved compiling all available nationally-representative data, recalculating estimates with improved methods if microdata were available, assessing data quality, and applying standard methods to generate trend estimates and uncertainty. A Bayesian curve fitting method was used to estimate trends. The method could account for potential data biases and capture short term fluctuations and accelerations in trends. It had performed well in out-of-sample validation exercises.

Discussing the overall strengths of global estimates, Ms. You noted that the UN IGME estimates were consistent and comparable. The UN IGME had achieved a high degree of transparency in the estimation process. However, the quality of the estimates relied on the quality of the empirical data underlying them. Discrepancies from countries' official estimates sometimes caused confusion, as did changes to time series in successive rounds due to methodological changes or new data. The estimates of uncertainty were difficult to communicate to users of the data.

In the last presentation of the session, Mr. Raftery (University of Washington) provided his experience on developing statistical methods for estimating population and health quantities and their uncertainty from data of limited quality. He began by describing problems with the data available to measure demographic and health quantities in countries. These include systematic biases, measurement error, and sampling variability. He argued that Bayesian approaches allowed modelling, estimating and correcting for biases, measurement error and variance explicitly. They also allowed the incorporation of expert knowledge and information from other countries via the so-called prior distribution, that is, information available before the data were collected. Estimates could be made for multiple countries at once, using multinational patterns, by a Bayesian hierarchical model. In addition, Bayesian methods produced estimates of uncertainty that were important for general assessments of accuracy as well as for avoiding risks in decision making.

Mr. Raftery gave two examples of work carried out with the United Nations. First, in the area of HIV prevalence estimates by UNAIDS, Bayesian methods were used to account for measurement error in DHS surveys and errors and bias in observations from antenatal clinics. Second, Mr. Raftery described work with the Population Division to reconstruct populations by age and sex with uncertainty estimates. The method required bias-corrected initial estimates of age-specific vital rates, net migration and population counts, and expert knowledge about measurement error variances. The method estimated all demographic quantities simultaneously, so that estimates were demographically consistent. While the populations had been reconstructed in this manner for only about a dozen countries, the method showed promise if systematic, consistent data for the past could be gathered for more countries.

During the discussion, a number of participants commented on the difficulty of presenting uncertainty bounds for population and health estimates to users. Often, it was politically difficult to present uncertainty intervals to politicians or policymakers, including confidence intervals from DHS.

Other problems with data quality, such as age misreporting, were also highly relevant to improving empirical data. One participant noted the pressure of demand for estimates of annual change, which was difficult to satisfy when the sample surveys used to measure indicators could not demonstrate statistically significant change. Mr. Raftery suggested that it was part of the responsibility of experts to educate users on the use of uncertainty intervals, and that such intervals would become increasingly accepted.

One participant noted the emphasis on civil registration and vital statistics as the ideal source for demographic estimates. However, complete registration, especially of deaths, was still a long way off for many countries. It was imperative to think about alternative systems that could be proposed. Mr. Mathers said that in middle-income countries, improvement in CRVS was being achieved because with economic improvements there were other motivations for registration, besides statistics. He also noted recent strides in political will for CRVS in Africa. However, significant progress could still take decades to achieve.

The question was raised of whether it was proper to release estimates, for example of maternal mortality, for countries where the available observations were non-existent or extremely sparse, or whether it was better to refrain from publishing estimates that were entirely modelled. The efforts of the UN IGME in promoting transparency in data and estimates were commended, and it was noted that the World Bank was attempting to increase the transparency of poverty estimates.

3. CONCLUSIONS AND RECOMMENDATIONS

During the closing session, each session moderator presented a brief overview of the key points from each session and a general discussion about cross-cutting topics followed.

The first session on censuses highlighted seven aspects of how population and housing censuses can contribute to strengthening the demographic evidence base for the post-2015 development agenda, but would also need further support to fulfil their potential: (1) censuses were a primary source of statistical data for countries lacking population registers and CRVS, and the 2020 round of censuses could serve as a baseline for the SDGs and for (local) planning and decision-making; (2) new technology and knowledge should be leveraged as much as possible to improve planning and implementation of field operations and the overall quality of conducting the census, including its speed, accuracy, and timeliness of the results; (3) appropriate resources and intensified support should be mobilized for building comprehensive national statistical systems with censuses as a central component, including the implementation of the new revision of United Nations Census Principles and Recommendations and their regional and national adaptation to local situations; (4) greater efforts should be made to disseminate and use more widely census data, including through public-private partnerships with civil society, academia, researchers and data scientists ; (5) census data should be increasingly integrated within an ecosystem in which census data are combined with auxiliary sources of information (such as administrative registers, household surveys, but also potentially other new data sources) to complement and update them between censuses, especially at subnational scale; (6) geolocation should be used both for data collection and analytical purposes, and georeferenced data should be disseminated, ideally at the smallest possible level, while still preserving individual privacy and confidentiality; and (7) investing in people, and especially in building national and local capacity, was critical. These recommendations called not only for resource mobilisation, but also to expand networking and partnerships to improve knowledge transfer and speed up innovation diffusion and the adoption of best practices, including through regional centres of excellence.

The second session focused on surveys and emphasized two key points: (1) cross-sectional household surveys remained the most common source of data for MDG and SDG monitoring (among the 169 specific targets in the SDGs framework, 42 included national household surveys as the source of data), and to derive population and demographic estimates in countries lacking nationally-representative population registers and vital registration; and (2) questions could be exactly phrased as needed and standardized, thus producing data directly related to indicators. Participants also noted that major international survey programmes had already been preparing to accommodate some of the new requirements of SDG monitoring (e.g., testing new modules and questions, adapting and collecting new age groups as needed for specific indicators, adapting sampling designs, or focusing on specific sub-populations). However, concerns were also expressed about the capacity to expand questionnaires beyond reasonable limits without compromising data quality and participation. It was also noted that despite high standards, surveys might produce results that were not consistent with other data sources or not consistent with the expected trend, but most of the time the differences or inconsistencies were either due to different methodologies in collecting data from different sources or the inconsistencies were within a margin of error.

Participants also highlighted that more specialized surveys (e.g., longitudinal panel studies or thematic surveys) could provide further valuable insights and complement multipurpose surveys through more specialized sampling designs or a more in-depth focus. Longitudinal surveys, for instance, offered unique ways to observe conditions and changes in the same individual or institutional units over time, and thus could help to study cross linkages among SDGs and their targets and enable randomized control trials. Thematic surveys such as PMA2020 focused on a core set of family planning indicators that were monitored more frequently and in more flexible ways. Specific migration surveys could provide more

insights about internal migration processes, determinants and characteristics or specific emigration communities in a destination country.

The third session on administrative registers and surveillance sites reviewed the progress and possibilities offered by these sources of information to provide vital statistics and other routine health and migration status data in a continuous and timely fashion. Participants noted the stall in the last decade, particularly in Africa and South America, in the collection and reporting of vital statistics from civil registration systems and the lack of internationally comparable and systematic evaluation of the completeness of vital registration. Participants also noted the recent efforts to scale-up civil registration and to improve vital registration through a closer integration with health facilities, community health workers and key local authorities through systematic notification systems and innovative use of ICT to improve efficiency and enable feedback mechanisms. The review of the experience with improved use of administrative routine data, either for family planning or international migration, showed the value and importance of investing in innovative approaches to understanding demographic phenomena, including reconciling differences between administrative data and other sources, as well as strengthening coordination mechanisms to standardize and consolidate information streams from multiple providers (e.g., public and private sector stakeholders).

In the fourth session on new sources of data, participants reviewed and discussed some of the challenges and opportunities associated with the use of this new kind of information to complement traditional data sources. Participants focused on how remote sensing combined with stratified sampling, local expert knowledge and socio-demographic data from censuses or population registers, could be used to improve local urban planning; how crowdsourcing, despite inherent biases, could be used to collect information or for validation, social mobilization or civic participation, including to enable local accountability and monitoring corruption; and how big data could provide relevant attitudinal and behavioural information, and contribute to a measurement revolution through better, faster, and less-costly tracking of specific SDG indicators. The presentations highlighted the need for new policy frameworks to ensure good governance, accountability and responsible use, and to overcome systemic barriers with the use of this type of information (e.g., lack of data standards or best practices for sharing big data, few standards for anonymization of big data, privacy and social issues, etc.). Participants also discussed how data science and population scientists can mutually benefit from their respective and complementary strengths to improve prediction and projection models and to correct sample bias in non-sampled data.

The fifth session on the integration of data sources highlighted major international efforts to create harmonized public-use geospatial population datasets and micro-samples. The session emphasized the great value added by the integration of multiple data sources, and the requirements to satisfy a wide variety of data users with research needs at the local, regional and global levels. Participants advocated for a multi-tiered approach that involves the provision of statistics at the lowest possible level of disaggregation (geography, age, among others), and detailed summary information for specific places (cities, districts) for planning and advocacy; the provision of microdata in a tiered format, ranging from public use samples to 100 per cent samples in secure data centres, when justified; and the provision of extensive metadata in a standardized format (census geography and its changes over time, related geocodes, questionnaires, editing procedures, among others) and appropriate planning for eventual data integration (Governments, research centres, and the private sector). The discussions highlighted the huge need for a major reinvestment in training at all levels; and developing national capacity through regular and increased funding for NSOs, institutional reforms, and greater involvement of NSOs in developing and using new sources of data and methods.

In the sixth session on global and country-level monitoring, participants reviewed and discussed the needs and challenges with both global and country-level monitoring of key MDG and SDG indicators,

the importance of harmonizing approaches, assumptions and data sources underlying estimates (including standardizing data quality assessment and controlling for potential biases), as well as the value of coordination mechanisms and consultative processes to ensure comparability across countries and time. Participants emphasized several key aspects such as transparency and replicability of methods, ensuring that all relevant data are publicly accessible, the systematic use of all empirical evidence, and reporting uncertainty ranges for estimates. The discussions also highlighted the growing needs and relevance for subnational estimates and analyses (especially to address inequities), and the need to enhance national capacity to produce timely, quality estimates, especially through strengthened CRVS, and disaggregated estimates.

In closing remarks, Mr. John Wilmoth, the Director of the Population Division, highlighted the importance of the meeting and how the contributions provided by all the participants would contribute to the forty-ninth session of the Commission on Population and Development, and especially to inform the Secretary-General's report prepared for the Commission on the session's theme "Strengthening the demographic evidence base for the post-2015 development agenda." Mr. Wilmoth also explained that all the presentations and background notes contributed by the various experts have been shared among panellists and other participants and will be posted on the web site of the Division upon the release of this report.

In preparing this report, a number of cross-cutting recommendations emerged through the different thematic sessions:

- Strengthen support for the 2020 round of censuses and the integration of household survey programs and CRVS as central components of comprehensive national statistical systems.

- Promote international statistical standards, and the use of harmonized questionnaires for core topics to ensure basic comparability, particularly important for regional and global monitoring.

- Leverage new technology and knowledge to improve data collection efficiency and quality.

- Build on new efforts to strengthen CRVS and to use service delivery data (both public and private), administrative data sources (e.g., health, education, housing), and national population registers.

- Proactively design links from censuses to surveys and administrative data (e.g., collect similar key variables among data sources, including using similar definitions and coding) and integrate census data into an ecosystem for intercensal updates of local population estimates for (local) planning and decision-making, and to derive small area socio-demographic estimates.

- Use responsive sampling design for more specialized postcensal household surveys on specific subpopulations or rare events (e.g., maternal mortality, disability status, international migrants).

- Improve the dissemination and generation of national data products, including local community profiles, online dissemination, dynamic tabulations on-demand, and national data archives with public use microdata. Treat all statistical data, within the limits required to protect individual privacy and confidentiality, as a public good that should be readily available to all interested users at the national level and at the local level through statistics for small areas and small sub-populations. Data should be made available not only in aggregate

form but also as much as possible at the individual record level for further secondary data analysis and data integration.

- Strengthen national capacity to produce and disseminate linked, small area administrative boundary files (or geolocation as appropriate) with publicly available datasets, such as detailed summary information from censuses for specific places (e.g., cities or districts), in order to facilitate data integration and overlays and to improve service delivery and local planning and advocacy.

- Increase the analytical use of existing and new data sources, and combine them through data integration, statistical linkages and geospatial locations to obtain more timely, robust and disaggregated estimates of key indicators.

- Complement traditional data sources with new data types and sources through more systematic use of geo-referencing of data (ideally at the smallest possible level, while still preserving individual privacy and confidentiality), more systematic dissemination of both statistical data and boundary files, and data disaggregation.

- Exploit the potential of big data and other innovative data sources, while addressing the challenges of data confidentiality, access and sharing, harmonizing classifications, and controlling for selection biases. It is essential to develop quality assessment standards for new types of data sources and demonstrably robust modelling approaches.

- Triangulate, validate, verify, calibrate and integrate administrative data as well as new approaches with other official data sources. Handle evolving selectivity, including changes over time and space in terms of resident populations, ICT users, types of housing structures, and so on.

- Encourage national statistical authorities to participate in and contribute public-use (micro) datasets to international repositories and data products for further harmonization, data integration dissemination and international research.

- Strengthen public-private partnerships, including with civil society, academia, researchers and data scientists, especially for data dissemination and (secondary) data use.

- Expand networking and partnerships to promote collaborative research and to improve knowledge transfer, speed up innovation diffusion and the adoption of best practices, including through regional centres of excellence.

Annex 1: Organization of Work

**UNITED NATIONS EXPERT GROUP MEETING ON
STRENGTHENING THE DEMOGRAPHIC EVIDENCE BASE
FOR THE POST-2015 DEVELOPMENT AGENDA**
Population Division
Department of Economic and Social Affairs
United Nations Secretariat
New York
5-6 October 2015

ORGANIZATION OF WORK

<u>Monday, 5 October 2015</u>

08:45 – 09:00   Registration Conference Room 6

09:00 – 10:45   **1. Opening of the meeting**

- Introduction and objective of meeting: *John Wilmoth, Population Division, Department of Economic and Social Affairs (DESA), United Nations*

- Introduction to the work of 49th Session of the Commission on Population and Development: *Dr. Mwaba Patricia Kasese-Bota (Zambia, Chairperson of the Bureau of the Commission)*

- Overview of the Post-2015 SDG monitoring framework: *Francesca Perucci (Statistics Division/DESA)*

- Keynote address: "Building a 'fit-for-purpose' demographic evidence base for the post-2015 agenda" *Neil Fantom (World Bank)*

10:45 – 11:00   Break

11:00 – 12:45   **2. Lessons learned from the 2010 round of censuses and planning for the 2020 round to meet the post-2015 agenda**

- Moderator: *Patrick Gerland (Population Division/DESA)*

- *Keiko Osaki and Margaret Mbogoni (Statistics Division/DESA)* – World Population and Housing Census Programme

- *Benoit Kalasa (United Nations Population Fund)* – Global and regional perspective

- *Andrew Mukulu (Uganda Bureau of Statistics)* – National perspective

- *C. Chandramouli (Registrar General of India)* – National perspective

12:45 – 14:00   Lunch

14:00 – 15:45   **3. Existing survey programmes and need for new survey modules or new thematic surveys designed to "count the uncounted" in support of more effective policy interventions**

- Moderator: *Vladimíra Kantorová (Population Division/DESA)*

- *Sunita Kishor (ICF International)* – DHS experience

- *Turgay Unalan (United Nations Children Fund)* – MICS experience

- *Amy Tsui (Johns Hopkins University)* – Performance Monitoring and Accountability 2020 surveys

- *William Axinn (University of Michigan)* – International longitudinal surveys perspective

- *Richard Bilsborrow (University of North Carolina)* – Internal and international migration surveys

15:45 – 16:00   Break

16:00 – 18:00   **4. Demographic evidence from civil registration systems, health information systems and other administrative data sources, including insights provided by health and demographic surveillance sites**

- Moderator: *Tom Moultrie (University of Cape Town)*

- *Adriana Skenderi (Statistics Division/DESA)* – Civil Registration and Vital Statistics (CRVS)

- *Carla AbouZahr (Independent Consultant)* – Health statistics and CRVS

- *Michelle Weinberger (Avenir Health)* – Administrative data: Example of service statistics for family planning

- *Frencel Tingga (Commission on Filipinos Overseas)* – Administrative data: Example of estimation of the stock of overseas migrant workers

- *Samuel Clark (University of Washington)* – Health and demographic surveillance systems

Tuesday, 6 October 2015

09:00 – 10:45   **5. Complementing traditional data sources with alternative acquisition, analytic and visualization approaches to ensure better utilization of data for sustainable development**

- *Alejandro M. Blei (New York University)* - Monitoring global urban expansion using remote sensing and a network of city-based researchers

- o *Manuel Garcia Herranz (United Nations Children Fund)* - uReport and mTrac experience

- o *Robert Kirkpatrick (United Nations Global Pulse)* - UN Global Pulse experience with the use of big data for population-related issues

- o *Emmanuel Letouzé (Data-Pop Alliance)* - New data sources for population sciences

10:45 – 11:00   Break

11:00 – 12:45   **6. Data disaggregation and utilization challenges: Prospects for the integration of multiple data sources to produce estimates for different geographical scales and time periods**

- o Moderator: *Thomas Le Grand (Université de Montréal)*

- o *Steven Ruggles (University of Minnesota)* – Experience of IPUMS, iDHS and TerraPopulus

- o *Alex de Sherbinin (Columbia University)* – Experience of CIESIN with GPW, GRUMP and other global socio-economic data products

- o *Andrew Tatem (University of Southampton)* – Experience of WorldPop in mapping population numbers, demographics and behaviours

- o *Mark Montgomery (Population Council)* – Experience of analytical use of multiple data sources

12:45 – 14:00   Lunch

14:00 – 15:45   **7. Role of empirical observations and model-based estimates with uncertainty for global and country-level monitoring**

- o Moderator: *Ann Biddlecom (Population Division/DESA)*

- o *Colin Mathers (World Health Organization)* – Experience of maternal mortality estimates and global health estimates

- o *Danzhen You (United Nations Children Fund)* – Experience of child mortality estimates

- o *Adrian Raftery (University of Washington)* – Measuring and communicating uncertainty for population and health estimates

15:45 – 16:00   Break

16:00 – 17:00   **8. Summary and conclusions**

- o Summary of key points from each session

- o Discussion

- o Concluding remarks: *John Wilmoth (Population Division/DESA)*

Annex 2

LIST OF PARTICIPANTS

INVITED EXPERTS, MODERATORS AND RAPPORTEURS

Carla AbouZahr
Independent Consultant
Geneva, Switzerland

Susana Adamo
Research Scientist, Adjunct assistant professor
CIESIN
The Earth Institute, Columbia University
Palisades, New York

William Axinn
Professor
Population Studies Center
University of Michigan
Ann Arbor, Michigan

Ann Biddlecom
Chief
Fertility and Family Planning Section
Population Division, United Nations Department of
   Economic and Social Affairs
New York, New York

Richard Bilsborrow
Professor
Carolina Population Center
University of North Carolina
Chapel Hill, North Carolina

Alejandro Blei
Research Scholar
Marron Institute of Urban Management
New York University
New York, New York

Chandrasekaran Chandramouli
Registrar General & Census Commissioner
Office of the Registrar General and Census
   Commissioner
Ministry of Home Affairs
New Delhi, India

Samuel Clark
Associate Professor
University of Washington
Seattle, Washington

Alex de Sherbinin
Associate Director
CIESIN
The Earth Institute, Columbia University
Palisades, New York

Neil Fantom
Manager
Development Data Group
World Bank
Washington DC

Manuel García-Herranz
Research Scientist
Innovation Unit
UNICEF
New York, New York

Patrick Gerland
Chief
Mortality Section
Population Division United Nations Department of
   Economic and Social Affairs
New York, New York

Benoit Kalasa
Director
Technical Division
United Nations Population Fund (UNFPA)
New York, New York

Vladimíra Kantorová
Population Affairs Officer
Population Data Unit
Population Division, United Nations Department of
   Economic and Social Affairs
New York, New York

H.E. Dr. Mwaba Patricia Kasese-Bota
Chairperson of the Bureau of the Commission on
   Population and Development, 49th Session
(Zambia) - African Group

Robert Kirkpatrick
Director
United Nations Global Pulse
New York, New York

Sunita Kishor
Director
Demographic and Health Surveys (DHS) Program
ICF International
Washington DC

Thomas LeGrand
Professor
Department of Demography
Université de Montréal
Montreal, Canada

Emmanuel Letouzé
Director
Data-Pop Alliance
New York, New York

Colin Mathers
Coordinator
Mortality and Burden of Disease Unit
World Health Organization (WHO)
Geneva, Switzerland

Margaret Mbogoni
Senior statistician
Demographic and Social Statistics Branch
Statistics Division, United Nations Department of
    Economic and Social Affairs
New York, New York

Mark Montgomery
Professor, Senior Associate
Population Council
New York, New York

Tom Moultrie
Professor, Director
Centre for Actuarial Research
University of Cape Town
Cape Town, South Africa

Andrew Mukulu
Statistician
Deputy National Census Coordinator
Uganda Bureau of Statistics (UBOS)
Kampala, Uganda

Keiko Osaki-Tomita
Assistant Director
Demographic and Social Statistics Branch
Statistics Division, United Nations Department of
    Economic and Social Affairs
New York, New York

Francesca Perucci
Assistant Director
Statistical Services Branch
Statistics Division, United Nations Department of
    Economic and Social Affairs
New York, New York

Adrian Raftery
Professor
University of Washington
Seattle, Washington

Steven Ruggles
Professor, Director
Minnesota Population Center
University of Minnesota
Saint Paul, Minnesota

Adriana Skenderi
Statistician
Demographic Statistics Section,
Statistics Division, United Nations Department of
    Economic and Social Affairs
New York, New York

Andrew Tatem
Professor, Director
WorldPop Project
University of Southampton
Southampton, United Kingdom

Frencel Tingga
Senior Emigrant Services Officer
Commission on Filipinos Overseas
Manila, Philippines

Amy Tsui
Professor
Johns Hopkins Bloomberg School of Public Health
Baltimore, Maryland

Turgay Unalan
Household Survey Specialist
UNICEF
New York, New York

Michelle Weinberger
Senior Associate
Avenir Health
Glastonbury, Connecticut

John Wilmoth
Director
Population Division, United Nations Department of
    Economic and Social Affairs
New York, New York

Danzhen You
Statistics and Monitoring Specialist
UNICEF
New York, New York

UNITED NATIONS SECRETARIAT

Population Division / United Nations Department of Economic and Social Affairs, New York

Kirill Andreev
Population Affairs Officer
Fertility and Family Planning Section

Lina Bassarsky
Population Affairs Officer
Estimates and Projections Section

Jorge Bravo
Chief
Population and Development Section

Julia Ferre
Population Affairs Officer
Population Policy Section

Victor Gaigbe-Togbe
Population Affairs Officer
Mortality Section

Sara Hertog
Population Affairs Officer
Population and Development Section

Stephen Kisambira
Population Affairs Officer
Fertility and Family Planning Section

Yumiko Kamiya
Population Affairs Officer
Population and Development Section

Nicole Lai
Population Affairs Officer
Population and Development Section

Nan Li
Population Affairs Officer
Mortality Section

Clare Menozzi
Population Affairs Officer
Migration Section

Cheryl Sawyer
Population Affairs Officer
Estimates and Projections Section

Matthew Stockton
Information Systems Assistant
Mortality Section

Division for Social Policy and Development / United Nations Department of Economic and Social Affairs, New York

Karoline Schmid
Inter-Regional Adviser on social policies and development

Statistics Division / United Nations Department of Economic and Social Affairs, New York

Meryem Demirci
Interregional adviser on population and Housing censuses
Demographic Statistics Section

Serrano Lombillo Armando
Statistician
Demographic Statistics Section

Other

Yacob Zewoldi
Independent Consultant

Hania Zlotnik
Independent Consultant

UNITED NATIONS SPECIALIZED AGENCIES

United Nations Children's Fund (UNICEF)

Jan Beise
Consultant
New York, New York

Lucia Hug
Consultant
New York, New York

United Nations Population Fund (UNFPA)

Sabrina Juran
Technical Specialist, Data and Research
New York, New York

Ann Pawliczko
Senior Technical Adviser, Data and Research
New York, New York

Clara Rodriguez Ribas
Special Assistant to the Technical Division Director
New York, New York

World Bank

Umar Serajuddin
Senior Economist-Statistician
Development Data Group
Washington DC

Emi Suzuki
Demographer
Development Data Group
Washington DC

OTHER PARTICIPANTS

Andrea Verhulst
Demographer
University of Wisconsin-Madison
Madison, Wisconsin

Saara Romu
Senior Project Officer
Bill & Melinda Gates Foundation
Seattle, Washington

Vincent Seaman
Senior Programme Officer
Bill & Melinda Gates Foundation
Seattle, Washington

MEMBER STATES

Philippines

Angel L. Borja, Jr
Philippine Overseas Labor Office-Washington

Adeline de Castro
Department of Labor and Employment (DOLE), Philippines

Josie B. Perez
Philippine Statistics Authority

Lolito Tacardon
National Capital Region of the Commission on Population (POPCOM), Philippines

Zambia

Theresa L. Chand
Zambia Mission to the United Nations
New York, New York