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Department of Economic and Social Affairs
Population Division

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



United Nations
New York, 2015

The Department of Economic and Social Affairs of the United Nations Secretariat is a vital interface between global policies in the economic, social and environmental spheres and national action. The Department works in three main interlinked areas: (i

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 centered 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 goals, it is essential that the new monitoring framework goes beyond global and national averages and disaggregate 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

- Technology innovation and analysis (e.g., data innovation networks, systems for global data sharing, filling research gaps);
- Capacity and resources (e.g., funding streams, investment needs, private sector participation, capacity development and global data literacy); and
- 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 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/>

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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 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 strengths that UNFPA had in censuses. UNFPA was the

with the final report and widely disseminated on 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

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 data were expensive and difficult to collect posed unique sampling design complexities, including th

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 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. Countries could and should easily collect data to account for both birth place of people and recent migrants to their basic characteristics. Labour force surveys conducted in most countries at frequent intervals would 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

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 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 health 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 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

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

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 to 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 Mei (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 (U

online traces; web content from social media, crowdsourced 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 initiating 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 sampling biases 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 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 AT DIFFERENT GEOGRAPHICAL SCALES AND TIME PERIODS

In this session, panellists presented their experience 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 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

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 access, as well as building materials, educational attainment, literacy, school enrolment, disabilities, economic status, 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-Interna

Mr. Tatem (University of Southampton) presented the WorldPop perspective on mapping population numbers, demographics and behaviors. 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 in 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. It has been 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 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 improvement. Data could be accessed through the data portal on the WorldPop website and in the GoogleEarth engine.

In contrast to the top-down approaches of 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. An additional effort at malaria control in northern Namibia entailed uniform spraying of DDT across geographies, 6 Tw [,

The last panellist, Mr. Montgomery (Poplar Council) presented an overview of the

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 for 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 shock in childhood that seemed to place them on a disadvantaged path well into adulthood. Mr. Bilson 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 for the purposes of data collection and had no other meaning. Mr. Montgomery offered that while high-resolution data may seem too small to be useful, the small area units could be clustered 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, provided information as to their characteristics and thus researchers should keep in mind the needs of the stakeholder. Participants also warned that, with respect to household surveys, there was a potential 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

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

In this session, panellists presented on experience 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 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, and 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 GHA 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 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 highly sensitive. Difficulties arose due to sparse data, underreporting of events even in countries with good data, and definition 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 measuring maternal mortality. A Bayesian estimation method was used to account for errors in 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.

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 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 appropriate to release estimates, for example of maternal

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 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 collaborative processes to ensure comp

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

Monday, 5 October 2015

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*

- *Manuel Garcia Herranz (United Nations Children Fund)* - uReport and mTrac experience
- *Robert Kirkpatrick (United Nations Global Pulse)* - UN Global Pulse experience with the use of big data for population-related issues
- *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

- Moderator: *Thomas Le Grand (Université de Montréal)*
- *Steven Ruggles (University of Minnesota)* – Experience of IPUMS, iDHS and TerraPopulus
- *Alex de Sherbinin (Columbia University)* – Experience of CIESIN with GPW, GRUMP and other global socio-economic data products
- *Andrew Tatem (University of Southampton)* – Experience of WorldPop in mapping population numbers, demographics and behaviours
- *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

- Moderator: *Ann Biddlecom (Population Division/DESA)*
- *Colin Mathers (World Health Organization)* – Experience of maternal mortality estimates and global health estimates
- *Danzhen You (United Nations Children Fund)* – Experience of child mortality estimates
- *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

- Summary of key points from each session
- Discussion
- Concluding remarks *John Wilmoth (Population Division/DESA)*

Annex 2

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