Economic & Social Affairs

UNITED NATIONS EXPERT GROUP MEETING ON CHANGING POPULATION AGE STRUCTURES AND SUSTAINABLE DEVELOPMENT

New York, 13-14 October 2016

Report of the Meeting

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ESA/P/WP/247

Department of Economic and Social Affairs
Population Division

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DESA

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The Population Division of the Department of Economic and Social Affairs provides the international community with timely and accessible population data and analysis of population trends and development outcomes for all countries and areas of the world. To this end, the Division undertakes regular studies of population size and characteristics and of all three components of population change (fertility, mortality and migration). Founded in 1946, the Population Division provides substantive support on population and development issues to the United Nations General Assembly, the Economic and Social Council and the Commission on Population and Development. It also leads or participates in various interagency coordination mechanisms of the United Nations system. The work of the Division also contributes to strengthening the capacity of Member States to monitor population trends and to address current and emerging population issues.

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This publication has been issued without formal editing.

Suggested citation:

United Nations, Department of Economic and Social Affairs, Population Division (2017). *United Nations Expert Group Meeting on Changing Population Age Structures and Sustainable Development*. No. ESA/P/WP/247.

ESA/P/WP/247

Printed in the United Nations, New York

1. BACKGROUND AND SCOPE OF MEETING

The world's population is experiencing an historic shift in its age distribution, from the mostly young age structures of the past, towards larger proportions of middle-aged and older persons in present and future decades. This shift is driven by the demographic transition from high to low levels of both fertility and mortality. In countries that receive a significant number of migrants, the changes in the age structure can also be affected by migration flows. The social and economic consequences of these changes vary greatly across regions and countries, due to considerable diversity in levels of fertility and mortality, and in the speed with which the demographic transition has unfolded or is unfolding in different parts of the world. In consideration of these major global demographic trends and their impacts on development, the Commission on Population and Development decided that the special theme of its 50th session, which will take place in New York from 3 to 7 April 2017, would be "Changing population age structures and sustainable development".

The Programme of Action of the 1994 International Conference on Population and Development (ICPD) recognized the importance of changing age structures for understanding and implementing policies and programmes to achieve the goals specified therein. Subsequently, the World Programme of Action for Youth (1996) and the Madrid International Plan of Action on Ageing (2002) specified internationally agreed commitments to foster the dignity, social integration, participation and improvement of the living conditions of two major population age groups. Changes in the age composition of the population are also highly relevant for attaining the Goals and targets of the 2030 Agenda for Sustainable Development (2015), which, as part of its pledge that "no one will be left behind", includes a number of targets pertaining explicitly to people of all ages, especially in the areas of health, education, decent work, poverty and social protection.

In order to examine the latest evidence regarding the causes and consequences of the changing age distribution of the population, the Population Division of the Department of Economic and Social Affairs (DESA) convened an expert group meeting on "Changing population age structures and sustainable development", held at the United Nations Headquarters in New York on 13-14 October 2016.

The meeting brought together experts from different parts of the world to review the demographic drivers of changing population age structures and to examine the implications of these shifts for government policies regarding health, education, work, social protection and intergenerational support. The experts reviewed research on topics that included: social security in ageing societies; new perspectives on ageing; the demographic and economic constraints to balancing work and family obligations; the links between health, education and fertility trends; and the aggregate economic implications of changing age structures, with explicit attention to the demographic dividend. The experts discussed priorities for policymakers to consider as they anticipate the changing population age structures of the future.

This report summarizes the presentations and ensuing discussions that took place within each substantive session of the meeting 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/25/.

2. SUMMARY OF SESSIONS

A. OPENING OF THE MEETING

The meeting was opened by the Director of the Population Division, Mr. John Wilmoth. After welcoming participants, Mr. Wilmoth explained that the meeting was intended to contribute to the substantive preparations for the fiftieth session of the Commission on Population and Development, which was to take place from 3 to 7 April 2017. He noted that by decision of Member States, the upcoming session of the Commission would have as its special theme "Changing population age structures and sustainable development".

Mr. Wilmoth stressed that major shifts in population age distributions constituted a global demographic trend of fundamental importance to sustainable development. Changes in the population age structure were critically related to development issues as addressed in the Programme of Action of the 1994 Cairo conference and in the 2030 Agenda for Sustainable Development, which was adopted by the United Nations General Assembly in September 2015. The 2030 Agenda includes the Sustainable Development Goals and targets, which span a wide range of social, economic and environmental aspects of development.

Mr. Wilmoth reminded participants that the demographic transition from high to low levels of fertility and mortality had resulted in fundamental changes in the age structure of human populations, which initially became younger and then eventually much older. The initial tendency for populations to become younger was attributable to the reduction of mortality, especially at young ages, which resulted in large increases in the number of surviving children and young people. The decline in fertility eventually brought an end to the increasing numbers of children and initiated a long-term process of population ageing, which was characterized by a gradual shift in the population age distribution from younger to older ages.

Mr. Wilmoth stated that fundamental changes in the population age structure were directly related to a number of Goals and targets of the 2030 Agenda, especially in the areas of health, education, gender equality, productive employment and decent work, poverty eradication and social protection, among others. Because of their interaction with the social, economic and environmental aspects of sustainable development, demographic trends—and policy responses to those trends—would affect the ability of countries and of the world as a whole to achieve the Sustainable Development Goals. Conversely, progress in meeting the Goals and targets in some key sectors, such as education and health, would influence demographic trends, including fertility, which was the primary driver of changes in the population age distribution.

Mr. Wilmoth noted that an important feature of the 2030 Agenda was the pledge by Member States that no one would be left behind. He said that keeping this pledge would require that governments and other actors give priority to addressing the situations of disadvantaged and vulnerable groups. Some members of society were vulnerable and required protection and assistance by virtue of their age, in particular children, youth and older persons. Adapting social protection systems to fundamental changes in the size of different age groups, in a manner that would ensure the financial sustainability of those systems over the long term, was one of the major challenges faced by countries as a consequence of the demographic transition.

Foreshadowing the messages of a later presentation on global demographic trends, Mr. Wilmoth described trends in the population age structure of the world, noting that it had evolved significantly over the past half-century. In 1950, more than half of the population consisted of children and youth under the

age of 25 years and older persons aged 60 years or over represented less than 6 per cent of the global population. By 2030—the time horizon for the achievement of the Sustainable Development Goals (SDGs)—the proportion of children and youth was projected to fall to less than 40 per cent of the world's population and the share of older persons was projected to grow to more than 16 per cent of the global total.

Mr. Wilmoth noted the considerable heterogeneity across countries and regions in the timing and speed with which the demographic transition was unfolding. As a result, the social and economic consequences of changing population age structures also varied greatly across countries and regions. He expressed his expectation that the meeting would consider a range of situations and experiences. Presentations and discussion would address the situation of countries and regions where the demographic transition started only recently and where the most pressing challenges pertained to a large and growing population of children and youth, as well the situation in other parts of the world where fertility had been below the replacement level for decades and the progressive ageing of the population presented an entirely different set of challenges.

Mr. Wilmoth expressed his hope that participants would find the meeting informative and stimulating. He also expressed his appreciation for the richness that he anticipated the experts would bring to the discussions, in particular by highlighting the situations and experiences of countries and regions where they had expertise. He reiterated that all of these elements would be taken into consideration in the preparation of the report of the Secretary-General on changing population age structures and sustainable development, which would inform the discussion of these topics by Member States and other stakeholders during the next session of the Commission on Population and Development in 2017.

In closing, Mr. Wilmoth thanked the participants in advance for their contributions to an informed discussion of changing population age structures and sustainable development.

Mr. Jorge Bravo, Chief of the Demographic Analysis Branch of the Population Division, reviewed the organization of work of the meeting before yielding the floor to Ms. Mun Sim Lai, Population Affairs Officer in the Population Division, who presented a global overview of changing population age structures and their relation to sustainable development. She noted that in 2015, children and youth (aged 0-24 years) accounted for 42 per cent of the world's population, while those in the working ages (25-64 years) made up 50 per cent. By 2050, the share of children and youth was projected to decline to 35 per cent and the share of working age to remain essentially the same. Between 2015 and 2050 the proportion of older persons (aged 65 years or over) globally was projected to double, from 8 per cent to 16 per cent.

Ms. Lai explained that large differences in population age structure were observed across regions and she used the examples of Africa and Europe to illustrate the extreme ends of the spectrum. The population of Africa was relatively young, with children and youth accounting for around 60 per cent of the population in 2015; even though that share was projected to decline, by 2050 still half of the population was projected to be younger than 25 years. By contrast, children and youth accounted for only one third of the population of Europe in 2015, and that share was projected to remain stable through 2050. Ms. Lai pointed out that population ageing was most advanced in Europe compared to other regions, and that by 2050 the share of older persons in Europe would become nearly equal to the share of children and youth.

Ms. Lai emphasized that fertility decline was the most important driver of population ageing. Mortality decline was less influential on the population age structure because it tended to occur across the entire age range and, thus, to influence the size of all age groups. Reductions in fertility rates caused a decline in the number of births, gradually shifting the balance from younger people towards older people in the population. Ms. Lai explained that differences across countries and regions in the timing and pace of fertility decline produced the differences in population age structure mentioned earlier. In 2015, 66

countries had total fertility rates greater than 3.2 children per woman and 42 of those were located in sub-Saharan Africa. Around 70 countries had very low levels of fertility in 2015, with total fertility below 2.0 children per woman; countries in Asia and in Latin America and the Caribbean were increasingly joining that group.

Ms. Lai pointed to the association between regional differences in total fertility and those in contraceptive use and the unmet need for contraception. She noted that worldwide, about 64 per cent of women who were married or in a union used contraceptives. However, the prevalence of contraceptive use in sub-Saharan Africa was only 28 per cent. Across other regions, contraceptive prevalence ranged from 59 per cent in Oceania to 75 per cent in Northern America. Ms. Lai noted that the unmet need for contraception is defined as the percentage of women of reproductive age, either married or in a union, who want to stop or delay childbearing but are not using any method of contraception. At the world level in 2015, 1 in 10 married or in-union women had an unmet need for contraception. The level of unmet need was lowest where contraceptive use was most prevalent and the level of fertility was low. In sub-Saharan Africa the level of unmet need was twice the world average. Unmet need was especially high in Western Africa, Middle Africa and Eastern Africa.

Ms. Lai also reviewed age patterns of mortality, demonstrating how improvements in survival at different ages had contributed to gains in life expectancy at birth. She noted that between 1995-2000 and 2010-2015 life expectancy at birth in Africa had increased by 7.3 years, the largest increase among the six major regions of the world. Half of the total increase in the African life expectancy was due to improvements in survival before age five, while increased survival above age 60 years contributed only about 0.6 years, or 9 per cent, to the total gain in life expectancy in the region. By contrast, in Northern America, improvements in survival above age 60 years accounted for 71 per cent of the total gain of 2.4 years in life expectancy at birth over the same period. In both Europe and Oceania, around half of the total improvement in life expectancy was due to improved survival above age 60.

Considering the question of whether it would be possible, or even desirable, to slow or reverse the process of population ageing, Ms. Lai emphasized that the shift toward older ages was in many ways a demographic success story, associated with economic and social development. At the same time, she acknowledged that population ageing and a sustained pattern of very low levels of fertility could pose challenges, for example, with respect to pension systems or social protection mechanisms that aim to improve the welfare of older persons.

Ms. Lai said that international immigration could sometimes slow the ageing process since immigrants tended to be of working age, but that this effect might be temporary, since migrants also grow older. She presented data from *World Population Policies 2015*, a forthcoming report of the Population Division that compares government policies on international migration—limited to regular or documented migration—to views on population ageing. Governments that viewed ageing as a major concern were more likely to want to maintain or raise the level of international migration. Ms. Lai noted, however, that the relationship between the two indicators was not very strong.

Turning to the associations between population ageing and sustainable development, Ms. Lai reminded participants that the 2030 Agenda and its 17 Sustainable Development Goals (SDGs) were built around three core pillars: economic growth, social inclusion and environmental protection. She said that demographic changes, including shifts in age structure, could affect development trajectories.

Data from the National Transfer Accounts (NTA) project, obtained according to the methods outlined in the *National Transfer Accounts Manual*, published by the United Nations, illustrated how production and consumption balances change with age over the course of the economic life cycle. Ms. Lai presented figures showing that children and older persons tended to consume more than they produced on average,

so that a "life cycle deficit" was observed at these ages, with a "life cycle surplus" during the working ages. She showed how aggregate age profiles of consumption and production differed across countries that were at different stages of the demographic transition, using the examples of Germany, where the population ageing process was more advanced, and the Philippines, with a comparatively young population age structure. In the Philippines, the deficit of consumption over production in the childhood ages was nearly 15 times larger than the old-age deficit, whereas in Germany, the old-age deficit was 50 per cent larger than the child deficit. Ms. Lai attributed the different deficit patterns of the two countries mainly to differences in the age distribution of the two populations.

Ms. Lai described the two broad categories of economic mechanisms for balancing periods of surplus and deficit over the economic life cycle: transfers and asset-based reallocations. She explained that asset-based reallocations involved both asset income and savings. When individuals accumulated pension funds or personal savings during their working years and relied on asset income during their retirement years, they were resorting to asset-based reallocations. Youth who borrowed to finance their education were also relying on a type of asset-based reallocation.

Examining inter-age flows of resources arising from sharing and saving patterns in the Philippines and Germany, Ms. Lai identified major differences between the two countries in terms of how the life cycle deficits were funded. In the Philippines, the life cycle deficit at young ages was funded primarily by private transfers, while the old-age deficit was funded mostly by asset-based reallocations. The public sector played only a minor role in redistributing resources from the working ages to support the costs of education and healthcare for young people in the Philippines. By contrast, in Germany, public transfers were instrumental in funding the deficits at both younger and older ages. Ms. Lai explained that over the past century in Germany, the government had assumed an increasing responsibility for functions once absorbed by families. As a result, public transfers had grown larger for the older population compared to those for the young. Ms. Lai stressed that a balanced approach to old-age support, relying not only on public transfers but also on asset-based transfers and labour market activity at older ages, could alleviate some of the fiscal pressures associated with population ageing.

Ms. Lai concluded with a set of questions that she hoped would be addressed over the course of the expert meeting, including: how could a decline in the fertility level be initiated in order to boost economic growth in countries where the expected decline in fertility had been delayed? How could job creation be accelerated in economies experiencing or anticipating a youth bulge in order to take advantage of the demographic dividend? How could the collective welfare and a desirable pattern of economic growth best be maintained in the context of rapid population ageing? What were the implications of changes in the population age structure for gender and social inequality, intergenerational equity and behavioural change, including with respect to living arrangements and personal health?

B. Social security in ageing societies

This session included three presentations addressing issues related to population ageing and social security in Europe, Latin America and Asia, respectively. The session was moderated by Mr. Vinicius Pinheiro, Special Representative to the United Nations and Director of the International Labour Organization's Office for the United Nations. Mr. Pinheiro opened the session by noting that fast-changing demographic profiles present enormous challenges to labour markets and social security. While the situation varied across the world's regions, he characterized the challenges ahead as a "time bomb" created both by threats to the sustainability of social security systems and by the low pension coverage that persisted in some countries that were already experiencing rapid ageing. He noted that some of the SDG targets addressed issues related to population ageing and that the targets aimed at social protection floors were especially important.

Ms. Agnieszka Chlon-Dominczak, Assistant Professor at the Warsaw School of Economics, delivered the first presentation of the session, "Population ageing and social security in Europe". She said that Europe was the continent where population ageing had progressed the farthest. However, she emphasized that ageing meant different things in different contexts, depending on characteristics of the population and its health, among other factors. One policy factor that was common across Europe was generally high pension coverage, but Ms. Chlon-Dominczak highlighted gender differences in pension rights as an important issue in coverage across Europe. Rather than being a "time bomb", she noted that ageing was a gradual process that took place over many years, requiring researchers and policy makers to prepare.

Ms. Chlon-Dominczak explained that the "new demography" of Europe, including population ageing, was driven by very low levels of fertility accompanied by continuing increases in life expectancy. This pattern had characterized populations in the region over the post-war period. According to population projections by Eurostat, about half of the countries in Europe were expected to experience declines in population size in the coming decades. By contrast, those countries that had managed to maintain somewhat higher levels of fertility would continue to see a modest growth in their populations. The largest population declines were anticipated for the countries of Central and Eastern Europe, where rapid economic changes following the collapse of communism around 1990 resulted in very rapid fertility declines.

Looking at the changes anticipated in the population pyramid representing 28 countries of the European Union combined between 2015 and 2050, Ms. Chlon-Dominczak noted that the size of the working-age population was projected to shrink, the number of children to hold steady and the number of older persons to grow. Over the short run, between 2015 and 2025, within the working-age population, the number of younger working-age people was expected to decline, even though an increase was projected for the working-age population above age 50. Beyond 2025, however, declines were expected across all age categories of the working-age population in Europe. While the vast majority of countries in Europe were expected to face declines in the number of working-age people, there was a small number of exceptions. Due largely to immigration, Luxembourg was not anticipating such a decline and the working-age populations of Norway, Belgium and Sweden were expected to be bolstered by their higher fertility rates. Virtually all countries of Europe were anticipating growth in the number of older persons, with at least a doubling of the older population between 2015 and 2050 projected for several countries.

Ms. Chlon-Dominczak cautioned that the circumstances of economic activity over the life course complicated traditional measures of dependency. She noted that not all older persons were economically inactive, while at the same time, not all working-age people were economically active. Therefore, dependency measures that relied on a criterion of age alone could be misleading. Economic activity at older ages depended on various institutions, including the educational system, the labour market, statutory ages of retirement or pension eligibility, and the sources and levels of support available. Ms. Chlon-Dominczak noted also that levels of intergenerational transfers varied substantially across the countries of Europe.

Ms. Chlon-Dominczak described her participation in AGENTA, the European National Transfer Accounts (NTA) project. She said that one goal of the project was to describe demographic and economic dependency. The data illustrated how dependency measures based only on age could diverge from those that also reflected economic activity. For example, of the European countries examined, demographic dependency was highest in Sweden, but the ratio of inactive to total population was relatively low in Sweden compared to other countries. High labour force participation in Sweden translated into much lower economic dependency. By contrast, even though the population of Hungary was younger, its level of economic inactivity was high, and therefore Hungary had higher levels of economic dependency despite its relatively young population.

Ms. Chlon-Dominczak then examined the evidence on how European countries were adjusting to population ageing. She analysed the association between total public expenditures and demographic trends. Statistically significant relationships between population ageing and public expenditure adjustments were observed, but the direction of the association varied across countries. In some countries, the level of expenditure decreased as the population aged, while in others, it grew.

Ms. Chlon-Dominczak explained that because most social security systems in Europe were mandatory pay-as-you-go schemes, the labour force indeed bore the cost of supporting them. The costs associated with social security systems varied across countries. Overall, pension costs were 11.2 per cent of gross domestic product (GDP), but ranged from as low as 7.2 per cent in Latvia to as high as 16.2 per cent in Greece. Ms. Chlon-Dominczak said that pension policies were at the heart of the European discussion. There was an open method of coordination between countries where they agreed on goals and indicators to ensure sustainable pensions. Ms. Chlon-Dominczak called participants' attention to a white paper on adequate, safe and sustainable pensions published by the European Commission in 2012. The paper put forth a range of initiatives to address population ageing such as measures to better balance time in work and time in retirement, ensuring the portability of pensions across countries, helping people to save more and ensuring that pension promises were kept. One key recommendation from the Commission was that the retirement age should rise with increases in life expectancy.

Ms. Chlon-Dominczak described the reports from working groups on population ageing and pension adequacy that were being published every three years. The most recent reports projected future pension spending over the next several decades and identified the degree to which that spending increased due to changes in the dependency ratio, changes in benefits and changes in the labour market (for example, people working to older ages). Ms. Chlon-Dominczak said that the report illustrated that pension sustainability would require both increasing the retirement age and reducing benefits to pensioners. In more than half of countries, the projections indicated that there would be a decline in the replacement rate, that is, the level of the pension benefit relative to the wages being replaced by a pension. Ms. Chlon-Dominczak explained that this was due, in part, to the gender dimensions of the labour market. Current pensioners were typically those who started working at age 20 years and retired at age 65 years. Many women currently approaching retirement, however, had experienced delayed entry to the labour market or labour market disruptions, often related to childbearing. As women with fewer years of labour force participation increasingly became pensioners, the gender gap in pensions was projected to widen in most countries.

In conclusion, Ms. Chlon-Dominczak emphasized that population ageing posed significant challenges for the social security systems in Europe and that the design of such systems needed to ensure both sustainability and adequacy of benefits. She said that many countries had introduced reforms aimed at maintaining the solvency of pension systems into the future, such as by increasing the effective pension age and the legal pension age, and by changing benefit formulas. Ms. Chlon-Dominczak said that the policy monitoring tools that existed in Europe encouraged reforms aimed at maintaining stability over the long term and often encouraged longer working lives and postponed retirement, which sometimes had the unintended side-effect of widening the gender gap in pensions since women tended to have fewer years of labour force participation than men. She advocated balanced and forward-looking structural reforms to increase productivity and labour market participation and to reconcile family and working lives.

The second presentation of the session, entitled "Ageing and social security in Latin America", was given by Mr. Rafael Rofman, the World Bank Programme Leader for Education, Health, Social Protection and Labour, and Poverty, covering Argentina, Paraguay and Uruguay. Mr. Rofman summarized the key message of his presentation as follows: short-term political dynamics drive policymaking related to population ageing, leaving little space for a discussion of long-term solutions. He listed the three core topics that characterized considerations of social security: population coverage, which

tended to be much lower in Latin America than in Europe; adequacy, referring to the level of pension benefits; and financial sustainability.

Mr. Rofman described a tendency in Latin America over the past century for policymakers to focus on short-term concerns. While the first pension systems were emerging in the region from the early twentieth century through the 1980s, most of the discussion centred on coverage and adequacy. During the 1980s, however, problems arose both because of population ageing and because of the overall fiscal challenges being faced in many countries. As a result, pension reforms introduced during that period focused mostly on making the systems more fiscally sustainable, rather than on improving their coverage and adequacy. Mr. Rofman explained that during the 2000s, the fiscal situation improved, but pension coverage was perceived as inadequate and therefore policymakers turned their attention back to this issue. During more recent years, the discussion was circling back to adequacy once again. Mr. Rofman gave examples from several countries. In Peru, there were debates about a provision to allow withdrawal of 95 per cent of the pension benefit in cash at the retirement age. In Argentina, adjustments were being made to benefits to improve adequacy. In Chile, major demonstrations had taken place to demand better pensions. In Uruguay, new retirees were finding themselves caught between the old and new social security systems. Brazil was an exception to this pattern since continuing fiscal concerns had kept the main focus on sustainability, rather than on coverage or adequacy. Mr. Rofman explained that the focus of pension reforms seemed to have been driven by political concerns rather than by a specific policy agenda.

Mr. Rofman identified three categories of policy responses to the arithmetic concerns arising from the growing numbers of older persons and increasing dependency ratios. The first category, termed "population parametric reforms", included such policies as increasing the minimum age at retirement, increasing vesting periods, reducing informality, and increasing labour force participation, especially for women. The second category, "financial parametric reforms", hinged on increasing contribution rates, reducing replacement rates and resorting to alternative financing sources. The third category consisted of "structural reforms" such as the introduction of funded pillars with implicit parametric changes and risk transfers from the state to individuals. Mr. Rofman said that this structural reform would fix a fiscal problem by transferring risk, but ultimately would not solve the financial problem facing pension systems.

Mr. Rofman emphasized that each of these short-term solutions fixed a fiscal problem, but were part of a zero-sum game that redistributed burdens and benefits both between and within generations. He offered the example of increasing the retirement age in an effort to maintain current dependency ratios: such an approach would require a retirement age of 85 years by the end of the century, if countries relied on that single reform to ensure the financial solvency of the system. Mr. Rofman said that the real long-term challenge was to expand the supply of goods and services on a per capita basis, which was difficult to accomplish in economies where the population of working age was declining.

Mr. Rofman discussed the recommended strategies for Latin America to accelerate economic growth as its population ages. Chief among them was the increasing investment in physical and human capital, especially education. He noted that gross domestic savings rates were flat in Latin America, similar to the situation of countries of the Organization for Economic Cooperation and Development (OECD) where populations were comparatively older and the favourable age structure associated with the first demographic dividend had already passed. Compared to other regions with similar age structure, the countries of Latin America were behind in terms of savings. Mr. Rofman noted that the expected years of schooling in countries of Latin America were much lower than in OECD countries or in the Republic of Korea. Moreover, the pace of acceleration in expected years of schooling that had occurred in countries of Latin America was much slower than had occurred in China.

Mr. Rofman urged countries of Latin America to increase productivity by adopting new technologies. He also expressed that there was a need for more open economies, but he cautioned that they should not be so open as to introduce labour market problems.

In conclusion, Mr. Rofman posited that there was a need to look beyond traditional contributory pension systems over the long-term. Given that economies had increasing numbers of informal workers, including at the higher end of the income distribution (for example, freelancers), policymakers needed to consider how to ensure the participation of informal workers in social security systems. Mr. Rofman also stressed that a sustained increase in workers' productivity would be critical for the future, particularly once the size of the labour force began to shrink with population ageing. He closed by reiterating that population ageing was a positive development for humanity, but he cautioned that the right institutions were needed to adapt to changes in population age structure. The financing of social protection programmes needed to become less dependent on the changing characteristics of labour markets.

Mr. Rafal Chomik, Senior Research Fellow at the Centre of Excellence in Population Ageing Research at the University of New South Wales, delivered the third presentation of the session, "Population ageing and social security in Asia". Addressing the "time bomb" analogy for population ageing, Mr. Chomik offered an alternative analogy of a "rising tide", which, like ageing, occurred gradually over time and could bring significant challenges. He said that Asia as a region was a good place to examine population ageing since it was home to more older persons than any other region, as well as the world's oldest country, Japan.

Mr. Chomik stressed that population ageing and social security systems varied widely across countries of Asia, and also within countries, such as between urban and rural areas. He said that the growing numbers of older persons created a demographic imperative for social security reform, but that there was also an economic imperative. Countries that had not yet implemented social security systems were facing pressure to do so since delays would have fiscal costs later and result in underinvestment in the human capital of older persons, contributing to their further economic dependency. He pointed out that precautionary savings in Asia, driven by the absence or inadequacy of pensions, could create a global imbalance, and he said that social security systems could prevent such an imbalance by allowing people to save less. Mr. Chomik said that there was also a political imperative for social security reform in Asia and that many people in the developing countries of the region expressed that they wanted more security provided by the government.

In considering social security reforms, Mr. Chomik said that it was important to take into account the needs of older persons with respect to their care, health and income. It was important to focus not only on the scope of social security systems, but also on their coverage and to consider what level of provision was expected from the public sector versus the community or family. He explained that traditionally, Asia had been very family-oriented, but that demographic trends, as well as trends in cohabitation and urbanization meant that families weren't always able to meet the needs of their older members. In many countries of Asia, people tended to rely more on labour markets than on family support or pensions for income in old age, especially in rural areas. After retirement, there tended to be greater reliance on family than on pension schemes for additional support.

Mr. Chomik took note of the varied structures of social security schemes already in place in the region. With respect to social structures aimed at poverty alleviation, Timor Leste and Thailand had universal plans, while several other countries had targeted plans or some mix of targeted plans with universal plans for those at advanced ages. In China, the universal pension was for rural dwellers only. With respect to contributory plans aimed at income replacement, defined benefit plans were the most common, although some countries had defined contribution plans as well. China bundled defined benefit and defined contribution plans together in their social security system. Both Cambodia and Myanmar had

neither a social nor a contributory pension system. There were also systems for civil servants in some countries, but these tended to be costly, not very portable and not equitable.

Mr. Chomik presented a chart showing the percentage of older persons receiving a social pension versus the level of benefit across several countries in Asia. He noted that the benefit level was low in most countries, amounting to less than 15 per cent of GDP per capita. In Hong Kong, special administrative region (SAR) of China, the social pension was often referred to as "fruit money", reflecting the low benefit level. Less than 20 per cent of the populations aged 65 years or over received a social pension in Japan, Mongolia, Malaysia, the Philippines, Viet Nam and India. In Thailand, nearly all older persons received the social pension, but the benefit level was very low. Only Timor Leste had both high coverage and a high benefit level for its social pension.

Mr. Chomik also described contributory pension coverage as low and said that most countries of Asia had seen little change over time in coverage levels. One exception was the Republic of Korea, where contributory pension coverage had increased by more than 50 per cent since the 1990s.

Mr. Chomik explained that there was a growing consensus in the region that social pensions were better than contributory pensions for maintaining the welfare of older persons. In OECD countries, retirees collected pensions for an average of 19 years, but the duration of retirement was much longer in some Asian countries. Like elsewhere, benefits tended to be lower for women than for men, given women's longer life expectancy and other factors.

Mr. Chomik informed participants that health care spending for older persons in Asia tended to be lower than would be expected given the levels of ageing and development. He described that while various health care models existed within the region, many countries were moving towards universal coverage. In China, a new system of rural health care was giving rural dwellers access to urban hospitals. In general, the region had seen a greater focus on hospitals at the expense of primary health care for older persons, which required greater coordination of care for comorbidities, including the non-communicable diseases (NCDs) that were common in old age. Health care indicators were also more focused on interventions for infectious diseases and children's health than on the health issues of older persons. Mr. Chomik said that out-of-pocket costs for health care were relatively high in most Asian countries.

With respect to long-term care, Mr. Chomik said that most of the developed countries of Asia had systems in place, but some countries relied heavily on community schemes. For example, in China, there was a pilot programme of "time banks" where younger older persons looked after older-older persons, eventually growing older and then being looked after themselves. Mr. Chomik stressed that issues around long-term care were a nascent part of public policy across most of Asia.

Mr. Chomik concluded by stressing that while there had been a lot of progress in Asia on issues related to population ageing, wide disparities persisted and overall, the region was not adequately prepared to deal with population ageing. The challenges being faced by the region were often linked to the persistent idea that the family would look after older persons, despite not having the resources. Given increasing life expectancy, the expectations on family were not just with respect to financial support, but also to long-term care. Mr. Chomik added that Asia had an opportunity to learn from the experience of other regions, but too often countries were repeating the policy mistakes made previously by OECD countries when their countries were at a similar point in the ageing process. Lastly, Mr. Chomik underlined that progress was needed both on policies and in the strengthening and coordination of institutions. For example, there was a need to have local governments implement some of the central government's policies with respect to long-term care.

During the discussion that followed the presentations, participants wondered whether in the next 50 years future pensions and habits of retirement would look different from the present. Responding to the notion that contributory systems that relied on the labour market to fund pensions were unsustainable, participants asked about the fiscal and social implications of shifting towards social pensions. Mr. Chomik responded that social pensions were seen as desirable, at least to support the poorest persons, because contributory systems would require increasing levels of subsidies in order to maintain coverage levels. Mr. Rofman expressed concern that in the next 50 years, pensions would look the same as the present. He stressed that pure contributory systems had never worked well in Latin America due to poor coverage. He noted that even Chile, the country with the lowest rate of workforce informality in the region, had significant gaps in the coverage of its pension system. He urged developing a stronger model of social pensions, not targeting the poor only but all citizens. Mr. Rofman suggested that some system of contributions could be implemented for those who wanted to receive more than the minimum pension. Ms. Chlon-Domonczak noted that the European Commission economic processes included indicators of the fiscal sustainability of social protection programmes.

Participants also questioned why savings rates had been so low in Latin America. Mr. Rofman explained that in many countries, increasing incomes were accompanied by large increases in taxes, which lowered saving rates. He said that the gains associated with the demographic dividend were not fully leveraged because they were used mostly to improve the welfare of the current population, rather than to invest in the future.

Some discussion centred on the projected gender gaps in social security in Europe. Ms. Chlon-Dominczak explained that the gaps arose from the way that pensions calculations were tied to lifetime income. Disruptions to women's labour market participation meant that changes to social security systems affected women differently than men. She noted that the European Parliament planned to discuss the pension gender gap during their meeting in December 2016. She said that the issue was garnering attention from both the economic and the legal perspectives. Other priority policy areas in Europe included consideration of how technology might be used to compensate for declines in the labour force, as well as how best to invest in skills, education systems and lifelong learning.

With respect to Mr. Chomik's presentation on Asia, participants wanted to know whether the social stigma associated with old-age care by persons outside the family prevented older persons from seeking the care they needed. Mr. Chomik agreed that such a stigma existed in some places and he said that China was actively seeking to address the issue, given the rapidly growing numbers of older persons whose families did not have the necessary resources to provide their care.

Mr. Pinheiro noted the absence of any presentation on social security in Africa from the session, and invited Mr. Eliya Zulu to comment briefly on the situation in that region. Mr. Zulu informed that the main challenge to developing social security systems in Africa was the weak economic base in the region, owing to high rates of informality in the workforce. He described that only 10-20 per cent of the labour market was comprised of salaried employees. Mr. Zulu said that the policy discussion in Africa was more focused on social protection that allowed people to survive to old age, rather than on social security during old age, with the exceptions of South Africa and Botswana, which had elaborate social security and social protection programmes in place. He noted that existing social protection mechanisms in Africa were funded primarily by donors. Kenya was a country that had substantially increased spending on health, but there were concerns about the sustainability of the increase. Overall in Africa, older persons relied upon family members for care and support. With respect to building human capital through education and advancing the economy, Mr. Zulu said this was high on the agenda in many countries and that some were interested in reforming their curricula to be more responsive to the labour market. However, he noted that the development of such policies remained in the early stages.

C. Demographic and economic constraints to balancing work and family obligations

The first afternoon session considered the demographic and economic constraints to balancing work and family obligations. The session included three expert presentations and was moderated by Ms. Yumiko Kamiya, Population Affairs Officer in the Population Division.

The first speaker, Mr. Albert Esteve, Director of the Centre for Demographic Studies and Assistant Professor at the Autonomous University of Barcelona, presented his work on "Intergenerational co-residence around the world". He noted that the work grew out of his background as a family demographer in Spain and also his experience working at IPUMS[1] International, where in 2000, he was responsible for integrating the first six countries into the international database of census microdata. He noted that since then, 88 countries had been included in the database and agreements had been established with a total of more than 100 countries.

Mr. Esteve described the WorldFam project, which he carried out between 2010 and 2015 with funding from the European Research Council. The project entailed looking at family patterns using microdata from IPUMS, and similar information from European labour force surveys, Demographic and Health Surveys, and Generations and Gender surveys. Mr. Esteve said that he was continuing research into family patterns with the goal of addressing two main questions: 1) How had demographic changes—including the timing and levels of fertility, mortality and nuptiality—affected intergenerational co-residence in the past and what was the likely impact of such changes in the future?; and 2) What were the consequences of major economic and social shifts—including with respect to living standards, wage labour, female labour market participation, urbanization, international migration and education—for levels and trends in intergenerational co-residence? He expressed that he was looking forward to collaborating with the United Nations on documenting trends in household composition and living arrangements.

Mr. Esteve identified numerous factors that influenced patterns of intergenerational co-residence. One group of factors included demographic constraints such as the number of surviving family members. Another group constituted demographic choices such as marriage, migration and leaving the parental home. A third group included socioeconomic constraints such as the nature of the economy (agrarian, industrial, etc.) or housing prices, while a fourth category consisted of cultural norms surrounding intergenerational co-residence. Mr. Esteve explained that differences in these factors, which varied across place, time and the life course, were thought to result in the huge variations in patterns of intergenerational co-residence observed across countries. At the same time, he noted that data on the factors that influenced intergenerational co-residence were less readily available than data on the residence patterns themselves.

Mr. Esteve presented estimates of family structure from around the world, using data from 69 countries in 2000. Box plots illustrated the range of living arrangements observed across countries, by five-year age group. For each age group, the box plots indicated substantial variation across countries in the proportion of people residing with parents, with a spouse or with children. While patterns for males and females were similar, older women were less likely to live with a spouse than older men. Notably, there were countries where 60 per cent of women aged 80 years or over were living alone.

Comparing family structures in the 2000s to those observed in the 1980s, Mr. Esteve noted that there was a near-universal trend towards increased co-residence with parents in the central age groups from 20 to 34 years. In turn, young adults in the 2000s were less likely than in the 1980s to reside with a spouse or with children. Mr. Esteve suggested that this trend could have been an effect of delayed home leaving

[1] Integrated Public Use Microdata Series

among young people, but he noted that it could also have been influenced by longer parental survival, which increased the likelihood that parents were still alive. In some countries, older persons were becoming less likely to live with their children, while in others the proportion living with children increased over time. In most countries, the proportion of older women living alone increased over time.

To give participants an illustration of the types of country-specific patterns that he had examined, Mr. Esteve showed results of the living arrangements analysis for men and women aged 25-29 years in selected countries. The results indicated increasing trends towards living with parents in most countries, with especially large increases in some countries, including Indonesia, Mexico and Portugal. Among males aged 75-79 years, the proportion living with children in the 2000s ranged from below 10 per cent in France to close to 70 per cent in Mali.

In conclusion, Mr. Esteve underscored that the availability of census and survey microdata allowed for a very detailed portrait of living arrangements and intergenerational co-residence across countries. Mr. Esteve explained that the next step in his research was to examine international trends in family structure by creating a harmonized typology of families. From there, he planned to investigate the determinants and drivers of those trends. Additional work was needed to select indicators that would be relevant for social policy. Some options included measures related to single motherhood, older persons living alone in low-income countries and children living separately from their parents.

Ms. Simone Wajnman, Professor of Demography at the Federal University of Minas Gerais, presented her work on the "Demographic dynamics of family and work in Brazil". She began by explaining why Brazil was an interesting case for studying the association between demographic change and work-family balance. First, the population age structure in Brazil was changing rapidly, driven by the decline in the total fertility rate from around 6 children per woman in 1970 to around 1.7 in 2016. Second, Brazil had experienced slow gains in productivity and economic growth had instead hinged on the rising supply of labour. Third, women's labour force participation was increasing rapidly, even as the labour force participation of males declined. Fourth, Ms. Wajnman identified a "machismo paradox" in Brazil, wherein women played a large role in the economy, but still had a very traditional division of domestic work. She expressed that this dynamic constrained development in Brazil.

Ms. Wajnman illustrated the potential for a first demographic dividend in Brazil by showing that during every decade between 1970 and 2010, the working-age population grew at a faster rate than the total population. In 1970-1980, for example, Brazil's working-age population grew at an average annual rate of 3.1 per cent, compared to 2.4 per cent growth of the total population. More recently, in 2000-2010, the working-age population grew at an average annual rate of 1.6 per cent, compared to 1.2 per cent for the total population. However, Ms. Wajnman cautioned that demographic trends alone were not sufficient to understand the impact of changing age structures on the economy. She explained that this was because the size of the active labour force depended also on the rates of labour force participation of specific demographic groups. Women's labour force participation in Brazil had grown from around 10 per cent in 1950 to close to 20 per cent in 2010, while men's labour force participation had declined from above 80 per cent in 1950 to below 70 per cent in 2010.

Ms. Wajnman described a "gender bonus" that occurred when the female labour force grew faster than the total labour force. Data on labour force participation in Brazil indicated a gender bonus across all decades between 1970 and 2010. For example, from 1970 to 1980, the female labour force grew at an average annual rate of 6.6 per cent, compared to 3.6 per cent for the total labour force. From 2000 to 2010, the female labour force grew by 2.8 per cent, compared to 1.9 per cent for the total labour force.

Ms. Wajnman then pointed out that women's labour force participation varied substantially according to the level of educational attainment. Among women with low levels of education, the labour force participation rate was below 50 per cent in the prime working ages, whereas more than 80 per cent of women with the highest levels of education were active in the labour force. Notably, the labour force participation of the most educated women in Brazil was similar to that in developed countries, indicating that there was not much potential for increasing it further.

Using an age-period-cohort method to project labour force size, Ms. Wajnman demonstrated that future growth of the female labour force would come from the changing composition of the population by level of education. She referred to this effect as the "education bonus". Ms. Wajnman noted that because population growth had slowed, Brazil's window of the demographic dividend was coming to a close and that projections indicated that by the 2030s, the growth of the working-age population would be slower than that of the total population. Moreover, projections showed the working-age population contracting in size between 2032 and 2042. However, the projections indicated that the gender bonus plus the education bonus would persist for ten years longer than the demographic bonus, if the latter is understood strictly in relation to changes in the population age structure.

Ms. Wajnman then turned the discussion to Brazilian women's responsibilities for household labour as a barrier to their increasing participation in the labour force. She noted that while women shared financial responsibilities with men, the limited data available on time use in Brazil indicated that women did most of the housework. One way to understand the impact of women's household responsibilities on their labour force participation was through logistic regression of labour force participation on family status, specifically, whether living with a spouse/partner or children. Results indicated that women experienced a labour market participation "penalty" from having a spouse or child, while men experienced a labour market participation "premium" associated with being married or having children. Specifically, women with a spouse or partner were 66 per cent less likely to be active in the labour force than their single peers, while men with a spouse or partner were 85 per cent more likely to be active in the labour force than their single peers. Having a pre-school aged child reduced women's labour force participation by 40 per cent, and increased that of men by 25 per cent. Separate logistic regressions of job quality (having a precarious job, part-time job or being self-employed) on family status provided further evidence of a penalty associated with marriage and children for women and, in general, a premium for men. Ms. Wajnman then presented her results of a Heckman selection model to measure the effect of family status on hourly wages. For women in Brazil, being married or having children was associated with lower hourly wages, while for men marriage and children tended to have a positive effect.

Ms. Wajnman then turned to examine the effect of family status on the housework carried out by men and women using a 2014 survey in Brazil in which respondents were asked how many hours they spent on housework each week. Among persons with no spouse/partner or children, women spent an average 6 more hours per week on housework compared to men (19 hours for women compared to 13 hours for men). Data for persons without children indicated that marriage added an average 5 hours to women's weekly housework (from 19 hours to 24 hours), while marriage reduced men's average housework burden by 3 hours (from 13 hours to 10 hours). Women with a spouse and a child performed an additional 5 hours of housework on average than married women without children (29 hours total), while men with a spouse and a child on average did no more housework than married men without children (10 hours total). Lastly, Ms. Wajnman identified a "single-motherhood premium" wherein women with a child but no spouse performed 6 fewer hours of housework each week compared to women with a spouse and a child (23 hours compared to 29 hours). She suggested that single mothers may have benefitted from the presence of another caregiver in the household, typically the woman's mother.

Ms. Wajnman described an "incomplete revolution" of gender roles in Brazil. The first stage of the revolution was characterized by an influx of women to the labour market, which destabilized traditional breadwinner/homemaker family arrangements, as well as increased rates of divorce and cohabitation and reduced levels of fertility. The second stage was characterized by the development of more equal partnerships of women and men in which men took on greater responsibility for domestic work. Ms. Wajnman stressed that Brazil was still in the first stage of the revolution, where the unequal division of labour in the household was constraining women's participation in the labour market.

Ms. Wajnman concluded by reiterating that the gender revolution in Brazil was taking place mostly in the labour market through job opportunities created for women and that the increase in women's labour force participation, historically, had produced changes in family relations. She lamented, however, that job opportunities for women were insufficient and working conditions were still worse for women than for men. Policy measures, such as shared parental leave, public child care, pre-school and elder care, as well as flexible working hours were needed to facilitate career and family balance. Ms. Wajnman closed her presentation by underscoring that Brazil's gender revolution needed to go beyond the labour market in order to manage the consequences of the demographic transition.

The final presentation of this session was given by Ms. Gretchen Donehower, Research Specialist with the Center on the Economics and Demography of Aging at the University of California at Berkeley. She presented her work on "Gender, age and economic activity" from the Counting Women's Work project. She began by noting that from an historical perspective, changing gender roles and changing population age structures were linked in that they were both related to changing levels of fertility. The possibilities for an individual's economic life varied substantially depending on the number and timing of of that individual's children. Ms. Donehower argued that given the future of population ageing, societies could no longer afford to separate people's economic activity along gender lines.

Presenting data from the United States Census Bureau from 1880 to the present, compiled by IPUMS, Ms. Donehower explained that men's labour force participation had been fairly stable at or above 90 per cent. For women, labour force participation increased from less than 20 per cent in 1880 to more than 75 per cent in the 1990s and had since levelled off. The average number of children aged 0-4 years in the household declined since 1880, except for a sizable bump during the post-war baby boom. Notably, there was no change in women's labour force participation associated with the baby boom, but that period did see a reduction in the number of hours women worked.

Ms. Donehower cautioned that maintaining separate economic spheres by gender—for example, by reserving agricultural work for men or childrearing for women—lead to legal discrimination and other unintended consequences of policies, such as when women were forced to leave the labour force upon marriage, for example. Separate economic spheres also led to inaccurate and unfair measurements of economic activity, such as, for example, when the value of a tomato produced by the household was included in GDP, but the value of the work performed to cook the tomato was not.

Using data from the National Transfer Accounts (NTA) project and Counting Women's Work, Ms. Donehower examined gender differences in labour income in Ghana, taking into account differences in labour force participation, hours worked and wages. The results showed large gender disparities: around age 35 years, women's labour income in Ghana was approximately 40 per cent of men's. Other countries, such as India and Senegal also showed large gender disparities in labour income across all ages. Data for South Africa and the United States of America showed gender disparities as well. In general, the gender gaps in labour income were smaller at younger ages when women had not yet started childbearing and because more recent female entrants to the labour force had less of an education gap with their male counterparts than did earlier generations.

Ms. Donehower stressed that there was reason to be optimistic that gender gaps in labour income would close. Charting estimates of the average years of schooling produced by the International Institute for Applied Systems Analysis (IIASA), Ms. Donehower showed that educational attainment was increasing in all regions of the world, while gender gaps in education for those aged 25 to 29 years were decreasing. In 1970, women in Africa had less than half the education of their male peers, but in 2010 the gap had closed to 80 per cent.

Ms. Donehower said that bringing gender equity to the age profile of labour income could help economies to adapt to population ageing. She showed the projected change in the potential support ratio between 2015 and 2050 under two scenarios: one with a constant labour income profile (no change in the gender gap) and the other where the gap between male and female labour income profiles closed by half. Results indicated that such a reduction in the gender gap in labour income could reverse unfavourable trends in the potential support ratio in Argentina, Mexico, the United States of America and Costa Rica. In China, closing the gender gap could slow the decline of the potential support ratio, but not reverse it.

Turning to address the issue of balancing labour force and household responsibilities, Ms. Donehower considered time use data from which age profiles of paid work and household production were estimated. Data from Senegal in 2011 indicated that, men spent no more than a few hours per week on housework on average. Women's time spent in paid work was about half that of men, but they engaged in substantially more housework than men across all ages. Similar data for South Africa also showed large gender differences in market work and household production. While data from the United States of America were closer to parity between men and women, gender disparities were still evident.

Ms. Donehower acknowledged the argument that division of labour is a household decision making strategy that is not necessarily problematic. But she cautioned that research on total time use had proven that there were negative effects to specializing in household production, such as less access to money, as well as constraints on participation in paid work, education or leisure activities. Ms. Donehower advocated an alternative approach to measuring the gendered economy by uniting time use with NTA data into National Time Transfer Accounts (NTTA). This approach entailed measuring time spent producing unpaid care and housework services, valuing that time by the replacement market wage, and then applying NTA methodology to estimate production and consumption by age. Using the example of Mexico in 2005, Ms. Donehower illustrated that once unpaid care and housework services were added to the total economy, the production age profiles of males and females looked much more similar. She said such an exercise could change perceptions of gender and work, as well as dependency. Moreover, a failure to measure the invisible economy missed the enormous costs of children. In the case of Mexico, household production was 22 per cent of GDP, while market labour was 42 per cent of GDP.

Ms. Donehower emphasized that the time costs of people mattered for discussions of population ageing. Lower levels of fertility in the future would free up even more resources than just the money no longer needed to educate increasing numbers of children. A broader perspective additionally considered that women who had fewer children could give more quality time to their children or enjoy greater access to leisure.

Ms. Donehower concluded her presentation with a set of policy recommendations aimed at promoting human rights and realizing gender dividends. She advocated removing barriers to women's full economic participation, including eliminating legal discrimination in wages and access to capital, as well as recognizing, reducing and redistributing unpaid care work and housework. She said specific programmes might include the following: infrastructure investments to reduce the amount of time women spend collecting firewood or water; marketizing some caregiving such as elder care; or redistributing household responsibilities between men and women. She underscored that such policy measures would maximize

returns from all kinds of development investment because they raised productivity. Moreover, Ms. Donehower urged that protecting the human rights of girls and women was the right thing to do.

During the discussion, participants agreed that more attention needed to be paid to the value of women's time. Ms. Donehower said that the estimates produced in the NTTA project were probably underestimating the value of women's time. She said that since traditional metrics only started counting human capital investment once children were enrolled in school, the investments parents made during early childhood went uncounted. Participants noted that some pension systems included credits in an effort to account for women's household production. While higher salaries was one mechanism to encourage women's labour force participation, Ms. Wajnman noted that in Brazil, even women who outearned their husbands spent more time on housework. The notion of a "sandwich generation" whereby working-age adults were caring for both young children and ageing parents at the same time, was also important for understanding people's changing family obligations, although participants noted that data on such trends were scant.

Reacting to Mr. Esteve's presentation on living arrangements, some participants wondered what effect economic recession had had on the likelihood that young adults continued to reside with their parents. Mr. Esteve responded that the recession seemed not to have driven this trend in Spain, since young people were observed to be living with parents whether or not they were employed. Ms. Wajnman added that in Brazil, as well, there was little evidence of a major impact of the recession on young peoples' leaving home. Participants also asked about trends in non-household living arrangements, such as prisons, military facilities, or long-term health care facilities. Mr. Esteve said that there was asymmetry in such living arrangements across countries and that non-household arrangements were not reflected in his dataset. He said that in some cases, large proportions of certain subgroups resided in group arrangements, such as in the Republic Korea, where census data indicated that around 30 per cent of males aged 20-24 were absent from the household population due to military service.

D. NEW PERSPECTIVES ON AGEING

In the final session of the afternoon, three experts delivered presentations on "New perspectives on ageing". The session was moderated by Ms. Rosemary Lane, Senior Social Affairs officer and United Nations Focal Point for Ageing in the Division for Social Policy and Development (DSPD). Ms. Lane opened the session by informing participants that DSPD and the Population Division worked closely together on issues related to population ageing and ensuring the well-being of older persons.

The first presentation of the session was given by Mr. Warren Sanderson, Professor of Economics and History at Stonybrook University, on the topic, "Age structure, mortality and prospective ageing". He began by showing participants a photograph of Stanislaw Kowalski, who at age 105 years was the oldest person ever to have competed in a sanctioned track and field event. A second photograph showed Ernie Andrus, age 93 years, who ran from the West Coast of the United States of America to the East Coast at a pace of five miles per day over three years. A third photograph showed Yuichiro Miura, who at age 80 years was the oldest person to have summited Mount Everest. Mr. Sanderson expressed that it was not surprising that older persons were engaging in more activities since average levels of physical and cognitive condition were improving over time.

Mr. Sanderson presented some of his the work on prospective ageing, which he had conducted in collaboration with Sergei Scherbov of IIASA. He began by noting that most measures of population ageing were based on chronological age. Examples included the old-age dependency ratio and the median age in the population. But Mr. Sanderson asked, should 60-year-old persons in Russia in 1950 be considered as elderly as 60-year-old persons in Sweden in 2050? He argued that they should not and that it was important to consider an alternative perspective.

Mr. Sanderson suggested an alternative approach that conceptualized peoples age based upon their remaining years of life expectancy. He explained that this approach reflected the needs and capacities of older persons and that it could be estimated from the United Nations life tables for all countries from 1950 and projected through 2100. Mr. Sanderson described prospective ages as "life expectancy-equivalent" ages, explaining that people with the same prospective age have the same remaining expected length of life.

Mr. Sanderson examined the implications of using the prospective age for discussions of old-age dependency, the median age of a population, policy studies and economic growth. He presented a prospective old-age dependency ratio (POADR), which was calculated as the number of people older than the old-age threshold (in this example, with a remaining life expectancy of 15 years, although Mr. Sanderson said that this threshold could be adjusted according to the analysts' preference) divided by the number of people between ages 20 years and the old-age threshold. He compared the POADR indicator to the traditional old-age dependency ratio measure for selected countries. Whereas the traditional old-age dependency ratio in the United States of America was projected to increase quickly over the coming decades through 2030, and then rise more slowly through the remainder of the century, there was no increase in the projected POADR after 2040. For Germany, projections indicated a rapidly increasing old-age dependency ratio until 2040 and a slower increase thereafter, but the POADR for Germany was projected to decline after 2040. For Brazil, both the traditional and the prospective old-age dependency ratios were projected to increase through 2100.

Mr. Sanderson explained that the prospective median age was the result of translating the median age of a population into a corresponding prospective age according to the remaining years of life expectancy. In the United States of America, the median age was projected to increase over the coming century, but the prospective median age was projected to decline after 2040. A similar pattern was projected for Germany. Mr. Sanderson elaborated that these declining trends in the prospective median age meant that successive cohorts of older persons had progressively more years ahead of them, a phenomenon with important implications for social policy.

Mr. Sanderson told participants that prospective ageing measures were increasingly being used in policy analysis. He cited the example of the 2015 World Bank report, "Golden Ageing: Prospects for Healthy, Active and Prosperous Ageing in Europe and Central Asia". In addition, a 2014 paper in the Journal of the Economics of Ageing concluded that prospective ageing measures were preferred over traditional ageing measures that relied on chronological age to explore the recent long-run economic growth experienced in European economies.

In conclusion, Mr. Sanderson recommended the use of prospective ageing measures, noting several benefits, namely, that they conceptualized age based on remaining life expectancy and that the measures were available across countries and over a long time series using the life table estimates and projections published by the United Nations.

The second presentation of the session was given by Mr. Amson Sibanda, Senior Social Affairs Officer in the Division for Social Policy and Development, addressing "Intergenerational socio-economic inequalities". Mr. Sibanda said that most of the materials in his presentation were from the United Nations Department of Economic and Social Affairs' (UN DESA) *Report of the World Social Situation 2016*, entitled "Leaving no one behind: The imperative of inclusive development", which was available online and would be launched formally later in October 2016. He said that some materials were also drawn from the 2013 *Report on the World Social Situation*, entitled "Inequality matters".

Mr. Sibanda noted that since a major theme of the 2030 Agenda was to leave no one behind, it was important to identify who was being left behind, and from what. He noted that factors beyond an individual's skill and effort affected access to opportunities, resources and participation in political, civil and cultural life. Examples of such factors included ethnicity, age, disability status, place of residence and gender. Mr. Sibanda said that the degree to which such factors were associated with access depended upon the norms, institutions and policies in place in a country. He also noted that disadvantages experienced by some groups could reinforce one another, such as when lower levels of health and education accompanied higher levels of poverty and unemployment, or diminished participation in political and civic life.

Mr. Sibanda said that inequalities often were rooted in historical circumstances but persisted even after the structural conditions that created them had changed. He gave the example of the long arm of apartheid in shaping current conditions of poverty and inequality in South Africa. Assessments of the degree to which people were left behind in development processes depended on the indicators used to assess progress.

Mr. Sibanda stressed that persistent inequality undermined efforts to reduce poverty, threatened human development, undermined social cohesion and inclusion and could lead to political instability, such as that which occurred during the Arab Spring movement. Recognizing these risks, there was growing global consensus on the need to bridge the divide between the haves and the have-nots.

Turning to discuss recent trends in inequality, Mr. Sibanda observed that there was no universal pattern across regions and countries. While there had been progress over the past decade to reduce economic inequalities and disparities in health and education across countries, the degree of inequality within some countries had risen. He said that between 1990 and 2010 income inequality increased in the majority of developed countries and in some large emerging economies, like China, as well. In almost all countries where inequality had risen, the richest one per cent captured a disproportionate share of the benefits of growth. Some progress was observed in Latin America, where 14 of 20 countries saw reductions in income inequality, and in Africa, where income inequality decreased in 19 of 35 countries.

Mr. Sibanda used some country-level examples to describe the degree of income inequality that persisted across countries. He said that the average income of a resident of Albania or the Russian Federation was lower than that of an individual in the lowest 10 per cent of the income distribution in Sweden. Moreover, a person in the lowest 10 per cent of the income distribution in Sweden earned 200 times more than an individual in the bottom 10 per cent of the income distribution in the Democratic Republic of the Congo.

On the topic of intergenerational mobility, Mr. Sibanda described the concept of intergenerational mobility as the relative role that one's family background plays in determining an individual's attainment in life. He considered the degree of mobility within a country to be an indicator of the degree of opportunity available to all people.

Mr. Sibanda described the intergenerational earnings elasticity (IEE) metric, which was often used to measure intergenerational mobility. It summarises the likelihood that a person will inherit their parents' relative position of income level. The IEE ranged from zero—indicating total mobility, or no relationship between parents' income and child's income – to one, indicating no mobility, or that child's income was wholly predicted by parents' income. In analysing the IEE across countries, Mr. Sibanda showed that values varied widely, ranging from a low of 0.15 (very mobile) in Denmark, to a high of 0.67 (limited mobility) in Peru. In general, countries with lower levels of income inequality tended to be characterized by high levels of intergenerational mobility, while those with the highest levels of income inequality

tended to have the lowest levels of intergenerational mobility. He noted that the association between intergenerational mobility and income inequality was termed the "Great Gatsby Curve".

Considering global trends in educational inequality over the past 50 years, Mr. Sibanda said that there had been some convergence between developed and developing countries, noting that the average years of schooling globally had more than doubled, from 3.12 years in 1950 to 7.9 years in 2010. Within regions, educational inequality had declined as well. In spite of these improvements, persistent gaps in schooling outcomes persisted within many countries, including disparities in educational attainment between urban and rural residents or between ethnic groups.

With respect to health, Mr. Sibanda described trends towards convergence in the life expectancy at birth across regions, which he attributed to improvements in standards of living, nutrition, public hygiene, education and technology. The gap between developed and developing regions in the life expectancy at birth had narrowed form 23 years in 1950-1955 to 10 years in 2005-2010. While most regions had achieved significant declines in child mortality, rates remained high in sub-Saharan Africa and regional gaps in child mortality were significant.

Mr. Sibanda highlighted the prevalence of stunting among children in several countries to illustrate trends in inequality across ethnic groups. Ghana had nearly completely closed the gap between ethnic groups from 1998 to 2014. While Peru had reduced stunting among all ethnic groups, Quechua children remained significantly behind their peers in 2014. Mr. Sibanda also showed the differences in labour force participation by disability status across selected countries. In many countries, the gaps were extremely wide, amounting to 40 percentage points or more.

In conclusion, Mr. Sibanda advocated a universal approach to social policy, which he said was key to inclusive development because it addressed the underlying causes of exclusion and social justice. Moreover, leaving no one behind required targeted measures to address the specific needs and vulnerabilities of excluded groups. Leaving no one behind also required establishing inclusive institutions that could provide all citizens with opportunities to participate in public life on equal terms. Lastly, Mr. Sibanda underscored that the poor would benefit from economic growth and share in the gains from globalization only when growth was sustained, inclusive and equitable.

The final presentation of the first day of the expert group meeting was a pre-recorded video message from Mr. John Beard, Director of the Department of Ageing and Life Course at the World Health Organization (WHO). He shared the position of the WHO on healthy ageing, and described its implications for both policy work and the technical work of the organization. Mr. Beard said he opted not to start his presentation with a description of trends in the proportion of older persons, despite the popularity of this indicator, because, from a policy perspective, he considered it to be a poor indicator of ageing. This was because protecting the human rights of older persons is essential, irrespective of their number of share of the population.

Mr. Beard expressed that most of the demographic indicators of population ageing were fundamentally flawed because they classified people as "old" based solely upon age. To illustrate, he charted the wide range of physical capacities measured among three different cohorts of women at older ages. The range of physical capacities was especially wide at very advanced ages. Policies needed to consider this diversity of capacities and needs among older persons. In addition, Mr. Beard illustrated the association between levels of income and physical capacity. Those with the highest levels of income tended to have higher average levels of physical capacity and their early-life advantages continued over the life course. Conversely, those with the lowest levels of income tended also to have the least physical capacity, even at younger ages, and that disadvantage persisted as they grew older. Mr. Beard urged that policies needed to be designed to overcome these inequities, which tended to build across life.

Mr. Beard said that in the WHO's 2015 *World Report on Ageing and Health* "healthy ageing" was redefined as the process of developing and maintaining the functional ability that enables wellbeing at older ages. He said that one advantage of this definition was that it shifted the focus away from the absence of disease and towards functioning. Mr. Beard noted that this shift had technical implications, including a need to define "functional ability". He explained that functional ability was jointly determined by intrinsic capacity, including physical and mental capacities, and the environment, including factors that could boost functional ability even when intrinsic capacity was diminished. He gave the example of eye glasses as an environmental factor that maintained functional ability in persons with poor eyesight. Mandatory retirement ages were an example of an environmental factor that reduced functional ability by precluding older persons' labour force participation.

To illustrate trends in intrinsic capacity over age, Mr. Beard presented data from Australia. In general, intrinsic capacity showed a tendency to decline over age. He identified three stages marking that decline and highlighted the types of measures that were required to improve functional ability at each stage. During the first stage, when intrinsic capacity is high and stable, it is important to promote healthy lifestyles and treat and cure diseases as they emerge. During the second stage, when intrinsic capacity is declining, it is important to slow or reverse those declines to improve future trajectories of intrinsic capacity. Mr. Beard stressed that the holistic needs of older persons needed to be addressed, rather than focusing on individual diseases. Environmental factors could maintain individuals' functional capacity during the declining stage, for example by enabling people to be physically active. During the third stage, which was marked by significant losses of intrinsic capacity, long-term care is crucial to enabling people to maintain meaning and dignity during the last years of life.

Mr. Beard described the Global Strategy and Action Plan on Ageing and Health, which was endorsed by WHO Member States in 2016 and outlines all of the actions necessary to support people across the three stages of intrinsic capacity. He said the Global Strategy envisioned a world in which everyone could live a long and healthy life and he described two specific goals: 1) Five years of evidence-based action to maximize functional ability that reaches every person; and 2) By 2020, establish evidence and partnerships necessary to support a Decade of Healthy Ageing form 2020 to 2030.

Mr. Beard listed the five key components of the actions outlined in the Global Strategy. The first key component was a commitment to action on healthy ageing in every country. The second key component was to ensure that everyone had the opportunity to grow old in age-friendly environments. Mr. Beard pointed to the network of more than 300 age-friendly cities that the WHO had developed. The third key component was to realign health systems to meet the needs of ageing populations, which entailed shifting their focus from acute care needs towards systems that could provide chronic care in an integrated way. He noted that this action was one of the core responsibilities of WHO. The fourth key component was to ensure equitable and sustainable long-term care systems, with particular attention to women who tended to be most heavily burdened with care responsibilities for ageing family members. The fifth key component of the Global Strategy was to improve measurement, monitoring and research on healthy ageing.

Addressing the issue of the costs associated with these actions, Mr. Beard encouraged participants to view healthy ageing as an investment that would bring returns to society. He said that investments in health, security and maintaining the skills and knowledge of older persons benefitted the workforce, family and communities. Moreover, it increased social cohesion and contributed to achieving the social development goals.

To begin to carry out the Global Strategy, Mr. Beard said that expert working groups had formed to identify specific cross-cutting actions to be taken between 2016 and 2020, positioning for a decade of

progress between 2020 and 2030. Key actions included changing negative stereotypes about older age, while also encouraging realistic perspectives of ageing, backed up by legislation that prevents discrimination. He said that experts wanted a dedicated platform enabling them communicate with each other and to facilitate access to resources for evidence-based decisions. Other key actions included the following: building the capacities of Member States; developing a better definition of integrated care and tools for clinicians to use to assess the health of older persons; and improving the training and increasing the numbers of health workers and social carers, including by adapting curricula in universities, creating new career paths and improving the salaries of caregivers, who had traditionally been under-remunerated. To ensure the accountability of countries, Mr. Beard said that there was a need to, by 2020, establish a baseline against which progress could be measured, possibly by undertaking a global survey of ageing and health. Lastly, key actions for the period between 2016 and 2020 included developing a clearer and stronger case to motivate governments to undertake investments in healthy ageing. He noted that many current economic approaches to framing expenditure on ageing, such as the old-age dependency ratio, themselves reflected ageist stereotypes, and that the WHO was working with the World Bank and the OECD on developing alternative approaches.

During the discussion, there was widespread agreement among participants that traditional demographic dependency ratios were inadequate metrics of the true level of dependency in the population. Participants expressed great interest in the conceptualization of prospective ageing as an alternative. They inquired whether it was also useful to consider health status in the prospective ageing approach. Mr. Sanderson replied that limited data on the prevalence of disability over time made it difficult to incorporate health status into prospective ageing measures. Elaborating on the policy implications of prospective ageing measures, Mr. Sanderson mentioned his paper on "intergenerationally fair pension ages", which utilized a characteristic of the life table called the life course ratio. In the paper, he proposed that the fraction of person-years lived above age 20 that are spent in retirement should be constant. He said that he was aware of several countries that were moving their retirement ages to be more intergenerationally fair. Mr. Sanderson stressed that social justice, rather than fiscal concerns, should be the primary impetus for raising the statutory retirement age.

Participants also asked Mr. Sanderson whether the prospective dependency ratios should have considered the delayed entrance to the labour force that was occurring in many populations where people were obtaining higher levels of education. Mr. Sanderson responded that this was an issue he was looking into. Data from the NTA project showed some upward movement in the age at entry to the labour market and pointed to big differences across countries.

Participants expressed scepticism about the comparability across countries in rates of labour force participation among persons with disabilities. Mr. Sibanda agreed that different contexts and definitions across countries made international comparisons difficult. Still, he stressed that the message the data conveyed was simple: that persons with disabilities were often disadvantaged in labour force participation. Participants also inquired as to whether there was evidence on trends over time in intergenerational inequality. Mr. Sibanda stated that he was not aware of a dataset that would permit such an analysis.

E. Fewer children and youth, with better health and education

Mr. Bravo welcomed participants to the second day of the expert group meeting and turned the floor over to Mr. Michael Herrmann, Special Advisor to UNFPA on Population and Economics, who moderated the first session of the morning. This session included two presentations addressing the topic, "Fewer children and youth, with better health and education". Mr. Herrmann asked participants to

consider what human capital was, whom it was for, and how it could be promoted. Education included primary and secondary education, as well as technical and vocational training, and life skills. Health entailed the absence of disease as well as treatment and care. A life course perspective suggested that good health started before birth, extended through childhood and to sexual and reproductive health care for teenagers, and then to older ages. From the perspective of ageing populations, it was critically important to invest in youth and older persons, as this could help to reduce the reliance on social protection later in life.

Ms. Elena Pradhan, doctoral candidate in the Department of Global Health and Population at the Harvard School of Public Health, delivered the first presentation of the session entitled, "Link between education and fertility in low- and middle-income countries". The theoretical framework for her presentation was taken from recent work she had completed in collaboration with David Canning and Dean Jamison, respectively. Ms. Pradhan explained that one economic theory of fertility posited that the opportunity costs of children were higher for mothers employed in formal labour markets. The demand for children depended on household income, the costs of children and parents' preferences for children relative to other goods, while the supply of children depended on a couple's level of fecundity and their children's level of mortality. Ms. Pradhan observed that recent research had shifted away from thinking about households as homogeneous units with respect to decision making, instead favouring a bargaining model in which educated women had more bargaining power in the household.

Ms. Pradhan asked participants to consider what education was. She offered that the input was schooling, but the output was how well that schooling could be leveraged to negotiate one's position within the household. She added that most data on the quality of education were limited to high-income countries, but there were some data for low- and middle-income countries on the impact of education quality on fertility and health outcomes. Increasing returns to education encouraged households to value more highly their investment per child as an alternative to having more children. Among poor households with low levels of education, she said that there was a financial constraint to educating children despite high returns to education, since they might not have been able to afford to send children to school even if they wanted to.

Ms. Pradhan also described a sociological theory of the link between education and changing fertility, which posited that educated families desired fewer children as a result of ideational changes that spread through social groups united by characteristics such as ethnicity, language or religion. The first evidence to support this theory came from 18th-19th century Europe, where analysts observed a strong correlation between language and fertility trends. However, recent evidence from Rwanda showed that women in the highest wealth quintile had the lowest levels of fertility, irrespective of their religion or ethnicity.

Ms. Pradhan outlined several mechanisms through which female education could impact fertility. First, educating girls and women increased their bargaining power within the household. Second, education increased women's access to and understanding of family planning methods. Third, in an extension of the ideational theory, education led to smaller desired family size. Fourth, education contributed to higher labour force participation of women and increased the opportunity costs of childbearing. Fifth, the children of more educated mothers faced lower risks of mortality due in part to better access to children's health services. Improved survival of the children of these mothers could then lead to lower fertility desires.

Asking whether male schooling or female schooling mattered more for fertility decline, Ms. Pradhan presented evidence based on both macro- and micro-level data. Her analysis of the macro-level data included hierarchical linear models to assess the association between male and female schooling and the logarithm of the total fertility rate across 80 countries, allowing for the effect of time (and the rate of technological change) to vary across countries. Results indicated that the impact of male schooling on the

total fertility rate was much smaller than the impact of female schooling. She also presented the results of a micro-level analysis of the determinants of fertility decline in Indonesia that had been carried out by Breierova and Duflo in 2004[2]. They also concluded that female education mattered much more than male education in increasing the age at marriage and delaying fertility. Ms. Pradhan explained that in some contexts increasing levels of male education could actually increase fertility since it increased the economic resources available to the household. She noted that women usually bore the opportunity costs of childbearing.

Ms. Pradhan added that there were other important determinants of fertility decline, besides education. She presented a scatterplot showing the total fertility rate against the average years of schooling to women aged 15 years or over across countries in 1980 and 2010. Notably, at a given level of female education, countries in 2010 had substantially lower levels of fertility than did countries at that level of female education in 1980. Ms. Pradhan explained that this difference provided evidence of advances in access to technologies that had occurred between 1980 and 2010.

Ms. Pradhan then presented estimates of the total fertility rate over the past few decades, disaggregated by level of female education for three countries in Africa: Ethiopia, Ghana and Kenya. In all three countries, among women with the highest levels of education the total fertility rate had long been at the replacement level of 2.1 children per woman. The higher fertility levels in the countries were thus driven by high fertility among women with lower levels of educational attainment. Among women with no education, the total fertility rate was around six children per woman. Ms. Pradhan noted that her analysis had detected a similar pattern in at least 20 countries of Africa, but that a similar pattern did not hold in countries of Asia. Estimates of the total fertility rate disaggregated by the level of female education in Bangladesh, Indonesia and Nepal showed more convergence over time than was observed in Africa. In Bangladesh, she said that such convergence probably occurred because the immense family planning programme in that country had succeeded in reaching women with lower levels of schooling.

Ms. Pradhan informed participants that numerous studies had indicated that female education contributed to delayed fertility. For example, a study she carried out in Ethiopia concluded that each additional year of female schooling lowered the probability of teenage marriage and childbearing by about six percentage points. The analysis indicated that the predicted total fertility rate among women with eight years of schooling was 53 per cent lower than that among women with no schooling. While it was difficult to disentangle the impact of economic mechanisms from that of ideational mechanisms in driving fertility decline, some studies offered powerful evidence. For example, Ms. Pradhan described a study of the Arab community in Israel, which had experienced an increase in female education with no corresponding increase in female labour force participation, yet fertility still declined. She noted that the increased bargaining power of women, a preference for higher investment per child rather than a large number of children, and increased access to contraceptives could also have contributed to fertility decline in this example.

Looking at female labour force participation across the world's regions, Ms. Pradhan observed that sub-Saharan Africa stood out for both high labour force participation and high total fertility. She noted that women in sub-Saharan Africa tended to participate more in informal labour markets where the opportunity costs might not have been the same as for formal employment. She offered that they may also have received support with childcare from their extended families, which allowed them to work outside the home, or that their labour force participation may have reflected economic necessities rather than personal preferences.

[2] Breierova, L. and Duflo, E. (2004). The impact of education on fertility and child mortality: Do fathers really matter less than mothers? NBER Working Paper No. 10513.

Ms. Pradhan stressed that more efforts were needed to address the gender gap in educational enrolment. She presented estimates that indicated that large gender gaps persisted in secondary and tertiary enrolment, noting also that data were missing for around 30 countries and that these countries tended to be the poorest and most disadvantaged in the world. Ms. Pradhan concluded by reminding participants that interventions to increase female schooling should have been motivated by a desire to increase women's agency and human capital and that the Programme of Action of the International Conference on Population and Development put reproductive rights and women's choice at the forefront of the provision of family planning methods. She emphasized that enabling environments of higher quality education were needed so that women could use their education to increase their bargaining power within the household, gain access to formal labour market employment, and increase their access to and knowledge of reproductive health programmes.

Mr. Ragui Assaad, Professor at the Humphrey School of Public Affairs at the University of Minnesota, gave the second presentation of the session, entitled "Beware of the echo: the youth bulge and fertility in selected Arab countries". He described the "echo" as a larger baby boom than what was expected in Arab countries as a result of an increased number of youth entering their childbearing ages. He said that in some countries fertility may actually have been increasing, in part because the opportunity cost of women's time was declining, primarily as a result of economic restructuring away from the public sector.

Showing United Nations estimates of the crude birth rate in selected countries, Mr. Assaad noted an increase between 2005-2010 and 2010-2015 in both Egypt and Tunisia. Yet, the United Nations projections did not expect the increase in birth rates to continue. Based on births recorded by Egypt's national statistical office, CAPMAS, the total number of births continued to increase after 2010 to levels well above those predicted by the median-variant UN projection. Mr. Assaad linked increases in births to the large numbers of youth entering their childbearing years ("youth bulge"). Population age distributions for Egypt and Turkey showed pronounced youth bulges, whereas in Jordan, where the estimated crude birth rate held steady in recent years, the youth bulge and echo were much less pronounced. UN estimates of the share of females in the peak childbearing ages of 20-34 years indicated large increases over the past few decades in Egypt, Jordan and Tunisia. In Tunisia, for example, that share had grown from just over 9 per cent in 1970 to close to 14 per cent in 2010.

Mr. Assaad said that population momentum bore some, but not all, of the responsibility for producing the echoes in births. He noted that Egypt, Jordan and Tunisia had achieved large gains in education for women and girls. The gender gap in education had closed in Egypt, reversed in Jordan, and closed or reversed in Tunisia. However, he said, these countries had not seen the declines in the total fertility rate that are normally expected with increasing levels of female education. In Egypt and Tunisia, United Nations estimates indicated that the total fertility rate had even increased in recent years.

Mr. Assaad looked to information on trends in women's age at marriage in the three countries to help explain the surprising trends in total fertility. In Egypt, the age at marriage increased until the 1970s birth cohorts, and then levelled off or perhaps declined slightly. Mr. Assaad attributed this trend to an easing of housing markets for young couples, but he said that a change in the opportunity costs of women's time could have contributed as well. In Jordan, the age at marriage for women had remained flat, while in Tunisia the median age of marriage had risen to 28 years.

Mr. Assaad also examined data on contraceptive use within marriage for another possible explanation for recent trends in fertility. While contraceptive use in Egypt had increased until around 2000, it had since levelled off at around 60 per cent.

Turning to the role of women's employment opportunities in shaping recent increases in fertility, Mr. Assaad presented data showing the percentage of men and women aged 25-39 employed in the public sector in Egypt from 1991 to 2012. The share employed in the public sector had declined markedly over this period for both men and women. Mr. Assaad said that men had largely been able to transition to private sector employment, but that women had not. He explained that private sector employment in Egypt was highly inhospitable to married women. As a result, women tended to leave the labour market when they married. Indeed, data on women's employment by years from marriage showed a sharp drop off in private sector employment during the year preceding marriage, while public sector employment continued to rise even after marriage.

In conclusion, Mr. Assaad said that he believed that the recent uptick of fertility in Egypt was not just a blip, but instead was likely to be sustained because it was linked to a reduction in married women's opportunity cost of time, caused by a secular decline of the public sector as a major employer in the Egyptian economy. He underscored that this shift had major implications for education and health systems, and eventually for the labour market, which was experiencing a short reprieve from demographic pressures.

Mr. Herrmann thanked both presenters and expressed that many of the issued discussed boiled down to how women were viewed in society. He said that women were at the centre of the discussion of human capital, and he expressed appreciation for research that went beyond educational attainment to examine the dynamics of labour markets.

Participants noted the diversity in the quality of education around the world and in the curricula, which in some instances focused more on credentials than on skills. Mr. Assaad agreed that in many Arab countries the curricula emphasized rote memorization rather than critical thinking. He said that women's higher levels of education increased their bargaining power in the household, but the disconnect with the labour market deserved attention.

Participants wondered whether economic policies, like the structural adjustment programmes supported by the World Bank and the International Monetary Fund, had shifted the allocation of national resources away from education and towards the repayment of debt in many African countries. This shift could have prevented fertility from declining further.

Participants questioned the ideational change theory of fertility decline, suggesting that the rate of return to education was a stronger determinant than ideation. Several participants agreed that the demand side of the labour market and related policies deserved more attention than they typically received in discussions of human capital. In former socialist countries, there was clear evidence that fertility decline was related to increased rates of return to women's education.

During the discussion, participants asked what characteristics of private sector employment in Egypt made it incompatible with marriage for women. Mr. Assaad explained that women's domestic roles changed dramatically upon marriage, with a sharp increase in the burden of domestic work. Moreover, in Egypt, married women tended to perform the same amount of housework regardless of their employment status. In the public sector, hours were shorter and the jobs were better able to accommodate women's domestic responsibilities.

Participants also discussed the characteristics of education that were associated with fertility decline. Ms. Pradhan described her earlier research, which indicated that over the period from 1980 to 2010, primary education was more important than secondary education for fertility decline, especially for teenage childbearing. In turn, the impact of secondary education was larger than the impact of tertiary education. She stressed that the adequacy and quality of education mattered, describing an initiative in

Malawi to make schooling free until the 10th grade, which had failed to increase levels of education because it did not simultaneously increase the number of schools and teachers and thus led to high dropout rates.

F. Aggregate economic implications of changing age structures: the demographic dividend

The final substantive session of the expert group meeting saw three presentations addressing the economic implications of age structures, with particular attention to the demographic dividend. Mr. Bravo moderated the session.

By video connection from Norway, Mr. Vegard Skirbekk, Professor at the Columbia University Aging Center and Senior Researcher at the Norwegian Institute of Public Health, presented a summary of his work on "Ageing, health and work potential". He began by describing the determinants of age-associated variation in productivity, noting that cognitive ability predicted job performance better than any other characteristic of older persons. He said that while aspects of fluid cognitive abilities like memory, learning and perceptual speed and reasoning abilities tended to decline with age, crystallized abilities like vocabulary size and semantic meaning were more stable. Using data from the German Qualification and Career Survey, Mr. Skirbekk illustrated how the types of characteristics that were valued in the labour market had shifted over time: physical strength had become less important, while cognitive ability had become more important. Moreover, the older cohorts in the labour market were the ones that experienced the largest increases in importance of cognition in their jobs.

Mr. Skirbekk introduced the concept of the cognitively-adjusted dependency ratio (CADR), which supplemented the traditional demographic old-age dependency ratio with a measure of cognitive functioning based on an internationally harmonized test of short term memory. The test entailed reading out ten words (in the local language) and recording how many of the words a respondent was able to recall correctly within one minute. Ability to recall at least 50 per cent of the words was classified as high cognitive functioning, while recall of less than 50 per cent was classified as low cognitive functioning. Mr. Skirbekk presented the age variation in the CADR across countries, which he had published in a 2012 paper in the *Proceedings of the National Academy of Sciences*. Recall scores were highest in the United States and Northern Europe and lowest in Southern Europe and Mexico. Mr. Skirbekk noted that level of education was often strongly predictive of cognitive functioning at older ages. He stressed that comparisons of the CADR with the traditional old-age dependency ratio demonstrated that having a young population did not necessarily imply a low ageing burden. The CADRs in India and Mexico were higher than those in the United States and Northern Europe, despite their younger populations.

Mr. Skirbekk showed a comparison of economic dependency ratios to the traditional, purely demographic old-age dependency ratios, which also revealed the stark differences with the traditional metric. The old-age dependency ratio in the United States was much higher than in Turkey, but Turkey's economic dependency ratio was double that of the United States. He attributed the difference to differences in labour force participation.

Mr. Skirbekk recalled the growing concern about increasing prevalence of obesity that accompanied prosperity in many parts of the world and he noted that these trends had significant implications for health and work potential later in life. He presented data that showed large differences in the trends in obesity by level of education. Most of the increase in obesity prevalence was concentrated at low levels of education. Men and women with tertiary education did not see an increase in obesity. He reasoned that countries that invested in education would experience less obesity following income growth.

In conclusion, Mr. Skirbekk emphasized that the countries that had been ageing successfully were the ones that had invested heavily in education and health. Ensuring high levels of cognition in old age was especially important to maintaining older persons' work potential and quality of life. He added that maintaining the productivity of individuals at older ages also depended on certain socioeconomic dimensions, such as culture and beliefs, as well as adjustments to economic fluctuations.

Participants asked Mr. Skirbekk to elaborate on the evidence that linked education to later-life cognitive ability. They wondered whether the initial investment in traditional education was sufficient or whether lifelong learning programmes were needed to bolster cognitive ability as well. Mr. Skirbekk replied that most of the research had focused on early life education, but it was likely that lifelong learning opportunities were also beneficial for maintaining cognitive ability. Participants also asked about the role of depression in influencing the cognitive ability of older persons. Mr. Skirbekk agreed that depression was a determinant of cognitive functioning and that its high prevalence meant that it was extremely important to prevent and treat depression. Lastly, participants asked Mr. Skirbekk to comment on the Flynn effect, which described a tendency for successive cohorts to perform better on measures of both fluid and crystallized intelligence. Mr. Skirbekk replied that while intelligence scores were continuing to improve in some countries, there was evidence of a flattening out in others. He said that future trends in intelligence and other measures of cognitive ability would be an important determinant of how countries will cope with population ageing.

Mr. Eliya Zulu, Executive Director of the African Institute for Development Policy, presented on "Africa's demographic transition and demographic dividend". He began with a review of trends in fertility rates around the world, noting that they had fallen everywhere except in the least developed countries. These trends had implications for trends in the proportion of the population in the working ages, which determined the opportunity for a demographic dividend. Mr. Zulu noted that the ratio of working-age persons to those at other ages was reaching a peak in Eastern Asia at about 2.5. Projections indicated that the ratio would peak at a much lower level in sub-Saharan Africa. In Latin America, the peak ratio was higher than was projected for Africa, but lower than for Eastern Asia. Mr. Zulu described some heterogeneity in peak working-age ratios across countries of Africa. Tunisia had already peaked at a high level due to its rapid pace of fertility decline, and Ethiopia was projected to experience a high peak as well. Many countries in sub-Saharan Africa, such as Kenya and Tanzania, would experience much lower peaks.

Mr. Zulu described three categories of countries in Africa with respect to their demographic trends. There were 32 countries in the high fertility group, with fertility above 4.5 children per woman. Most of these were located in Central and Western Africa, but some were in other regions as well. There were 10 countries where fertility was clearly declining. The third group consisted of the 10 countries where fertility had already fallen below 3.5 children per woman, mostly located in Southern and Northern Africa.

Mr. Zulu expressed that he was encouraged by the attention African policymakers were paying to the issue of dependency and the demographic dividend. He said that after the 1994 Cairo conference, there was great concern in the region about child dependency as a bottleneck to development, but those concerns had not been sufficient to inspire action. More recently, the demographic dividend perspective seemed to be more appealing to politicians than the issue of child dependency, even though they were describing essentially the same issue. Mr. Zulu described the approach of focusing on the demographic dividend as "old wine in new bottles".

While African leaders were interested in pursuing fertility decline to create a more favourable ratio of workers to dependents, Mr. Zulu said that they were also concerned about the possibility of fertility decline leading to the problems associated with population ageing. He noted that some European leaders

had expressed regret about their own rapid demographic shifts and that many African leaders were asking for expert guidance on how to avoid the same problems. Mr. Zulu said that he was working to provide such guidance by simulating the levels of demographic dividend that African countries and other high-fertility countries could harness under different socio-economic policy scenarios. The DemDiv macrosimulation model created by the Futures Group and funded by USAID pointed, in particular, to the importance of investing in family planning and education for girls and women in order to take advantage of the demographic dividend. The model relied on a demographic component built upon the Bongaarts proximate determinants framework of fertility, as well as an economic component characterized by a Cobb-Douglas production function. Variables from the World Economic Forum Global Competitiveness Index, such as market efficiency and infrastructure, among others, were also incorporated within the model.

Mr. Zulu described using the DemDiv model to compare different scenarios for policymakers. For Malawi, four scenarios had been considered: the status quo, an "economic emphasis" scenario, a "social emphasis" scenario, and a combined scenario that incorporated both economic and social policies. Results indicated that the combined scenario would produce a youth bulge in Malawi and then the possibility of a massive demographic dividend. Mr. Zulu said that the African Institute for Development Policy had been working with UNFPA to generate and analyze different scenarios for 14 countries.

Mr. Zulu noted that one key characteristic of Africa's demography, distinguishing it from the trends observed in Asia or Latin America, was that high levels of fertility had persisted over a very long period. This meant that in sub-Saharan Africa, even if birth rate fell quickly, the number of people entering the labour force would still be very large, producing employment challenges no matter the pace of fertility decline.

Turning to consider the pace of fertility decline that could be achieved in sub-Saharan Africa, Mr. Zulu described the high levels of unmet need for contraception in the region. He said that if contraceptive use increased by 15 percentage points, the total fertility rate would decline by one child per woman. Mr. Zulu noted, however, that persistently high under-five mortality rates, early marriage, and low secondary school enrolment for girls were barriers to achieving fertility decline in sub-Saharan Africa.

Mr. Zulu then turned to discuss the prospect of job growth in Africa, which was necessary to take advantage of the demographic dividend. He said that 70-80 per cent of households in the region relied on agriculture, but that this was the slowest growing sector of the economy. While faster growing, the manufacturing and service sectors were comparatively small and thus not creating many jobs. Mr. Zulu also noted that women's labour force participation was not translating to higher per capita GDP in many countries. There was a need for better governance, to eliminate corruption and improve the quality of institutions, to better position countries to attract foreign investment.

Mr. Zulu concluded by stating his appreciation for the growing political will surrounding the demographic dividend in Africa. He described a meeting he had attended at the United Nations in New York in September 2016, which urged African governments to commit to investing in their youth in order to harness the demographic dividend. The presidents of Malawi and Zambia were among the participants of that meeting. President Museveni of Uganda had participated in the launch of the report on the demographic dividend, which was authored by the Uganda National Planning Authority and presented simulations from the DemDiv model. Moreover, the African Union Summit to be held in January 2017 was to devote its session to the topic of "harnessing the demographic dividend through investments in youth". Mr. Zulu underscored that researchers needed to assist policymakers in prioritizing education policy, assessing what the optimal rate of fertility decline was and determining the investments needed.

In the final presentation of the expert group meeting, Mr. Michael Abrigo, Research Fellow at the East-West Center and Research Specialist at the Philippine Institute for Development Studies, presented recent work from the National Transfer Accounts (NTA) project on "New international evidence on the demographic transition and demographic dividends". He began with a brief overview of the NTA project, noting that data from more than 60 economies were available on the project website, having grown considerably since the project began with less than 20 countries in the mid-2000s. There were now 70 country teams covering 80-90 per cent of the world's population and the data was produced in a way that was consistent with the United Nations System of National Accounts (SNA).

Mr. Abrigo said that demographic change was a potentially powerful development factor operating through multiple channels. He defined the "first demographic dividend" as what occurred when fertility decline led to a substantial, sustained, but ultimately transitory, rise in the number of workers relative to the number of consumers. The "second demographic dividend" occurred when fertility decline led to an increase in the productivity of the labour force. He explained that the second dividend resulted from increased physical and human capital, was delayed compared to the first dividend, and unlike the first dividend, could be permanent and self-sustaining. Taken together, evidence for the first and second dividends suggested a substantial potential payoff to policies that enabled couples to have fewer children, with families and governments investing more in each child.

Mr. Abrigo stated that about 70 per cent of countries were currently benefitting from the first demographic dividend, but that many were reaching the end of that phase. By 2040, only about 40 per cent of countries would still be benefiting from the first dividend, while 60 per cent would have already passed through it. On average, the first demographic dividend added about half a percentage point to growth. This gain was expected to be smaller in Africa but to last longer, adding an average of 0.38 percentage points between the start of the dividend in 1991 and its projected end in 2084. Mr. Abrigo noted that the length of the first dividend varied substantially across regions. It was estimated to be shortest in Europe, having lasted about 37 years ending in 2001, and longest in Africa, where it was expected to last for 93 years.

Mr. Abrigo explained that the second demographic dividend was driven by two mechanisms. The first mechanism was the increase in human capital spending while fertility declined. Cross-sectional data on human capital investment and total fertility across countries indicated that every 1 per cent decrease in the level of fertility was associated with a 1 per cent increase in human capital spending, which translated into higher future productivity. The second mechanism was the increasing demand for pension wealth and other assets produced by population ageing. He said there was evidence that the capital in an economy increased and overall productivity was greater in populations where older persons were more economically independent and a larger share of pensions were funded with assets, as opposed to relying primarily on public and private transfers.

Mr. Abrigo then presented the results of an analysis based on macrosimulations of the demographic dividend for Nigeria, produced using the DemDiv model described earlier by Mr. Zulu. The simulations considered medium- and low-fertility scenarios compared with a "no change in fertility" scenario, as well as a "radical fertility decline" scenario based on China's experience. The first set of results pertained to the growth effect associated with the first demographic dividend under each fertility scenario for three periods: 2010-2040, 2040-2070 and 2070-2100. For the near term, 2010-2040, the radical decline scenario produced a growth effect that was twice as large as the low-fertility scenario, which, in turn, had a larger growth effect than the medium-fertility scenario. Over the medium term, 2040-2070, the growth effects across these three scenarios were similar. Over the long term, 2070-2100, the growth effects of the medium- and low-fertility scenarios were similar, but the growth effect of the radical decline scenario turned negative due to rapid population ageing.

With respect to the second demographic dividend, Mr. Abrigo demonstrated that the radical fertility decline scenario produced the largest growth effect, followed by the low-fertility scenario and then the medium-fertility scenario. He noted that the size of the second dividend growth effect was small over the short term from 2010-2040, and that the medium-term effect over 2040-2070 was due mostly to increased assets in the economy, while the long-term effect from 2070-2100 was more due to human capital accumulation. Mr. Abrigo also showed the simulated growth effects of the two dividends combined under the three fertility decline scenarios for Nigeria. The growth effects of both the medium- and low-fertility scenarios amounted to around 1.5 percentage points over the medium to long term.

Mr. Abrigo closed his presentation by emphasizing that the bonuses of demographic dividends were policy dependent. He noted that research could identify the right policies that were capable of boosting future growth and that, in the case of the second dividend, such a boost to growth could be sustained and permanent.

During the discussion, participants inquired as to whether and how the age profiles of production and consumption described in the NTA project were considered to change over time. They also asked whether NTA data on income permitted distinguishing between hours worked and the intensity of work. Others clarified that the NTA projections assumed that current profiles of production and consumption held constant and only the demography changed. Empirical evidence on changing patterns in ageing populations had indicated that over time, both production and consumption increased at older ages. Mr. Abrigo explained that by using constant age profiles of production and consumption for the projection, the results could be interpreted as a lower bound for the predicted second demographic dividend.

Participants wondered whether the asset accumulation that drove the second demographic dividend was dependent upon pension systems and capital markets. They noted that the second dividend seemed to presume a closed economy and that the example of Japan, a rapidly ageing economy where people tended to save, had not seen the kind of economic boost predicted by the second dividend. Mr. Abrigo agreed that when assets were held domestically, the national economy improved, but that if assets were exported, the economic boost associated with the dividend would be felt elsewhere.

Some participants noted that the policy messages being given to African leaders regarding demographic trends seemed largely the same as 30 years ago, and asked whether the latest efforts could be expected to achieve a different result. Mr. Zulu answered that the context was different today than 30 years ago. During the 1970s, messages aimed at slowing population growth were viewed largely as the West imposing its views on Africa. Now that the world had seen the experiences of Asia and Latin America through the demographic transition, the messages were more acceptable. Moreover, today's focus was less on population growth and more on shifting age structures. Mr. Bravo noted that Member States had continued to emphasize the validity of the Programme of Action of the ICPD more than 20 years since the Cairo conference. He emphasized that the demographic dividend was an effective economic argument to advocate for the further implementation of the Programme of Action, including population policies, and that this was easier for some governments to accept, especially in places where local political, cultural or religious views did not result in full acceptance of all the tenets of the Programme of Action. Mr. Zulu noted further that the issue of helping Africa to undergo the demographic transition and to harness the associated dividend had become a global one, particularly in the wake of growing concerns about international migration flows.

G. CLOSING

Mr. Bravo closed the meeting by thanking the participants for their excellent presentations and stimulating discussion. He expected their contributions to be extremely valuable as substantive inputs to

the report of the Secretary-General to the 50th session of the Commission on Population and Development.

Annex 1: Organization of Work

UN/POP/EGM/2016/INF.3

13 October 2016

ENGLISH ONLY

UNITED NATIONS EXPERT GROUP MEETING ON CHANGING POPULATION AGE STRUCTURES AND SUSTAINABLE DEVELOPMENT
Population Division
Department of Economic and Social Affairs
United Nations Secretariat
New York
13-14 October 2016

ORGANIZATION OF WORK

Thursday, 13 October 2016

9:00 – 09:30 Registration

09:30 – 10:00 **Session I: Opening of the meeting**

- Welcome: *John Wilmoth, Population Division*
- Introduction and objectives of the meeting: *Jorge Bravo, Population Division*
- Global overview of changing population age structures and sustainable development: *Mun Sim Lai, Population Division*

10:00 – 11:30 **Session II: Social security in ageing societies**

Moderator: *Vinicius Pinheiro, International Labour Organization*

- Population ageing and social security in Europe: *Agnieszka Chlon-Dominczak, Warsaw School of Economics*
- Ageing and social security in Latin America: *Rafael Rofman, World Bank*
- Population ageing and social security in Asia: *Rafal Chomik, University of New South Wales*

11:30 – 13:30 Lunch break

13:30 – 15:00 **Session III: Demographic and economic constraints to balancing work and family obligations**

Moderator: *Yumiko Kamiya, Population Division*

- Intergenerational co-residence around the world: *Albert Esteve, Autonomous University of Barcelona*
- Demographic dynamics of family and work in Brazil: *Simone Wajnman, Federal University of Minas Gerais*
- Gender, age and economic activity: *Gretchen Donehower, University of California, Berkeley*

15:00-15:15 Break

15:15 – 17:00 **Session IV: New perspectives on ageing**

Moderator: *Rosemary Lane, Division for Social Policy and Development*

- Age structure, mortality and prospective ageing: *Warren Sanderson, Stony Brook College*
- A life course approach to health and ageing: *John Beard, World Health Organization (video)*
- Intergenerational socio-economic inequalities. *Amson Sibanda, Division for Social Policy and Development*

Friday, 14 October 2016

9:30 – 11:00 **Session V: Fewer children and youth, with better health and education**

Moderator*: Michael Herrmann, UNFPA*

- Fertility decline and education in developing countries: *Elina Pradhan, Harvard University*
- Fertility trends, health of children and youth in Arab countries, *Ragui Assaad, University of Minnesota*

11:00 – 11:15 Break

11:15 – 12:45 **Session VI: Aggregate economic implications of changing age structures: the demographic dividend**

Moderator: *Jorge Bravo, Population Division*

- Ageing, health and work potential: *Vegard Skirbekk, Columbia University (video conference)*
- Africa's demographic transition and demographic dividend: *Eliya Zulu, African Institute for Development Policy*

- New international evidence on the demographic dividends: *Michael Abrigo, University of Hawaii*

12:45 – 13:00 **Session VII: Closing**

- Closing remarks: *Jorge Bravo, Population Division*

Annex 2

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