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General debate

Population, education and sustainable development

Report of the Secretary-General

Summary

In its decision 2021/101, the Commission on Population and Development decided that the theme for its fifty-sixth session in 2023 would be “Population, education and sustainable development” (see [E/2021/25](#)). The present report has been prepared to inform the Commission’s deliberations on that topic.

In the report, the Secretary-General examines the dynamics of the school-age population in different regions of the world, the relationship between education and the three components of population change, namely fertility, mortality and migration, and the connections with gender equality and the empowerment of women, human capital formation, economic growth and environmental sustainability. The discussion highlights linkages between demographic variables and trends and access to quality education at all levels, including early childhood, primary, secondary and tertiary education and lifelong learning. The report also includes selected conclusions and recommendations.

* [E/CN.9/2023/1](#).



I. Introduction

1. Since the founding of the United Nations, education has been recognized as fundamental to human development and social progress. The right to education and participation in cultural life was included in the Universal Declaration of Human Rights in 1948. Chapter XI of the Programme of Action of the International Conference on Population and Development, held in Cairo in 1994, contains calls for the provision of universal access to primary education and for closing the gender gap in primary and secondary education. Governments were requested to expand policies and programmes to support youth and adult education and lifelong learning, paying particular attention to migrants, Indigenous Peoples and persons with disabilities.

2. The International Conference on Population and Development also called on Governments to provide formal and informal education on population and health issues, including sexual and reproductive health. Education on such topics is important to enhance gender equality and equity, promote responsible sexual behaviour and protect adolescents from early and unwanted pregnancy, sexually transmitted infections and sexual violence and abuse.

3. The 2030 Agenda for Sustainable Development includes the aim of ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all (Sustainable Development Goal 4). In addition, education-related targets and indicators are part of several other Goals, including Goal 1 on poverty, Goal 3 on health, Goal 5 on gender equality, Goal 8 on economic growth and decent work, Goal 12 on sustainable consumption and production and Goal 13 on climate change.

4. In September 2022, the Secretary-General convened the Transforming Education Summit in response to the global crisis of equity and inclusion in education programmes and the quality and relevance of instruction. The aim of the Summit was to mobilize action, ambition, solidarity and solutions to transform education by 2030. The Commission on Population and Development focused on linkages between population, education and sustainable development as the world continued to recover from the coronavirus disease (COVID-19) pandemic, which set back progress on several of the Goals, including those related to poverty, health care and education.

II. General perspective on population, education and sustainable development

A. Relationships between education, population growth, economic growth and environmental sustainability

5. In 2003, the last time that the Commission incorporated education into its special theme, there was already extensive evidence from various times and locations of critical linkages between education and population change (see [E/CN.9/2003/2](#)). The evidence base on this topic has grown steadily since then, confirming the role of education as a key determinant of levels and trends in fertility and mortality and, more broadly, highlighting the significance of human capital in all aspects of population dynamics.¹ Education and training over the life course are, in turn, critically important to sustain socioeconomic development, especially in modern economies increasingly driven by innovation and productivity growth. From a macroeconomic perspective, a well-trained and well-educated workforce reinforces the positive impacts of the demographic dividend and tempers the fiscal and economic challenges associated

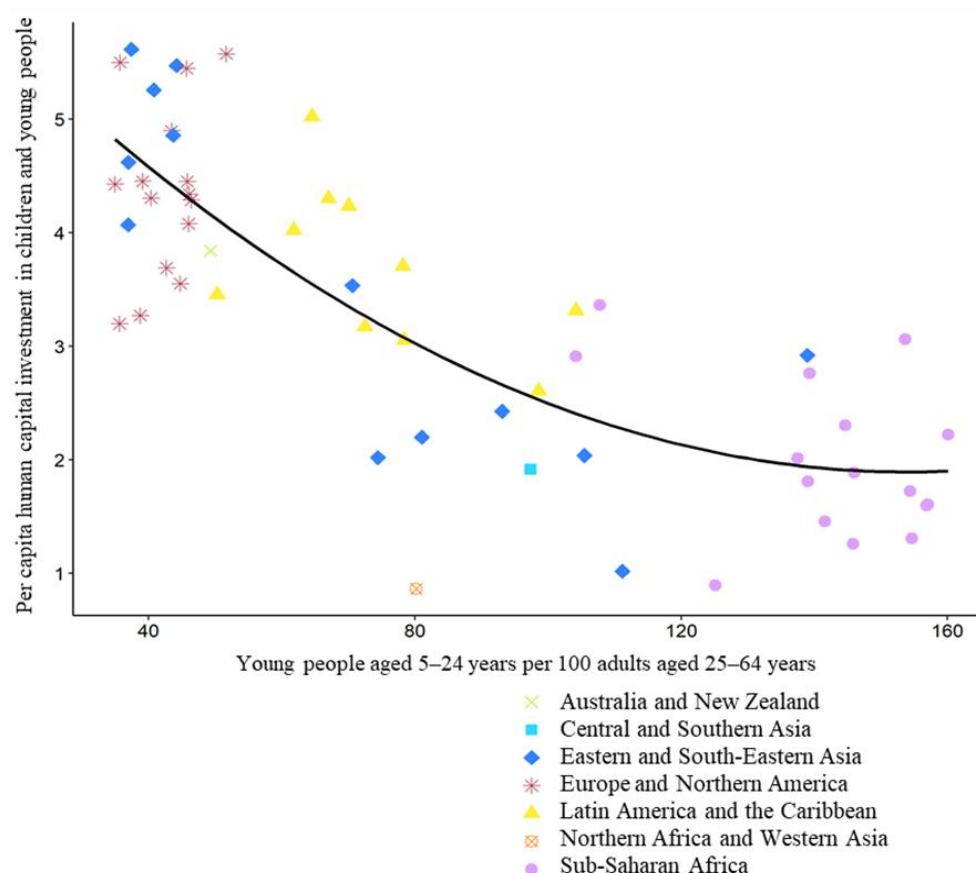
¹ Wolfgang Lutz, William P. Butz and Samir K.C., eds., *World Population and Human Capital in the 21st Century* (Oxford, Oxford University Press, 2014).

with rapidly ageing populations, while contributing to the achievement of various Sustainable Development Goals.

6. National spending on human capital formation (education and health) in young people under the age of 22 years averages approximately 5 per cent of gross domestic product (GDP) across countries. However, the ratio of spending per person to GDP per capita varies widely across countries and tends to be negatively associated with the ratio of the number of young people to the size of the working-age population (see figure I), illustrating the trade-off between the number of children and per capita investments in human capital.

Figure I

Human capital investment in children and young people by the relative size of the population aged 5–24 years, selected countries by region, circa 2010



Source: National Transfer Accounts database (2022); and United Nations, World Population

Prospects: 2022 Revision, available at <https://population.un.org/wpp>.

Note: Human capital investment is equivalent to the spending on education and health per person aged 5–24 years divided by GDP per capita. The relative size of the population aged 5–24 years is equivalent to the population size in that age range divided by 100 adults aged 25–64 years. The graph includes information for 66 countries with available data.

7. Access to education in a population is related to a broad range of demographic outcomes and behaviours (see chaps. III and VI). Countries with high rates of population growth and youthful populations tend to have lower enrolment rates in primary and secondary education. Conversely, countries with high levels of primary school enrolment typically experience lower child and maternal mortality rates. Insufficient budgetary allocations, extreme poverty, early childbearing, armed

conflicts and natural disasters are the primary factors keeping students out of school, especially in low-income countries.

8. Education also serves to raise public awareness of pressing global environmental problems, such as the loss of biodiversity or marine pollution, and to encourage young people to become environmentally conscious. Indeed, investments in education about the environment and sustainable development are critical to achieving global development goals. Beyond specific knowledge of these topics acquired through formal schooling, a well-rounded education equips people of all ages to adopt innovative practices that minimize the harmful environmental impacts of their economic activities.

B. Impacts of the pandemic

9. School closures and disruptions to instruction during the COVID-19 pandemic deepened the global learning crisis by exacerbating pre-existing inequalities in access to and quality of education. The pandemic reversed some of the progress achieved towards gender equality in education, as girls and women were especially hard hit by school closures.

10. While full closures during 2020 and 2021 for in-person instruction averaged 141 days around the globe, students in South Asia and in Latin America and the Caribbean missed as many as 273 and 225 full days of school, respectively, between February 2020 and February 2022.² Humanitarian situations, including those resulting from armed conflict, have made challenging situations worse in some parts of the world. For example, in Ukraine nearly two thirds of the 5.7 million school-age children have been forced from their homes and are now living elsewhere in the country or in neighbouring countries.³

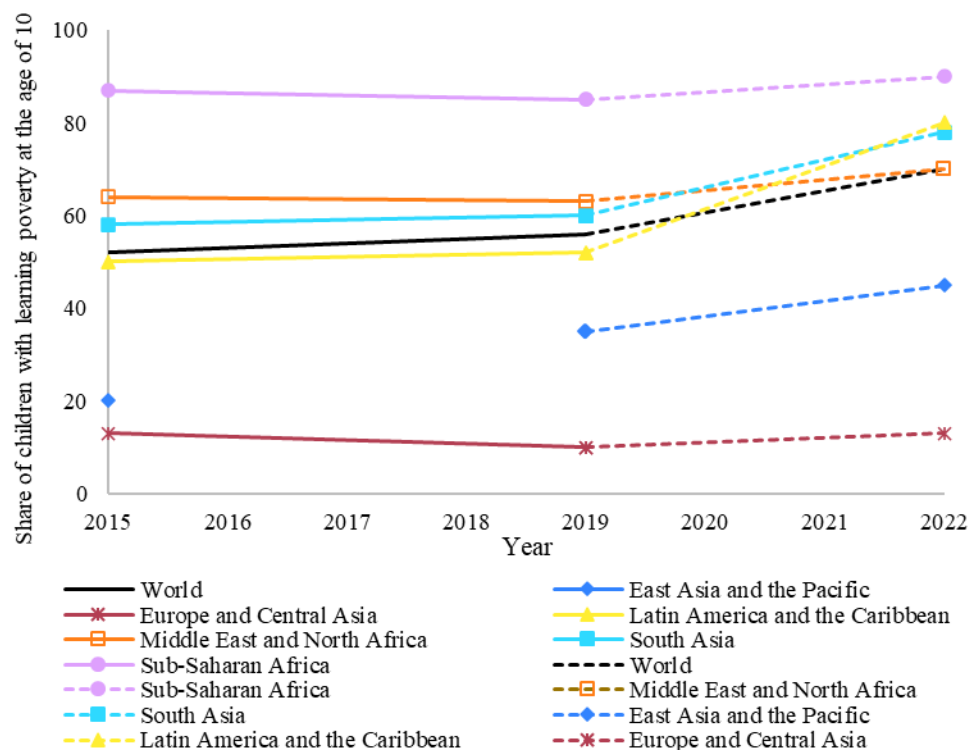
11. Figure II shows that any reductions in learning poverty (deficiencies in basic reading skills) achieved in the years immediately preceding the pandemic were fully reversed thereafter, with the largest increases occurring in Latin America and the Caribbean and in South Asia. Currently, 7 of 10 children in low- and middle-income countries have extreme deficiencies in their basic reading skills.⁴

² World Bank and others, *The State of Global Learning Poverty: 2022 Update* (2022).

³ United Nations Children's Fund (UNICEF), "Ukraine war response: ensuring access to learning", 2022.

⁴ World Bank and others, *The State of Global Learning Poverty*.

Figure II
Prevalence of learning poverty by region, 2015, 2019 and 2022



Source: World Bank, *State of Global Learning Poverty: 2022 Update*.

Note: Learning poverty refers to the share of children with deficiencies in basic reading skills at the age of 10.

C. Trends in the school-age population

12. The school-age population is the population at a particular age or within a particular age group, as defined in a country's regulations or laws, corresponding to a specific grade or level of education.⁵ The school-age population is a key input used to produce education-related indicators of the Sustainable Development Goals and to assess the demand for education.

13. The global school-age population aged 6–11 years, usually corresponding to those in primary education, is expected to reach an all-time high of 820 million in 2023. It is projected to drop to 774 million in 2032, then to reach a secondary peak of around 806 million in the early 2050s and to decline continuously thereafter.

14. Some regions are already experiencing a decline in this segment of the school-age population. It reached a peak in Europe and Northern America in 1968, followed by Eastern and South-Eastern Asia in 1979, Latin America and the Caribbean in 2002 and Central and Southern Asia in 2012. Elsewhere, in Northern Africa and Western Asia, Oceania (excluding Australia and New Zealand), sub-Saharan Africa, and Australia and New Zealand, the school-age population aged 6–11 years is projected to peak after 2050.

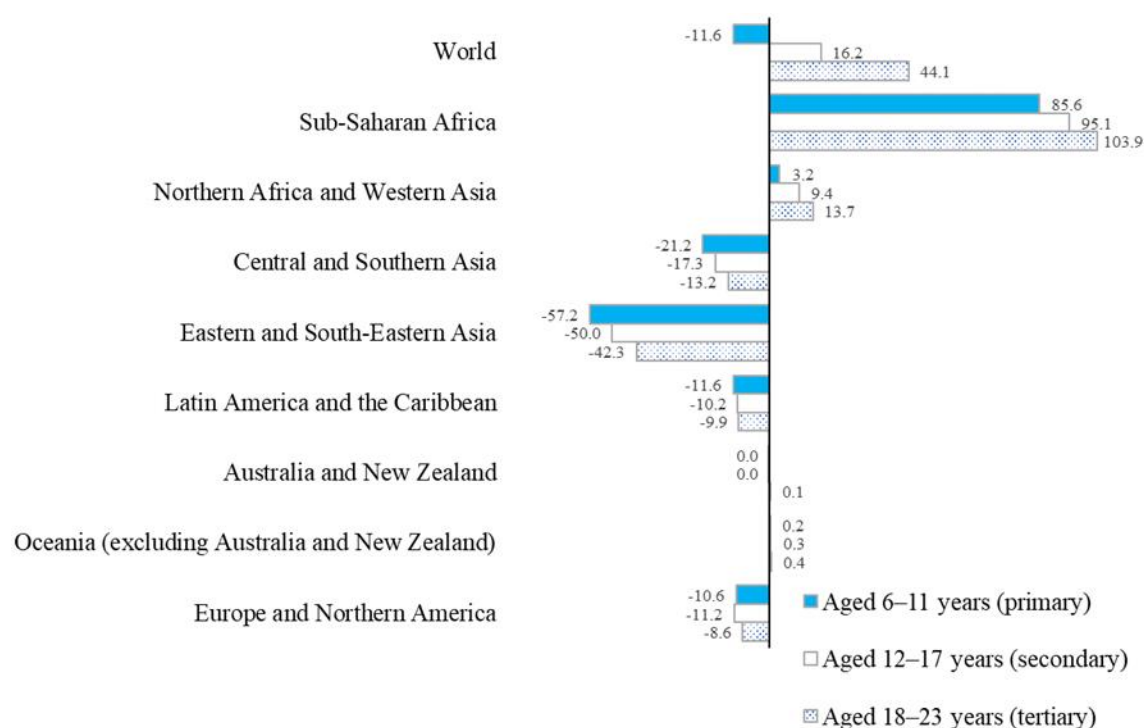
⁵ See UNESCO Institute of Statistics, "Population of the official age/school age population", online glossary. Available at <https://uis.unesco.org/en/glossary-term/population-official-age-school-age-population>.

15. The projected global trend of the school-age population aged 12–17 years (typically, those in secondary education) and of those aged 18–23 years (in tertiary education) is similar to the projected trend of the school-age population aged 6–11 years (in primary education), shifted in time by 6 and 12 years, respectively. Thus, the global school-age population aged 12–17 years is projected to reach its peak of nearly 816 million in 2029 then begin to fall. The school-age population aged 18–23 years is projected to reach an all-time high of 811 million in 2035 and to follow a similar downward trend thereafter.

16. Figure III shows the projected regional trends by age group. Eastern and South-Eastern Asia is expected to experience the largest decline in the school-age population aged 6–23 years between 2022 and 2050. The second largest decline over this period will take place in Central and Southern Asia. Sub-Saharan Africa will see the largest increase overall and across all three age segments. Growth of the school age population aged 6–23 years in sub-Saharan Africa is expected to account for 90 per cent of the global increase between 2022 and 2050.

Figure III

Projected change (in millions) in the size of the school-age population in three age segments, world and regions, 2022–2050



Source: United Nations, World Population Prospects: 2022 Revision.

17. Overall, the global school-age population aged 6–23 years was around 2.3 billion in 2022. It is projected to increase to nearly 2.4 billion in 2030 and to fluctuate within that range until 2056. However, the size of the school-age population aged 6–23 years as a proportion of the total population is projected to decline in all regions in the coming decades. This provides an opportunity for many countries to invest in quality education and to increase expenditure per student without necessarily increasing the fiscal burden associated with supporting the school-age population.

Role of human capital formation in population projections

Forecasts of the school-age population such as those described in the present report are based on standard population projections with data disaggregated by age and sex. However, additional insights can be gained about future human capital formation if the evolution and demographic impacts of educational attainment are also considered.

The size and demographic composition of the future school-age population depend primarily on past and future trends in fertility and on the size of successive cohorts of women in the reproductive age range. A secondary factor is the probability of surviving from birth through the range of school ages. Most national and international population projections, including those published by the United Nations in the World Population Prospects series, derive projected counts of population by age and sex on the basis of assumptions about future trends in fertility, mortality and migration. Some research groups have added education as an extra dimension, in addition to sex and age, to account explicitly for interrelationships between educational attainment and population change.^a Incorporating this additional information allows analysts to formulate scenarios associated with alternative educational policies and to study their potential impact on human capital formation and economic growth in future years. Forecasts of population composition by level of education can inform long-term economic, geopolitical and strategic planning, taking into account the skills and capacities of the future labour force.

^a For example, Lutz, Butz and K.C., eds., *World Population and Human Capital in the 21st Century*.

18. Because the education sector serves population groups defined primarily by age, located in school districts whose boundaries are often different from other administrative subdivisions, planning related to educational services requires population estimates and projections by single years of age for detailed geographic units.

D. Implications for education sector budgets

19. The allocation of resources devoted to education depends on demographic conditions in each country. As the number of children declines, maintaining the same level of aggregate spending in education results in an increased investment per child. This relative easing of the demographic pressure on educational spending is an important benefit of the fertility decline as part of the demographic transition. A detailed study of the fiscal implications of such changes in 10 countries in Latin America⁶ found that projected reductions in the school-age population would permit large increases in spending per student, reaching the average levels of per capita expenditure of countries that are members of the Organisation for Economic Co-operation and Development and facilitating the achievement of universal secondary education with little or no increase in taxes.

⁶ Tim Miller, Carl Mason and Mauricio Holz, “The fiscal impact of demographic change in ten Latin American countries: projecting public expenditures in education, health, and pensions”, in *Population Aging: Is Latin America Ready?*, Daniel Cotlear, ed. (Washington, D.C., World Bank, 2011).

20. Spending on education has important implications for inequalities in learning. From the mid-2010s to 2020, public spending on education as a share of GDP rose gradually for countries in all income groups. However, average public spending per capita in some regions, such as sub-Saharan Africa (\$254) and South Asia (\$358), represented a small fraction of the average level in Europe and Central Asia (\$6,156).⁷ Also, in poor countries, the share of private spending on education tends to be very high, benefiting a small segment of the student population and reinforcing pre-existing inequalities. In 2020, the share of private spending in low-income (39 per cent) and lower-middle-income (26 per cent) countries was much higher than in upper-middle-income (6 per cent) and high-income (2 per cent) countries.

21. The COVID-19 pandemic led to significant cuts in public spending on education in low-income and lower-middle-income countries,⁸ which face extraordinary challenges in recovering from learning losses due to the pandemic and resuming progress towards the universal completion of primary and secondary education by 2030, as prescribed by target 4.1 of the Sustainable Development Goals.

E. Education and labour force participation over the life cycle

22. Formal education and vocational training play a key role in preparing new entrants for the labour force and providing opportunities for them to upgrade their skills throughout their careers. The impact of educational attainment on employment status and earnings varies by stage of development and income level. In high-income and upper-middle-income countries, labour force participation and earnings rise with educational attainment. In these countries, workers with at least upper-secondary education are more likely to find employment and receive higher earnings than those with lower educational levels. The unemployment rate is typically much higher for workers, including young adults, who have not completed upper-secondary education. Therefore, in such countries, policies to support the completion of secondary education, facilitate school-to-work transitions and remove barriers to employment can help individuals to obtain better compensated, more productive employment, benefiting the macroeconomy and alleviating fiscal pressure from unemployment insurance programmes.⁹

23. By contrast, in low-income and lower-middle-income countries, individuals with higher levels of education do not necessarily have higher labour force participation rates. A large share of the economic activity and employment in low-income economies is concentrated in the informal sector, in agriculture, manufacturing and trade, where skilled job opportunities are less abundant. If employed, workers with a tertiary degree in these countries are much more likely to have formal jobs with favourable benefits and working conditions. However, highly skilled workers in these countries tend to have higher unemployment rates than workers with lower levels of education. These countries need to address the challenge of improving their education systems in terms of access and quality while expanding employment opportunities suitable for an increasingly skilled labour force. Such expansion requires an environment that is conducive to sustained economic growth (see [E/CN.9/2022/2](#)).

⁷ World Bank and United Nations Educational, Scientific and Cultural Organization (UNESCO), “Education finance watch 2022”, 2022.

⁸ World Bank, “Two-thirds of poorer countries are cutting education budgets due to COVID-19”, 22 February 2021.

⁹ International Labour Organization (ILO), *World Employment and Social Outlook: Trends 2020* (Geneva, 2020); and ILOSTAT, “Education pays off, but you have to be patient”, Spotlight on Work Statistics, No. 10, January 2020.

24. More highly educated workers generally earn higher wages, have better employment opportunities and health and do less physically demanding work than workers with less schooling. At older ages, these factors may raise their ability and willingness to remain in the workforce. Evidence from high-income countries and some upper-middle-income countries suggests that people with advanced education are more likely to remain employed past the age of 65 than those with less education,¹⁰ supporting greater autonomy and income security at older ages and alleviating some of the fiscal pressures on public budgets associated with population ageing.

III. Education trends, including progress towards the targets of the Sustainable Development Goals

A. Early childhood education

25. Target 4.2 of the Sustainable Development Goals seeks to ensure universal access to quality early childhood education programmes by 2030. Early childhood education facilitates the transition of young children to primary schooling, gives them a foundation for lifelong learning and yields numerous other benefits concerning academic performance, cognitive ability, the development of social skills and lifestyles, gender equality and health, contributing to more cohesive and egalitarian societies. By contrast, insufficient investment in early childhood education can lead to poorer health, learning deficits, lower earning potential and a less productive workforce.

26. Globally, more than 175 million children do not have access to early childhood education.¹¹ In 2020, about 1 in 4 children who were 1 year younger than the official age for entering primary school were not attending an early childhood education programme.¹² Most children who miss out on early childhood education live in low-income countries: in 93 developing countries or areas with data available between 2013 and 2021, 71 per cent of children aged 3–5 years did not attend such a programme; this proportion was nearly 82 per cent for the least developed countries (see figure IV). An even smaller proportion of children in the poorest households within countries attend preschool programmes. For example, in sub-Saharan countries, only about 9 per cent of children aged 3–5 years in households in the lowest income quintile were enrolled in an early childhood education programme in 2020, compared with 54 per cent for the highest quintile.

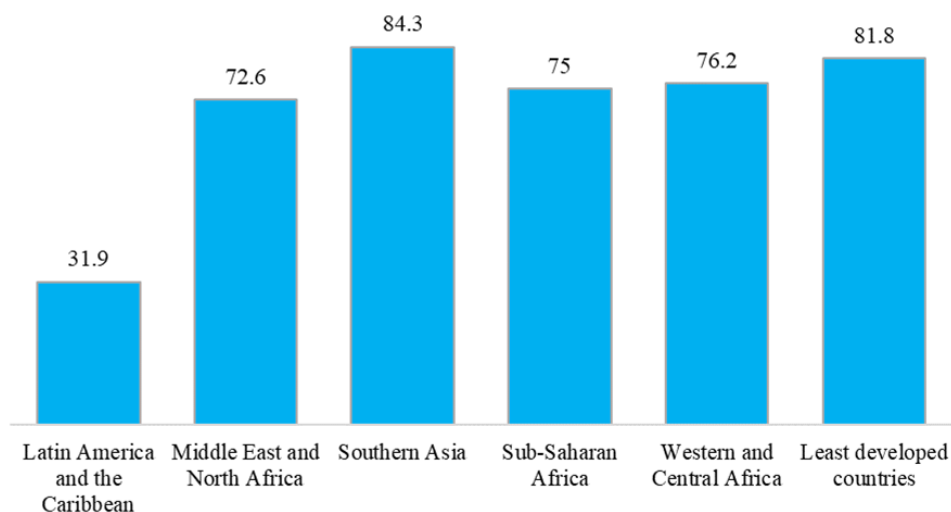
¹⁰ René Böheim and others, “The impact of health and education on labour force participation in aging societies: projections for the United States and Germany from a dynamic microsimulation”, NBER Working Paper, No. 29534 (Cambridge, Massachusetts, National Bureau of Economic Research, 2021).

¹¹ UNICEF, *A World Ready to Learn: Prioritizing Quality Early Childhood Education* (New York, 2019).

¹² The percentage of children aged 36–59 months attending an early childhood education programme (by sex and family wealth quintile). See www.unicef.org/education/early-childhood-education.

Figure IV

Proportion of children aged 3–5 years who did not attend an early childhood education programme, selected developing regions, 2013–2021



Source: www.unicef.org/education/early-childhood-education. Based on demographic and health surveys, multiple indicator cluster surveys and other household surveys in 93 countries.

B. School enrolment and completion

27. In 2020, 745 million children were enrolled in primary schools globally, about 168 million more than in 1990. In low-income countries, the number of children enrolled at primary school ages quadrupled from 1990 to 2020.¹³ This expansion was driven both by population growth and higher rates of school participation. In most regions, the primary net enrolment rate¹⁴ in 2020 was 90 per cent or higher, although in sub-Saharan Africa 80 per cent of primary school-age children were enrolled, up from 61 per cent in 2000. At the lower secondary level, the net enrolment rate was 85 per cent in 2020 globally, compared with 67 per cent at the upper secondary level. During the past three decades, the expansion of tertiary education has been particularly rapid in sub-Saharan Africa, Northern Africa and Western Asia, and Central and Southern Asia, with nearly six-fold increases in the numbers of students.

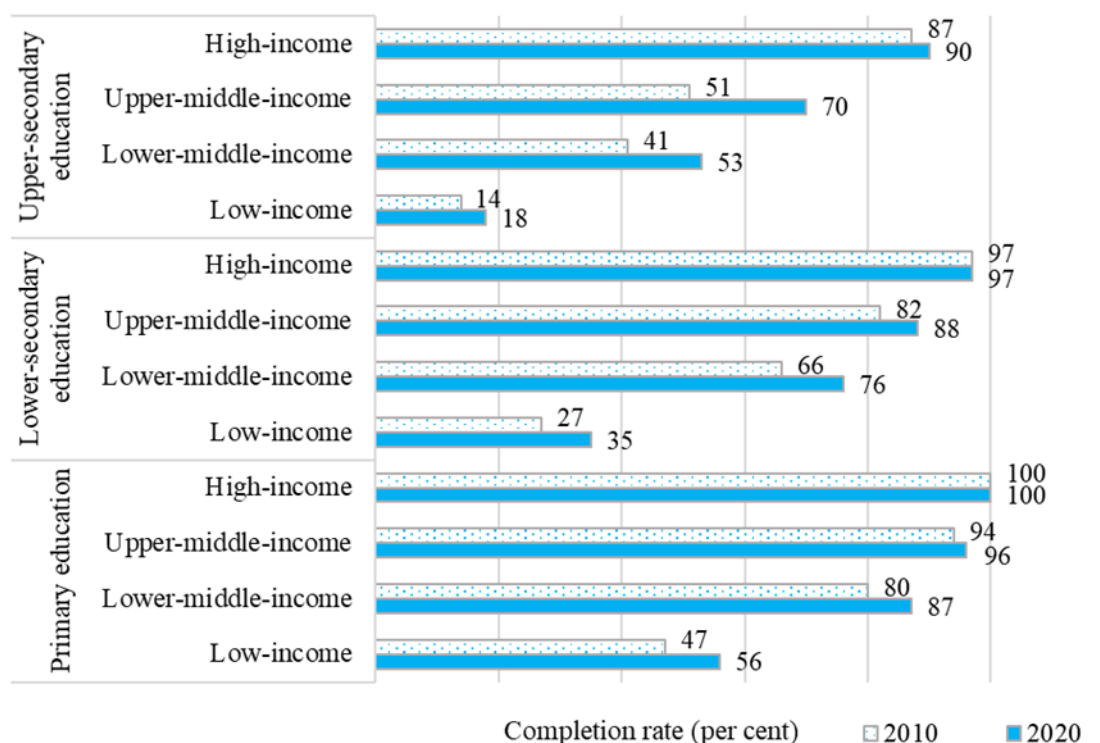
28. Global progress towards the Sustainable Development Goal target of universal completion of primary and secondary education by 2030 has been uneven. In 2020, the completion rate for primary education was 87 per cent globally, but only 63 per cent in sub-Saharan Africa. At the lower- and upper-secondary levels, completion rates worldwide in 2020 were 77 and 58 per cent, respectively. Low-income countries have much lower completion rates: just over half for primary school and slightly more than one third for lower secondary education (see figure V).

¹³ UNESCO Institute for Statistics, UIS.Stat database. Available at <http://data.uis.unesco.org>.

¹⁴ UNESCO Institute for Statistics, “Total net enrolment rate”, online glossary. Available at <http://uis.unesco.org/en/glossary-term/total-net-enrolment-rate>.

Figure V

Completion rates for primary and secondary education, by country income group, 2010 and 2020



Source: UNESCO Institute for Statistics, September 2022 release, available at <http://sdg4-data.uis.unesco.org>.

29. Globally in 2020, fewer than half of all enrolled students reached minimum proficiency in reading at the lower-secondary school level (or just over one third of all children, including those out of school). In sub-Saharan Africa, only about 10 per cent of children who completed lower secondary school had achieved minimum proficiency in reading.

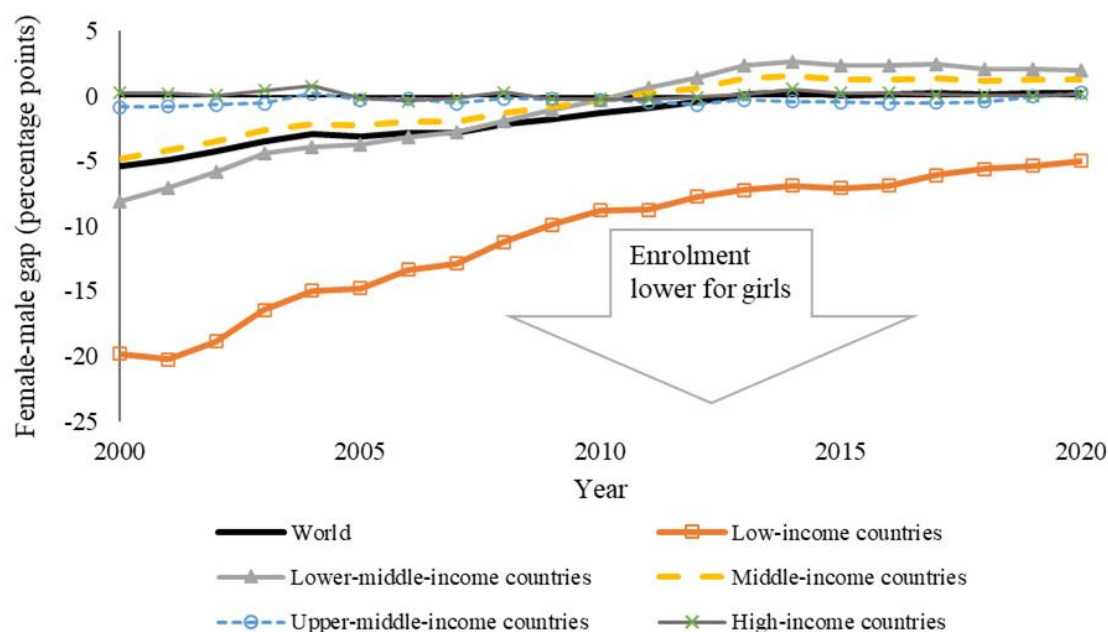
30. The gender gap in school enrolment and attendance has declined over the past two decades. In 2020, the global gap in out-of-school rates for primary, lower-secondary and upper-secondary levels of education was less than 2 per cent in each case.¹⁵ Larger gender gaps remain at each level in sub-Saharan Africa and Northern Africa and Western Asia. Low-income countries are farthest from gender parity in enrolment, having made significant yet relatively slow progress over the past 10 years. For lower-secondary education, as shown in figure VI, enrolment rates for young women in low-income countries are still 5 percentage points lower than for young men, while at the upper-secondary level the disadvantage was 9 percentage points. Globally, girls have an advantage regarding completion rates at each education level, with timely completion 2 percentage points higher for girls than for boys in 2020, although girls' completion rates lag in Central and Southern Asia and sub-Saharan Africa at the upper-secondary level. In some regions, the female advantage in enrolment, educational achievement and school performance has been

¹⁵ UNESCO, *Global Education Monitoring Report: Gender Report – Deepening the Debate on Those Still Left Behind* (Paris, 2022). The gender gap in enrolment is defined as the difference between female and male rates for the official age range for a given education level.

long-standing. However, those gains have not translated into equivalent success in the labour market, where women remain at a disadvantage in most countries.¹⁶

Figure VI

Gender gap in enrolment rates for adolescents of lower-secondary-school age (female-male), by country income group, 2000–2020



Source: UNESCO Institute for Statistics, UIS.Stat database, available at <http://data.uis.unesco.org>.

31. Completion rates also vary by location and household wealth. For example, only one sixth of countries with available data reached parity between rural and urban zones in the completion of lower-secondary education, while differences in completion remained widespread between the poorest and richest households within countries. Girls in the poorest households remain at a disadvantage in terms of educational attainment and learning outcomes.¹⁷

C. Digital inclusion

32. Fluency with and access to digital technology are necessities of modern life. As the world grappled with the COVID-19 pandemic, teachers, parents and students witnessed first-hand how digital technologies allowed education to be maintained, and even expanded in some cases. Some 63 per cent of the world's population now has online access, and the number of Internet users has increased rapidly since 2019, by 17 per cent globally and by 20 per cent in the least developed countries. Despite the great potential of digital technology for positive change, however, the digital divide is still superimposed onto global economic inequalities: in 2021, close to

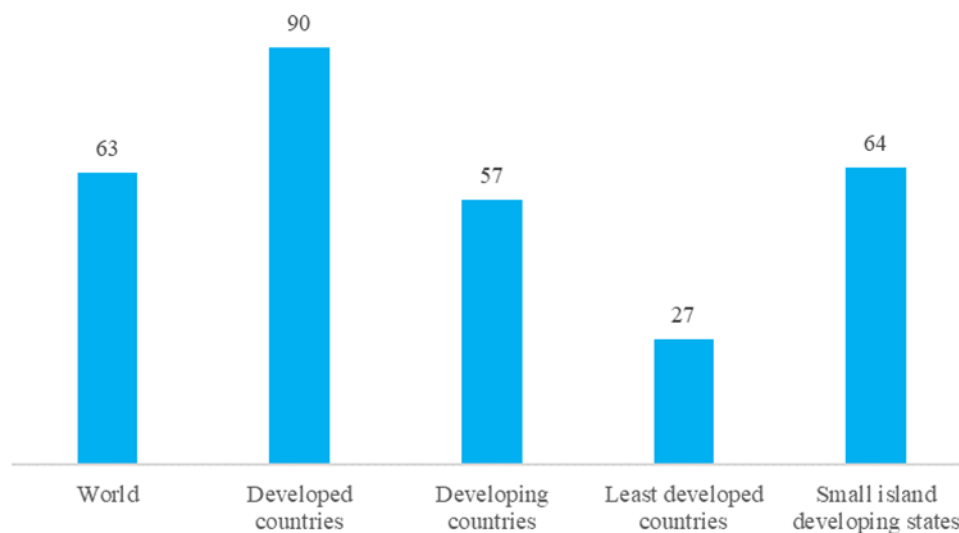
¹⁶ In Latin America and the Caribbean, for example, women are underrepresented in fields related to information and communications technologies, engineering, industry and construction, helping to perpetuate their low level of participation in research and development, scientific production, publication of academic research and other areas associated with better paying, more stable employment. See *Social Panorama of Latin America and the Caribbean: Transforming Education as a Basis for Sustainable Development* (United Nations publication, 2022).

¹⁷ United Nations, "Goal 4: quality education", in *The Sustainable Development Goals Extended Report 2022* (United Nations publication, 2022).

90 per cent of the population in developed countries used the Internet, compared with only 27 per cent in the least developed countries (see figure VII).¹⁸

Figure VII

Percentage of individuals using the Internet, 2021



Source: International Telecommunication Union, *Measuring Digital Development: Facts and Figures 2021*.

D. Lifelong learning

33. Demographic changes, along with new technologies and globalization, are transforming the world of work, bringing fresh opportunities and novel challenges for people to access decent jobs and for companies to thrive and adapt. The COVID-19 pandemic disrupted labour markets worldwide and accelerated structural transformations related to remote and flexible work, digitalization and the demand for new types of jobs and skills.¹⁹

34. The context of these changes includes the progressive ageing of the global population. With unprecedented numbers of people surviving to advanced ages, lifelong learning and the re-skilling of workers are more important than ever. Moreover, the strengthening of intergenerational workforces can alleviate associated fiscal pressures on health and pension systems and contribute to sustained and more inclusive economic growth.²⁰

35. There has been significant progress in access to adult learning and education, notably in the participation of women and other disadvantaged and vulnerable groups, such as Indigenous Peoples, rural populations, migrants, older persons, persons with disabilities and prisoners, who often have limited access to learning opportunities.²¹ Despite the progress made, however, significant gaps and challenges remain. Among

¹⁸ International Telecommunication Union, *Measuring Digital Development: Facts and Figures 2021* (Geneva, 2021).

¹⁹ ILO, *Shaping Skills and Lifelong Learning for the Future of Work* (Geneva, 2021).

²⁰ *World Social Report 2023: Leaving No One Behind in an Ageing World* (United Nations publication, 2023).

²¹ UNESCO Institute for Lifelong Learning, *5th Global Report on Adult Learning and Education: Citizenship Education – Empowering Adults for Change* (Hamburg, 2022).

159 countries and areas with available data, about 60 per cent reported no improvement in participation by persons with disabilities, migrants or prisoners. In 24 per cent, the participation of rural populations and of older persons had declined.

E. Progress in education, building human capital and effects on other Sustainable Development Goals

36. Ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all (Sustainable Development Goal 4) is a key development goal that has great value in itself. Moreover, available evidence suggests that expanded access to quality education brings myriad direct and indirect benefits to society and has the potential to drive progress towards all global goals.

37. The evidence includes both the direct effects of a widely observed association between increased educational attainment and reductions in fertility and mortality (see chaps. IV and V), as well as the indirect impacts of changing population age structures on the macroeconomy and society at large. Countries currently experiencing growth in the size of the working-age population relative to children and older persons (including many in Africa and Asia, and some in Latin America and the Caribbean and the Arab region) can realize a sizeable “demographic dividend”, namely a boost to per capita economic growth derived from an increase in the relative size of the working-age population during a particular stage of the demographic transition (see [E/CN.9/2017/2](#) and [E/CN.9/2022/2](#)). In addition, improvements in educational attainment contribute directly to productivity and income growth, implying that a substantial portion of the demographic dividend may in fact be an education dividend.²²

IV. Education, entry into reproductive life and fertility

A. Fertility trends and educational levels: international evidence

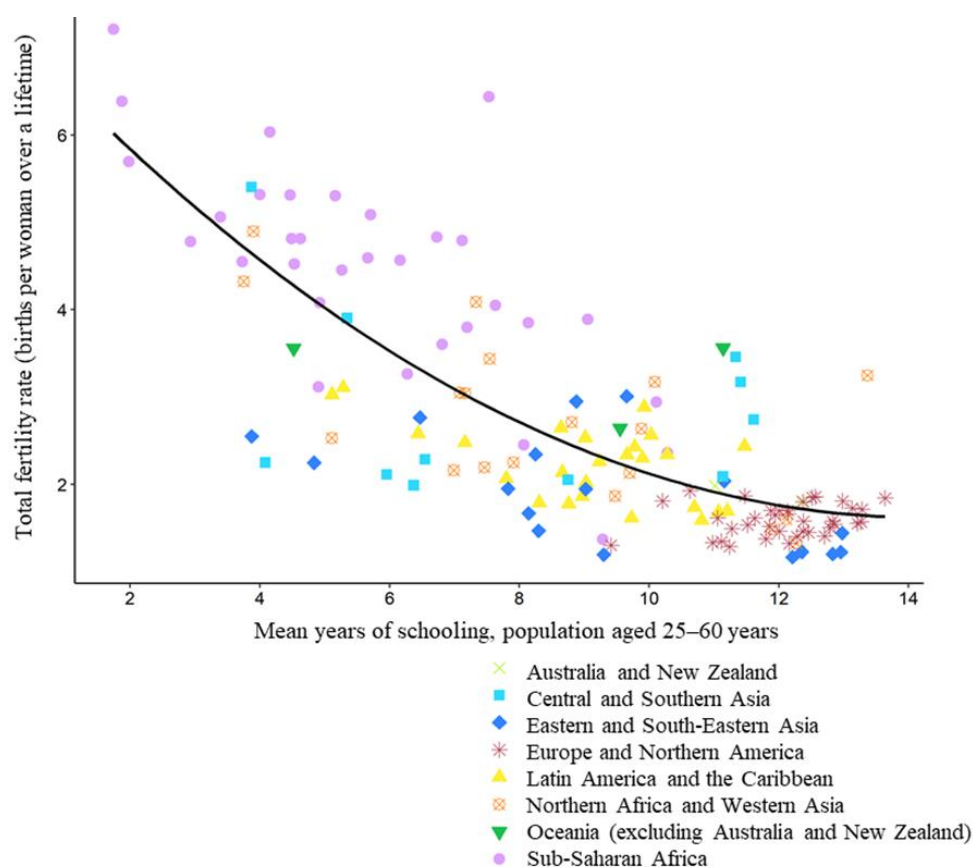
38. Women with higher education levels generally bear fewer children than those who are less educated, with differences especially marked in low- and middle-income countries. More educated women have greater autonomy in reproductive decision-making and more knowledge about and access to family planning, and are more likely to delay their marriage and childbearing than women with less education.

39. An inverse correlation between levels of education and fertility is generally observed across countries (see figure VIII). The same is true for changes over time in recent decades: the expansion of primary and secondary education in developing countries, together with the increased availability of family planning services, has been closely associated with the global decline in fertility.²³

²² Jesús Crespo Cuaresma, Wolfgang Lutz and Warren Sanderson, “Is the demographic dividend an education dividend?”, *Demography*, vol. 51, No. 1 (February 2014).

²³ Daphne H. Liu and Adrian E. Raftery, “How do education and family planning accelerate fertility decline?”, *Population and Development Review*, vol. 46, No. 3 (September 2020).

Figure VIII
Average fertility level by mean years of schooling, 148 countries, circa 2015



Source: United Nations, World Population Prospects: 2022 Revision; and Robert J. Barro and Jong-Wha Lee, “International data on education attainment”, Barro-Lee dataset. Available at www.barrolee.com.

40. Fertility varies within countries by educational level at various stages of the transition from high to low fertility. In the early stages of the transition, significant fertility differentials are observed between women with and without primary education, but these differences tend to diminish as countries move towards lower fertility levels. Relative differences in fertility between women with and without secondary education or higher become more noticeable at more advanced stages of the fertility transition, even though absolute differences tend to be small.

41. The fertility decline in sub-Saharan Africa started later than in other regions and stalled in the early 2000s, due partly to stagnation in the enrolment of girls in primary school from the 1980s to the early 2000s. If fertility had continued its earlier downward trend, it is estimated that there would have been about 13 million fewer births to women aged 15–34 years between 1995 and 2010 in 10 countries in Africa in which the fertility decline had stalled, including Kenya, the Niger and Nigeria.²⁴

42. The educational attainment of women, in particular at the lower-secondary level or higher, has played a more important role in accelerating fertility decline in recent decades. However, there have been concerns that in many sub-Saharan African

²⁴ Endale Kebede, Erich Striessnig and Amme Goujon, “The relative importance of women’s education on fertility desires in sub-Saharan Africa: a multilevel analysis”, *Population Studies*, vol. 76, No. 1 (2022).

countries the expansion of education may have been achieved without much improvement in quality, with many primary school students not acquiring the literacy skills expected for their age and grade.

43. In developed countries that achieved low fertility decades ago, educational differentials remain, with mixed evidence for births of different orders. In these countries, the educational attainment of women continues to be positively associated with levels of childlessness and the average age of women at the birth of their first child. However, in countries in Northern and Western Europe, there is also increased evidence of a positive association of education with overall fertility intentions and with the frequency of second or third births. Especially in the Nordic countries, greater gender equality within households combined with supportive, family-friendly policies may be contributing to an upturn in fertility among more educated women.

B. Education and age at initiation of sexual activity, contraceptive use and childbearing

44. Educational attainment influences various aspects of people's sexual and reproductive lives, including when they become sexually active, if and how they use family planning and the timing of their childbearing. In general, research indicates that education and family planning programmes help to reduce levels of both wanted and unwanted fertility.

45. Across major world regions, higher levels of education are associated with a higher mean age at sexual initiation. Completion of secondary education yields the largest impact on delaying sexual initiation. However, evidence from sub-Saharan Africa suggests that the positive correlation between education and age at sexual initiation may hold only or mostly for girls and women and may even be reversed for boys and men.²⁵

46. The use of modern contraceptive methods is also positively correlated with the level of education. Education affects the uptake of modern contraceptives by increasing knowledge about the biology of reproduction, including about mortality risks facing mothers and children, by dispelling myths and misinformation about negative side effects and by providing useful information about the convenience and efficacy of modern methods. Education may also indirectly influence modern contraceptive use through its effects on labour force participation, income, wealth and socioeconomic status, all of which are associated with higher rates of modern contraceptive use. Consequently, improvements in girls' and women's education influence the timing of marriage and childbearing and thus affect the speed of fertility transitions at the national level.

47. Completion of education at the secondary level or higher affects the labour force participation and economic empowerment of women. These, in turn, increase their income, bargaining position in the household and freedom of movement, providing greater opportunities for them to access effective family planning services.

C. Early marriage or childbearing and educational attainment

48. The proportion of women aged 20–24 years who were married or in a union before the age of 18 (Sustainable Development Goal indicator 5.3.1) remained high in many countries in 2021, in particular in sub-Saharan Africa (35 per cent), Central and Southern Asia (28 per cent), and Latin America and the Caribbean (21 per cent).

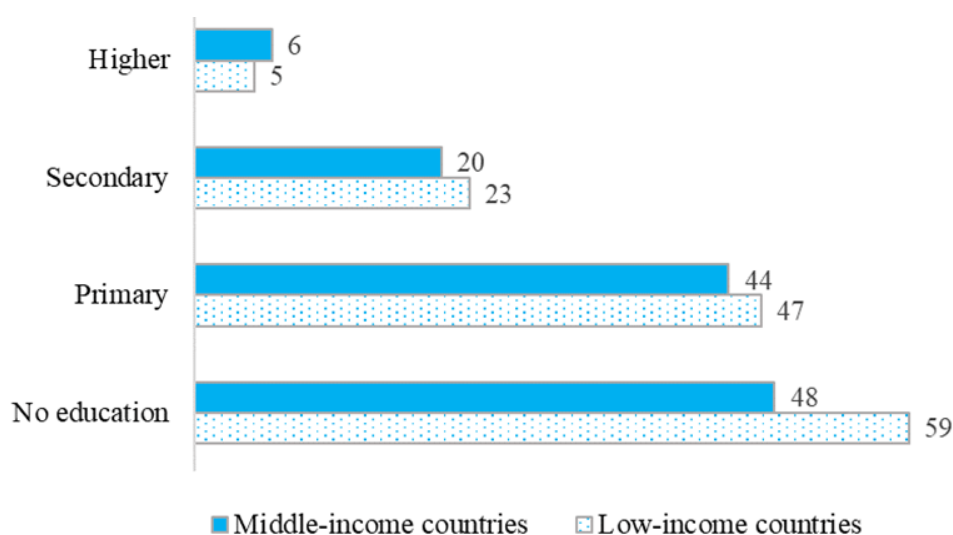
²⁵ Stephanie Simmons Zuilkowski and Matthew C.H. Jukes, "The impact of education on sexual behavior in sub-Saharan Africa: a review of the evidence", *AIDS Care*, vol. 24, No. 5 (2012).

These three regions together account for about three quarters of the 650 million girls and women who were married or in a union before the age of 18 globally.²⁶

49. Early marriage and childbearing can have lifelong impacts on girls' socioeconomic outcomes as these demographic events can interrupt their education, leading to early withdrawal from the education system, reduced economic independence and an increased risk of poverty. Keeping girls in school is one of the most effective ways of combating child marriage. On average, the likelihood of a girl marrying as a child is reduced by six percentage points for every additional year of secondary education.²⁷ This impact is evident also in data from low- and middle-income countries showing that women with higher levels of completed education are much less likely to have been married before the age of 18 (see figure IX).

Figure IX

Percentage of women married before the age of 18 by highest level of education completed, 49 low- and middle-income countries, 2010–2021



Source: Demographic and health surveys.

Note: Percentages are based on data reported by women aged 20–24 years at the time of the survey.

50. Studies in countries in sub-Saharan Africa, Latin America and the Caribbean, and Europe and Northern America have shown that, the earlier girls marry, the less likely they are to be literate or to attend and complete secondary education. Similarly, girls who give birth before the age of 18 have worse educational and labour market outcomes than those who do not.²⁸

51. These relationships are also reflected at the population level: across countries, adolescent fertility rates among girls aged 10–14 years (Sustainable Development Goal indicator 3.7.2) are negatively correlated with female education completion rates at the primary, lower-secondary and upper-secondary levels (indicator 4.1.2) (see figure X).

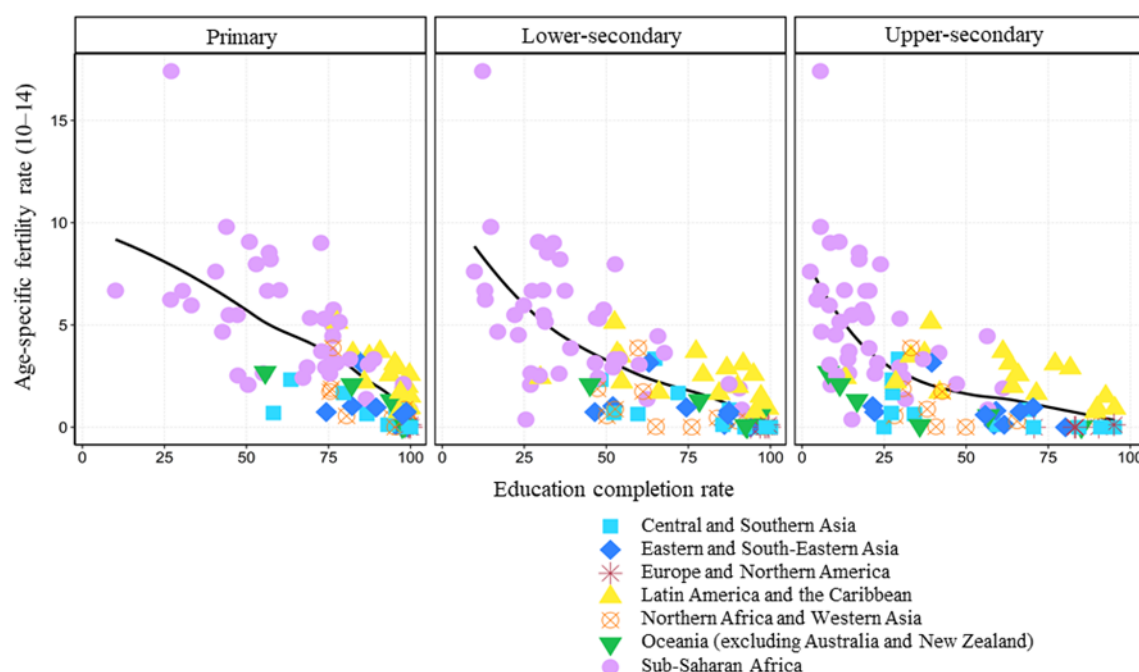
²⁶ UNICEF, “Child marriage around the world”, 11 March 2020.

²⁷ Quentin Wodon and others, *Missed Opportunities: The High Cost of Not Educating Girls* (Washington, D.C., World Bank, 2018); and World Bank, “Educating girls, ending child marriage”, 24 August 2017.

²⁸ Minh Cong Nguyen and Quentin Wodon, “Impact of child marriage on literacy and education attainment in Africa”, background paper prepared for a task funded by the Global Partnership for Education, September 2014; and Economic Commission for Latin America and the Caribbean and others, “Child, early and forced marriages and unions deepen gender inequalities”, 2022.

Figure X

Adolescent birth rate for girls aged 10–14 years by female education completion rate at the primary, lower-secondary and upper-secondary levels, 110 countries, 2019



Source: United Nations, World Population Prospects: 2022 Revision; and SDG Global Database, available at <https://sdghub.com/project/sdg-global-database>.

Note: Based on countries with available data on birth rate for the ages of 10–14 years.

52. Child marriage is a far more common reason for the early withdrawal of girls from education than early childbearing. However, child marriage and early childbearing are a less common direct cause of prematurely leaving school than poverty, distance to school, quality of instruction and the perceived value of education, among others.

53. Child marriage is more common in low- and middle-income countries that do not have a minimum legal age of marriage or do not enforce existing laws, especially in rural areas. Rigorous enforcement of a minimum legal age of marriage is needed to yield the desired individual and societal benefits. Multisectoral empowerment programmes that include life skills training, livelihood training, gender rights awareness training, exposure to future careers and sexual and reproductive health training have been shown to raise school enrolment rates and lower the risks of pregnancy and early childbearing.²⁹

D. Sexuality education, fertility outcomes and lifetime development implications

54. Comprehensive sexuality education is a curriculum-based process of teaching and learning about the cognitive, emotional, physical and social aspects of sexuality,³⁰ which can help in achieving development objectives on health, education and gender equality (Sustainable Development Goals 3, 4 and 5) and to reduce adolescent

²⁹ Thoi Ngo, “The good, the bad and the unintended: education, child marriage and early childbearing”, presentation at the expert group meeting of the United Nations Population Division, September 2022.

³⁰ UNESCO, “Why comprehensive sexuality education is important”, 21 April 2022.

fertility. Education on health, well-being, the human body, sex and relationships, delivered at a time when an adolescent's cognitive, emotional and social development is taking place, yields a range of benefits, including the ability to learn better and to lead a healthier and happier life.³¹

55. Conversely, a lack of education or of access to information about human sexuality creates cumulative disadvantages across the reproductive life course. Without adequate sexuality education, young people do not acquire good knowledge of contraceptive methods and how to use them effectively. Confinement to the household creates additional barriers to access to services, especially for younger unmarried women. In some contexts, these circumstances can also lead to an increased prevalence of gender-based violence, sexually transmitted infections (including HIV) and unintended pregnancies.

56. Comprehensive sexuality education can help to reduce early or unintended pregnancies, enhance gender-equitable attitudes and reduce school dropout rates.³² It can also help to delay sexual initiation and decrease the incidence of HIV and other sexually transmitted infections. When delivered in conjunction with reproductive health care, including contraceptive services, comprehensive sexuality education is a core component of effective pregnancy prevention programmes among adolescents and young people.³³ Schools are also important sites for delivering such education because trained teachers are able to develop age-appropriate knowledge, attitudes and skills and to support learners and their families in accessing health and social protection services.

V. Education, health and mortality

57. The 2030 Agenda underscores the interlinkages between development goals on health and education. The health, nutrition and well-being of learners are key determinants of educational outcomes. Education, in turn, has an impact on health by improving economic opportunities, leading to better, more stable jobs that allow families to accumulate wealth that can be used to improve health. Education may also facilitate the adoption of healthy behaviours, including eating healthy diets, engaging in regular physical activity and seeking and accessing preventive care services and social support to cope with stressors.

A. Differentials in mortality and health by education level

58. An educational gradient in health and mortality indicators has long been recognized. Recent studies have confirmed, for example, a clear association at the national level between mean years of schooling and measures of child and adult mortality. Between 1970 and 2010, 14 per cent of the reduction in mortality under the

³¹ Leon Feinstein and others, "What are the effects of education on health?", in *Measuring the Effects of Education on Health and Civic Engagement: Proceedings of the Copenhagen Symposium*, Richard Desjardins and Tom Schuller, eds. (Organisation for Economic Co-operation and Development (OECD), 2006).

³² Ann M. Starrs and others, "Accelerate progress-sexual and reproductive health and rights for all: report of the Guttmacher-Lancet Commission", *The Lancet Commissions*, vol. 391, No. 10140 (June 2018); and Laureen M. Lopez and others, "School-based interventions for improving contraceptive use in adolescents", *Cochrane Database of Systematic Reviews*, vol. 6, article No. CD012249 (2016).

³³ UNESCO and others, *International Technical Guidance on Sexuality Education: An Evidence-Informed Approach* (Paris, UNESCO, 2021); and Andrea Irvin and others, *Comprehensive Sexuality Education as a Strategy for Gender-Based Violence Prevention* (Bangkok, United Nations Population Fund, Asia Pacific Regional Office, 2021).

age of 5 and around 30 per cent of reductions in adult mortality could be attributed to gains in female educational attainment.³⁴ Education can have lifelong impacts on an individual's health status and is associated with health disparities throughout the life course, including at older ages.

59. Evidence of inequalities in mortality by educational status comes largely from high-income countries in Europe and Northern America, where there has been concern about the persistence of mortality differentials by education. In the United States of America, adults without a bachelor's degree experienced a downturn in life expectancy after 2010, while the life expectancy of those with a bachelor's degree continued to rise.³⁵ In 2020, Americans without bachelor's degrees were overrepresented in excess deaths associated with the COVID-19 pandemic, amplifying pre-existing inequalities. In Europe, the evidence is mixed, with mortality differentials between less- and more-educated populations declining in absolute terms but rising in relative terms.

60. In recent decades, data from sample surveys, cohort studies and demographic surveillance sites have expanded the understanding of educational differentials in health and ageing around the world. A project collating data from 17 cohort studies that included participants from 38 countries across six continents to assess patterns and trends in healthy ageing, including measures of physical health, cognition and functional ability, found that levels of education affected baseline scores of healthy ageing but had less of an impact on its rate of decline over a 10-year follow-up period.³⁶

61. Available data also confirm wide disparities in the prevalence of physical or functional disabilities between the least and most educated adults within countries. In the United States and countries in Europe, the prevalence of disability among adults aged 50 years or older was twice as high in about 2018 for those with low levels of education compared with those who were highly educated. Somewhat smaller differences were observed between similar groups in China, India and Mexico.³⁷

B. Relationship between parents' education and child's health

62. Recent research has confirmed that the increased education of mothers and fathers helps to reduce mortality under the age of 5 years, with maternal education being a stronger predictor than paternal education.³⁸ Children born to mothers with 12 years of education had a 31 per cent lower risk of dying under the age of 5 years compared with those born to mothers with no education; the difference was 17 per cent in respect of the father's education. The association between higher maternal or paternal education and lower child mortality was significant for all three age segments within the first five years of life (namely the neonatal period from 0 to 27 days, the post-neonatal period from 28 days to 1 year and the age range from the first to the fifth birthdays) (see figure XI). The association persists even after controlling statistically for other markers of family socioeconomic status. These findings provide

³⁴ Elina Pradhan and others, "The effects of education quantity and quality on child and adult mortality: their magnitude and their value", in *Disease Control Priorities*, 3rd ed., vol. 8, Dean T. Jamison, eds. (Washington, D.C., World Bank, 2017).

³⁵ Anne Case and Angus Deaton, "Life expectancy in adulthood is falling for those without a BA degree, but as educational gaps have widened, racial gaps have narrowed", *Proceedings of the National Academy of Sciences*, vol. 118, No. 11 (2021).

³⁶ Yu-Tzu Wu and others, "Education and wealth inequalities in healthy ageing in eight harmonised cohorts in the ATHLOS consortium: a population-based study", *The Lancet: Public Health*, vol. 5, No. 7 (July 2020).

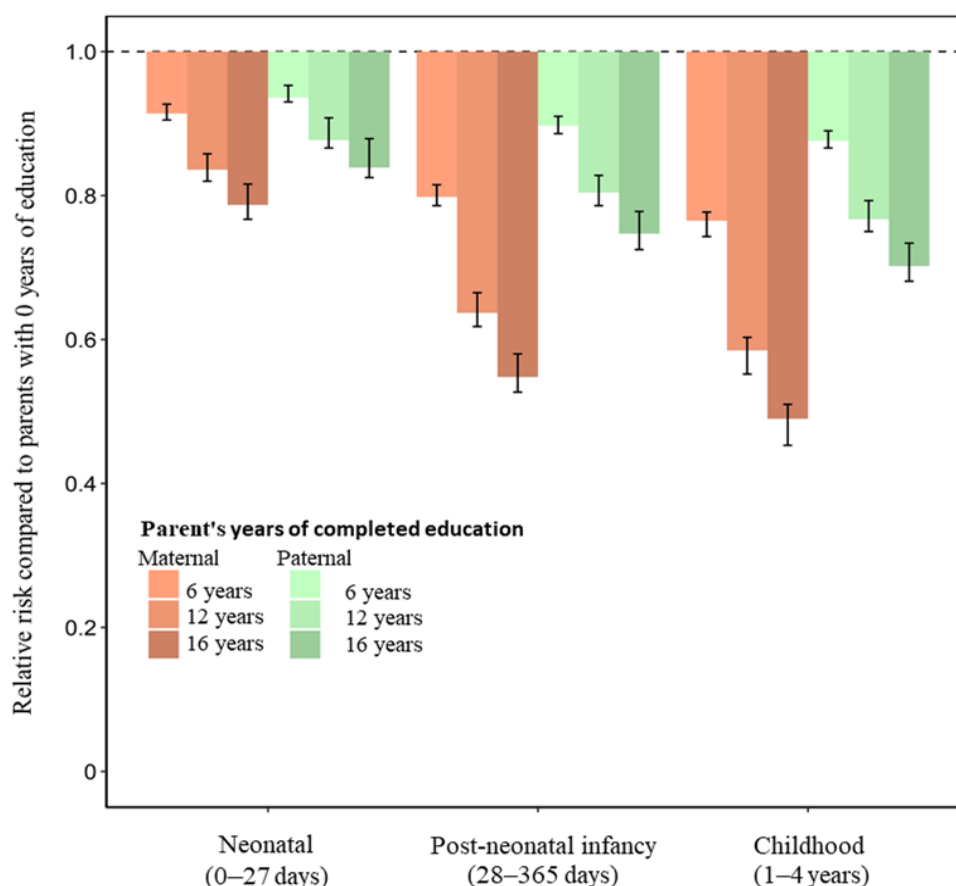
³⁷ *World Social Report 2023* (United Nations publication, 2023).

³⁸ Mirza Balaj and others, "Parental education and inequalities in child mortality: a global systematic review and meta-analysis", *The Lancet*, vol. 398, No. 10300 (August 2021).

robust evidence that universal access to quality education is critically important for the achievement of target 3.2 of the Sustainable Development Goals on reducing neonatal and child mortality.

Figure XI

Relative risks of neonatal, post-neonatal and child mortality, by parents' educational level



Source: Balaj and others, “Parental education and inequalities in child mortality”.

Note: The baseline category is “no education”. Based on the results of a meta-analysis of published studies of the effects of parental education on child mortality and an analysis of demographic and health survey data.

C. Education on sexual and reproductive health, including prevention of HIV/AIDS and other sexually transmitted infections

63. As stated in chapter IV, one positive impact of sexuality education is increased knowledge of behaviours and risks associated with sexually transmitted infections, including HIV. Existing evidence and guidance suggest that school-based sexuality education remains a crucial and cost-effective strategy for protecting the health and rights of young people, which should be part of a holistic strategy aimed at engaging young people in learning about and shaping their sexual and reproductive futures across multiple settings, including schools, communities, health services, families and households.³⁹

³⁹ UNESCO, *International Technical Guidance on Sexuality Education*.

64. Education about human sexuality and sexual and reproductive health is most impactful when school-based programmes are complemented with community actions and services, including distributing condoms, training health providers and involving parents and teachers. Multi-component programmes, especially those linking school-based sexuality education with non-school-based, youth-friendly health services, are particularly important for reaching marginalized young people, including those not in school.

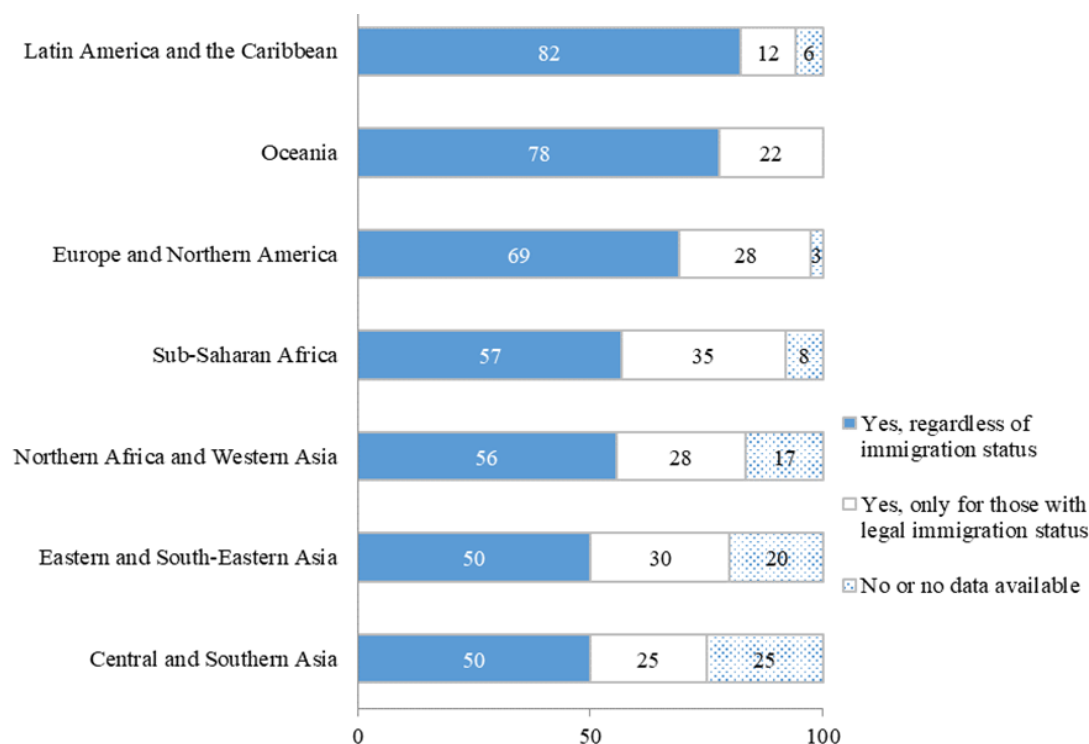
VI. Education and migration

65. Immigrants and their children, sometimes even those born in the host country, face various barriers in accessing quality education and learning opportunities. They are less likely to be enrolled in early childhood education, which can have a negative impact on their academic performance and lifetime educational attainment. Overcoming these barriers is critical to improving educational outcomes for migrant children and promoting their integration into host societies.

66. The proportion of Governments giving migrants access to public education varies across regions. Countries in Central and Southern Asia and in Eastern and South-Eastern Asia had the lowest shares of Governments (50 per cent each) reporting that they provided equal access to public education for all migrants, regardless of immigration status. Latin America and the Caribbean (82 per cent) and Oceania (78 per cent) had the highest proportions of Governments reporting such policies (see figure XII).

Figure XII

Percentage of Governments with policies in place to provide equal access to public education, by region, 2021



Source: World Population Policies database (2021), United Nations Inquiry among Governments on Population and Development, available at www.un.org/development/desa/pd/data/world-population-policies.

Note: Based on 138 countries with available data (as at 31 October 2021). Public education in this context refers to public preschools, primary schools and secondary schools.

67. Migration generates important economic benefits for countries of origin, with remittances being one of the most evident and sizeable. The vast majority of remittances worldwide in 2022 (\$540 billion of \$702 billion) were sent to low- or middle-income countries. Remittances can help to improve education outcomes in countries of origin because they allow poor, credit-constrained households to reduce their reliance on child labour for income and to defray school-related costs, potentially increasing school attendance, especially in low-income countries.

68. However, the transaction costs of sending remittances remain high, averaging 6.4 per cent in 2021, much higher than the Sustainable Development Goal target of less than 3 per cent by 2030. Efforts to lower remittance transaction costs and create alternative, low-cost channels should be prioritized, including those specified in the Addis Ababa Action Agenda of the Third International Conference on Financing for Development.

69. For countries of origin, the emigration of individuals with high levels of human capital and skills can have negative consequences in terms of productivity, the provision of services and tax revenues, a phenomenon known as brain drain. From the perspective of destination countries, immigration often brings a net gain in the human capital and skills of the average worker. In many countries that are members of the Organisation for Economic Co-operation and Development, immigrants are more likely to have attended or completed tertiary education than the native-born population.⁴⁰ Host countries benefit from the influx of highly skilled migrants, who often boost innovation, in particular in science and technology. “Brain waste” occurs when well-educated, highly skilled migrants are employed in occupations that require lower skill levels, resulting in a loss of income and a waste of human capital.

70. The Global Compact for Safe, Orderly and Regular Migration contained calls for Governments to facilitate the mutual recognition of skills, qualifications and competences of migrant workers at all skill levels and promote demand-driven skills development to optimize the employability of migrants in formal labour markets in countries of destination and in countries of origin upon return, as well as to ensure decent work in labour migration (see General Assembly resolution [73/195](#), annex).

VII. Conclusions and recommendations

71. Population data from national population censuses, population registers and other sources, as well as geographically disaggregated population projections, are fundamental inputs to policy planning in education. Population estimates and projections disaggregated by age, sex and geography, together with data on school enrolment, attendance and completion, are needed for planning and to monitor the education-related targets of the Sustainable Development Goals.

72. The school-age population is projected to decline in most regions over the next few decades. Declining numbers liberate resources that can be used to increase expenditure per student and improve the quality of education. However, school-age populations will continue to grow in sub-Saharan Africa, Northern Africa and Western Asia, and Oceania (excluding Australia and New Zealand), where more resources will be needed to expand the coverage and improve the quality of education.

73. Governments and the international community should ensure universal access to quality education at all levels, so that all people, including those with disabilities, Indigenous Peoples and other disadvantaged or vulnerable groups,

⁴⁰ OECD, *The Road to Integration: Education and Migration*, OECD Reviews of Migrant Education (Paris, 2019).

have access to lifelong learning opportunities and can participate fully in society and contribute to sustainable development.

74. Policies that support the completion of secondary education, facilitate school-to-work transitions and remove barriers to employment can help individuals to obtain better compensated, productive employment while benefiting the macroeconomy and lowering the costs of unemployment insurance.

75. Education serves to raise public awareness of pressing global environmental problems, such as global warming, loss of biodiversity and marine pollution, and may encourage young people to be more environmentally conscious. Investments in education about the environment and sustainable development are critical to meet global development objectives and to combat climate change and environmental degradation.

76. Education and family planning programmes help to reduce both wanted and unwanted fertility and affect the pace of fertility decline. Education programmes should raise awareness about available options for family planning and should affirm the right of all persons to decide, freely and responsibly, the number of children that they wish to have and the timing of their births.

77. School-based sexuality education is a crucial and cost-effective means of protecting the health and rights of young people and should be part of a holistic strategy to engage young people in learning about their sexual and reproductive health, involving not only schools but also health services, families, households and communities. Well-designed curricula to deliver comprehensive education on human sexuality, gender, relationships and rights in participatory, learner-centred, age-appropriate and culturally relevant ways can help to foster positive social norms, promote gender equality and reduce rates of gender-based violence.

78. Rising educational levels are associated with improvements in population health and survival. Health outcomes for children are usually better when parents are well educated. Governments are encouraged to expand access to health care for all and to promote health literacy and education about behavioural factors affecting health, including for persons with lower educational levels.

79. Lifelong learning should be made available across the age range, including working-age adults and older persons, enhancing their employment prospects by teaching transferable skills. Governments are encouraged to promote active and healthy ageing and to implement lifelong learning policies in response to changing demographic trends and labour market needs.

80. Governments are encouraged to provide universal access to education for all migrants, regardless of their immigration status.

81. Governments should invest in skills development and facilitate mutual recognition of the skills, qualifications and competences of migrant workers at all levels, promoting demand-driven skills development to optimize migrant employability in formal labour markets and ensuring access to decent work.

82. During the high-level political forum on sustainable development in 2023 and the upcoming Sustainable Development Goals Summit, Member States may wish to consider the linkages between population change and access to quality education and lifelong learning, and their importance for achieving sustainable development.