United Nations | Department of Economic and Social Affairs

EXPERT GROUP MEETING ON
THE EVALUATION OF ADOLESCENT
FERTILITY DATA AND ESTIMATES
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BACKGROUND PAPER

Data selection for SDG monitoring and reporting on Indicator 3.7.2: Adolescent birth rate (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group

(Draft-please do not circulate)

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I. INTRODUCTION

The Population Division of the United Nations Department of Economic and Social Affairs produces the estimates of fertility and other demographic phenomena at the global, regional and country levels. It contributes to the development of the methodology for estimating and evaluating the levels and trends of adolescent fertility.

The Cairo Programme of Action sought to substantially reduce all adolescent pregnancies and to protect and promote the rights of adolescents to reproductive health education, information and care. The Programme of Action recognized that whereas valid, reliable, timely and internationally comparable data form the basis for policy and programme development, implementation, monitoring and evaluation, many gaps remained in the quality and coverage of baseline information and in the continuity of data sets over time, including vital data on births.

The Programme of Action did not define the adolescent group either by age or other characteristics, such as age at puberty or grade of school enrolment. For the purpose of implementing and monitoring the improvement in maternal health, the Millennium Development Goals (MDGs) defined adolescent women as women 15 to 19 years of age, adopting the conventional definition that adolescent birth rate is the annual number of live births per 1,000 women in that age group.

The Global indicator framework for the Sustainable Development Goals (SDG)[1] expanded the scope of the target of ensuring universal access to sexual and reproductive health-care services to include the birth rate of adolescent girls aged 10-14 years.[2] The General Assembly stressed the importance of national ownership and leadership in the implementation of the Agenda for Sustainable Development. Governments would have the primary responsibility for follow-up and review of the progress made in implementing the Goals and targets, at the national, regional and global levels. The follow-up and review would be based on the global indicator framework and data produced by national statistical systems and information collected at the regional level.[3]

A critical aspect in measuring progress towards the achievement of the Goals and targets of the 2030 Agenda for Sustainable Development is to make high-quality statistical information available, in accordance the Fundamental Principles of Official Statistics[4] and the Principles Governing International Statistical Activities.[5] The Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs) has identified the Population Division as the custodian agency for SDG indicator 3.7.2. Adolescent birth rate (ages 10-14 and 15-19). The Population Division is tasked with providing accurate, timely, disaggregated and internationally comparable data and information on the SDG Indicators under its purview. This includes the development of methods and standards for data collection, to contribute to capacity-building activities in data collection and verification, and to

[1] The global indicator framework for the Sustainable Development Goals and targets of the 2030 Agenda was developed by the Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs). IAEG-SDGs is responsible to the United Nations Statistical Commission and it is tasked to develop and implement the global indicator framework for the SDGs and targets. It is composed of Member States and includes regional and international agencies as observers. Its terms of reference are available at: https://unstats.un.org/sdgs/files/IAEG-SDGs%20Terms%20of%20Reference_2017.pdf.

[2] The global indicator framework was adopted by the General Assembly on 6 July 2017 and is contained in the Resolution adopted by the General Assembly on Work of the Statistical Commission pertaining to the 2030 Agenda for Sustainable Development (A/RES/71/313), available at: https://undocs.org/A/RES/71/313.

[3] *Transforming our world: the 2030 Agenda for Sustainable Development* (A/RES/70/1), Resolution adopted by the General Assembly on 25 September 2015. Available at: https://undocs.org/A/RES/70/1.

[4] https://unstats.un.org/unsd/dnss/gp/fundprinciples.aspx

[5] https://unstats.un.org/unsd/ccsa/principles_stat_activities

establish transparent mechanisms for adjusting or estimating the data in consultation with the concerned countries.

The General Assembly urges international organizations to base the global reporting on SDG indicators on data and statistics produced by National Statistical Systems (NSSs). If specific country data are not available for reliable estimation, custodian agencies are urged to consult with concerned countries to produce and validate modelled estimates before publication (A/RES/71/313 para. 7).[6]

The Guidelines on Data Flows and Global Data Reporting for Sustainable Development Goals[7] further recommend that in cases where the data are provided by an entity outside of the National Statistical Systems (e.g., international data collection, other government offices, other data source), the custodian agency[8] is expected to consult with the data provider to ensure that there is agreement on the data and metadata being used. If no agreement is reached between the custodian agency and the National Statistical Office or National Statistical Systems, the national data for this indicator should not be included in the Global SDG Indicators Database but may be used for the calculation of regional and global aggregates.

The Global SDG Indicators Database admits only one observation or data point to be reported for each element of the indicator, for each year and country, requiring the Population Division, the custodian agency for SDG indicator 3.7.2. Adolescent birth rate (ages 10-14 and 15-19), to select one data point for each year and country, drawn from the various available statistical data sources. To the extent possible and as appropriate, this should be done in consultation with the respective national statistical offices or other pertinent national data producers.

Up until the establishment of the SDG framework, the Population Division had routinely gathered, estimated and assessed the data on childbearing among women in the main reproductive ages (15 to 49 years), including adolescent women aged 15 to 19 years. As will be explained in what follows, internal criteria, tools and guidelines aided the evaluation and selection of data points for monitoring the levels and trends of fertility among women aged 15-19. Fertility levels among women aged 15-19 have been benchmarked for almost all countries and areas. By comparison, only recently, given the specification of SDG indicator 3.7.2 to include adolescent births to girls aged 10-14, the Population Division began to examine the available data with a view to report about it in the future.[9]

This background paper reviews the experience drawn from the data gathering, assessment and selection of data points for the MDG and SDG reporting on the levels and trends of the conventional adolescent birth rate among women aged 15-19 years at country and regional levels. It outlines the criteria and procedures developed by the Population Division to address gaps in the data, evaluating the differences in fertility estimates due to the estimation methods and data sources. The paper then discusses the extent to which the existing procedures of data evaluation and selection could be

[6] https://undocs.org/A/RES/71/31
[7] https://unstats.un.org/unsd/statcom/49th-session/documents/BG-Item-3a-IAEG-SDGs-DataFlowsGuidelines-E.pdf
[8] In the present case case, the Population Division.
[9] The Population Division of the United Nations is the custodian agency of indicator 3.7.2 on adolescent birth (aged 10-14 years; aged 15-19 years) per 1,000 women in that age group and indicator 3.7.1 on family planning satisfied with modern methods. A custodian agency is an organization responsible for developing and recommending international standards and methodologies for the monitoring of SDGs. Other responsibilities include compiling and verifying internationally comparable country data and metadata, estimating regional and global aggregates, using the data for thematic reporting and inclusion in the Global SDG Indicators Database.

extended to the assessment and selection of data for the SDG reporting on childbearing among girls aged 10-14 years.

II. CHALLENGES OF STUDYING VERY YOUNG MOTHERHOOD

Adolescence and adolescent fertility

Adolescence is defined as the period following the onset of puberty during which a young person develops from a child into an adult. The global average age menarche, one of the markers of the onset of puberty among girls, is around 12 years. The most common onset of the transition to adulthood is generally considered to occur between the ages of 20 to 21 years but the transition is multifaceted and some transitions to adult life may occur earlier or later and within a shorter time frame and through different modalities within the same society(Juárez and Gayet, 2014; Eliason et al., 2015). Adolescence can be defined as covering the ages 12 to 19 years or 10-19 years to encompass the conventional quinquennial age groups 10-14 and 15-19 years. However, the Convention on the Rights of the Child defines a child as every human being below the age of eighteen years unless under the law applicable to the child, majority is attained earlier.[10] In many jurisdictions, the age of majority is set at age 18 or higher, suggesting that one approach in determining the period of adolescence is to focus on persons aged 12 to 17 years (United Nations, Population Division, 2012).

The base population for calculating the indicators of sexual and reproductive health of young adolescents is often limited to females (and males) aged 15-19 years, a legacy of data collection programmes that deemed the female reproductive life span to start at the age of 15 years. Although childbearing at ages below 15 years has historically been rare in many countries, the global decline in the age of menarche, the rising age at marriage and changing societal values (National Research Council and Institute of Medicine, 2005; Prentice et al., 2010; Pathak et al., 2014; Song et al., 2015) are widening the window of girls' susceptibility to sexual activity before marriage, pregnancy and low gynaecologic age. Girls are marrying later but continue to start sexual activity early. Within this window, the needs and challenges of young females aged 14 and younger are markedly different from those aged 18-19. Girls who begin sexual activity at young ages take longer to initiate contraceptive use and their risk of unwanted pregnancy is high. They are also less likely to use contraception at first sexual intercourse (Guleria et al., 2017) due in a large part to the lack of information and restrictions to using contraception (Finer and Philbin, 2013), that is to say, they have a much higher unmet need for family planning. In societies where marrying off underage girls is still common, the power dynamics within the household disadvantage the child brides. In such societies, girls who marry early more often participate in arranged marriages to much older boys or men (de Silva-de-Alwis, 2008), have less decision-making power and communication with their husbands (Santhya et al., 2011; Erulkar, 2013) and are more in polygamous unions than if they marry later (Erulkar and Bello, 2007). Child marriage exerts additional pressures and expectations upon the young brides, including the expectation of immediate pregnancy upon marriage. Married adolescents are less likely than their unmarried age mates to use contraceptives to delay a first pregnancy (United Nations, Department of Economic and Social Affairs, 2013).

[10] https://undocs.org/A/RES/44/25

Studies define young motherhood using different criteria based on both chronological age and other characteristics (Phipps and Sowers, 2002). Very young teenage mothers, under the age of 15 years, have either been excluded in the research and data collection or they have been aggregated with older teenage mothers, ranging from the age of 12 years or younger to 19 years into age groups such as 12 to 14, 14 to 16, 15 to 17 and 15 to 19 years, often without providing a rationale for choosing specific ages to include in their analyses. Often, estimates of childbearing among very young adolescents from household surveys are obtained from the birth histories collected from all or married women aged 15 years or older in sampled households, not from current/recent births as is customary for females in the main reproductive ages in household surveys and as is typically recorded in vital statistics. Also, in a census or a general household survey, all the questions are answered by the head of household or household person of reference; not the woman who gave birth.

A disaggregation of the adolescent age span into three groups (ages 10-14, 15-17 and 18-19) has been proposed (Dixon-Mueller, 2008), considering the physiological readiness of the female body for childbearing, the stage of cognitive development, and normative social expectations and legal requirements governing the transition to adulthood. Although most girls who experience menarche early will be physically mature enough at 15-17 years, those aged 10-14 are not physiologically and cognitively ready for sexual intercourse and pregnancy (Dixon-Mueller, 2008). There is evidence suggesting that early adolescent childbearing is best defined as giving birth at 15 years or younger at the time of the infant's birth, because the age at which poor birth outcome rates are lower and begin to stabilise is 16 years. A study of rates of preterm delivery, low birth weight and infant mortality by maternal age found that, starting at the age of 16 years, the three indicators of poor birth outcome were lower (and began to stabilize) than among mothers aged 15 years and below (Phipps and Sowers, 2002). Another study of childbirth outcomes among adolescent mothers in Latin America found that mothers under the age of 16 faced higher risks of morbidity and adverse pregnancy outcomes, compared to mothers aged 16 to 17 and 18 to 19 years (Conde-Agudelo et al., 2005).

Most research on adolescent childbearing focuses on females aged 15 to 19 years, while very little of it is devoted to those aged 14 years or younger. Within this younger adolescent age group, the differences of the girls' developmental characteristics, sexual and reproductive behaviour, and their fertility by age are understood in general, but reliable data disaggregated by single ages is not widely available. Research has found that childbearing is rare to nil among young adolescent females below 12 years in most countries, but that it is not so uncommon overall among adolescents under age 15 in several countries, for example in Angola, Bangladesh, Cameroon, Gabon, Guinea, Madagascar, Mali, Mozambique Niger, Nigeria and Sierra Leone where, in 2010-2017, 8 to 15 per cent of girls had had a child by the age of 15 (Finer and Philbin, 2013; United Nations, 2020). Among the major regions of the world, elevated levels of childbearing among girls aged 10-14 (6 or more births per 1,000 girls) appears to be much more common in sub-Saharan Africa and Latin America and the Caribbean than in other regions, with the notable exception of Bangladesh in Asia. Childbearing under age 15 is also associated with high fertility in later adolescence (15-19), with higher total fertility and population growth rates (United Nations, 2020).

Measurement issues and data sources on early childbearing are presented in a recent report by the Population Division (United Nations, 2020). In part, data on fertility among girls under age 15 are scarce and unreliable where birth registration as a whole is incomplete and otherwise deficient. In many cases, births among girls aged 10 to 14 years are unintended and, in some cases, a

consequence of coercive sexual intercourse. Pregnancy and childbearing at these ages are likely to be underreported or concealed to avoid shame, stigmatization or even litigation (Ruzibiza, 2020).[11] But that is not always the case, particularly where early and child marriages and early childbearing are common and positively sanctioned by the community.

Global estimates show that as of 2019, of all births, one in four had not been registered with a civil authority. The estimated figure for South Asia is one in three, and one in two for sub-Saharan Africa. In all other regions of the world, completeness of birth registration ranges from 95 per cent in Latin America and the Caribbean to 99 per cent in Eastern Europe and Central Asia, and 100 per cent in Western Europe and North America.[12]

Computation and data sources

The adolescent birth rate (ABR) is computed as a ratio. The numerator is the number of live births to females aged 19 years or younger, and the denominator is an estimate of exposure to childbearing by adolescents in the same age range. The computation is commonly aggregated for age groups 10-14 and 15-19 years but can also be computed by single years of age. The data required to calculate the adolescent birth rate can be obtained from three sources: civil registration systems, population censuses or population-based surveys. The numerator and the denominator are calculated differently for civil registration, survey and census data.[13]

Data from civil registration systems are considered to be of good quality if they cover 90 per cent or more of all live births taking place within a country or area. The information on coverage of birth registration can be found on the website of the United Nations Statistics Division.[14] Estimates based on civil registration systems, national projections and vital statistics from censuses are provided by national and international agencies or obtained from other published sources. For many countries that either lack a civil registration system or have a registration system where the coverage is too incomplete to be utilized for statistical purposes, censuses, sample surveys and survey-based estimates are the main sources.

The Population Division maintains a database on fertility rates from different sources including estimates produced by National Statistical Offices and regional statistical units (United Nations, Department of Economic and Social Affairs, 2017, 2019). Existing data since the last round of SDG reporting are updated from various sources up to a specified cut-off date—usually by the end of January of the reporting year. When a new revision of the World Population Prospects has been published, the adolescent birth rate computed from civil registration data are recalculated using the revised female population from the World Population Prospects. The Population Division has often reached out to the United Population Fund (UNFPA) to request its country offices to assist in obtaining data that might be available but not yet published. Also, through the UNFPA, data that the

[11] Statutory rape or defilement laws are based on the premise that until a person reaches a certain age, that individual is legally incapable of consenting to sexual intercourse. Statutory rape laws can frighten a young mother and her partner into misreporting or under-reporting a pregnancy.
[12] https://data.unicef.org/topic/child-protection/birth-registration/: accessed on 9 December 2019 (data updated in March 2019). This dataset draws on household surveys, but also on national civil registration systems to monitor levels and trends in birth registration
[13] Details of the computation methods are described elsewhere (United Nations, 1983; United Nations, Population Division, 2004).
[14] http://unstats.un.org/unsd/demographic/CRVS/CR_coverage.htm

Population Division deems questionable are verified by the National Statistics Office or other relevant government agency.

Table 1. Distribution of data points and of countries or areas[15] with at least one data point on the adolescent birth rate (15-19 years), by type of data source, 2000-2018

Data Source Type	Number of Data Points	Number of Countries	Data Points (per cent)	Countries (per cent)
Census	257	99	4.1	22.0
Estimate	1147	69	18.3	15.4
Panel	3	2	0.0	0.4
Registration	3346	156	53.3	34.7
Survey	1526	123	24.3	27.4
Total	6279	449	100	100

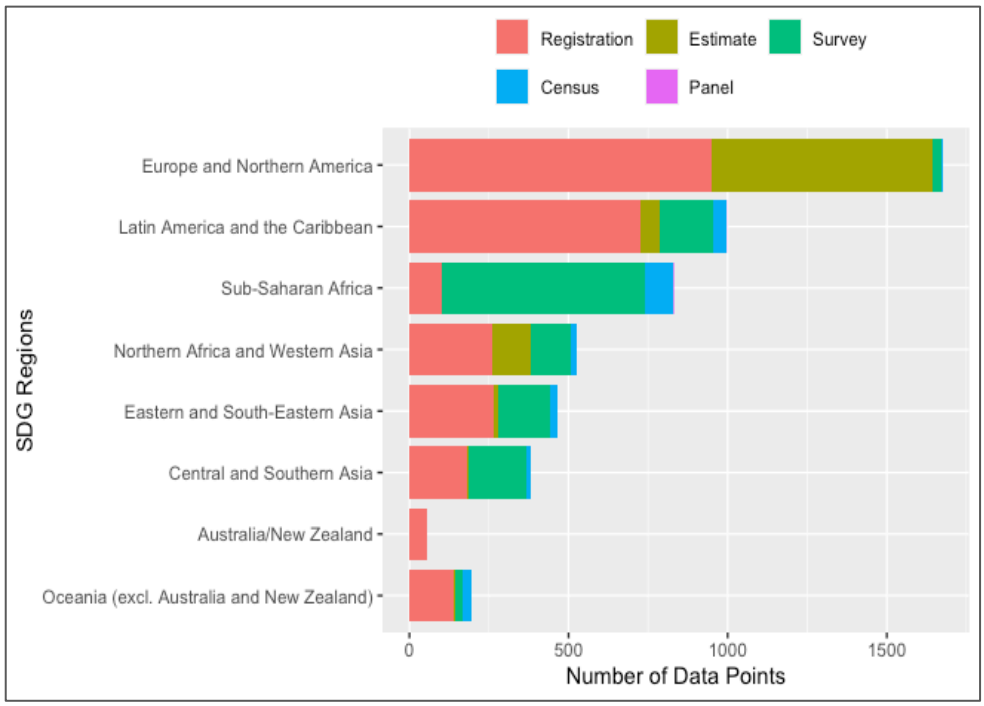
Source: United Nations, Department of Economic and Social Affairs, 2017; 2019 and updated since publication of database.
Note: the "Number of countries" refers to the counts of countries having data points on the adolescent birth rate (15-19 years) from each of the data source types listed in the first column during 2000-2018. Since countries can and often do have data points drawn from more than one source, the total figure (given at the bottom of the table) is greater than the number of countries in the world.

The data presented in this paper are from the most recent version of the database, updated up to the last round of the SDG reporting in 2020. Table 1 shows the distribution of the data points drawn from the database and updates for 223 countries or areas from 2000 to 2018 for which data on the adolescent birth rate were reported to the Global SDG Indicators Database in 2020. The largest proportion of data points on the adolescent birth rate (15-19 years) comes from registration (53 per cent), followed by surveys (24 per cent) and country estimates (18 per cent). Censuses account for the remaining 4.1 per cent of the data points on adolescent birth rate (15-19 years) for the period 2000-2018. Most data points come from registration systems in Europe and Northern America, Latin America and the Caribbean, and Northern Africa and Western Asia (figure 1). Europe and Northern Africa has a large number of data points from country estimates. Sub-Saharan Africa has a large number and proportion of data points from household surveys. The distribution of data points on the adolescent birth rate (15-19 years)[16] by SDG region and data source is shown in annex table A.2 and by country and type of data source in annex table A.3.

For 165 countries, there is more than one observation (or data point) of the adolescent birth rate for some years, obtained from different types of data sources and methods of estimation. However, SDG reporting requires that only one value of the adolescent birth rate be given for any given year. For this purpose, the Population Division has developed internal guidelines to aid the selection of the data points that are consistent with the levels and trends in the adolescent birth rate for a given country.

[15] The designations used in this paper and the assignment of countries or areas to specific groupings is for statistical convenience and do not imply the expression of any opinion whatsoever on the part of the Secretariat of the United Nations concerning the legal status of any country, territory, city or area or of its authorities, or concerning the delimitation of its frontiers or boundaries, or concerning its political or other affiliation.
[16] The published fertility database has not yet integrated data on the adolescent birth rate for females aged 10 to 14 years.

Figure 1. Distribution of the adolescent birth rate (15-19) by SDG regions, 2000-2018



III. DATA SELECTION PROCEDURES/GUIDELINES

The selection process involves three-tiered groups of data sources (annex table 1). The top-priority selection is the adolescent birth rate computed from civil registration systems covering 90 per cent or more of all live births, and the female population in the pertinent age group taken from the latest revision of World Population Prospects produced by the Population Division.[17] When the number of live births is missing, the direct estimate of the adolescent birth rate reported by the pertinent National Statistical System or regional organization (such as Eurostat or ECLAC/CELADE) is selected. For small countries, with a total population of less than 90,000, it is not possible to estimate the adolescent birth rate using the data from both registration (if available) and the World Population Prospects because the number of women aged 15-19 are not published in the World Population Prospects.

In countries where the coverage of the civil registration system is lower than 90 per cent of all live births or where the civil registration is lacking, the adolescent birth rate is obtained from household survey data and census data. In countries with multiple nationally representative survey programmes, data from such surveys conducted at certain intervals are given preference in the selection of the adolescent birth rate. When such surveys are not available, the next tier of selection are adolescent birth rates obtained from other surveys using retrospective birth histories, censuses and other surveys, in that order or, in exceptional cases, other published analytical reports.

The rates obtained from this last tier of sources present challenges. Adjusted adolescent birth rates might be published without providing information on the adjustment method and assumptions. Also, the reference periods used to calculate the published adolescent birth rates vary, ranging from 12 months before the census to 36 or 60 months before the survey. It is common to find, within the same report, the current adolescent birth rate based on the three-year period preceding the survey and retrospective adolescent birth rates based on five-year intervals preceding the survey. As noted in Annex table 1, for countries where data are scarce, data points might be selected for reference periods located more than five years before the survey.

Discrepancies in adolescent birth rates might arise due to different sources, different denominators, different reference periods, different adjustment methods or the inclusion of births to women under 15 years of age. Discrepancies might arise when adolescent birth rates from data sources are calculated using direct vs. indirect estimation methods or when the birth rate is calculated using truncated birth histories. A comprehensive account of why two indicators from different sources may unexpectedly differ is provided elsewhere (Pullum et al., 2017).

The selection of the adolescent birth rates (15-19 years) for the SDG reporting is aided by an interactive automated process and review by analysts. The data for each country are selected using the three-tiered procedure described above and shown in annex table 1. The adolescent birth rates (15-19 years) from various sources are plotted against the reference years with confidence intervals of 95 per cent (as shown in figure 2 for Bangladesh) to aid the eye in seeing patterns to determine which of the empirical data points are closer to smoothed means or expected values of the adolescent birth rate based on a locally weighted regression model.

[17] The quality of births data depends on the accuracy and coverage of the information, the treatment of infants born alive but die before registration or within the first 24 hours of life, the quality of the reported information relating to age of the mother, and the inclusion of births from previous periods. In some cases, the births are tabulated by year of registration rather than by year of occurrence. Also, the changing number of births recorded may, in part, reflect changing completeness of registration or enumeration.

Figure 2. Adolescent birth rates (15-19), Bangladesh, 2000 – 2018

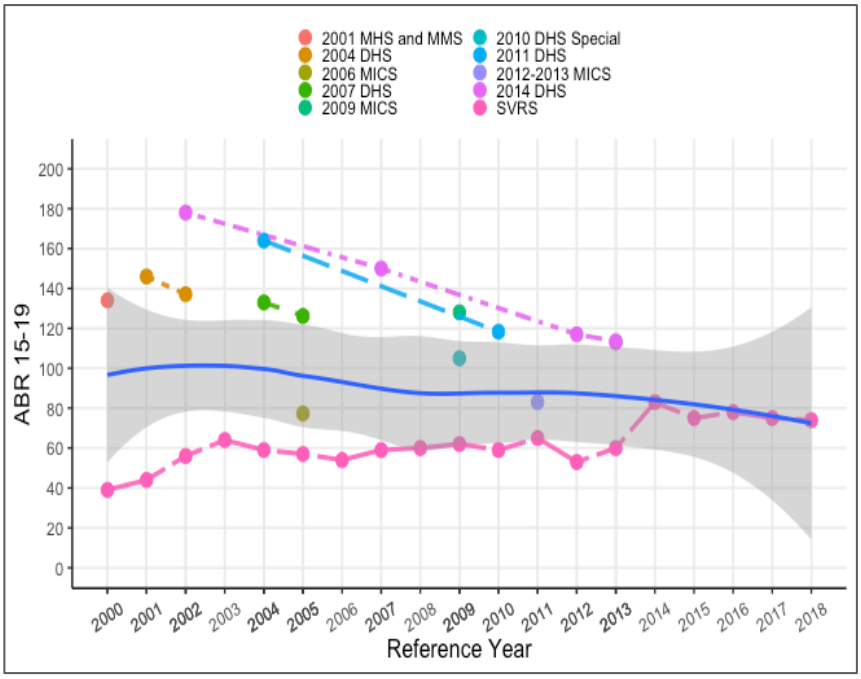
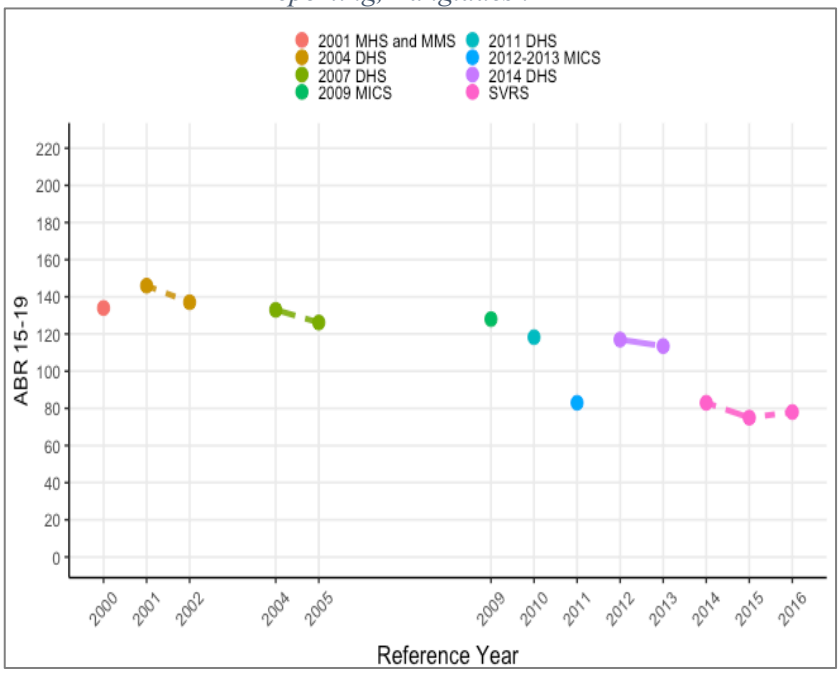


Figure 3. Adolescent birth rate (15-19) preselected for SDG 2020 reporting, Bangladesh



Most of the data points that fall outside this interval would ordinarily be excluded. However, "borderline" data points that are deemed plausible, based on the historical pattern, are preselected for further assessment (figure 3). Conversely, data points that fall within the confidence intervals are sometimes excluded by the analyst if they diverge from the plausible historical pattern.

For example, the adolescent birth rates of Bangladesh obtained from the MICS survey conducted in 2006 (77 births per 1,000 women in 2005) and DHS Special survey conducted in 2010 (105 births per 1,000 women in 2009) are excluded even though they fall within the confidence intervals, because they deviate from the historical trends from other sources. The birth rates obtained from the sample vital registration system (SVRS) are overall too low compared with those obtained from other sources, even when the birth rates from the SVRS hover close to the borderline of the lower confidence interval between 2007 and 2013. Between 2013 and 2014, the adolescent birth rate obtained from the SVRS rise to a level that is identical to the birth rate obtained from the 2012-2013 MICS survey, suggesting an improvement in data collection in the sample vital registration system. The selection of data between 2005 and 2014 is a bit more tentative. The selection can be made by connecting the data points

for 2005, 2009, 2010, 2012, 2013 and 2014. The selection of that trend would imply that the adolescent birth rate did not change much between 2005 (126 births per 1,000 women) and 2009 (128 births per 1,000 women). It would also imply a steep decline of 27 per cent in the adolescent rate between 2013 and 2014, which might be inconsistent with the historical pattern. Also, such selection would omit the birth rate in 2011 (83 births per 1,000 women) from the MICS survey.

An alternative selection would be to connect the data points for 2005 (from 2007 DHS), 2011 (from 2012-2013 MICS) and 2014 (from the SVRS). Such selection implies that there was no change in the adolescent birth rate in Bangladesh between 2011 (83 live births per 1,000 women) and 2014 (83 live births per 1,000 women), which might not be plausible, because the historical pattern shows annual declines in the adolescent birth rate. Such trend would exclude the birth rates in 2012 and 2013, obtained from the 2014 Demographic and Health Survey.

The guidelines used by the Population Division suggest that where a series of data points are available from the same source and can provide an assessment of trends, those data are given preference in the selection of the adolescent birth rate if they are compatible with adolescent birth rates from alternative sources. In the Bangladesh example, the birth rate in 2009 (from 2009 MICS) is compatible with the birth rate in 2010 (from 2011 DHS) which is, in turn, compatible with the birth rates in 2012 and 2013 (from the 2014 DHS). On the other hand, the birth rate in 2011 (from 2012-2013 MICS is compatible with the birth rates from the SVRS for the years 2014 thru 2016. In the Bangladesh example, there are no clear-cut levels and trends in the preselected adolescent birth rates between 2005 and 2014.

The preselected adolescent birth rates are further assessed by calculating the average annual percentage change in the ABR (15-19 years), which are then plotted (with confidence intervals of 95 per cent) against the reference years. Data points that fall outside this interval are excluded. Also excluded are data points that show at least 25 per cent change in the average annual in the ABR (15-19 years). Such a year-to-year change in the ABR (15-19 years) is deemed implausible, based on observed historical rates of change in the adolescent birth rate among women aged 15-19 years in any given country. There are very rare exceptions to this guideline, as in the case of Bangladesh where the preselected birth rates obtained from the Sample Vital Registration System were selected for the SDG reporting despite a steep decline of 27 per cent between 2013 and 2014. Therefore, the adolescent birth rates preselected for Bangladesh (figure 3) were all selected for the SDG reporting in 2020.

Kenya presents a better example of this selection step (figure 4). From 2000 to 2002, the average annual decline in the adolescent birth rate (15-19 years) was one per cent. It hovered between 0 and 3 per cent from 2002 to 2014. Between 2014 and 2016, the annual decline in the ABR (15-19 years) was 27 per cent, a steep decline that was implausible given the historical record of the ABR (15-19 years) decline in Kenya shown in figure 4. The adolescent birth rates in 2016, 2017 and 2018 were calculated using civil registration data that were most likely incomplete. Also, those adolescent birth rates (15-19 years) are incompatible with those from alternative sources. All the three data points were de-selected because each represented a sharp decline from 2014 that was implausible and inconsistent with the historical pattern of adolescent fertility in Kenya. The selected adolescent birth rates for the SDG reporting in 2020 for Kenya are shown in figure 5.

These selection procedures were applied to each of the 217 countries or areas with at least two data points of the ABR (15-19 years). Four countries had one data point each (Liechtenstein, Tokelau, Turks and Caicos Islands, and Wallis and Futuna Islands). The selected draft dataset for

SDG indicator 3.7.2 were shared with selected National Statistics Offices either directly or through the UNFPA and the Population Division of ECLAC (CELADE) for consultation.

Figure 4. Preselected birth rates (15-19) for SDG reporting, Kenya

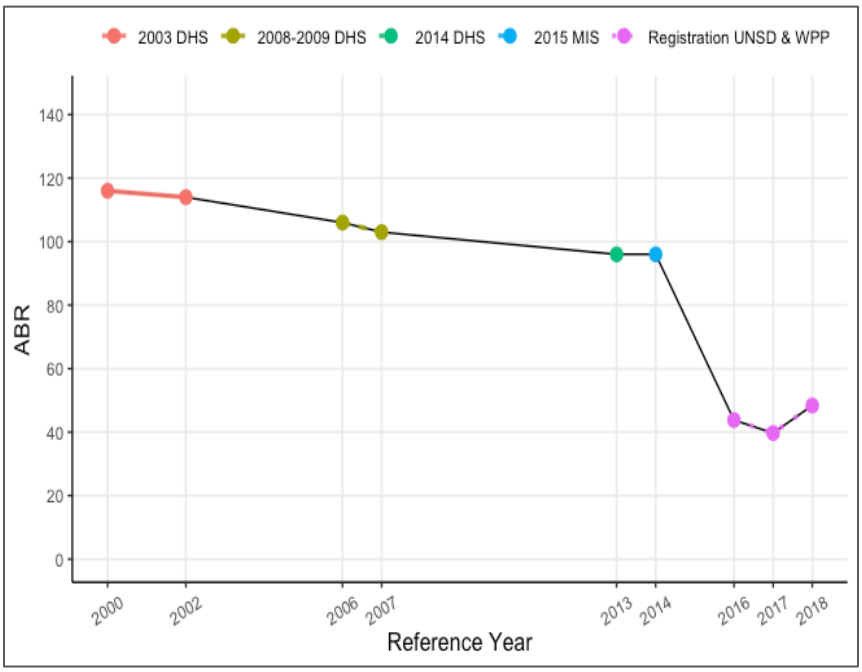
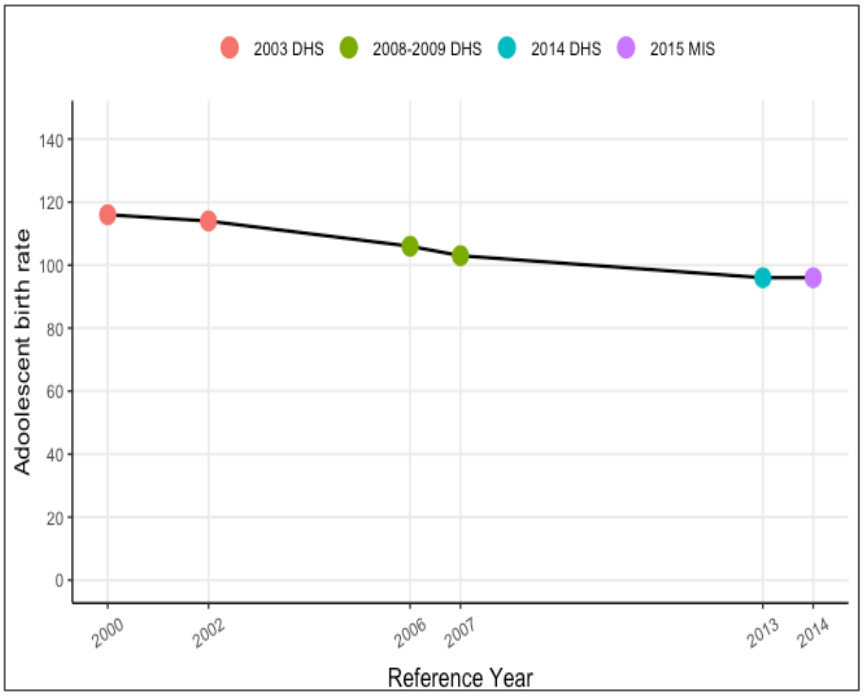


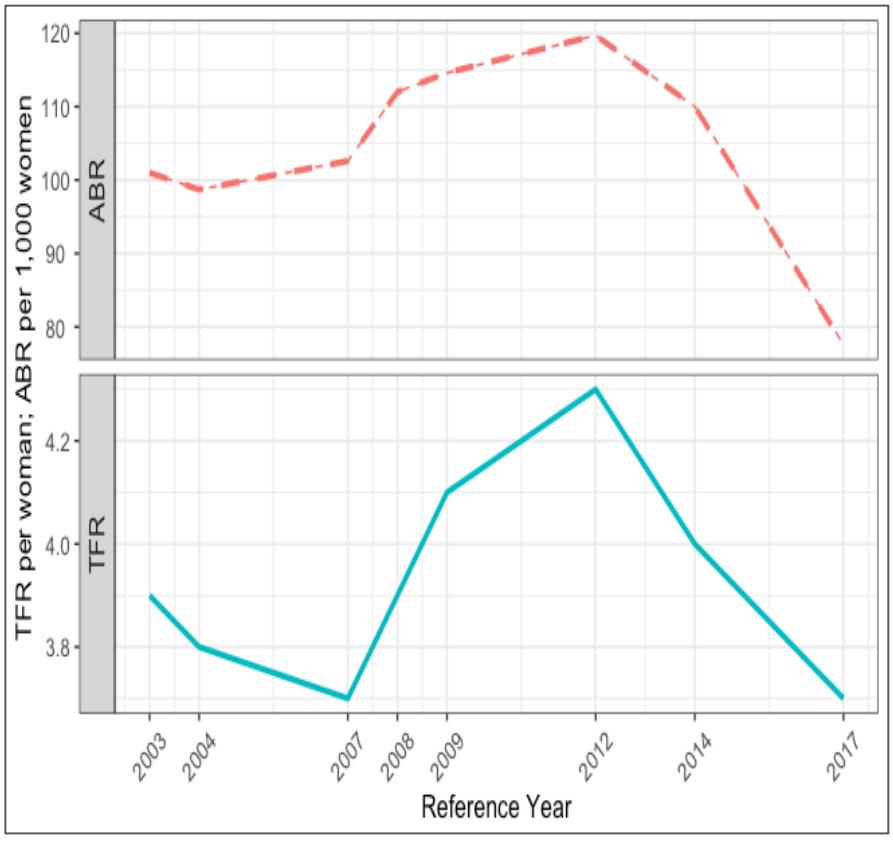
Figure 5. Selected birth rate (15-19) for SDG reporting, Kenya



A. Comparison of the levels and trends of the adolescent birth rate and total fertility rate

An argument can be made for selecting data points of the ABR (15-19 years) whose patterns, levels and trends are consistent with the patterns, levels and trends of the total fertility rate (TFR) among women aged 15-49 years. When a data source provides both the ABR (15-19 years) and TFR, it is instructive to compare the two rates. Often, high levels of the ABR associated with high levels of the TFR. A systematic comparison of the ABR (15-19 years) and TFR has never been applied in the selection process of the ABR (15-19 years) data for SDG reporting. From the 2,498 data points selected for the SDG reporting in 2020, 1,856 reference points have both the ABR (15-19 years) and TFR and 192 countries or areas have two or more of each. Figure 6 illustrates how a comparison of the ABR (15-19 years) and TFR could augment the assessment of the levels, trends and consistency of the adolescent birth rates. The levels and trends in the ABR (15-19 years) in Zimbabwe are in sync with the levels and trends of the TFR, indicating that the selected ABR (15-19 years) data points are plausible and consistent with the levels of total fertility.

Figure 6. Comparison of adolescent birth rate and total fertility rate, Zimbabwe



Challenges in estimating, assessing and selecting early adolescent birth rates

Data on early childbearing are available from the Demographic Yearbook maintained by the Statistics Division of the United Nations[18] and from household surveys conducted by national and international data collection programmes, including the Demographic and Health Surveys (DHS), Multiple Indicator Cluster Surveys (MICS), World Fertility Surveys (WFS), the Pan Arab Project for Child Development (PAPCHILD) and Family Health Surveys (PAPFAM), and Reproductive and Health Surveys (RHS). Data from many household surveys include birth histories of adolescent females aged 15-19 that can be used to estimate adolescent childbearing among girls aged 10 to 14 years.[19] In 2018, the Population Division commissioned a study to estimate the fertility rates of women by 3 and 5-year retrospective periods from about 435 microdata sets in international survey programs, including the adolescent fertility rates among girls aged 10-14 years (Schoumaker, 2019). The study included a disaggregation of the fertility rates by various characteristics or sub-populations as relevant for the 2030 development agenda, such as urban/rural, years of education and household wealth quintile. The study found that despite the small numbers of births to girls below age 15 in some countries, fairly reliable estimates of the levels and trends in fertility in age group 10-14 could be produced for the period as far back as to before the 1960s. Most trends in the fertility rates of 10 to 14-year-olds seemed plausible, but some unexpected outliers were deemed to be unreliable. Estimates from the earlier years of the series may not be reliable in some countries. Early adolescent fertility rates (10 to 14 years) trended downwards over the last decades but remained at high levels in sub-Saharan Africa and some Asian countries, including Bangladesh.

Data on the adolescent birth rate for ages 10 to 14 years are available for more than 194 countries or areas in world, from around 1940 to 2017, five of which have only one data point (Andorra, Liechtenstein, Montserrat, San Marino and Tonga). For purposes of SDG reporting, only the data from 2000 to the present are selected.

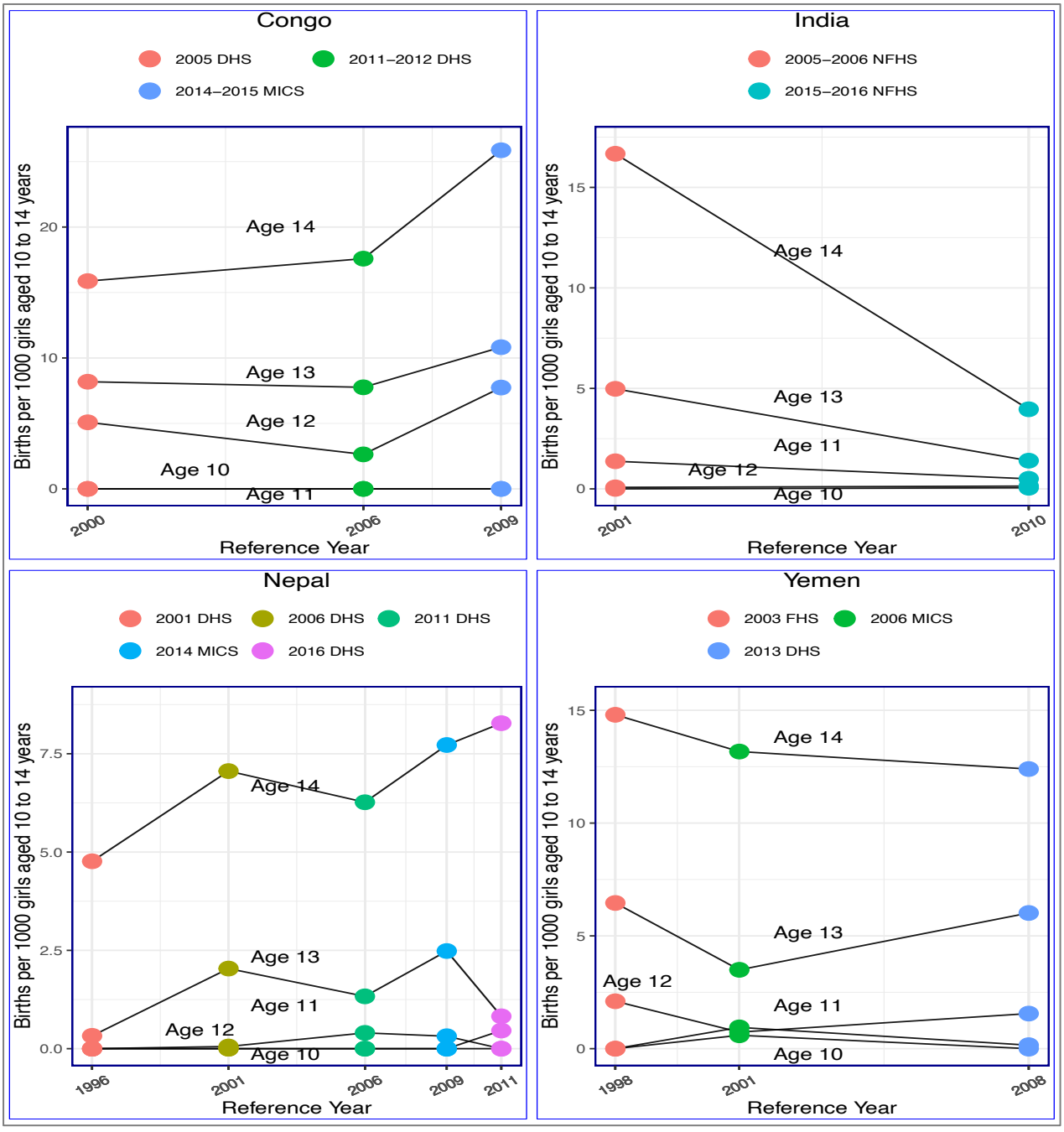
Unlike the experience gained in the collection and analysis of the adolescent birth rate among women aged 15-19 years, the analysis of childbearing among girls under age 15 began only recently and presents several challenges. Ordinarily, the assessment and selection of the most plausible birth rate for a given country and year would be aided by smoothing of trends but the requirement to use "country data" for SDG reporting obviates that method.

Perhaps the biggest challenge is the scarcity of the data to benchmark the levels and patterns of childbearing among this group of girls. The adolescent birth rate among girls aged 10-14 is usually not included in the calculations of the total fertility rate, conventionally based on fertility data for among women aged 15-49. Partly for this reason, in many countries, the age pattern and level of childbearing among girls under the age of 15 remain unknown. Little is known also about the relationship between the childbearing at ages 10-14 and childbearing among older adolescents aged 15-19 or the wider reproductive age span (15-49 years).

[18] The Demographic Yearbook System is available on the following website: https://unstats.un.org/unsd/demographic-social/products/dyb/

[19] The calculation of the early adolescent birth rate and the underlying assumptions are provided elsewhere (Way, 2014; MacQuarrie et al., 2017; Croft et al., 2018; Pullum et al., 2018).

Figure 7. Adolescent birth rate by single years among girls aged 10 to 14 years, selected countries

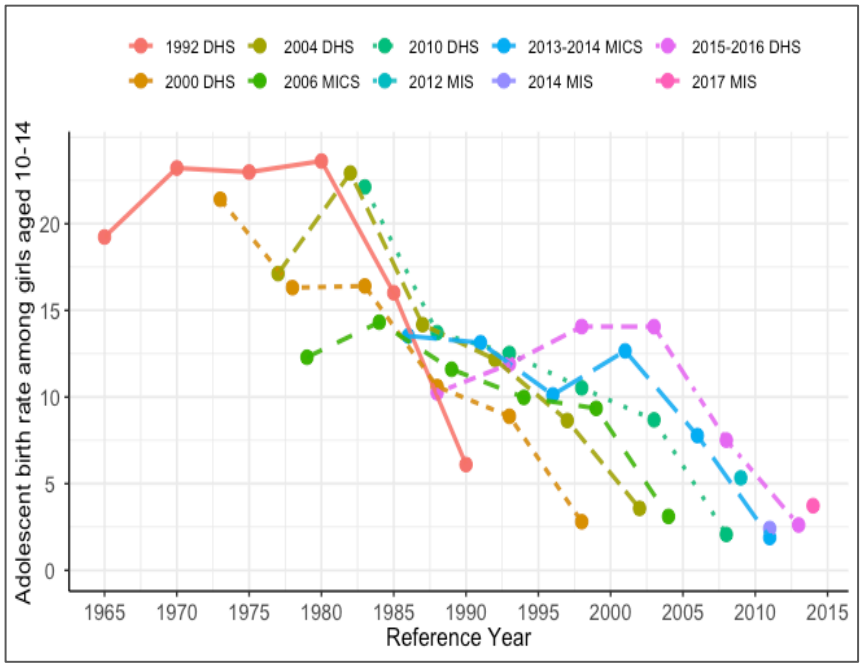


In many countries or areas, the incidence of very early childbearing at ages 10 to 14 years is low. In 77 countries—mostly in Europe, Northern America, Australia, India and Japan—the adolescent birth in the most recent year was less than one birth per 1,000 girls aged 10 to 14 years. For some of the reasons discussed earlier, births of girls under the age of 15 are likely to be underreported, but it is typically not known to what degree the adolescent birth rate of girls aged 10-

14 is underestimated. In most countries or areas, there is a large gap between fertility levels at age 13 or 14 and fertility at age 12 or below. In particular, the birth rate among girls aged 10 and 11 is close to zero in most countries with data on single-age fertility rates (figure 7 and annex figure A.1).[20]

Levels and trends vary over time and by age. In countries such as India, Indonesia, Pakistan, Senegal, Turkey and Togo, trends show declines in early childbearing at ages 14 and 13 years since 2000 (annex figure A.1).[20] Conversely, in countries such as Congo, Brazil, Paraguay and Sudan, among others, fertility rates at ages 13 and 14 years appear to have increased during this period. In other countries, including Mozambique, Nigeria and Rwanda, there is no clear trend, while fertility levels at those ages seem static in Chad, Cameroon and Madagascar.

Figure 8. Adolescent birth rates among girls aged 10-14 during five-year periods before each survey, Malawi



Furthermore, as it is the case with fertility rates in other age groups, for some countries that have data from retrospective birth histories, the estimates of the trends in adolescent birth rate among girls aged 10-14 from one survey are not always consistent with the trends derived from other surveys (annex figure A.2).[20] In Malawi, for example, rates of early childbearing from two of the most recent DHS surveys (2010 and 2015-2016) show rates that are rather far apart for the same reference years (figure 8). Specifically, the early adolescent birth rate in 2003 was 8.7 per 1,000 girls using the data from the DHS survey conducted in 2010, but 14.1 per 1,000 girls, using the 2015-2016 DHS survey. Similarly, in 2008 the rate from the 2010 DHS survey was 2.1 per 1,000 girls compared to 7.5 per 1,000 girls from the 2015-2016 DHS survey. The birth rates for the most recent reference year, on the other hand, are almost identical across all surveys.

The experience gained in the selection of the adolescent birth rate among women aged 15-19 years for SDG reporting can be applied to the selection of the adolescent birth rates among girls aged 10-14 years. For each country, it is possible to match the data sources, the reference years, or both the sources and reference years for the adolescent birth rates of girls aged 10 to 14 and the selected adolescent birth rates of those aged 15 to 19 for the SDG reporting. The selection of

[20] Annex figures are available at: https://www.un.org/development/desa/pd/sites/www.un.org.development.desa.pd/files/unpd-egm-fer-2020-10-background_paper_annexfigures.pdf

adolescent birth rates of girls aged 10-14 for each country and reference year can thus be based on the selected adolescent birth rate of girls aged 15-19 for the SDG reporting. When following this procedure, we found that 160 countries have matching data sources on adolescent birth rate of girls aged 10-14 and the selected adolescent birth rate (15-19 years) for the SDG reporting, of which 117 countries have 3 or more matched data points.

Of the 1117 data points matched, only 75 data points appear to be from the same source. Some discrepancies arise simply because data from the same source are labelled differently in the database. For example, the data sources for Côte d'Ivoire for 2009 are labelled as 2011-2012 DHS-MICS for adolescent birth rate (10-14 years) and as 2011-2012 DHS for adolescent birth rate (15-19 years). It may appear, therefore, that these data sources are different but in fact they are not. Also, the values of the adolescent birth rate (15-19 years) from the Demographic Yearbook are often obtained from National Registration Systems, so corresponding data on the adolescent birth rate (10-14 years) from National Registration Systems are effectively from the same source. Once we correct for the differences in labeling, the number of data points from the same source will increase.

The countries with at least three matched data points are divided into two categories in order to assess the relative levels and patterns of the matched data on the adolescent birth rate (10-14 years) and the adolescent birth rate (15-19 years) selected for the SDG reporting. The *first* category consists of 40 countries where the adolescent birth rate (10-14 years) for the most recent year is at least one birth per thousand women. The *second* category consists of 77 countries where the adolescent birth rate (10-14 years) for the most recent year is less than one birth per thousand women.

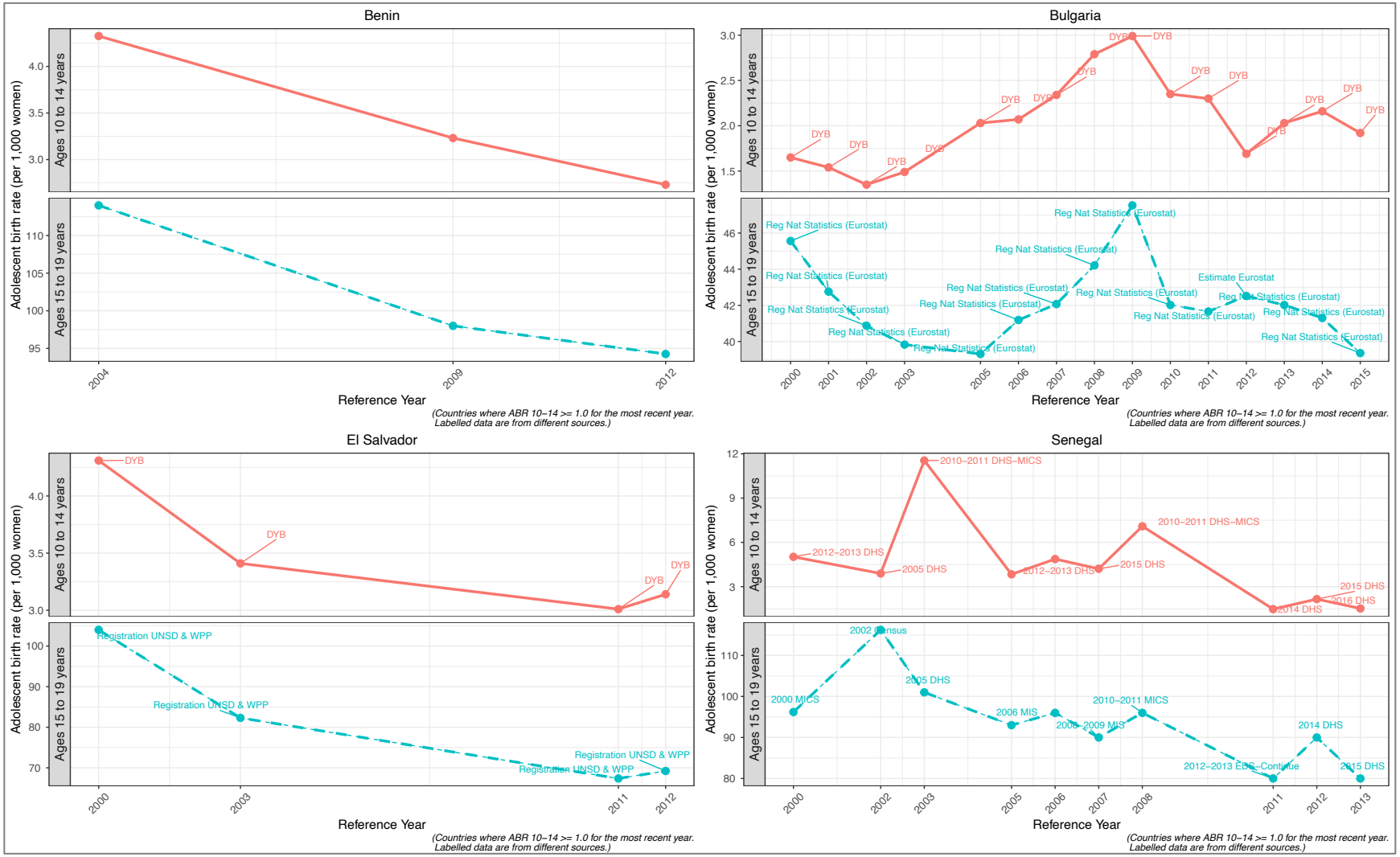
We observe little variability in the levels and trends of the adolescent birth rate (10-14 years) among countries in the first category (ABR 10-14 years less than one birth in 1,000 girls; data not shown)). The majority of these countries have adolescent birth rate (15-19 years) below 50 births per 1,000 women (annex figure A.3).[20]

Examples of the second category of countries are shown in figure 9. Among these countries, the levels and trends of the adolescent birth rate (10-14 years) seem broadly similar to the adolescent birth rate (15-19 years), for example in Argentina, Benin, Bulgaria, El Salvador, Chile, Cuba, Guatemala, Mexico, Namibia, Senegal and Uganda. The same appears to hold even where some data points are drawn from different sources, such as in Argentina, Bulgaria, Guatemala, Namibia and Senegal. In countries such as Argentina and Bulgaria, the data from the Demographic Yearbook are often from National Registration Systems. In Benin, however, all comparable data points are drawn from the same source, suggesting that it is plausible to select the adolescent birth rate (10-14 years) based on the selection criteria for the adolescent birth rate (15-19 years) for the SDG reporting when the data sources for both rates are the same, or when the either birth rate is from the Demographic Yearbook or National Registration Systems. On the other hand, divergent patterns are evident in a few countries where the majority of data points on the adolescent birth rate (10-14 years) and adolescent birth rate (15-19 years) are drawn from different sources such as Brazil, Romania (since 2010), Suriname and Venezuela (annex figure A.3).[20]

One goal of the expert group meeting is to consider and recommend methods for assessing and procedures to select the ABRs 10-14 years drawn from different data sources. Other specific questions to discuss include a) possible inferences about birth rates at ages 15-19 as they may apply to birth rates at ages under 15 years; b) selection of the rates for both adolescent age groups from the same source or from different sources; c) usefulness of different forms of age disaggregation and grouping, including rates by single ages, age groups different from the standard quinquennial 10-14 and 15-19 (for example, age groups 12-15 and 16-19 years); and d) pros and cons of including under-15 adolescent fertility in the estimation of the total fertility rate.

Discussions should keep in mind that the SDG Indicator Framework requires that national data on the indicators should be provided to the maximum possible number of countries or areas. Given that Inter-Agency and Expert Group on the SDG Indicators can revise and propose changes to the SDG Indicator Framework, the Population Division shall welcome recommendations for consideration by the IAEG-SDGs.

Figure 9. Adolescent birth rate among girls aged 10-14 years matched with the adolescent birth rate among women aged 15-19 years selected for monitoring and reporting on Sustainable Development Goals, selected countries



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ANNEX TABLES

Annex table 1. Selection process based on three-tiered groups

	GROUP 1 (registration data are reliable and complete):
	UNSD & WPP: Registration data from the United Nations Statistics Division (number of births only if vital registration data are considered to be reliable and complete) and World Population Prospects (population of women 15-19).
	GROUP 2:
A.	National statistics & WPP: When DYB data are not the most recent data, registration data from national statistics offices are used in numerator and WPP data in the denominator (population of women 15-19).
B.	National statistics: National estimates of ABR based on registration data (considered to be reliable and complete).
	GROUP 3:
A.	Survey – DHS (preliminary and final datasets)
	- birth history data: 0-2 years before survey (to get most recent estimate)
	- period 0-4 years is given higher priority over the period 5-9 year before survey)
	Exceptions: Trends from 5-9 or 10-14 years before the survey are allowed for countries with limited data. (Examples, Afghanistan 2003 from 2010 Afghanistan Mortality Survey, Angola 2003 from 2011 MIS, Gabon 2004 from 2012 DHS, 2000 for Solomon Islands Demographic and Health Survey 2006-07, Tajikistan 2005 from 2012 DHS).
B.	Survey -- Other nationally representative surveys (including MICS and national surveys)
C.	Census data from UNSD
D.	Census data from all other sources (adjusted have preference over unadjusted), including research articles
E.	Own-children estimate (both from survey and census data) including research articles

Annex table 2. Distribution of data points on the adolescent birth rate (15-19 years) by data source and SDG region, 2000-2018

Data Source Type	SDG Region	Number of Data Points	Per cent
Census	Central and Southern Asia	20	0.3
	Eastern and South-Eastern Asia	30	0.5
	Europe and Northern America	3	0.0
	Latin America and the Caribbean	48	0.8
	Northern Africa and Western Asia	20	0.3
	Oceania (excl. Australia and New Zealand)	33	0.5
	Sub-Saharan Africa	103	1.6
Estimate	Central and Southern Asia	7	0.1
	Eastern and South-Eastern Asia	22	0.4
	Europe and Northern America	838	13.3
	Latin America and the Caribbean	95	1.5
	Northern Africa and Western Asia	178	2.8
	Oceania (excl. Australia and New Zealand)	4	0.1
	Sub-Saharan Africa	3	0.0
Panel	Latin America and the Caribbean	1	0.0
	Sub-Saharan Africa	2	0.0
Registration	Australia/New Zealand	70	1.1
	Central and Southern Asia	236	3.8
	Eastern and South-Eastern Asia	273	4.3
	Europe and Northern America	1214	19.3
	Latin America and the Caribbean	875	13.9
	Northern Africa and Western Asia	374	6.0
	Oceania (excl. Australia and New Zealand)	166	2.6
	Sub-Saharan Africa	138	2.2
Survey	Central and Southern Asia	198	3.2
	Eastern and South-Eastern Asia	171	2.7
	Europe and Northern America	30	0.5
	Latin America and the Caribbean	199	3.2
	Northern Africa and Western Asia	147	2.3
	Oceania (excl. Australia and New Zealand)	24	0.4
	Sub-Saharan Africa	757	12.1
Total	-	6279	100.0

Annex table 3. Distribution of data points on the adolescent birth rate (15-19 years) by country and data source, 2000-2018

Country	Registration	Survey	Estimate	Census	Panel	Total
Afghanistan		24				24
Albania	18	15	35	1		69
Algeria	8	10	2	1		21
American Samoa	20					20
Andorra	20		5			25
Angola		17	1			18
Anguilla	2			1		3
Antigua and Barbuda	33			1		34
Argentina	57	1	2			60
Armenia	20	6	23			49
Aruba	29			1		30
Australia	30					30
Austria	30		19			49
Azerbaijan	43	2	13			58
Bahamas	33			2		35
Bahrain	35		22			57
Bangladesh	22	21				43
Barbados	13			1		14
Belarus	34		11			45
Belgium	24		19			43
Belize	13	9				22
Benin		19		2		21
Bermuda	17					17
Bhutan		20		4		24
Bolivia		7		5		12
Bosnia and Herzegovina	24		20			44
Botswana	2	5		4		11
Brazil	26		25	1		52
British Virgin Islands	8					8
Brunei Darussalam	23					23
Bulgaria	32		20			52
Burkina Faso		19		4		23
Burundi		23		2		25
Cabo Verde	2	2		4		8
Cambodia		9				9
Cameroon		21		2		23

Country	Registration	Survey	Estimate	Census	Panel	Total
Canada	25		3			28
Central African Rep		3		2		5
Chad		8		1		9
Chile	43					43
China		17	8	2		27
China, Hong Kong SAR	24		2			26
China, Macao SAR	14			1		15
China, Taiwan Province	23		9			32
Colombia	28	13		1		42
Comoros		5		1		6
Congo	2	14				16
Congo, Dem Rep		8				8
Cook Islands	1		1	3		5
Costa Rica	35	1				36
Croatia	27		20			47
Cuba	51					51
Curaçao	5			4		9
Cyprus	24		28			52
Czechia	24		20			44
Côte d'Ivoire		32				32
Dem. People's Rep. of Korea		1		2		3
Denmark	20		27			47
Djibouti		11				11
Dominica	4					4
Dominican Republic	17	21		2		40
Ecuador	19	5				24
Egypt		12	12			24
El Salvador	20	17				37
Equatorial Guinea		5		2		7
Eritrea		8				8
Estonia	30		23			53
Eswatini		18		2		20
Ethiopia		13		3		16
Faroe Islands	20					20
Fiji	8		1			9
Finland	25		22			47
France	25		22			47
French Guiana	21					21
French Polynesia	23					23
Gabon		6		2		8

Country	Registration	Survey	Estimate	Census	Panel	Total
Gambia		19		6		25
Georgia	26	1	66			93
Germany	34		22			56
Ghana		45		3		48
Gibraltar	1					1
Greece	30		2			32
Greenland	20					20
Grenada	6					6
Guadeloupe	14					14
Guam	27					27
Guatemala	16	14				30
Guinea		20		2		22
Guinea-Bissau		17				17
Guyana	2	16		3		21
Haiti		21		3		24
Honduras	9	9		3		21
Hungary	25		24			49
Iceland	28		22			50
India	30	24		4		58
Indonesia		18		1		19
Iran	6	1	7	8		22
Iraq		16				16
Ireland	23		24			47
Israel	39					39
Italy	47		22			69
Jamaica	16	4		3		23
Japan	24		3			27
Jordan		14				14
Kazakhstan	47	1				48
Kenya	4	15				19
Kiribati		4		5		9
Kuwait	31					31
Kyrgyzstan	42	13				55
Lao PDR	2	29		4		35
Latvia	30		20			50
Lebanon	1	4				5
Lesotho	1	21		3		25
Liberia		16		2		18
Libya	5	3				8
Liechtenstein	17		16			33

Country	Registration	Survey	Estimate	Census	Panel	Total
Lithuania	25		22			47
Luxembourg	27		21			48
Madagascar		19				19
Malawi	2	25		1		28
Malaysia	29					29
Maldives	27	11		1		39
Mali		19		2		21
Malta	25		35	1		61
Marshall Islands		1		1		2
Martinique	21					21
Mauritania		16		2		18
Mauritius	36			1		37
Mayotte	15					15
Mexico	21	10	6	4	1	42
Micronesia	4			4		8
Moldova	28	7	7			42
Mongolia	31	4				35
Montenegro	33		19			52
Montserrat	11			1		12
Morocco		8		1		9
Mozambique		15		2		17
Myanmar	7	13		4		24
Namibia		14		3		17
Nauru	7	1		1		9
Nepal		24		3		27
Netherlands	23		20			43
New Caledonia	37					37
New Zealand	40					40
Nicaragua		5		3		8
Niger		15		7		22
Nigeria		25			2	27
Niue			1	1		2
North Macedonia	20		34			54
Northern Mariana Islands	17					17
Norway	29		21			50
Oman	33	1		2		36
Pakistan		33				33
Palau	11		1	1		13
Panama	33	2	8			43
Papua New Guinea		2		1		3

Country	Registration	Survey	Estimate	Census	Panel	Total
Paraguay	7	14				21
Peru	22	28		1		51
Philippines	1	20				21
Poland	26		23			49
Portugal	27		23	1		51
Puerto Rico	41			2		43
Qatar	29					29
Republic of Korea	45					45
Romania	27	1	30			58
Russian Federation	26		5			31
Rwanda		19		2		21
Réunion	21		2			23
Saint Kitts and Nevis	3					3
Saint Lucia	25			1		26
Saint Pierre and Miquelon	1					1
Saint Vincent & Grenadines	26			2		28
Samoa	2	3		4		9
San Marino	5					5
Sao Tome and Principe		12		1		13
Saudi Arabia	2	2	1	3		8
Senegal		42		8		50
Serbia	26	2	21			49
Seychelles	52			2		54
Sierra Leone		31		5		36
Singapore	29					29
Slovakia	24		23			47
Slovenia	25		21			46
Solomon Islands		6		2		8
Somalia		8				8
South Africa	1	12		2		15
South Sudan		5		4		9
Spain	26		22			48
Sri Lanka	20	6				26
State of Palestine		16				16
Sudan		6		5		11
Suriname	25	1	6	2		34
Sweden	22		19			41
Switzerland	21		21			42
Syria		10		1		11
Tajikistan	2	16				18

Country	Registration	Survey	Estimate	Census	Panel	Total
Tanzania		20		4		24
Thailand	21	5				26
Timor-Leste		9		7		16
Togo		19		1		20
Tokelau				1		1
Tonga	5	3		5		13
Trinidad and Tobago	28					28
Tunisia	6	5				11
Turkey	47	10	11			68
Turkmenistan	12	1				13
Turks and Caicos Islands	3					3
Tuvalu	2	1		1		4
Uganda		12		2		14
Ukraine	30	5	14			49
United Arab Emirates	25					25
United Kingdom	32		19			51
United States Virgin Islands	29					29
United States of America	36					36
Uruguay	36		35	1		72
Uzbekistan	28	3				31
Vanuatu	2	3		2		7
Venezuela	24	1	13			38
Viet Nam		46		9		55
Wallis and Futuna Islands				1		1
Western Sahara				5		5
Yemen		21		2		23
Zambia		8		4		12
Zimbabwe		31		3		34
Total	3346	1526	1147	257	3	6279