Future Scenarios of Adolescent Contraceptive Use, Cost and Impact in Developing Regions

Ann Biddlecom, Taylor Riley, Jacqueline E. Darroch, Elizabeth Sully, Vladimíra Kantorová and Mark Wheldon

Key Points

- This report presents scenarios of adolescent contraceptive use through 2030 to highlight the potential impact and costs associated with overall increased contraceptive use among adolescents and an increased use of long-acting, reversible contraceptives (LARCs), specifically.

- Under a scenario that assumes the most likely level of modern contraceptive use to be reached in a particular year (median values of probabilistic projections), the number of adolescent women using modern contraceptives in developing regions would reach 19.8 million in 2030, and 57% of adolescent women would have their need for modern contraception met.

- The total annual cost of services in 2030 for the projected 19.8 million modern method users would be an estimated $310 million. The cost would be lower, at $275 million, if 20% of adolescent women using short-acting methods were to choose LARCs.

- An estimated 7.1 million unintended pregnancies would be averted under this scenario. Because LARCs are highly effective, a shift toward use of these methods would avert an additional 300,000 unintended pregnancies.

- Under a scenario with accelerated growth in modern contraceptive use among adolescent women in developing regions, the number of modern method users would reach 27.1 million in 2030, and the proportion of adolescent women whose need for modern contraception would be met would rise to 79%.

- Contraceptive services for the 27.1 million modern method users in 2030 would cost an estimated $412 million. The cost would drop to $365 million under an assumption of increased LARC use.

- In 2030, an estimated 9.6 million unintended pregnancies would be averted under this accelerated growth scenario, and an additional 400,000 unintended pregnancies would be averted with a shift to LARC use.

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Planning for Future Contraceptive Needs of Adolescents

Although recent progress has been made in meeting adolescents' need for contraception, gaps persist in funding, programs and policies intended to ensure that all adolescents who want to prevent pregnancy are able to obtain and use modern contraceptives,* that they are given their choice of a wide range of methods, and that they receive essential services related to contraceptive use, including counseling, supplies and follow-up. Current policies and programs inadequately address both the supply- and demand-side aspects of adolescent contraceptive use and need.[1] As a result, about half of all pregnancies among adolescent females aged 15–19 in developing regions† are estimated to be unintended, and more than half of these unintended pregnancies result in induced, and often unsafe, abortion.[2] In addition, unprotected sex that can lead to unintended pregnancy also exposes many adolescents to the risk of HIV and other sexually transmitted infections; as a result, HIV is currently a large contributor to the overall disease burden among adolescents in Southern Africa and Eastern Africa.[3]
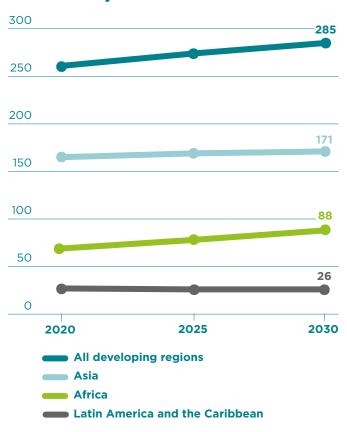
Future scenarios that project adolescent contraceptive use, costs of contraceptive services and impacts on unintended pregnancy are informative for anticipating pressure on domestic budgets, need for donor investments, total market demand for contraceptives, and need for policies and programs that keep pace with adolescents' demand for contraceptives. Scenarios that can account for past trends in adolescent sexual and contraceptive behaviors and build in robust information about future trends in underlying social and demographic behaviors are especially useful tools for planning.

At a minimum, scenarios must account for demographic trends. Future growth in the population of adolescent women will vary widely across developing regions: Africa is projected to experience rapid growth from 2020 to 2030, Asia is expected to experience slow growth, and the number of adolescent women will be relatively stable in Latin America and the Caribbean (Figure 1).[4] Projected subregional changes vary widely, from an increase of

GROWING POPULATION

The population of adolescent women in developing regions is expected to reach 285 million by 2030.

Projected number of 15–19-year-old women (in millions)

NOTES: Asia includes Oceania and excludes Australia, Japan and New Zealand. Data points reflect the medium variant population projection, which corresponds to the median of several thousand projected trajectories of specific demographic components.
SOURCE: reference 4.

*Defined as permanent methods (female and male sterilization); long-acting, reversible methods (IUDs and implants); and short-acting methods (hormonal pills, injectables, patches, male and female condoms, emergency contraception and other supply methods, as well as modern fertility awareness–based methods and the lactational amenorrhea method). †According to United Nations Population Division classifications, developing regions comprise all of Africa, Asia (excluding Japan), Latin America and the Caribbean, and Oceania (excluding Australia and New Zealand). In this report, we include Oceania with Asia, given the small populations of developing countries in Oceania.

about one-third in Western Africa (from 21 million to 28 million) to a decline from 17 million to 16 million in South America.[4]

This growing population's need for and use of modern contraceptives shift over time alongside changes in sexual behavior, age at marriage, awareness of and demand for particular methods, and ease of access to family planning services.[5] Data from 43 countries in developing regions show increases over the past two decades in the mean age at first marriage in Africa, Asia, and Latin America and the Caribbean.[6] And for regions with country-level data, the mean age at first sex has increased in Sub-Saharan Africa and decreased in Latin America and the Caribbean. The increases in age at marriage and first sex were primarily reflective of increases in educational attainment over time within a given population, rather than of trends within groups of the same education level.

The types of modern contraceptive methods that adolescents use are also important to consider in scenarios of future use and demand. Although short-acting methods like oral contraception, injectables and male condoms account for most adolescent method use,[7,8] multicountry studies show that failure rates with these methods are higher among adolescents than among older users. In addition, adolescents are more likely than older women to receive contraceptive care from providers with limited capacity to provide LARC methods.[9] They also may encounter common barriers to obtaining methods (e.g., stockouts or provider prejudice or misinformation) or using them (e.g., stigma or perceptions of health side effects).[10] Direct provision of contraceptive methods to adolescents is an effective intervention for preventing unintended pregnancy,[11] and ensuring that a wide range of methods is available and offered is a critical component of these services. This includes offering long-acting, reversible contraceptive (LARC) methods—implants and IUDs—as well as the services for removing these methods.

This report uses probabilistic projections based on past trends in contraceptive use to generate scenarios of contraceptive need among women aged 15–19 in all developing regions. It estimates the associated costs of contraceptive services and the potential impact on unintended pregnancy among this population. The analysis focuses on adolescents' use of modern contraceptives because these are typically the most effective methods for preventing unintended pregnancy. The analysis also includes an assessment of shifts in the current mix of methods used by adolescent women toward LARCs, which are among the most effective reversible methods to prevent pregnancy.

The results quantify potential pathways that adolescents' contraceptive needs may take by 2030 and the resources needed to provide services for different levels of modern method use—not only in terms of commodities and supplies, but also personnel costs and indirect (program and health systems) costs. Planning for future trends in modern contraceptive method use helps ensure that all adolescents have access to contraceptive information, counseling and provision, and this objective is part of global international agreements to improve adolescent health (e.g., the Global Strategy for Women's, Children's and Adolescents' Health, 2016–2030).[12]

The scenarios take into account future demographic changes in population and marriage and union formation and are based on the median of probabilistic projections of modern contraceptive method use in 2020, 2025 and 2030. Other recent studies using scenarios of contraceptive use have been of limited use to planning efforts, for instance because they were not specific to adolescents, used unrealistic assumptions of meeting all contraceptive need immediately, or did not examine the full range of service costs or consider a long time horizon.[2,13–15]

Data and Methods

This report compares four scenarios for the future use of modern contraceptives among adolescent women aged 15–19 to examine the relative impact of increases in overall modern contraceptive method use and shifts toward increased use of LARC methods on future needs, cost and impact. All four scenarios rely on the same projections of the number of adolescent women and the proportion who are married.[‡] The four scenarios were calculated for 2020, 2025 and 2030. The final year corresponds with the end of the time period laid out for accomplishing the United Nations (UN) Sustainable Development Goals; by then, countries will be expected to have made commitments to reach sexual and reproductive health–related targets, including for family planning. Estimates of the distribution of contraceptive methods used by adolescents, the annualized per-user costs of contraceptive services and the impact of adolescents' contraceptive use on preventing unintended pregnancy come from recent data and estimates[16] that are part of Adding It Up, an ongoing Guttmacher Institute project on the costs and benefits of investing in contraception and maternal and newborn health care in developing regions. We also drew on probabilistic projections to 2030 of family planning indicators among 15–19-year-old married and unmarried adolescent women.[17,18] We describe below each data component underlying the future scenarios of contraceptive need, cost and impact. The code used to generate these results is available at osf.io/c2xnv/.

Contraceptive method mix

We used country-specific estimates of the mix of modern contraceptive methods used by married and unmarried adolescent women in 2017[16] to inform method mix patterns into the future. The 2017 estimates were based on data from more than 130 nationally representative surveys, including Demographic and Health Surveys; Multiple Indicator Cluster Surveys; Performance, Monitoring and Accountability 2020; Reproductive Health Surveys and other independent surveys. For countries with missing data, estimates were based on averages from other countries in the same subregion or region, or on data from a demographically or socioeconomically comparable country, so that percentages and absolute numbers represent the entire population of adolescent women in subregions of Africa, Asia, and Latin America and the Caribbean.

We assessed the prevalence of dual method use by analyzing data from 114 surveys fielded between 2000 and 2016, using adolescent women's responses about the contraceptive methods they or their partners were using and responses to a separate question on condom use at last sex. Respondents were married or unmarried adolescent women who were sexually active in the three months prior to the survey interview. Concurrent use of two or more modern methods was uncommon: In only three of the 54 countries represented by the survey data did dual method use (typically male condom with another method) constitute 5% or more of total use among adolescent female contraceptive users. Therefore, we focused analyses on the most effective method reported by adolescents in surveys.

In 2017, short-acting contraceptive methods, such as the pill and the male condom, accounted for almost all modern method use (89%), and LARCs accounted for 10% of modern method use, among adolescent women in developing regions as a whole (Figure 2, page 6 and Appendix Table 1, available online at https://www.guttmacher.org/report/adolescent-contraceptive-use-in-developing-regions).[§] Short-acting methods accounted for more than three-quarters of adolescent modern method use in every subregion, although the specific mix of methods varied. We applied the 2017 estimates of method mix by marital status for each country to the scenarios of the number of adolescent modern and traditional method users by marital status for 2020, 2025 and 2030.

Projections of adolescent contraceptive use and need

To depict plausible future trends in modern contraceptive use and need among adolescent women aged 15–19 in our scenarios, we used model-based projections to 2030 of modern and traditional contraceptive prevalence and of contraceptive nonuse among those wishing to avoid pregnancy for at least two years. These projections were

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‡Throughout this report, we use the term "married" to include those in a cohabiting union. §This snapshot of modern methods is based on separate distributions of method-specific use for married and unmarried adolescent users that were applied to the number of contraceptive users by marital status and then summed so that the results reflect all adolescent contraceptive users.

FIGURE 2

CURRENT METHOD MIX

Throughout developing regions, the majority of adolescent women currently using modern contraceptives use a short-acting method.

Region	Short-acting	Long-acting, reversible	Permanent
ALL	89	10	
Africa	90	10	
Sub-Saharan Africa	91	8	
Eastern Africa	90	10	
Middle Africa	98	2	
Southern Africa	99		
Western Africa	87	13	
Northern Africa	80	19	
Asia	88	10	2
Eastern Asia	82	15	3
Central Asia	76	23	
Southern Asia	89	6	5
Southeast Asia	91	7	2
Western Asia	87	12	
Oceania	98	2	
LAC	89	9	2
Caribbean	88	11	
Central America	83	11	6
South America	94	5	

% distribution of female modern method users aged 15–19, by method type, 2017

■ Short-acting methods ■ Long-acting, reversible methods ■ Permanent methods

NOTES: Components may not add to 100 because of rounding. Asia includes Oceania and excludes Australia, Japan and New Zealand. LAC=Latin America and the Caribbean. SOURCE: See Appendix Table 1.

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developed by the UN Population Division[18] and draw from models pertaining to married[19] and unmarried women[20] of reproductive age (15–49). The projections take into account the future number of adolescent women by using the medium variant of age- and sex-specific population projections[4] and the future number of adolescent women who are married.[21] The UN generates probabilistic projections separately for married adolescents and unmarried adolescents and models modern method use,** traditional method use and nonuse among women who do not want to become pregnant in the next two years. The scenarios presented in this report reflect the sum of the values for married adolescents and unmarried adolescents to represent all adolescent women.

The UN model-based projections use a comprehensive survey data set of time trends in contraceptive use by age and marital status.[17] They fit a Bayesian hierarchical model, which improves estimation for countries with little or no data by pooling data among countries within subregions and regions. The model for married adolescents uses geographic clustering. The model for unmarried women uses a two-category classification for sexual activity (low vs. higher), combined with geographical clusters, to improve estimation for countries with little or no data. In general, patterns of contraceptive use among unmarried adolescent women are expected to be more similar across countries when the level of sexual activity among unmarried adolescents (and, hence, exposure to the risk of pregnancy) is relatively similar than when this factor is not taken into account. For 18 countries or territories,†† there are no data available on contraceptive use for adolescent women; these countries are excluded from the UN model-based projections and, consequently, from the scenarios presented in this report.

Scenarios of future adolescent contraceptive use

As adolescent women increasingly attain more schooling and delay the start of childbearing, there is potential for more demand for modern contraceptive methods, including LARCs. We developed scenarios of future trends in adolescent modern contraceptive use that would depict a likely trajectory and an accelerated trajectory for levels of overall modern contraceptive use, as well as potential changes in the mix of contraceptive methods used. All four scenarios use the same median projections for 2020–2030 of the number of adolescent women and the proportion

who are married (see box, page 8) and the same total number of adolescents with a need for contraceptive services in each year (i.e., modern method users, traditional method users and those who want to avoid pregnancy but are not using any method of contraception).

Scenario 1 uses our best estimate of what the level of modern contraceptive method use may be in a particular year (2020, 2025 or 2030). This level is the median of the model-based, probabilistic projections of the proportion of adolescent women aged 15–19 using modern contraceptive methods, which means that there is at least a 50% chance that modern method use will reach the projected level in a particular year. This scenario assumes that the current 2017 mix of modern contraceptive methods used by adolescent women would remain the same over time.

Scenario 2 uses the same level of projected growth in modern contraceptive use as scenario 1, but assumes 20% of users of short-acting methods would shift to using LARCs, compared with the method mix in 2017. To calculate this shift, we reduced by 20% for each country the share of adolescent women's modern method use that was attributed to each type of short-acting method. We assume this group of users would instead use LARC methods and that use would be divided among IUDs and implants in the same country-specific proportions as are seen among current 2017 users. Proportions of adolescent women using sterilization, using traditional methods and wanting to avoid pregnancy but not using any contraceptive method all remain fixed at the 2017 proportion for each country. The 20% reduction in each short-acting method and switch to LARC methods is an assumption that has been used in prior analyses of impact and also aligns with recent trends in the uptake of LARC methods like the implant.[22,23]

Like scenarios 1 and 2, scenario 3 assumes that the current 2017 mix of modern contraceptive methods used by adolescent women would remain the same over time, but it differs from the first two scenarios in that it presents estimates based on an accelerated model of growth in overall modern contraceptive use. We assumed that 50% of the adolescent women using traditional methods and 50% of the adolescent women who want to avoid pregnancy and are not using any form of contraception would instead use modern contraceptive methods. These numbers were added to the median estimate of the model-based, probabilistic projections of the proportion of adolescent women aged 15–19 using modern contraceptive methods.

**In the UN model-based estimates and projections, modern method use does not include use of fertility awareness–based methods; however, these methods constitute a very small percentage of reported use (Appendix Table 1). ††Brunei Darussalam, Cyprus, Federated States of Micronesia, French Guiana, French Polynesia, Guadeloupe, Guam, Hong Kong (China), Israel, Macao (China), Martinique, New Caledonia, People's Democratic Republic of Korea, Réunion, Singapore, Tonga, U.S. Virgin Islands and Western Sahara.

Scenario 4 uses the accelerated growth in modern contraceptive method use outlined in scenario 3, but assumes a 20% shift away from short-acting methods to LARCs (compared with the method mix in 2017), as described above for scenario 2. We restrict our discussion of scenarios 3 and 4 to 2030 because we assume that these large increases in contraceptive use would occur over time and would be fully realized by 2030.

Contraceptive service costs

To obtain a full picture of the investments needed, we computed the costs of contraceptive commodities and supplies, health personnel, and programs and systems associated with each scenario. Estimates for the components of contraceptive service costs reflect a normative bottom-up approach of computing annual per-user costs for specific contraceptive methods and are drawn from the most recent Adding It Up study (a detailed specification of the cost estimates, methodology and data sources used

is available online).[16] The cost estimates (all of which are expressed in 2017 U.S. dollars) are not based on actual expenditures (e.g., what adolescents pay out of pocket for contraceptive methods) because those data are rarely available in a standard format for many countries. Instead, they are based on the prices of contraceptive commodities and supplies, health personnel costs (assuming staff time for both method provision and counseling) and other components of contraceptive service provision. Following the methodology used for Adding It Up, we used standard World Health Organization protocols and expert opinions to specify the type and amount of drugs, supplies and personnel time required for provision of each method.[16]

The cost estimates reflect the recommended treatment components of contraceptive care, rather than actual levels of care. They are not adjusted for differences in the source of service provision (public or private health facilities, commercial drug sellers etc.), the quality of contraceptive care actually provided, or differences in client needs for information and services. These factors are

BOX
Four scenarios of adolescent women's modern contraceptive use

Component	1	2	3	4
Proportion of women aged 15–19 using modern methods	Median projection	Median projection	Median projection + 50% of traditional method users + 50% of women who want to avoid pregnancy and are not using any contraceptive method	Median projection + 50% of traditional method users + 50% of women who want to avoid pregnancy and are not using any contraceptive method
Proportion of adolescent female modern method users who use LARC methods	Same as in 2017	20% of users of short-acting methods would shift to using LARCs	Same as in 2017	20% of users of short-acting methods would shift to using LARCs
Population of women aged 15–19	Median projection	Median projection	Median projection	Median projection
Proportion of women aged 15–19 who are married	Decrease	Decrease	Decrease	Decrease

NOTE: LARC=long-acting, reversible contraceptive.

likely to affect actual service provision to varying extents, depending on local context. For instance, the source of service provision is closely linked to the type of method used, and adolescents are more likely to use short-acting methods, such as pills and condoms, that can be obtained from sources outside of the health care system than longer acting or permanent methods, which generally require a clinic visit. Likewise, quality of care may vary by age-group: Among condom users, adolescents are more likely than older individuals to obtain the method from informal sources with limited capacity to provide standard aspects of contraceptive care, such as counseling.[9]

Total direct costs are the sum of the average annual costs of commodities, supplies and personnel. The costs of permanent and LARC methods were converted to annual costs by dividing total lifespan method costs (for insertion, follow-up and removal) by the expected average number of years of use. The average use in years was based on information from the 2011 updates to the U.S. Agency for International Development couple-years of protection conversion factors.[16] Annual costs for short-acting methods were estimated by multiplying commodity unit costs by the number of units assumed to be needed during a year of use. We assumed the annual cost for each specific method would be the same for adolescents as for older users.

Program and systems costs, also known as indirect costs, were derived from research conducted by the United Nations Population Fund.[16] These costs are estimated as a region-specific proportion of direct costs.

Costs for the four scenarios reflect projected changes in the number of users of each contraceptive method. Costs are not adjusted for inflation and do not assume changes in the way services are delivered and costed in the future (e.g., we assume economies of scale will remain constant).

Impact of modern contraceptive use

Our measure of impact is the number of unintended pregnancies averted by modern contraceptive method use under each scenario. Unintended pregnancies averted is the difference between a) the number of unintended pregnancies that would occur due to method-specific contraceptive failure among the modern method users in each scenario and for each year, and b) the number of unintended pregnancies that would occur if all sexually active adolescents using a modern contraceptive method were to use no contraceptive method at all.

To estimate the number of unintended pregnancies that would occur in each scenario, we estimated country- and method-specific rates of pregnancy among married and sexually active unmarried adolescent women wanting

to avoid pregnancy. We first multiplied the number of method-specific contraceptive users by a single set of method-specific failure rates. Specifically, we used estimates of age-specific typical-use failure rates (which we assume do not vary by region or country) for contraceptive pills, injectables, condoms, IUDs, withdrawal and periodic abstinence;[24] for sterilization, we used a use-failure rate of 0.5 (female) and 0.15 (male).[25] For the remaining methods, we used supplementary data from the United States and a few developing countries.[16] Method-specific failure rates were assumed to remain constant across the time period considered in this report.

For the pregnancy rate among adolescent women who want to avoid pregnancy but are not using a contraceptive method, we used the 40% from the Adding It Up study for all women of reproductive age[16] and multiplied that rate by the number of adolescent women who want to avoid pregnancy and are not using any method. This 40% pregnancy rate is lower than a commonly cited pregnancy rate of 85%, which is based on the first-year pregnancy rate for couples who are attempting to conceive.[25] We assumed a 40% pregnancy rate is more realistic for the adolescent population in question because it reflects probable lower levels of sexual activity. We calibrated the resulting number of unintended pregnancies to a robust set of modeled estimates of unintended pregnancies[26] by applying country-specific adjustment ratios.[16] We assumed that the adjustment for adolescent women was the same as that for all women of reproductive age.

Projections for Adolescent Contraceptive Use

Scenarios 1 and 2 assume the most likely level of modern contraceptive method use and need to be reached in a particular year (median values from the probabilistic projections). We expect there would be at least 17 million adolescent modern method users in 2020, increasing to 18.3 million in 2025 and to 19.8 million in 2030 (Appendix Table 2). In all, there would likely be 2.8 million more adolescent modern method users in developing regions in 2030 than in 2020. Growth in the number of modern method users is expected in all subregions of Africa and all but two subregions in Asia (Southern and Southeast Asia). Declines are expected in the Caribbean and South America, and very slight growth is likely in Central America.

Even with this overall projected growth in modern method use, 14.7 million adolescent women in developing regions in 2030 are projected to have an unmet need for modern contraception—that is, they are able to become pregnant but do not wish to do so in the next two years and are not using a modern method of contraception. For both scenario 1 and scenario 2, this includes 1.7 million adolescent women who use traditional methods and 13 million who want to avoid a pregnancy but are using no method. Fifty-four percent of these adolescents are projected to live in Africa, 32% in Asia, and 15% in Latin America and the Caribbean. The proportion of the need for contraceptives that would be satisfied by modern method use in 2030 under this scenario is 57% in developing regions overall, 52% in Africa, 59% in Asia, and 67% in Latin America and the Caribbean. This measure is computed as the number of modern method users divided by the sum of the numbers of modern method users, traditional method users and adolescents who want to avoid pregnancy but are not using any form of contraception.

Under scenario 1, 17.8 million adolescent women in developing regions would use short-acting methods and 1.7 million would use LARC methods in 2030 (Figure 3)—reflecting the same mix of modern methods used by adolescents in 2017. Scenario 2 assumes that 20% of adolescent women using each type of short-acting method would switch to LARC methods, such that, in 2030, 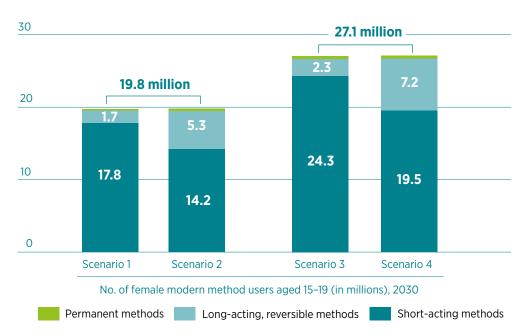14.2 million adolescent women would be using short-acting methods and the number of adolescent LARC users would grow to more than five million.

Scenarios 3 and 4 assume that the number of adolescent women using modern contraceptives in developing regions would increase at an accelerated rate, reaching 27.1 million in 2030. As a result of this higher level of modern contraceptive uptake among traditional method users and women who want to avoid a pregnancy but are using no method, the number of adolescent women with an unmet need for modern methods in 2030 in scenarios 3 and 4 would be lower than in scenarios 1 and 2, at about 7.3 million—0.9 million who

FIGURE 3

FUTURE MODERN METHOD USE

The number of adolescent modern contraceptive users in developing regions is expected to reach almost 20 million in 2030.

No. of female modern method users aged 15–19 (in millions), 2030

Permanent methods　Long-acting, reversible methods　Short-acting methods

use traditional methods and nearly 6.5 million who want to avoid a pregnancy but are using no method. The proportion of need for contraceptives that would be satisfied by modern method use in 2030 under these scenarios is 79% in developing regions overall, 76% in Africa, 80% in Asia, and 84% in Latin America and the Caribbean.

Under scenario 3, the number of short-acting method users is projected to reach 24.3 million in 2030, and the number of LARC users is projected to reach 2.3 million; these proportions reflect the method mix in 2017. Scenario 4 assumes that 20% of adolescent women using of each type of short-acting method would switch to LARC methods. As a result, there would be in 7.2 million adolescent women using LARCs in 2030 and 19.5 million using short-acting methods.

In 2030, fewer than 300,000 adolescent contraceptive users in scenarios 1 and 2 and approximately 425,000 users in scenarios 3 and 4 are expected to be reliant on permanent methods (female and male sterilization).

Costs of Projected Contraceptive Use

Under scenario 1, the annual total cost (direct and indirect) of modern contraceptive services for adolescent women in developing regions is projected to be $280 million in 2020: $70 million in Africa, $98 million in Asia, and $112 million in Latin America and the Caribbean (Table 1 and Appendix Table 3). Costs would reach $310 million per year in 2030. The annual cost per adolescent contraceptive user in 2030 would be $15.71 in developing regions overall, ranging from $11.62 in Africa to $24.89 in Latin America and the Caribbean. Under scenario 2, with a shift from short-acting methods to LARCs, total annual costs in 2030 would be $275 million, and per-user costs would be reduced by $1.19–2.66 across regions, compared with scenario 1. Relative to scenario 1, the elevated LARC use modeled in scenario 2 would reduce costs at each year covered in this analysis. Moreover, compared with scenario 1 in 2020, scenario 2 in 2030 would result in savings, even while providing modern contraceptive services to 2.8 million additional users.

Under scenario 3, which assumes accelerated contraceptive uptake and a method mix that reflects 2017 patterns,

services for 27.1 million modern method users in 2030 would cost an estimated $412 million: $135 million in Africa, $147 million in Asia, and $130 million in Latin America and the Caribbean. The annual cost per adolescent contraceptive user in 2030 would range from $11.40 in Africa to $24.64 in Latin America and the Caribbean. Scenario 4's assumption that 20% of users of short-acting methods would shift to using LARCs would reduce costs in 2030 by $47 million compared with scenario 3, and the annual cost per adolescent contraceptive user in 2030 would range from $10.30 in Africa to $22.04 in Latin America and the Caribbean.

The scenarios differ not only in total cost, but in costs by component. Under scenario 1, between 2020 and 2030, annual costs of commodities and supplies are projected to increase by $10 million and those for personnel by $10 million (Figure 4, page 13). Scenario 2's shift of 20% of short-acting method users to LARCs would slightly raise the cost of commodities and supplies by $2 million, while personnel costs remain the same.

Under scenario 3, in which the 27.1 million adolescent contraceptive users in 2030 would use the same mix of
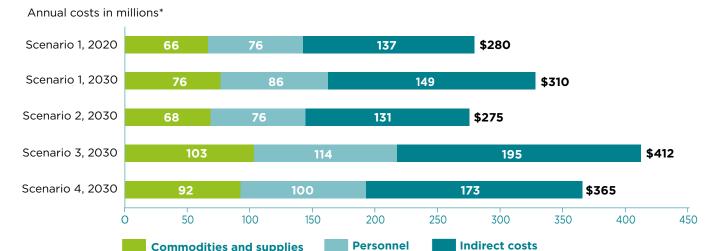
TABLE 1

Total annual cost and average annual cost per user of contraceptive services for adolescent modern method users by region and scenario, 2020 and 2030

	2020	2030			
	Scenario 1	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Total cost (in millions)*					
All developing regions	$280	$310	$275	$412	$365
Africa	$70	$94	$85	$135	$122
Asia	$98	$110	$95	$147	$126
Latin America and the Caribbean	$112	$106	$95	$130	$116
Average total cost per user					
All developing regions	$16.49	$15.71	$13.90	$15.22	$13.48
Africa	$12.22	$11.62	$10.43	$11.40	$10.30
Asia	$14.48	$14.92	$12.92	$14.77	$12.73
Latin America and the Caribbean	$24.90	$24.89	$22.24	$24.64	$22.04

*All estimates are in 2017 dollars. Indirect costs are applied proportionately to direct service costs. Estimates do not account for inflation.
NOTE: Numbers may not add to totals because of rounding.

FIGURE 4

FUTURE CONTRACEPTIVE COSTS

Projected costs of contraceptive services for adolescent modern method users will vary widely depending on the pace of growth and mix of methods used.

Annual costs in millions*

Scenario	Commodities and supplies	Personnel	Indirect costs	Total
Scenario 1, 2020	66	76	137	$280
Scenario 1, 2030	76	86	149	$310
Scenario 2, 2030	68	76	131	$275
Scenario 3, 2030	103	114	195	$412
Scenario 4, 2030	92	100	173	$365

■ Commodities and supplies ■ Personnel ■ Indirect costs

*All estimates are in 2017 U.S. dollars. Indirect costs are applied proportionately to direct service costs. Estimates do not account for inflation.
NOTE: Numbers may not add to totals because of rounding.

modern methods as current adolescent users, commodities and supplies would cost $103 million annually and personnel would cost $114 million. The shift from short-acting methods to LARCs described by scenario 4 would reduce costs across components, compared with scenario 3.

Costs under each scenario vary widely by region (Appendix Table 3), in part due to regional differences in the projected numbers of adolescent modern method users, the 2017 mix of modern methods and the costs of contraceptive services.

Impact of Projected Contraceptive Use

A key indicator of the impact of modern method use is its role in preventing unintended pregnancy. Even if all adolescent women were using contraception, some unintended pregnancies would still occur because of inconsistent or incorrect use (e.g., forgetting to take oral contraceptive pills, incorrect use of male condoms) and method failures. Yet, as more adolescent women who want to avoid pregnancy begin to use modern contraceptive methods, as opposed to traditional methods or no method at all, fewer unintended pregnancies will occur.

Under scenario 1, modern contraceptive use among 19.8 million adolescent women in developing regions in 2030 would avert 7.1 million unintended pregnancies (Figure 5 and Appendix Table 4). Under scenario 2, if 20% of these users shifted from short-acting methods
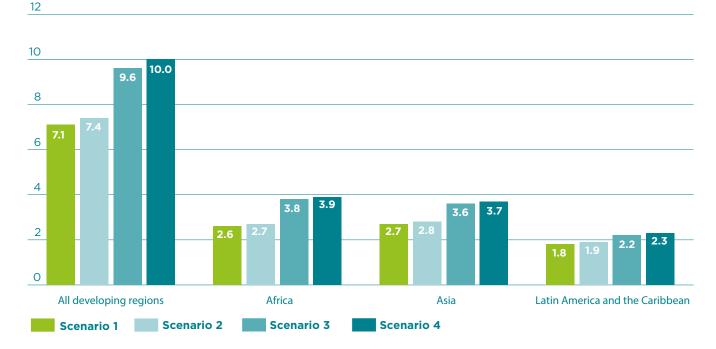
to LARCs, an additional 300,000 unintended pregnancies would be averted. Under scenario 3, modern method use among 27.1 million adolescent women in 2030 would avert 9.6 million unintended pregnancies (or an additional 2.5 million unintended pregnancies over scenario 1), and scenario 4's shift from short-acting methods to LARCs would avert an additional 400,000 unintended pregnancies.

FIGURE 5

UNINTENDED PREGNANCIES AVERTED

Projected increases in adolescent women's use of modern methods would lead to the prevention of about 7–10 million unintended pregnancies.

No. of unintended pregnancies averted (in millions)

	All developing regions	Africa	Asia	Latin America and the Caribbean
Scenario 1	7.1	2.6	2.7	1.8
Scenario 2	7.4	2.7	2.8	1.9
Scenario 3	9.6	3.8	3.6	2.2
Scenario 4	10.0	3.9	3.7	2.3

NOTE: Numbers may not add to totals because of rounding.

Conclusion

To ensure that all adolescents have ongoing access to the services they need to prevent unintended pregnancy, governments, donors and advocates must anticipate this group's contraceptive needs up to and beyond the end of the UN Sustainable Development Goals in 2030. Stakeholders must also plan ahead for the costs of meeting these needs. While future trends in adolescent contraceptive needs are difficult to predict accurately, it is a certainty that the population of adolescents in developing regions will continue to grow. Taking into account their future numbers and marriage patterns, this report presents four informative scenarios of adolescent contraceptive needs, costs and impact between now and 2030.

Our analyses focused on two factors—an acceleration in contraceptive use and a shift in the method mix toward long-acting, reversible methods—and accounted for future changes in population numbers and marriage patterns. However, the scenarios do not account for social and economic factors that can shape contraceptive behaviors over time. For instance, we did not examine changes in adolescent women's desire to delay and space childbearing or in their autonomy to make sexual and reproductive decisions. One of the most important social changes over time pertaining to adolescents is the increasing level of girls' and women's education in developing regions and its general association with later average ages at first sex, first marriage and first birth.[6] Given the remarkable progress in adolescent women's school participation and literacy over the past few decades, an additional scenario that draws on the association of education and demand for and use of contraceptives may be a useful next phase in generating informative scenarios. Further research could decompose these scenarios to show the relative contributions of population, education, changes in exposure to pregnancy (e.g., marriage and sexual activity outside of marriage) and contraceptive behavior.

Other limitations of this analysis also offer avenues for future research. For one, we did not build in method-specific changes over time apart from the shift from short-acting methods to LARCs. Increased use of specific methods, such as emergency contraception, or the scale-up of new method technologies, such as self-administered injectables, could play a substantial role in future contraceptive use among adolescent women. In addition, our estimates of annualized method-specific costs per contraceptive user were not differentiated by public or private sector, nor did we differentiate the costs of providing contraceptive services to different groups of adolescents (e.g., by urban or rural residence, or by out-of-school status). Further work on scenarios could take advantage of information on the uncertainty in model-based projections of contraceptive use in order to generate and assess targets for meeting future demand for contraceptives.[27]

Sexually active adolescents who want to avoid a pregnancy often face multiple cultural, social and health-service challenges to obtaining and using modern contraceptive methods. Forming and strengthening programs and policies that address these challenges depend on the availability of reliable information on what the future may hold. This report, as well as further efforts toward creating probabilistic projections, help make a robust case for investing in adolescents now.

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