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Measuring Adolescent Women's Sexual and Reproductive Health Within A Rights-Based Framework: Developing and Applying an Index

Ragnar Anderson, Christine Panchaud, Lisa Remez and Susheela Singh

HIGHLIGHTS

- To explore the feasibility of creating an easy-to-use summary data tool from survey data, we combined 16 indicators into an index measuring four dimensions of adolescent women's sexual and reproductive health and rights. The index was tested using data from 30 countries that had relatively recent nationally representative surveys and were distributed across four regions.
- The resulting index, denoted by the summary acronym AISAR, examines *adolescents'* access to *information* and *services, agency* in sexual activity and health, and perceptions of *rights* within marriage. To explore how the tool can be used, we also created an index of adolescents' needs for sexual and reproductive health information and services.
- Although the results are tentative and exploratory, some general patterns emerged. Conditions of adolescent women's sexual and reproductive health and rights are poorest in the 13 Sub-Saharan African countries, where needs are also among the highest. Latin American countries have above-average conditions, but also have very high needs. The South and Southeast Asian countries tend to have relatively poor sexual and reproductive health conditions for adolescent women, but also have below-average needs. The three Eastern European countries have above-average health and rights conditions with relatively low needs.
- Our exploratory exercise showed large gaps in the availability of survey data that accurately measure adolescents' receipt of sexual and reproductive health information and their access to services, and even larger gaps in data to document their sense of agency in sexual and reproductive matters and understanding of their sexual rights.
- Despite the difficulties of drawing conclusions from an index with many missing data points, these findings suggest that developing such indices is a useful endeavor that can provide helpful, at-a-glance summary information to policymakers and program planners. The analysis also makes clear the great need to improve on this pilot effort.
- The existing data gaps point to the need for national surveys to develop and include new questions to more accurately measure adolescents' understanding of sexual health issues, their access to needed services, and their ability to exercise their rights and exert agency over their sexual and reproductive lives.

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Introduction

The inability of many adolescent women to protect their sexual and reproductive health is a pressing concern. The inalienable right of all women to do so has been established through multiple mechanisms, including human rights treaties and international conventions.[1–4] The right to reproductive health is commonly defined as "a human right that protect[s] against the causes of ill health and promote[s] sexual and reproductive well-being."[5] Although it applies to all people, men and women of all ages, certain groups in particular face barriers to exercising this right. Notably, adolescent women's age and biology place them at higher than average risk for unintended pregnancy and STIs, including HIV. (In this report the term "adolescents" refers to 15–19-year-olds.) They also often have the highest unmet need for services that prevent such outcomes.

Strong youth policies are in place in many countries, and adolescent fertility is a progress indicator for one of the global targets specified in Millennium Development Goal (MDG) 5, reduce maternal mortality by 75% between 2000 and 2015. Yet even though improving adolescent sexual and reproductive health is high on the global agenda,[6,7] comparatively little attention is paid to monitoring how that agenda is implemented and its impact on real-life outcomes. In fact, evidence clearly shows large gaps in adolescents' ability to obtain the information and services that they need to protect and preserve their sexual and reproductive health and rights.[8–11] Those gaps are widest in the developing world and can have a marked negative impact on adolescent health and on public health in general.

For example, when adolescents are unable to prevent unintended pregnancies by practicing contraception, unplanned births or induced, often unsafe, abortions can result. In 2014, an estimated 12 million adolescents living in developing regions gave birth.[12] Although unplanned births among all women of reproductive age are falling globally, large proportions of births to adolescents in the developing world continue to be unplanned,[13] which can have lifelong consequences for both mother and infant. Moreover, this outcome reflects only those pregnancies that ended in *births*; as of 2008, an estimated 3.2 million adolescent women in the developing world (excluding China) resorted to induced abortion that year.[14] Laws that highly restrict legal abortion in the majority of these countries mean that most abortions of adolescents there are clandestine and unsafe, and adolescents are thought to "suffer the most from the negative consequences of unsafe abortion."

Cultural attitudes that restrict adolescents' access to sexual health information, practices that encourage unions between adolescent women and much older men, and adolescents' limited agency to negotiate condom use all put them at high risk for contracting STIs, including HIV. Reports of the Joint United Nations Programme on HIV/AIDS (UNAIDS) do not present separate estimates of HIV prevalence for 15–19-year-olds,[15] but some recent national-level surveys show very high rates among this age-group in countries with generalized epidemics (those in which at least 1% of the population is infected). For example, HIV prevalence among 15–19-year-old women in six Sub-Saharan African countries ranges from 2.7% to 7.1%.*[16] UNAIDS reports that Sub-Saharan African 15–24-year-old women account for one in four new infections and are twice as likely as their male counterparts to be living with HIV.[15] Moreover, the coverage of HIV testing is extremely low among adolescent women in Sub-Saharan Africa, and as a result most—more than four in five—do not know their HIV status.[17]

In general, adolescents worldwide still have inadequate access to sexuality education and to sexual and reproductive health services.[10] Rigorous research has shown that providing them with comprehensive sexuality education and sufficient access to needed reproductive and sexual health care does not lead to early sexual initiation but does improve their sexual health outcomes.[18–21] A growing body of evidence clearly shows the benefits of investing in the sexual and reproductive health of all people, including adolescents, and the economic and public-health costs for failing to do so.[22,23]

Much of the existing work on indicators of adolescent sexual and reproductive health focuses on knowledge,

*These six countries (with survey year and prevalence rates) are Kenya (2008–2009, 2.7%), Malawi (2010, 4.2%), Mozambique (2009 AIDS Indicator Survey, 7.1%), Uganda (2011, 3.0%), Zambia (2007, 5.7%) and Zimbabwe (2010–2011, 4.2%). (Source: reference 16.)

attitudes, behaviors and outcomes, whereas coverage of rights is far more limited.[8,24–26] It is essential to take into account adolescent women's rights to the full range of information, services and skills-training that would enable a healthy and satisfying sexual life and ensure protection from violence and abuse. Measuring the fulfillment of rights is intrinsically hard, but not impossible given the availability of useful proxies.

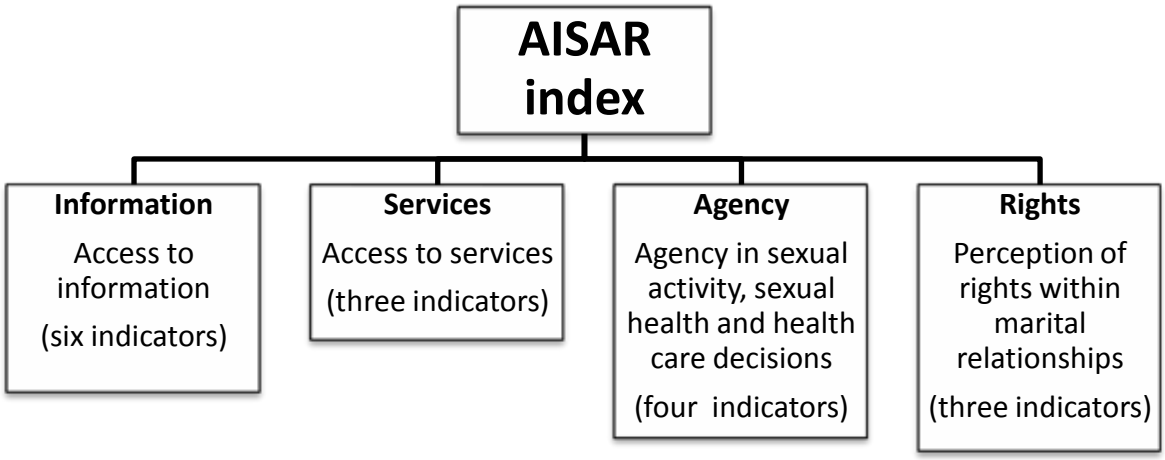
Many studies and two global goals (MDGs 5 and 6) have highlighted the need for quantitative measurements of adolescent sexual and reproductive health and rights. A comprehensive index that combines a broad range of related measures would mark significant progress toward satisfying this longstanding need to capture the situation of adolescent women at the country level. An index is an attractive data-analysis and presentation tool because it provides policymakers and program planners with a simple way of sizing up the current situation to see where needs are most pressing. For example, Population Action International (PAI) produced a Reproductive Risk Index in 2007[27] and a Sexual and Reproductive Health and Rights Index in 2014.[28]

In line with recent efforts to use quantitative indicators to monitor contraceptive programs' fulfillment of human rights,[29] we sought to explore whether an index could assess the state of adolescent women's reproductive health and rights, paralleling the above efforts. Our index was conceived within the broad concept of other ongoing rights-based initiatives that are developing indicators to assess whether women are able to get care and its quality. As such, it started by considering the services framework developed originally by Karen Hardee and colleagues that identified four key components of good-quality family planning services: availability, accessibility, acceptability and quality (AAAQ).[30] The authors subsequently expanded these components to encompass four more, namely, accountability, community participation, supportive community norms and increased individual agency.[30,31] Although Hardee's framework is focused on family planning and is oriented toward all women and couples regardless of age, it is a useful starting point for conceptualizing the needs of adolescent women in the broader sense of their overall sexual and reproductive health care and rights.

To develop our index, we drew on data generated for a guide (a collaborative project with International Planned Parenthood Federation [IPPF]) on how to effectively use data to improve the sexual and reproductive health and rights of young people.[13] A total of 70 indicators for 30 countries already processed for that project served as the foundation for our development of this new adolescent index. These indicators are primarily drawn from national demographic and health surveys and therefore fall short of measuring certain aspects of the AAAQ framework and its related components. Nevertheless, given time and financial constraints, and reasonable approximation, we aligned these indicators to match what we could of that framework, while also adding and revising indicators to specifically address the situation of adolescent women.

In all, we used 16 of the indicators falling into four domains or components to develop our index. Because adolescent women are just beginning their sexual and reproductive lives and need information first and foremost, the

FIGURE 1. AISAR index components



Note: In this and all figures, AISAR = Adolescents' Information, Services, Agency and Rights.

first component of our index includes a range of variables that together give an idea of adolescent women's access to sexual and reproductive health *information*. The second component reflects the AAAQ element of accessibility, as measured from adolescent women's actual use of maternal and reproductive health *services*. In line with Hardee's individual *agency*, the third component of our index draws on indicators of adolescent women's ability to protect their sexual health and prevent negative outcomes. Finally, for the fourth component, we sought as close a proxy as possible to assessing adolescent women's perceptions of a wife's sexual *rights* within marriage, specifically concerning sexual activity and domestic violence. These four components—Adolescents' Information, Services, Agency and Rights—are combined into a single index having the acronym AISAR (Figure 1).

Any attempt to create an index of hard-to-measure attitudes and behaviors is greatly constrained by data availability and suitability, especially when circumstances dictate the use of preexisting indicators. Nonetheless, given the pressing need for better data tools, testing and applying the AISAR index is a worthwhile research endeavor. In this report, we describe how the index is constructed and provide results for 30 countries, based on their most recent survey that was available at the time of analysis. The countries lie in four major geographic regions (Africa, Eastern Europe, South and Southeast Asia, and Latin American and the Caribbean), offering a good test of whether the index will work well in a wide range of social, economic and cultural contexts, and also providing a means of assessing similarities and differences within regions. Separately, we also constructed an index of need for information and services among adolescent women to examine the relationship between the AISAR index and related needs, providing insight into the AISAR index's utility for informing policies and programs. Finally, we discuss implications of our findings, as well as gaps in the data and the need for collecting information that better captures the situations and needs of adolescent women.

Data Sources and Methods

Data Sources

As mentioned previously, our exploratory AISAR index took advantage of survey data that had already been assembled for a joint Guttmacher and IPPF project. Approximately half of the 30 countries included were selected by IPPF as part of their larger programming efforts (Albania, Dominican Republic, Egypt, Ethiopia, Guatemala, Honduras, Kenya, India, Indonesia, Pakistan, Philippines, Senegal, Vietnam and Zambia). Guttmacher added 16 more countries to achieve some degree of regional representation and variation in the sample. At the time of our original analysis, all countries had had surveys that were fielded in the past 10 years.

The source of survey data for 29 of the 30 countries is the Demographic and Health Survey (DHS) program conducted by Macro International, an organization that implements national sample surveys on sexual and reproductive health in a wide range of countries, working in collaboration with local institutions. The sole country with data from a different survey program is Guatemala, for which we relied on a comparable data set, collected with technical assistance from the U.S. Centers for Disease Control and Prevention (CDC). A strong advantage of these types of surveys is that the data are highly comparable across countries, with standardized questions on most topics, and standardized approaches to study design, training of field staff, data collection and data processing. All data presented are weighted results, therefore providing representative information for the population of adolescent women in each country.

The surveys from which data were drawn for the jointly produced guide were fielded between 2002 and early 2011.[13] Because these surveys are meant to be routinely updated and several newer ones had recently become available, we use more recent survey data for seven countries in our index. These countries (and their most recent survey year) are Bangladesh (2011), Honduras (2011–2012), Indonesia (2012), Mozambique (2011), Pakistan (2012–2013), Peru (2012) and Uganda (2011). Given the cyclical nature of constantly replenishing data, several included countries will likely have more recent data available by the time this report is published.

All 30 surveys are nationally representative and have large samples; interviews are conducted face to face with women aged 15–49 (and in many countries, also with men of reproductive age). With one exception, all of the indicators in our index use adolescent women aged 15–19 as their denominator. The exception is the proportion of adult women aged 18–49 agreeing that young adolescents should be taught about the condom, and this indicator is included here to get a sense of the broader societal context in which adolescents live. In doing so, we borrow from Hardee's extended AAAQ program framework, which recommends incorporating a measure of supportive community norms.[30] The unweighted samples of women aged 15–19 are sizable, ranging from 567 in Pakistan to 23,955 in India, with the exception of Vietnam (see Appendix Table 1). In that country, only 67 adolescent women were interviewed in a survey of ever-married women only. In addition to Vietnam, three other countries included in this index had surveys that were limited to ever-married women: Bangladesh, Egypt and Pakistan.

Methods

Indicators Used in the AISAR Index

From the 70 indicators that were compiled for the guide project, we selected 16 to go into the AISAR index. These describe the situation of adolescents' sexual and reproductive health and rights and capture four dimensions of adolescent women's lives: accessibility to information, accessibility to services, agency in matters of sexual activity and health, and perceptions of rights within marital relationships. The rationale behind the choice of each of these indicators is discussed in the Results section.

The availability of data for each of the 16 indicators varied across the 30 countries. Unsurprisingly, the indicators measuring opinions and attitudes, especially on the agency and rights components, were most affected by missing data. At the country level, those that lack data on more than one of the 16 indicators are Egypt, Guatemala and Pakistan (data missing on five indicators) and Bangladesh and Vietnam (four indicators). At

the component level, unavailable data affect the reliability of scores for several countries. The reliability of the information component, which includes six indicators, is relatively good, with six countries (Bangladesh, Colombia, Dominican Republic, Egypt, Guatemala and Pakistan) missing data on one of the six indicators. The services component, made up of three indicators, is not missing data for any country. For the individual agency component, which includes four indicators, six countries (Bolivia, Indonesia, Moldova, Nepal, Peru and Philippines) lack data for one indicator. However, five countries (Bangladesh, Egypt, Guatemala, Pakistan and Vietnam) lack data for two (i.e., 50%) of the four indicators, compromising the reliability of their scores on this component. The situation is similar for the three-indicator rights component: Bangladesh is missing data for one indicator; however, four countries (Egypt, Guatemala, Pakistan and Vietnam) are missing data for two indicators (i.e., 66% of data for this component), which negatively affects the reliability of these countries' scores on this component.

The comparability of the rights component across countries is further affected by the fact that some countries lack parts of multipart contributing indicators. For example, the indicator gauging women's sense of sexual autonomy within marriage includes an item from an empowerment of women question that asks about three situations in which a woman is justified in refusing sex with her husband (i.e., she knows he has sex with other women, knows he has an STI, or is tired or not in the mood). However, wide variability in survey questionnaires meant that some countries did not collect these exact data. Thus, in three countries (Honduras, Mozambique and Uganda) this indicator is based on data for only one of the three situations. Moreover, for our rights index indicator that uses responses to an item on negotiating safer sex, many countries that did not have this item did have similar content covered in the above empowerment of women question. Thus, we were able to use data on whether a wife can refuse intercourse if her husband has an STI as a proxy for the missing survey item on whether she can ask her husband to use condom use in that situation in six countries (Bangladesh, Bolivia, India, Indonesia, Peru and the Philippines).

When data on an indicator were missing from the most recent survey (at the time of analysis), we used data from the preceding survey, when available. Because most of the missing indicators assess attitudes, which are relatively slow to change, we assumed that using the second-most recent survey would not unduly compromise comparability.

Calculation of Component and Summary Scores

Each AISAR indicator is expressed so that higher-value responses (percentages or averages) denote a more favorable situation for adolescent women. We used a two-step process to calculate component scores. First, all indicators were scaled to the range of 0 to 100. (For each indicator, the lowest value is converted to a minimum value of 0 and the highest value is converted to a maximum value of 100. This means that all indicators are treated as equal in importance, so they contribute equally to the component scores and are not differentially weighted.) Second, the indicator scores for a given component were summed and divided by the number of indicators in the component to derive the component score. In all instances in which data were missing, we calculated each country's component score on the basis of the number of component indicators for which countries supplied data. Finally, we averaged the four component scores to obtain our summary AISAR index score. As with the 16 constituent indicators, higher component scores and higher summary index scores indicate a more positive environment for adolescent women. Tabulations were done using SPSS version 18.

Index of Adolescents' Needs for Information and Services

To make the AISAR index more useful for policy making and program planning, we also developed an index measuring adolescents' need for sexual and reproductive health information and services, abbreviated as the needs index. Crossing these two indices can indicate, in the aggregate, how adolescents are situated in regard to getting information and services, compared with their level of need for them. The needs index comprises seven indicators. As with the AISAR indicators, all seven are coded in the same direction, but in this case, higher values indicate a greater need for sexual and reproductive health information and services. Six of these indicators come from the same sources as the AISAR indicators; the seventh, HIV prevalence, comes from UNAIDS. The UNAIDS indicator that we use is the midrange estimate of the percentage of 15–24-year-old women infected with HIV, because this measure is not available for 15–19-year-olds; the indicator is for 2012,[15] the most recent year for which these data were available at the time of our analysis. Although some DHS and CDC surveys provide this indicator for 15–19-years-olds, the measure is available for only a minority of the 30 countries. Moreover, the values for 15–24-year-olds should not vary much from those for 15–19-year-olds. Indeed, DHS survey–based HIV prevalence rates among 15–19-year-old women in six Sub-Saharan African countries (see above; 2.7–7.1% in 2007–2011[16]) are similar to the UNAIDS values among

15–24-year-old women in these countries (3.6–6.6% in 2012[15]).

Because of widespread cultural taboos against sex and especially premarital sex, asking adolescent women to report on these intimate topics is always problematic and especially so in very socially conservative countries. As mentioned above, four of the 30 countries (Bangladesh, Egypt, Pakistan and Vietnam) surveyed ever-married women only. As a result, unlike the surveys fielded in the 26 other countries, these four did not have information on the timing of first sex, which is one of the needs index indicators; another indicator that also depends on this measure is the difference between median age at first sex and first marriage. We assumed that in these four countries, the timing of first sex coincides with the timing of first marriage and used the median age at first marriage as a proxy for median age at first sex. We considered this plausible, given the minimal level of premarital sexual activity in these countries,[8] and given findings from an experimental question posed to ever-married Bangladeshi women showing that virtually none reported having had sex before marrying.[32] Finally, the needs index score was calculated in the same way as the AISAR index score. Every country supplied data for all seven indicators in the needs index with the exception of Albania, which is missing data on a single indicator.

Results

AISAR Index Components

Below we discuss each of the four components that we used to build the AISAR index, commenting on each of the 16 indicators. We then present the summary scores for the four dimensions of adolescent women's sexual and reproductive health and rights. These are, broadly speaking, adolescent women's exposure to and familiarity with related information; their use of related services; their agency in sexual decision-making and ability to protect their sexual and reproductive health; and their perceptions of women's sexual and bodily autonomy within marriage and right to be free from domestic violence.

Access to Information

Component indicators. For the access to information component, we used indicators that we hoped would provide a good sense of adolescent women's access to and receipt of information: knowledge about contraception and HIV, access to channels of communication through which they may receive such information, and attendance at secondary school for the potential receipt of sexuality education (Table 1).

• *Average number of modern contraceptive methods* known among adolescent women* measures familiarity with effective methods and thus, indirectly, having received information on this crucial reproductive health topic. Although knowing that a method exists does not denote knowing how to use it correctly, it is certainly a prerequisite; knowledge also does not necessarily correlate with availability and access. The median number of modern methods known among adolescents in these 30 countries is roughly 4.3, found in both Moldova and Pakistan. The three countries in which adolescents know the fewest modern contraceptive methods, fewer than two, are Democratic Republic of Congo (DRC), Nigeria and Vietnam (1.6–1.9), whereas adolescents in Colombia, Dominican Republic and Nepal know at least six (6.1–6.5).

• *Percentage of 15–19-year-old women with comprehensive knowledge of HIV/AIDS* measures the proportions who have more than superficial knowledge. This indicator is a composite measure of familiarity with the two most common ways of preventing HIV (using condoms and being monogamous with an uninfected partner), understanding that a healthy-looking person can have HIV, and rejecting the two most common local misperceptions about HIV transmission. The median for this measure is between Senegal and Mozambique, where 26–27% of adolescent women have such comprehensive knowledge, which is essential to prevention. It is lowest, at fewer than 12%, in the four overwhelmingly Muslim countries, which also have minimal HIV prevalence (Bangladesh, Egypt, Indonesia and Pakistan). The three countries with the highest levels of comprehensive knowledge, at 46–49%, are all in Sub-Saharan Africa (Rwanda, Tanzania and Zimbabwe), where the epidemic is most concentrated. Unfortunately, the country with the highest HIV prevalence among 15–24-year-old women as of 2012, Mozambique,[35] has only a moderate level of comprehensive knowledge among 15–19-year-old women, at 27%, a value that is lower than that in 14 other countries.

• *Percentage of 15–19-year-old women who know a source for condoms* measures the extent to which adolescent women have information about where to obtain a method that protects both their sexual and reproductive health. It is only the first step toward using the method. Of the 26 countries that supplied data on this indicator, the median percentage of 15–19-year-old women knowing where to get a male condom falls between Zambia (67%) and Ghana and Uganda (69% each). The range across countries is broad, going from 30–33% in Nigeria and DRC to 94–95% in Colombia, Peru and Ukraine, with the bulk of remaining countries (eight) having values in the 70s and 80s.

• *Percentage of 15–19-year-old women who have recently been exposed to family planning messages in the media (radio, television or newspaper)* measures whether these countries have recently had campaigns publicizing family

*Sterilization (male and female), pills, IUDs, injectables, implants, patches, male and female condoms, diaphragms, spermicides (foam or jelly) and emergency contraception.

planning through three media channels and whether these messages have reached adolescents. It is a good measure of a country's commitment to increasing awareness of family planning. The median value is in Indonesia, where 53% of adolescent women had recent exposure to messages about family planning. The lowest proportions are in DRC and Pakistan (at 17–19%), countries that have historically had very weak family planning programs.[33] Vietnam, Colombia and the Philippines occupy the opposite end of the spectrum, with at least 70% of adolescent women saying they had had such recent exposure. Vietnam and Colombia have had very strong national programs for decades, and the timing of the Philippines' survey in 2008 marked the start of a historic campaign to pass a reproductive health law.[34]

• *Percentage of secondary school–aged adolescent women attending secondary school* is an indicator of their potential exposure to life skills or sexuality education. It is also an indicator of the minimum level of schooling women need to be educated enough to exert some control over their reproductive lives. The median level of female secondary school attendance at the time of the survey lies between Ghana (42%) and Nigeria and India (46% each). The range is wide—starting at 13% in Ethiopia and Malawi, and reaching 85% in Ukraine. The strong educational disadvantage of Sub-Saharan African adolescents is clear in the fact that, with the exception of Zimbabwe, the remaining 11 countries in that subregion fall below the median, with fewer than one-fifth of secondary school–aged women attending school in five countries (Ethiopia, Kenya, Malawi, Rwanda and Uganda). Unsurprisingly, in the upper–middle income countries[35] of Colombia and Moldova* net attendance reaches 70–79%.

• *Percentage of 15–19-year-old women exposed weekly to radio, television and newspapers* denotes good, regular access to all three of these mass media. Although adolescents' exposure has nothing to do with content, it does provide a sense of the potential reach of these media for programming that conveys messages about preserving and protecting sexual and reproductive health and rights. The indicator requires exposure to all three media every week, so it is measuring a high level of exposure. Three countries (Pakistan, Rwanda and Bangladesh) have negligible values on this indicator, with 0–1% of adolescents having weekly exposure to all three media. A relatively large number of countries fall into a narrow range of values: In 12 of the 29 with data (Colombia did not collect these data), fewer than 10% of adolescent women have such weekly exposure, and in another seven, fewer than 20% do. The four outliers, at 49–52%, are two Eastern European countries (Moldova and Ukraine) and two Latin American countries (Dominican Republic and Guatemala).

Component score. Overall scores for the access to information component ranged from 10 to 84; the median score, at 51.5, is found between Vietnam and Uganda (Figure 2). Unsurprisingly, two countries in Latin America (Colombia and Dominican Republic) and two in Eastern Europe (Ukraine and Moldova) have the highest access to information scores (79–84). Three of the four countries with the lowest scores are in Sub-Saharan Africa, with DRC having by far the lowest score of all 30 countries, just 10 out of a possible 84. The scores for one-third of countries are values in the 50s—with representation from all four subregions. Aside from this clustering around the midpoint, no clear pattern emerges. Although our predetermined choice of countries severely hampers our ability to accurately detect patterns by region, the regional averages are similarly low in Africa and South and Southeast Asia (40 and 43, respectively) and similarly high in Latin America and Eastern Europe (69 and 73, respectively).

Access to Services

Component indicators. The three indicators in the access to services component provide an overall measure of adolescent women's access to maternal and contraceptive care, as shown by their actual use of these services (Table 2). The ability to get quality contraceptive care is critical to allow adolescents to decide the timing and number of births. At this age, postponing motherhood to achieve more education can drastically alter the future. And when these women do decide to start their families, getting adequate prenatal and delivery care is essential to ensuring both their own and their infants' health. Combined, the three indicators on use of these services provide a good sense of how accessible they are to adolescent women.

• *Percentage of women younger than 20 whose most recent birth was delivered at a health facility* measures receipt of basic maternal health care. This indicator, which is limited to women who gave birth as adolescents in the five years preceding the survey,† also gives a sense of adolescents' access to health care more generally, as many

*Data on school attendance were unavailable from the surveys conducted in Ukraine and Guatemala. Thus, the data shown were drawn from the World Bank Development indicators and represent the percentage enrolled in (as opposed to attending) secondary school in the same years as the surveys.

†There are two exceptions: Bangladesh and Vietnam, whose time frame for births is three years preceding the survey.

women will receive a package of services at the health facility where they deliver. Mozambique and Zimbabwe, with 63–65% of adolescent deliveries occurring at health facilities, occupy the midpoint. Ethiopia is a notable outlier, at just 12%, suggesting that adolescents there run the highest risk of going without timely treatment should they develop complications giving birth. At the other extreme, facility-based births are basically universal, at 95–100%, in five countries—the three in Eastern Europe and the two Latin American nations of Colombia and the Dominican Republic.

• *Percentage who made four or more prenatal care visits among women younger than 20 at the time of birth* for their most recent pregnancy illustrates the extent to which pregnant adolescents get consistent, preventive care during pregnancy, which is critical for both mother and child. Nepal and Zambia occupy the median value, at 54–55%. Not only is the spread of values wide across the 30 countries, but it is also more evenly distributed than many other indicators, with at least a few countries falling in nearly every 10–percentage point spread (starting with values in 30s, 40s, 50s, etc.). There is some expected overlap with the related delivery care indicator just mentioned, with Ethiopia again being an important outlier: Just 15% of pregnant Ethiopian adolescents make the recommended number of prenatal care visits. Moldova and Dominican Republic again show the highest rates of coverage, along with another upper–middle income country,[35] Peru (at 90–94% for these three countries).

• *Percentage of demand for contraception satisfied by use of modern methods among married 15–19-year-old women* assesses the extent to which married adolescents who want to avoid pregnancy are using effective, modern methods as opposed to using less effective, traditional ones or not using any method at all. (It is calculated by dividing the percentage using a modern method by the sum of the percentage having unmet need for contraception,* the percentage using a modern method and the percentage using a traditional method.) As this indicator incorporates elements of unmet need and the extent to which countries have made modern methods available and accessible, it is useful in assessing how well married adolescents are protected from the negative effects of unintended pregnancy (including unsafe abortion) and unplanned births (i.e., those that come too soon and those that are not wanted at all).

The median is seen in Tanzania and Vietnam, each with 39% of demand for contraception being met by modern methods. The values are evenly spread out—at least through percentages in the 60s. The very high outliers, at 76% and 87% in Rwanda and Indonesia, respectively, reflect their very low levels of unmet need (6.4–6.7%)[16] together with high levels of modern method use (29–48% of married 15–19-year-olds use such methods). The same cannot be said for Nigeria, DRC and Ghana, however; because these Sub-Saharan African countries have both low modern method use and high unmet need, only 9–11% of demand is met by modern methods. (To cite just one of these three countries as an example, in Nigeria, 19% of married adolescent women have an unmet need for contraception, but only 2% use a modern method.[13])

Component score. The median score on the access to services component, 44.5, falls between Uganda and Zambia. Values range from 11 to 87 (Figure 3). Compared with scores for the first component (access to information), the scores on access to services show more uniformity, at least below the median until reaching the score of 31; nine countries have scores within a narrow range of 36 to 41. The four countries with the highest scores, at 81–87, are all in Latin America—Colombia, Dominican Republic, Honduras and Peru. These four also have relatively high-performing national family planning programs and have recently invested in promoting prenatal and maternal care.[33] Two countries stand out for having the lowest scores by far—Ethiopia and Nigeria at 13 and 11, respectively. In Ethiopia, because modern method use satisfies a fairly high proportion of demand for contraception (above the median on this indicator), its overall low score on the access to services component is driven by its very low prevalence of facility-based births and prenatal care coverage. Nigeria, on the other hand, has among the lowest of all scores on all three service indicators, with minimal adolescent use of modern contraceptives and of maternal and prenatal care. Regional averages are 76 and 71 for Latin America and Eastern Europe, respectively. The average is considerably lower in Africa and South and Southeast Asia, at 43 and 39, respectively.

*In brief, unmet need among married adolescent women is the proportion who are able to become pregnant, want to postpone pregnancy for at least two years, but are nonetheless not using any method of contraception. In 2012, the DHS program revised how it calculates unmet need. The values presented here use the revised definition, so will not match those published in nearly all reports of surveys used in our index (source: Bradley SEK et al., Revising unmet need for family planning, *DHS Analytical Studies,* Calverton, MD, USA: ICF International, 2012, No. 25).

Agency in Sexual Activity, Sexual Health and Health Care Decisions

Component indicators. The indicators in the agency component speak to the extent to which adolescent women marry at age 20 or older (which enhances the possibility for independence and continued schooling); their ability to protect themselves from pregnancy and STIs with condoms; and to have a say in their own health care decisions if married. It also includes a measure that shows the extent to which adult women in society support providing information to young adolescents on condoms (a proxy for community approval of adolescents being allowed to protect their sexual health; Table 3). Together, these indicators provide a sense of adolescent women's personal agency and the cultural environment in which they navigate their sexual and reproductive lives. The quality of this environment heavily influences whether adolescents can make their own sexual and reproductive choices, or whether those choices are made by others.

• *Percentage of 15–19-year-old women who have* ***never*** *been married* is our measure of adolescent marriage, since all AISAR index items are scored in the same direction, with higher scores denoting better outcomes (i.e., higher proportions never marrying means a lower prevalence of adolescent marriage). Delaying marriage until after adolescence can mean more time to complete schooling, which greatly increases opportunities for work and economic independence. Postponing early marriage can also delay the onset of early motherhood, which can severely limit a young woman's educational and professional prospects. Moreover, as the age gap between adolescents and their husbands is often very wide, especially in Sub-Saharan Africa,[36,37] adolescents who have much older husbands often have little say in when they have sex, so simply delaying marriage in and of itself can mean more sexual autonomy.

Tanzania and Zambia fall at the midpoint for this indicator, with 80–81% of adolescent women never having married at the time of their interview (when they were aged 15–19). The range across countries is fairly small, with values clustering in the 70s and 80s for 23 countries. Bangladesh and Mozambique are clear outliers, as only 54–59% of adolescents in those countries have never married. At the other extreme, most adolescent women, 91–96%, have never married in five countries: Albania, Ghana, Rwanda, Ukraine and Vietnam.

• *Percentage of 15–19-year-old women reporting they can get condoms on their own* is a useful indicator of their self-efficacy, specifically, their belief that they can access services and overcome taboos that stigmatize women for getting a condom on their own. Unfortunately, this indicator reports responses to a hypothetical question, "If you wanted to, could you yourself get a condom?" and as such does not measure actual behavior. However, for adolescent women, just feeling empowered to get a condom without outside help is important, as it is the first step toward self-protection from both unintended pregnancy and STIs.

Of the 24 countries with data on this indicator, the midpoint falls between Ethiopia, and Albania and Nepal, with 30–31% of adolescent women reporting that they could get a condom if they wanted to. There is relatively little variation from this median, with half of the countries having values within 10 percentage points of it. The outliers by far are India and Nigeria, with fewer than 10% of adolescents in those countries answering yes to this question (8–9%). On the other end of the spectrum, three-quarters of adolescent women in Colombia responded they could get a condom on their own.

• *Percentage of married 15–19-year-old women who have sole or joint (with husband) say in their own health care** is a proxy for how much control a married adolescent has over her life in general, and thus provides a glimpse of the relationship dynamics of her marriage. Although the question asks about health care overall, this can certainly include contraceptive care as well as pregnancy-related and HIV/STI care. Of the 28 countries supplying data, the midpoint falls between Zambia and Ethiopia, where 59% and 69%, respectively, of married adolescents say they make health care decisions on their own or together with their partner. The Sub-Saharan African, predominantly Muslim country of Senegal is worthy of mention, as its level is so much lower than any other country's, at 19%. (This means that 81% of Senegalese adolescent wives do not participate at all in their health care decisions, which are made for them by others, who are overwhelmingly their husbands.) Two other countries have values below 30%—Nigeria and Pakistan. On the other hand, participation by young wives in decisions about their health care is the norm in two of the three Eastern European countries, with 92–93% of Ukrainian and Moldovan adolescent wives saying they decide on their own or jointly with their

*This indicator is the sum of two proportions in a percentage distribution of women by their responses to the question asking who usually makes decisions about their health care (mainly wife, wife and husband jointly, mainly husband, other). Thus, this indicator measures the proportion reporting that they mainly control their health care decisions plus the proportion reporting that they have joint say with their husband.

husband. Unlike many other indicators whose values are more evenly spread across each 10–percentage point value range, eight of the 28 countries with data, representing all four subregions, have percentages in the 70s denoting moderately high levels of participation.

• *Percentage of 18–49-year-old women who agree that 12–14-year-olds should be taught about condoms* shows the level of community support broadly for young adolescents being informed about ways to protect their sexual health and, more specifically, support for providing sexual health education when it is needed most—before the age by which most adolescents become sexually active. Although the indicator measures support for information on one subject only, condom use is so essential to both pregnancy and HIV prevention that it is a good proxy for adult support of young adolescents' right to receive sexuality education in general and to be informed about their sexual health. We present data on adult women's attitudes only, and their responses refer to educating 12–14-year-olds of both sexes about condom use in 21 of the 22 countries with data. (The sole exception is India, whose questionnaire differed on every part of this indicator; see Table 3.) Of the 22 countries, the midpoint lies between Malawi and Mozambique, at 58% each, and Albania and Kenya, at 61% each. The highest proportions of adult women supporting education on condom use (91–93%) are in Latin American or Eastern European countries, which have low levels of HIV prevalence (Dominican Republic, Honduras, Colombia and Ukraine). India and Vietnam show the lowest values for this indicator, at 28–29%.

Component score. Kenya's agency component score, at 53, falls at the midpoint for all countries, which have a range from 13 to 86 (Figure 4). Variation from the median on this score is fairly evenly spread out, with at least a few countries falling within every 10–percentage point grouping (e.g., 60s, 70s, 80s) except for the one true outlier, Nigeria, at 13; this country was among the three with the lowest values for every indicator making up this component. That a Sub-Saharan African country, Rwanda, has the fourth-highest score on this component (right behind Moldova, Ukraine and Colombia) is encouraging and unexpected. It speaks to that country's nation-building with a focus on gender equality after its institutions and infrastructure were all but destroyed in the mid-1990s; Rwanda's very high ranking on the gender equity index demonstrates that relatively poor countries can successfully implement policies that improve the status of women.[38] Regionally, Africa has an average agency component score of 46, with a wider range than the other components' scores, at 13–82; Eastern Europe has a high average of 77 (but has only three countries) with a small range of 62–85. South and Southeast Asia has an average score of 41, with a range of 18–68. The region of Latin America and the Caribbean has a narrower range of 64–86, with an average of 73.

Perception of Rights Within Marital Relationships

Component indicators. This component seeks to capture adolescent women's understanding of a wife's rights to autonomy in a marriage (Table 4). Similar to the indicators in the previous component on agency, the indicators for this component also provide a glimpse into a complex social topic: gender equality, specifically the roles and rights of each sex in a marital relationship. The culturally defined attitudes around what happens in the private sphere of marriage can reveal a great deal about normative expectations and attitudes—that is, although these data refer to the perceptions of many still unmarried adolescents, they reflect societal norms. Except for the four countries that interviewed ever-married women only (Bangladesh, Egypt, Pakistan and Vietnam), the responses are from all adolescents regardless of marital status, and we know that only a minority—from 4% in Rwanda to 41% in Mozambique—of 15–19-year-olds in these countries had ever married by the time of the survey. Thus, these attitudes, and their attendant expectations for behaviors, reflect what adolescent women have witnessed in their own family and what their culture dictates to be appropriate behavior for a wife. Although the indicator wording refers to rights within marital relationships only, adolescent women's responses are surely also influenced by what they have lived or witnessed in sexual relationships outside of marriage. Together, these indicators describe the perceptions of what adolescent women assume will be their sexual rights within marriage, including rights to exercise control over sexual activity, to be free from infection and to be free from domestic violence.

• *Percentage of 15–19-year-old women who agree with three reasons why a wife would be justified in refusing sex (i.e., she knows her husband has sex with other women, she knows that he has an STI, or she is tired or not in the mood)* measures the extent to which adolescent women feel a wife must have sex with her husband irrespective of his infidelity, her risk of infection and her desire to not have sex. This indicator does not reflect actual personal behavior, but instead gives a sense of adolescent women's expectations of a wife's role and status in marital relationships. Of the 25 countries with data on

this indicator,* the median falls at Ghana, with 61% agreeing a wife has the right to refuse intercourse in all three specified circumstances. The lowest proportions endorsing wives' sexual autonomy are found in the Sub-Saharan African nations of DRC and Senegal (26% and 31%, respectively). On the other hand, in two countries, both in Latin America (Dominican Republic and Peru), 87–88% of adolescent women believe a wife has the right to refuse sex with her husband in all three circumstances.

• *Percentage of 15–19-year-old women who believe that if a wife knows that her husband has an STI, she is justified in asking him to use a condom* gauges women's ability to negotiate condom use within marriage. This question cannot get at what happens should a husband refuse that request. As with many of the attitude questions, nationally representative surveys that are primarily concerned with behaviors can get at only the essential first step toward women's empowerment and autonomy. In many countries, taboos against using condoms in marriage mean that married women are at especially high risk for STIs, including HIV. These risks are heightened when adolescent women marry much older men who are likely to have (or have had) extramarital sexual partners; such pronounced age disparity is especially common in many countries in Sub-Saharan Africa with high HIV prevalence.[36,37]

Among the 27 countries with data for this indicator,† Albania occupies the midpoint, at 80% of adolescent women saying they believe a wife is justified in asking that her husband use a condom if he has an STI. This high-value median, and the lack of real variation from it (17 of the 27 countries with data fall at the median or within 12 percentage points of it) shows a lot of support in these countries of a wife's right to ask her husband to use a condom (or to refuse sex with him, the proxy for this indicator used in six of the 27 countries). The outliers include the Dominican Republic, where support for a wife's request for condom use is nearly universal (97%) and DRC, where fewer than half (47%) of 15–19-year-old women agree that a wife should be able to ask a husband to use a condom if he has an STI.

*Because the surveys in Honduras, Mozambique and Uganda did not ask about three situations in which a wife would be justified in refusing sex, we provide available data for just one of the three reasons—namely, knowing that her husband "is having sex with other women."

†Questionnaires for six of these included countries—Bangladesh, Bolivia, India, Indonesia, Peru and the Philippines—did not ask this specific question. Therefore, for these countries, this indicator uses a related measure, namely, the "percentage of women aged 15–19 who believe that if a husband has an STI, his wife is justified in refusing to have intercourse with him."

• *Percentage of 15–19-year-old women who disagree with all five reasons that would justify a husband hitting his wife* addresses the following reasons: the wife burns the food, she argues with her husband, she goes out without telling him, she neglects the children and she refuses sexual intercourse with him. This indicator measures adolescent women's attitudes on the unacceptability of domestic violence—the higher the proportion, the more unacceptable. Given the exact reasons posed in the question, the indicator reflects attitudes toward the rights to sexual autonomy, to freedom of movement and to freedom of expression. Nigeria occupies the midpoint, at 60% disagreeing with all five reasons, a positive for this country that so often is at the lowest point on other indicators. The values on this indicator are relatively evenly spread out across countries, with two notable exceptions. Rejection of justifications for domestic violence is universal in the South Asian country of Nepal (at 99%). At the other extreme, only one-quarter (26%) of adolescents in the Sub-Saharan African country of DRC agreed that domestic violence would be not be justified in all five circumstances presented in the question; in other words, three-quarters agree that it would be justified in at least one of these circumstances.

Component score. The results for the perceptions of rights component show a wide range of scores—from zero (in DRC) to 96 (in both the Dominican Republic and Peru; Figure 5). The actual values on all three of DRC's indicators in this component are above zero, but the component score is zero, because of how we set up the conversions for minimums in component scores among the 30 countries; that is, the zero is a relative score, meaning DRC has the lowest score by comparison with all other countries. The median score of 56.5 falls between the Sub-Saharan African nations of Rwanda and Ghana. With the important exception of DRC just mentioned, scores for this component are among the most evenly spread out of the four (i.e., no real clustering), with at least three countries falling into five 10–percentage point spreads (i.e., the 30s, 40s, 50s, 70s and 90s). Excluding DRC, the three countries with the lowest scores are Senegal, Zambia and Mozambique (25–31). Nepal, Peru and the Dominican Republic occupy the opposite end of the score spectrum (94–96). The appearance of the South Asian nation of Nepal in this list of highest-scoring countries is encouraging. The regional average for this index varies widely. It is 39 in Africa, 58 in South and Southeast Asia, 75 in Eastern Europe, and 88 in Latin America and the Caribbean.

AISAR Index Summary Score

We combined each country's individual component scores (Tables 1–4) to yield a country-level summary AISAR index score (Table 5). The higher the score, the more likely that adolescent women live in an environment that is conducive to enhancing and protecting their sexual and reproductive health and rights. Lower scores, on the other hand, suggest that adolescent women are having a hard time getting the information and services they need to achieve a good overall state of sexual and reproductive health.

The AISAR index summary scores range from 17 to 86 across countries (Figure 6). There are two 10-point "modes"—that is, scores in the 40s and in the 50s (with six countries each). The rest of the countries fall within the following 10-point spreads—80s (three countries), 70s (four), 60s (four), 30s (three) and 20s (three), and DRC's score is the lowest, at 17. The midpoint, at 51.5, falls between two Sub-Saharan African countries, Ghana and Malawi. As expected, given that Colombia, Dominican Republic and Ukraine show high scores on individual components (always in the top five), these three countries also have the highest summary scores. From the lowest-score standpoint, the placement of DRC, Nigeria and Senegal reflects the fact that they fall within the eight lowest scores on the information, agency and rights components. Interestingly, Senegal did relatively well on one component—it is close to the median on the access to services component score—suggesting that despite good access to services, adolescent women in Senegal are hampered from attaining overall good sexual and reproductive health because they lack information, agency and rights.

It is encouraging to see that the Sub-Saharan African, low-income country of Rwanda[35] has a summary index score that places it within the eight highest-scoring countries. Rwanda's divergence from the 12 other Sub-Saharan African countries' summary scores likely stems from its very high performance on the access to services and agency components. Unsurprisingly, given their individual component scores, all six Latin American countries fall within the top nine highest scores on the summary index. Another clear pattern emerges with the three Eastern European countries: Ukraine is the highest scoring on three of the four components (exception is services), followed closely by Moldova (with services exception just mentioned, where it is highest), and Albania brings up the rear. It is worth noting, however, that Albania's score is above the median on all four components.

Of the seven very different South and Southeast Asian countries represented, the Philippines, Nepal and Indonesia fall above the median on the summary index. The remaining four countries—Bangladesh, India, Pakistan and Vietnam—fall substantially below the median. In the case of the Sub-Saharan African countries, their sheer number (13) means that they are likely to have a notable range: This group's summary scores range from a low of 17 in DRC to a high of 65 in Rwanda. With the important exception of Rwanda, the other countries in this subregion fall at or below the median of the summary index. The situation for adolescents in these 12 countries leaves much room for improvement.

Index of Adolescents' Needs for Information and Services Together with AISAR

As mentioned earlier, we wanted to provide policymakers and program planners with a way to use the AISAR index and came up with a potential index of need for information and services (needs index) to pair it with. This second index quantifies the extent to which adolescents' sexual and reproductive behaviors or related outcomes create potential need for information and services.

Needs Index Indicators

We selected seven indicators for inclusion, all of which can represent different aspects of need among adolescent women for sexual and reproductive information and services (Table 6).

• *Percentage of 15–19-year-old women who have ever had sexual intercourse,* regardless of marital status, is a useful indicator of the minimum level of need for sexual health information and services. Ideally, all adolescent women (not only those who have ever had sex) should receive such information and services. In four countries—Egypt, Bangladesh, Pakistan and Vietnam—where only ever-married women were interviewed, we use the available data on the percentage ever having married as a proxy for the percentage ever having had sex. This assumption is plausible because sexual activity before marriage is very low in these four countries, based on data available from studies other than the national DHS surveys.[8]

In most countries, 25–45% of 15–19-year-old women report that they have had sexual intercourse. Bolivia and Senegal are at the midpoint (30%). Seven countries—most of which have a relatively high age at first marriage and some of which are also known for having especially conservative sexual and gender values—have values at 14% and below. In only three countries have at least 50% of adolescent women ever had sex: Colombia in Latin America and two of the least developed Sub-Saharan African countries, DRC and Mozambique. The latter country has a very high proportion of adolescents who have

ever married (not shown), which contributes to its high level on this ever sex indicator.

• *Percentage of 18–24-year-old women who married before age 18* shows the extent to which women have married before reaching adulthood. Early marriage often means a high likelihood of childbearing during adolescence, which increases need for pregnancy and delivery care; it is also directly related to increased need for contraceptive care. And in countries where young women have far older spouses and condom use is taboo within marriage, adolescent wives are at very high risk for STI infection, including HIV.[36] Women who marry very young are often less able than older women to access the information and services they need.

One Sub-Saharan African country and one South Asian country, Zimbabwe and Pakistan, respectively, occupy the midpoint at 30% of 18–24-year-olds marrying before adulthood. More than half of the 30 countries cluster around the midpoint within a 10–percentage point spread (with values in the 20s, 30s and 40s). The outliers with the lowest prevalence of such early marriages, at 7–9%, are two of the three Eastern European countries (Albania and Ukraine) and Rwanda and Vietnam. On the other end of the spectrum, marrying while still a minor is by far most frequent in Bangladesh, as 69% of 18–24-year-olds in that country have married before age 18.

• *Average gap in years between median ages at first intercourse and first marriage* measures the average duration of the period during which adolescents engage in premarital sexual activity, which heightens their need for information and services to prevent unintended pregnancy and STIs. These all-important services need to be specially tailored so adolescents can overcome the obstacles created by stigma condemning sexual activity outside of marriage. The midpoint value for this gap is one year, as shown in Rwanda and Guatemala. For eight countries, the gap is zero, indicating that first sex effectively coincides with first marriage; for four of these countries, the value is assumption-based, in the absence of the necessary data from surveys in these countries (Egypt, Bangladesh, Pakistan and Vietnam). In six countries, the gap in the timing of first sex relative to first marriage is more than two years. Adolescent women are at risk for possible negative outcomes from premarital sexual activity for the longest durations in the Latin American countries of Peru and Colombia (3.1 years and 3.8 years, respectively).

• *Percentage of married 15–19-year-olds who have an unmet need for contraception* is a standard measure that assesses how well married adolescents' desire to postpone pregnancy matches their contraceptive practice. We lack data on the subset of women who usually present the highest unmet need for contraception—single adolescents who are currently sexually active—because of the very small sample sizes of such women in some countries and the lack of data for this subgroup in a few countries. High levels of unmet need for contraception show that many of the women who potentially need contraceptive methods do not have access to them (i.e., mismatch between low levels of contraceptive use and strong desires to avoid pregnancy). Low levels of unmet need can mean *either* that strong desires to postpone pregnancy are being met with high levels of contraceptive use *or* that few women want to postpone pregnancy and so very few are practicing contraception; in both cases, however, the absolute level of unmet need for contraception is low.

Two Sub-Saharan African countries, Mozambique and Zambia, fall at the midpoint for this indicator, at 22%. It shows relatively little variation, with 18 of the 30 countries having percentages of unmet need in the teens and 20s. Three countries have extremely low levels of unmet need at less than 10% (Egypt, Indonesia and Rwanda). The country with the highest unmet need by far is Ghana, at 62%. The distance of this value from the next highest one represents the single most important outlier in our study, showing a true departure from the norm and suggests that Ghanaian married adolescents are at highest risk for unplanned childbearing and unsafe abortion.

• *Percentage of recent births to mothers younger than 20 that were unplanned* conveys the extent to which adolescents may need contraceptive services. It should be mentioned that this indicator refers to only those unintended pregnancies (i.e., those wanted later or not at all) that were brought to term; given the lack of data on abortion incidence among adolescents by country, it does not include the many additional unintended pregnancies that ended not in births but in induced abortions. The median falls between Ethiopia and the Philippines, at 28% and 30%, respectively, of recent births being unplanned. In four countries, fewer than 10% of births to adolescents are unplanned (Egypt, Pakistan, Indonesia and Albania). Unsurprisingly, the three countries with the highest levels of unplanned childbearing are in Latin America, a region that tends to have far lower fertility—and more important for this measure, lower wanted fertility—than the other regions included in our indices. Specifically, in Bolivia, Colombia and Peru, nearly two-thirds of all births to women who were adolescents when they delivered were unplanned. That at least one-quarter of recent births were

unplanned in 17 countries shows a high level of need for contraceptive information and services among adolescents.

• *Age-specific fertility rate among 15–19-year-olds,* or the annual rate at which adolescents give birth, shows the extent of early childbearing. Having a baby during adolescence is a good marker of potential needs for maternal and child health services. High adolescent fertility might also signal high need for contraceptive care. The spread between countries with the highest and lowest rates is very large, that is, rates from 17 to 167 births per 1,000 women aged 15–19. The midpoint falls roughly between India and Bolivia, where the annual rate is 88–90 births per 1,000 women aged 15–19. All three Eastern European countries fall among the four with rates below 35; the fourth is the Southeast Asian country of Vietnam (at 25). These rates sharply contrast with the highest rate of 167 births per 1,000 adolescents in Mozambique. The next five highest values, from 121 to 152, are all in other Sub-Saharan African countries (DRC, Malawi, Nigeria, Uganda and Zambia).

• *Percentage of 15–24-year-old women infected with HIV* is the closest measure to prevalence among adolescents, and it is available for 29 of 30 countries (Albania is the exception). This proportion gives a sense of how far the epidemic has reached into the general youth population as of 2012. If high, it signals an elevated need for treatment and counseling; in particular, HIV-positive women need tailored counseling in fulfilling culturally prescribed roles as wives and mothers. Among the 29 countries with data, Senegal occupies the midpoint with a prevalence of 0.3%. As expected, prevalence rates are very low in the majority of countries. The exceptions are nine Sub-Saharan African countries that have generalized epidemics (a country is considered to have a generalized epidemic if the HIV prevalence is 1% or more in the overall population); within this group, 4–7% of 15–24-year-old women are HIV positive in Malawi, Mozambique, Uganda, Zambia and Zimbabwe.

Needs Index Scores

The overall scores on the needs index show the extent to which the situation of adolescent women creates need but no more. That is, the scores say nothing about the extent to which this need is met. The higher the score, the greater the need for information and services. This index's median score falls between Honduras, at 45, and Bangladesh and Nigeria, at 46 each. The needs scores are very evenly spread out, with values in every 10–percentage point spread up to the score of 68, with one country, Mozambique, having the highest level of need, with an outlier value of 80. The countries with the next highest scores, in the 60s, include four Sub-Saharan African countries (Ghana, Malawi, Uganda and Zambia) and one Latin American country (Colombia). The three countries that score lowest on this index are Egypt, Indonesia and Vietnam. These three countries likely have the lowest level of need for information and services because they each have low levels of early marriage (and sex), little premarital sexual activity, few unplanned births (albeit for different reasons) and low adolescent fertility rates.

A Practical Application—Crossing the Needs and the AISAR Indices

Plotting the needs index score (on the vertical axis, scaled from 6 to 80) against the AISAR index (on the horizontal axis, from 17 to 86; Figure 7) clarifies the connection between a given country's needs with respect to adolescents' sexual and reproductive health and rights and the current conditions that inform and influence those needs. Countries' scores on these two indices place them into four quadrants.

In interpreting the scatter plot figure, it is important to bear in mind that both indices are relative measures and show the position of each country relative to all others in the analysis. In other words, the indices are not measuring the absolute level of need or the precise conditions conducive to adolescent women's sexual and reproductive health. Because this group of 30 countries is very diverse, the indices span a very wide range of needs and conditions. Another basic point affecting interpretation and use of this figure is the notable absence of a sexuality education indicator from both indices. Although we lack data, *all* adolescents need comprehensive sexuality information that is appropriate to their development and that is provided early enough in adolescence to enable them to make informed decisions about having sex and protecting their sexual health when they become sexually active. While the indicators and components that comprise the indices point to lower or higher levels of need, and to poorer or better conditions conducive to adolescent women's protecting their sexual health, some fundamental and universal needs are not captured by the indices.

Placement in the *upper left quadrant* of the scatter plot indicates the greatest mismatch between adolescents' sexual and reproductive needs and their actual situation (i.e., highest need and poorest state of current sexual and reproductive health). The countries in the *lower left quadrant* have a poorer adolescent sexual and reproductive health situation, but their lower level of need means that fewer resources are likely called for. Being situated in the

lower right quadrant signals the best situation—relatively low need and better sexual and reproductive health conditions for adolescent women. Finally, being situated in the *upper right quadrant* indicates a good overall situation—although the level of need is high, the sexual and reproductive health situation is also relatively better. Thus, the "fit" of a country's needs to the actual sexual and reproductive health environment for adolescents is poorest in the upper left quadrant and best in the lower right quadrant.

The distribution of the 30 countries across the four quadrants shows that where a country falls on the AISAR index can have very different programmatic implications depending on where it lies on the needs index. Figure 7 shows a *generalized* distribution of the four major regions into the four major quadrants. That is, 10 Sub-Saharan African countries cluster in (or right up against) the upper left quadrant. Placement within the quadrant is also revealing: In this quadrant, Mozambique has both the highest overall level of need and the third poorest adolescent sexual and reproductive health conditions, meaning it requires a very large investment in programming. The position within this quadrant of DRC and Nigeria, below Mozambique on the needs index but furthest to the left on the health conditions index, suggests that these two countries also require substantial investment to improve standards of adolescent sexual and reproductive health.

Two Sub-Saharan African countries (Senegal and Ethiopia) and the enormous South Asian nation of India cluster in the upper part of the lower left quadrant, indicating relatively poor conditions of adolescent health and medium levels of need. Pakistan and Vietnam fall low on the needs index, toward the bottom of this quadrant, but they also are below the median on conditions conducive to good adolescent sexual and reproductive health. All three Eastern European countries, one Sub-Saharan African country (Rwanda) and one Southeast Asian country (Philippines) all fall toward the center of the lower right quadrant, indicating higher than median levels of adolescent sexual and reproductive health and lower than median levels of need. In this quadrant, the Southeast Asian nation of Indonesia and the North African country of Egypt lie at the lower end of the needs index range. Collectively, these findings indicate that within the limitations of what we can measure, the countries falling in the lower right quadrant are in a relatively good situation. Finally, five of the six Latin America countries cluster in (or on the boundary of) the upper right quadrant, with medium to high levels of need and medium to good conditions of adolescent sexual and reproductive health.

Because this exercise is exploratory, we decided to see how the scatter plot would change if we looked at just a single AISAR index component instead of the summary index that incorporates all four. Figure 8 graphs the only component for which we have complete indicator data from all 30 countries, access to services, against the needs index. The result is some shifting in and out of quadrants (four countries), but for the most part, countries stayed within their original quadrant, with some changing position within it. For example, because Nepal's and the Philippines' services scores mostly fall below the median, these two countries moved toward poorer health conditions—that is, from the lower right quadrant in Figure 7 to the lower left quadrant in Figure 8.

In addition, the relatively high scores on the services index in two Sub-Saharan African countries, Zambia and Zimbabwe, moved them toward better conditions, out of the upper left quadrant and into the upper right quadrant. Nigeria's very low modern contraceptive use, together with its low maternal and prenatal coverage, moved that country even further to the extreme on the AISAR index within the quadrant characterized by high needs and poor sexual and reproductive health. Mozambique moved a bit to the right within the high-needs and poor-conditions quadrant, toward a slightly better health situation.

The above confirms that the pattern of overall need for improvement in conditions that are conducive to adolescent women's sexual and reproductive health is very similar whether we consider the full AISAR index or only its component that measures access to services. In addition, the key result shown in both figures is that the most pressing issues of high levels of need *and* very poor adolescent health—that is, countries in the upper left quadrant—demand immediate programmatic attention.

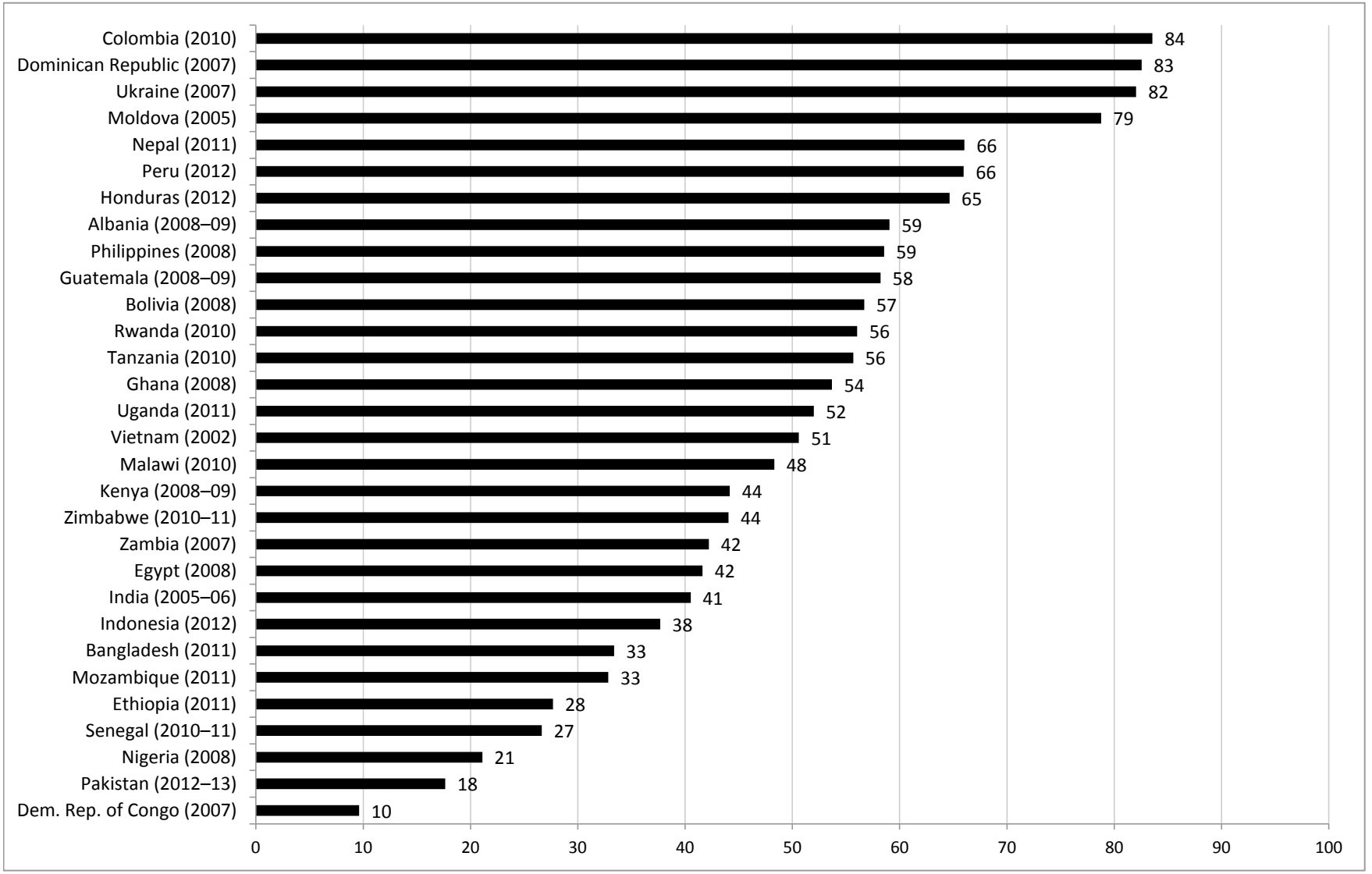
TABLE 1. Access to information, AISAR index: indicators and component score, by region and country

Region and country (survey year)	Indicators						Component score
	Average no. of modern contraceptive methods known among women 15–19*,†	% with comprehensive knowledge of HIV/AIDS, among women 15–19‡	% who know a source for condoms among women 15–19§	% recently exposed to FP messages in the media, among women 15–19 (radio, television or newspaper)**	% attending secondary school among secondary school–aged young women††	% who are exposed weekly to radio, television and newspapers, among women 15–19	
Africa							
Dem. Rep. of Congo (2007)	1.7	14	33	17	25	4	**10**
Egypt (2008)	4.4	3	u	59	64	2	**42**
Ethiopia (2011)	4.2	24	41	43	13	2	**28**
Ghana (2008)	4.7	28	69	56	42	19	**54**
Kenya (2008–09)	3.7	42	54	56	18	14	**44**
Malawi (2010)	5.1	40	72	52	13	7	**48**
Mozambique (2011)	3.0	27	61	42	22	6	**33**
Nigeria (2008)	1.6	20	30	31	46	9	**21**
Rwanda (2010)	5.4	49	82	60	16	1	**56**
Senegal (2010–11)	2.9	26	41	31	27	11	**27**
Tanzania (2010)	5.2	46	75	50	25	12	**56**
Uganda (2011)	5.2	36	69	66	18	8	**52**
Zambia (2007)	3.5	32	67	36	35	15	**42**
Zimbabwe (2010–11)	4.1	46	55	25	48	9	**44**
Eastern Europe							
Albania (2008–09)	2.9	36	78	54	55	31	**59**
Moldova (2005)	4.3	38	88	52	79	52	**79**
Ukraine (2007)	3.8	39	95	58	85	51	**82**
South and Southeast Asia							
Bangladesh (2011)	5.8	11	u	28	40	1	**33**
India (2005–06)	3.9	19	39	61	46	13	**41**
Indonesia (2012)	4.1	9	42	53	59	7	**38**
Nepal (2011)	6.2	25	83	68	58	11	**66**
Pakistan (2012–13)	4.3	1	u	19	34	0	**18**
Philippines (2008)	4.2	19	56	76	64	26	**59**
Vietnam (2002)	1.9	42	57	70	37	24	**51**
Latin America and Caribbean							
Bolivia (2008)	4.5	22	65	44	62	36	**57**
Colombia (2010)	6.5	21	94	75	70	u	**84**
Dominican Republic (2007)	6.1	39	89	u	53	49	**83**
Guatemala (2008–09)	4.8	20	u	48	39	50	**58**
Honduras (2012)	5.6	29	87	56	52	21	**65**
Peru (2012)	5.6	19	95	57	64	20	**66**

*Refers to methods that were first spontaneously mentioned by respondents, and then prompted if not. Although specific countries' questionnaires varied, the following modern methods were usually covered: sterilization (male and female), pills, IUDs, injectables, implants, condoms (male and female), emergency contraception, and barrier methods, such as diaphragms and spermicides (e.g., jelly or foam). †Data not collected in the most recent surveys for Bangladesh and Peru; as a result, the values shown are from earlier surveys—the 2007 Bangladesh Demographic and Health Survey (DHS) and Peru's 2007–08 continuous DHS. ‡Comprehensive knowledge is a three-part measure. It combines respondents' ability to correctly report two ways of reducing the risk of getting HIV (by consistently using condoms and by having just one monogamous partner who is HIV negative); to correctly report that a healthy-looking person can have HIV; and to correctly reject the two most common local misconceptions about HIV transmission. Data for this indicator were unavailable in the 2002 Vietnam DHS, so the data shown are from the 2005 Vietnam AIDS Indicator Survey (AIS). §These data were unavailable in the 2002 Vietnam DHS, so the data shown come from the Vietnam 2005 AIS. **These data were unavailable in the 2008–09 Guatemala survey, which was conducted with assistance from the U.S. Centers for Disease Control and Prevention (CDC), titled Encuesta Nacional de Salud Materno Infantil, or ENSMI (National Survey of Maternal-Child Health). Thus, the data shown come from Guatemala's previous survey, the 2002 ENSMI. ††Data on school attendance were unavailable in the 2007 Ukraine DHS and the 2008–09 Guatemala ENSMI. Thus, the data shown, which are net enrollment ratios for the same years in which the surveys were conducted, come from the World Bank Development indicators. For the Philippines, the school attendance data shown come from the 2003 DHS. For Vietnam, the data shown are the percentage of 16–20-year-olds enrolled in higher secondary school from the 2002 DHS. *Note:* u=unavailable.

Sources: In this and all following tables, the sources for the data are references 13 and 16, and Guttmacher Institute, special tabulations, survey data files, individual country and survey year.

FIGURE 2. Access to information, component scores by country



Sources: In this and all following figures, the sources for the data are references 13 and 16, and Guttmacher Institute, special tabulations, survey data files, individual country and survey year.

TABLE 2. Access to services, AISAR index: indicators and component score, by region and country

Region and country (survey year)	Indicators			Component score
	% whose most recent birth in past 5 yrs.* was delivered at a health facility, among mothers <20	% whose most recent birth in past 5 yrs.* was monitored by ≥4 prenatal care visits, among mothers <20	% of demand for contraception satisfied by use of modern methods among married women 15–19†	
Africa				
Dem. Rep. of Congo (2007)	73	46	10	**36**
Egypt (2008)	73	68	63	**68**
Ethiopia (2011)	12	15	40	**13**
Ghana (2008)	57	70	11	**41**
Kenya (2008–09)	53	37	37	**37**
Malawi (2010)	81	45	49	**56**
Mozambique (2011)	63	50	20	**39**
Nigeria (2008)	23	31	9	**11**
Rwanda (2010)	87	36	76	**66**
Senegal (2010–11)	75	47	14	**39**
Tanzania (2010)	58	37	39	**39**
Uganda (2011)	67	51	29	**44**
Zambia (2007)	60	55	34	**45**
Zimbabwe (2010–11)	65	58	65	**62**
Eastern Europe				
Albania (2008–09)	95	71	17	**58**
Moldova (2005)	100	90	41	**79**
Ukraine (2007)	99	71	54	**76**
South and Southeast Asia				
Bangladesh (2011)	26	27	69	**36**
India (2005–06)	41	35	18	**23**
Indonesia (2012)	55	83	87	**78**
Nepal (2011)	47	54	24	**36**
Pakistan (2012–13)	50	32	25	**28**
Philippines (2008)	38	72	23	**39**
Vietnam (2002)	48	26	39	**31**
Latin America and Caribbean				
Bolivia (2008)	76	69	32	**57**
Colombia (2010)	96	85	68	**86**
Dominican Republic (2007)	99	94	58	**87**
Guatemala (2008–09)	60	80	47	**62**
Honduras (2012)	88	87	69	**85**
Peru (2012)	86	90	61	**81**

*For Bangladesh and Vietnam, data refer to most recent birth among births in the past three (instead of five) years. †We calculated the percentage of demand satisfied by modern methods as follows: the percentage of married 15–19-year-old women who are using a modern contraceptive method divided by the sum of the percentage with unmet need, the percentage using a modern method plus the percentage using a traditional method. Despite some variability across the 30 countries, modern methods asked about in the surveys included sterilization (male and female), pills, IUDs, injectables, implants, condoms (male and female), and barrier methods, such as diaphragms and spermicides (e.g., foam or jelly). In contrast, traditional methods encompass the lactational amenorrhea method (LAM), rhythm (periodic abstinence), withdrawal and local folk methods.

FIGURE 3. Access to services, component scores by country

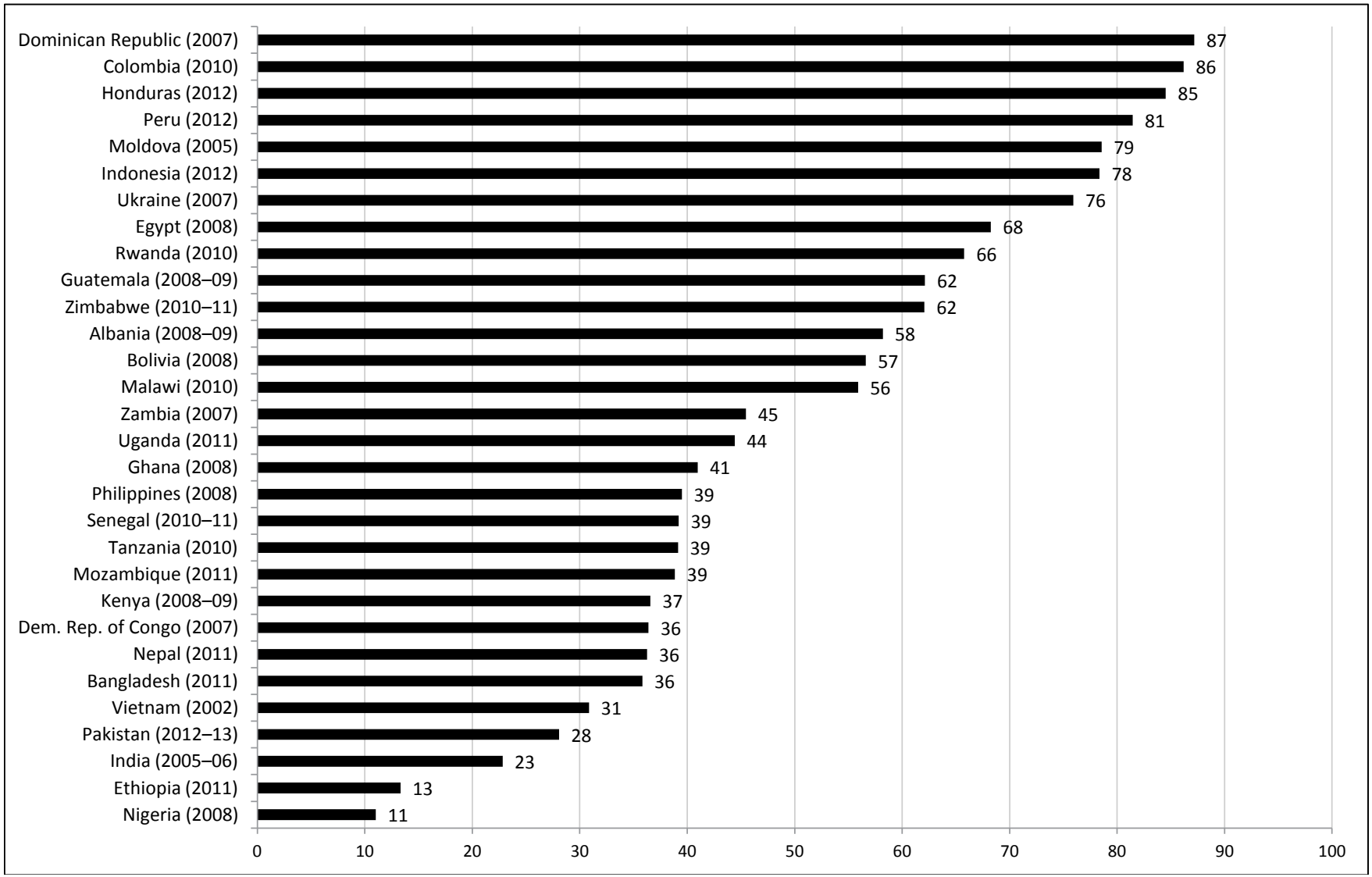
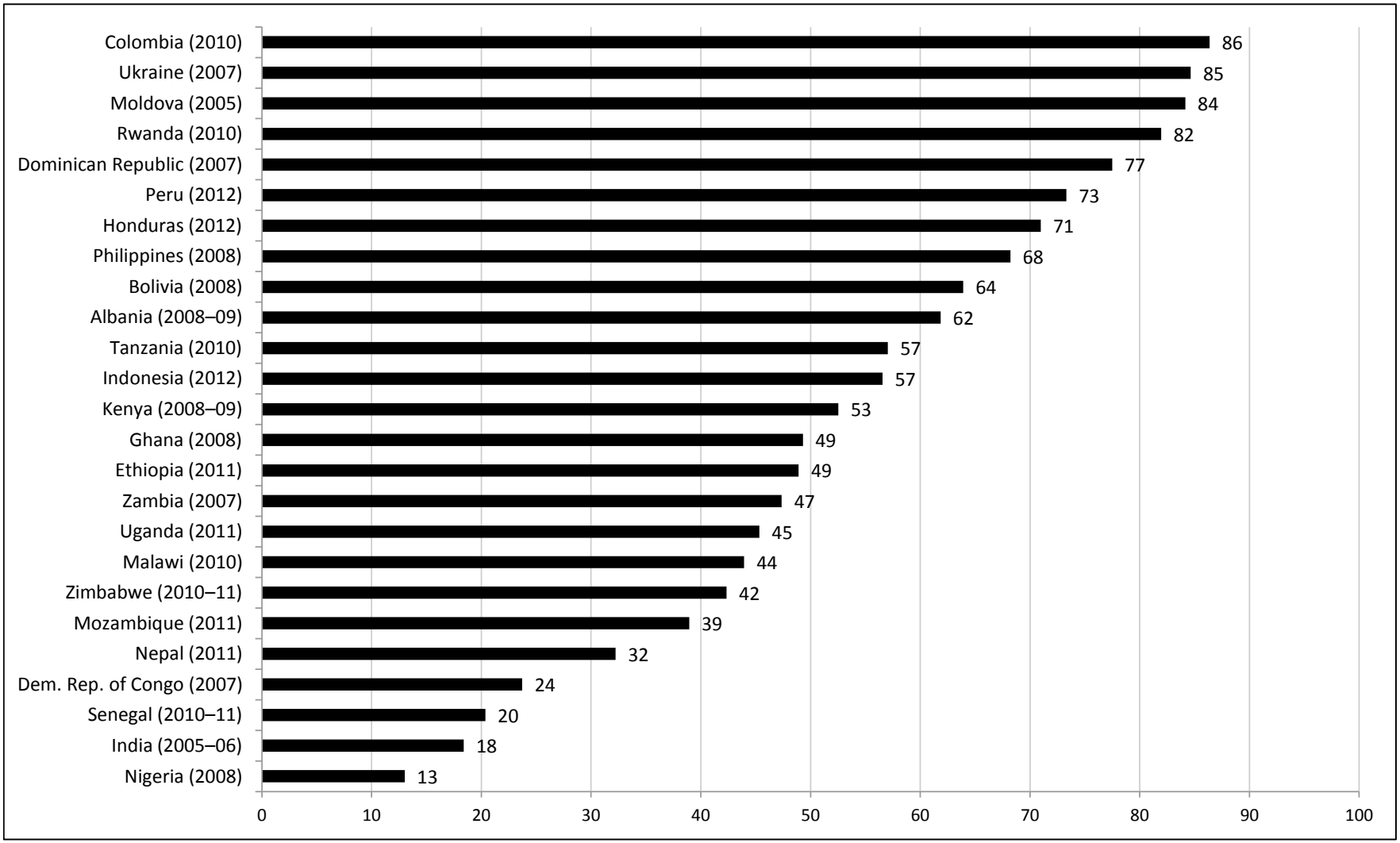


TABLE 3. Agency in sexual activity, sexual health and health care decisions, AISAR index: indicators and component score, by region and country

Region and country (survey year)	Indicators				Component score
	% who have **never** been married among women 15–19*	% reporting they can get condoms on their own among women 15–19	% having sole or joint (with husband) say in their own health care among married women 15–19	% who agree 12–14-year-olds should be taught about condoms among women 18–49†	
Africa					
Dem. Rep. of Congo (2007)	75	11	30	45	**24**
Egypt (2008)	87	u	76	u	**78**
Ethiopia (2011)	77	30	69	54	**49**
Ghana (2008)	91	23	54	53	**49**
Kenya (2008–09)	87	28	57	61	**53**
Malawi (2010)	74	38	47	58	**44**
Mozambique (2011)	59	38	58	58	**39**
Nigeria (2008)	71	8	24	32	**13**
Rwanda (2010)	96	51	70	89	**82**
Senegal (2010–11)	75	14	19	42	**20**
Tanzania (2010)	80	62	41	65	**57**
Uganda (2011)	77	32	45	64	**45**
Zambia (2007)	81	27	59	56	**47**
Zimbabwe (2010–11)	74	28	77	37	**42**
Eastern Europe					
Albania (2008–09)	92	31	71	61	**62**
Moldova (2005)	89	u	93	73	**84**
Ukraine (2007)	93	39	92	93	**85**
South and Southeast Asia					
Bangladesh (2011)	54	u	48	u	**20**
India (2005–06)	72	9	40	28	**18**
Indonesia (2012)	87	18	76	u	**57**
Nepal (2011)	71	31	35	u	**32**
Pakistan (2012–13)	86	u	26	u	**42**
Philippines (2008)	89	25	89	u	**68**
Vietnam (2002)	96	u	u	29	**51**
Latin America and Caribbean					
Bolivia (2008)	85	28	83	u	**64**
Colombia (2010)	83	75	77	92	**86**
Dominican Republic (2007)	73	63	82	91	**77**
Guatemala (2008–09)	78	u	u	79	**68**
Honduras (2012)	73	48	79	92	**71**
Peru (2012)	87	49	78	u	**73**

*The term married denotes both formal, legal unions and informal, consensual unions. †These data were unavailable in the most recent surveys for Tanzania and Guatemala; therefore, we provide data from earlier surveys for these two countries (2004–05 Tanzania DHS and the 2002 Guatemala ENSMI). In addition, for India, these data are the percentage of 15–49-year-old women who support in-school instruction to 13–15-year-old girls about condoms to prevent STIs. *Note:* u=unavailable.

FIGURE 4. Agency in sexual activity, sexual health and health care decisions, component scores by country



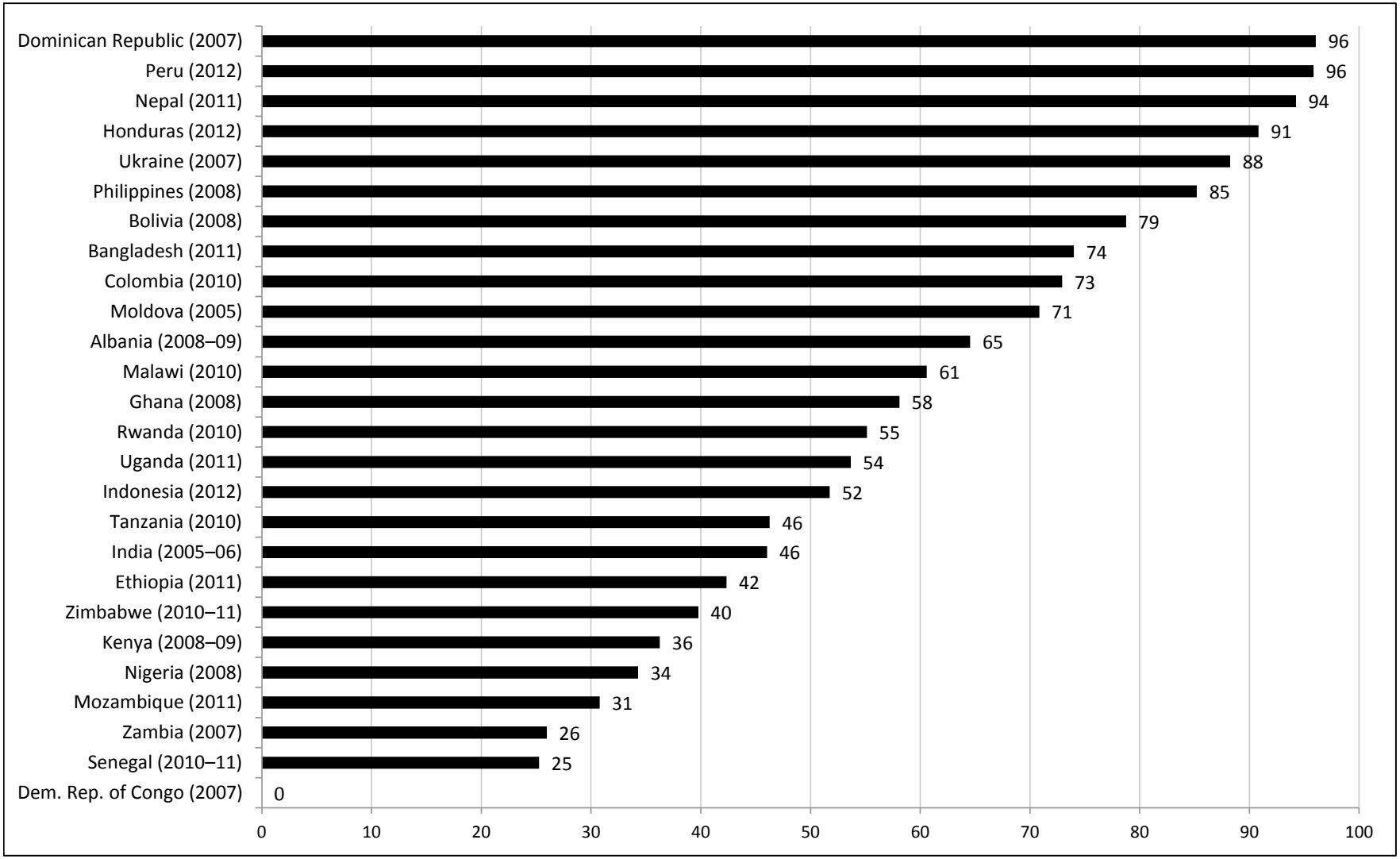
Note: Bangladesh, Egypt, Guatemala, Pakistan and Vietnam have been removed from the figure because they are missing at least half of the data for this component.

TABLE 4. Perception of rights within marital relationships, AISAR index: indicators and component score, by region and country

Region and country (survey year)	Indicators			Component score
	% who agree with all three reasons why a wife is justified in refusing intercourse among women 15–19*,†,‡	% who believe that if husband has STI, wife is justified in asking him to use a condom among women 15–19§,**	% who do not agree with any reason why husband is justified in hitting wife among women 15–19††	
Africa				
Dem. Rep. of Congo (2007)	26	47	26	**0**
Egypt (2008)	u	u	50	**33**
Ethiopia (2011)	64	73	36	**42**
Ghana (2008)	61	84	59	**58**
Kenya (2008–09)	51	70	43	**36**
Malawi (2010)	48	81	84	**61**
Mozambique (2011)	36	50	78	**31**
Nigeria (2008)	43	62	60	**34**
Rwanda (2010)	55	94	44	**55**
Senegal (2010–11)	31	72	39	**25**
Tanzania (2010)	59	76	48	**46**
Uganda (2011)	73	82	38	**54**
Zambia (2007)	38	68	39	**26**
Zimbabwe (2010–11)	52	69	52	**40**
Eastern Europe				
Albania (2008–09)	64	80	76	**65**
Moldova (2005)	68	86	76	**71**
Ukraine (2007)	76	92	97	**88**
South and Southeast Asia				
Bangladesh (2011)	u	93	67	**74**
India (2005–06)	60	70	55	**46**
Indonesia (2012)	58	80	55	**52**
Nepal (2011)	84	93	99	**94**
Pakistan (2012–13)	u	u	47	**30**
Philippines (2008)	80	92	85	**85**
Vietnam (2002)	u	60	u	**26**
Latin America and Caribbean				
Bolivia (2008)	79	85	83	**79**
Colombia (2010)	68	75	97	**73**
Dominican Republic (2007)	87	97	94	**96**
Guatemala (2008–09)	u	u	93	**92**
Honduras (2012)	90	93	85	**91**
Peru (2012)	88	95	96	**96**

*The three reasons are the wife knows that her husband has sex with other women, she knows that he has an STI, and she is tired or not in the mood. †Data on this indicator were unavailable in the most recent surveys for 10 countries. Therefore, the values shown come from earlier surveys in Ethiopia (2005 DHS), Kenya (2003 DHS), Malawi (2004 DHS), Nepal (2006 DHS), the Philippines (2003 DHS), Rwanda (2005 DHS), Senegal (2005 DHS), Tanzania (2004–05 DHS), Uganda (2006 DHS) and Zimbabwe (2005–06 DHS). ‡These data were unavailable for Honduras, Mozambique and Uganda. We provide a similar indicator as a proxy: the percentage agreeing that a wife can refuse intercourse for one reason alone (instead of three)—she knows that her husband has sex with other women. §Data on this indicator were unavailable in the source surveys for three countries. Therefore, the values shown come from earlier surveys in Kenya (2003 DHS) and the Philippines (2003 DHS), and from a specialized HIV survey in Vietnam (2005 AIDS Indicator Survey [AIS]). **Data on this indicator were unavailable for Bangladesh, Bolivia, India, Indonesia, Peru and the Philippines. We provide a similar indicator as a proxy: the percentage agreeing that if a husband has an STI, his wife is justified in refusing sex, instead of being justified in asking him to use a condom. ††DHS surveys include questions about whether a husband is justified in hitting his wife in the following situations: the wife burns the food, she argues with her husband, she goes out without telling him, she neglects the children or she refuses to have sexual intercourse with him. For the Guatemala ENSMI, the indicator is the proportion disagreeing that there are "some situations for which a husband is justified in beating his wife." *Note:* u=unavailable.

FIGURE 5. Perception of rights within marital relationships, AISAR index, component scores by country



Note: Egypt, Guatemala, Pakistan and Vietnam have been removed from the figure because they are missing at least half of the data for this component.

TABLE 5. AISAR index component scores and summary score, by region and country

Region and country (survey year)	Component scores				Summary score
	Access to information	Access to services	Agency in sexual activity, sexual health and health care decisions	Perception of rights within marital relationships	
Average (overall)	49.7	51.3	53.7	58.4	52.8
Median (overall)	51.5	44.5	52.5	56.5	51.5
Africa (regional avg.)	**40**	**43**	**46**	**39**	**42**
Dem. Rep. of Congo (2007)	10	36	24	0	**17**
Egypt (2008)	42	68	78	33	**55**
Ethiopia (2011)	28	13	49	42	**33**
Ghana (2008)	54	41	49	58	**51**
Kenya (2008–09)	44	37	53	36	**42**
Malawi (2010)	48	56	44	61	**52**
Mozambique (2011)	33	39	39	31	**35**
Nigeria (2008)	21	11	13	34	**20**
Rwanda (2010)	56	66	82	55	**65**
Senegal (2010–11)	27	39	20	25	**28**
Tanzania (2010)	56	39	57	46	**50**
Uganda (2011)	52	44	45	54	**49**
Zambia (2007)	42	45	47	26	**40**
Zimbabwe (2010–11)	44	62	42	40	**47**
Eastern Europe (regional avg.)	**73**	**71**	**77**	**75**	**74**
Albania (2008–09)	59	58	62	65	**61**
Moldova (2005)	79	79	84	71	**78**
Ukraine (2007)	82	76	85	88	**83**
South and Southeast Asia (regional avg.)	**43**	**39**	**41**	**58**	**45**
Bangladesh (2011)	33	36	20	74	**41**
India (2005–06)	41	23	18	46	**32**
Indonesia (2012)	38	78	57	52	**56**
Nepal (2011)	66	36	32	94	**57**
Pakistan (2012–13)	18	28	42	30	**29**
Philippines (2008)	59	39	68	85	**63**
Vietnam (2002)	51	31	51	26	**40**
Latin America and Caribbean (regional avg.)	**69**	**76**	**73**	**88**	**76**
Bolivia (2008)	57	57	64	79	**64**
Colombia (2010)	84	86	86	73	**82**
Dominican Republic (2007)	83	87	77	96	**86**
Guatemala (2008–09)	58	62	68	92	**70**
Honduras (2012)	65	85	71	91	**78**
Peru (2012)	66	81	73	96	**79**

Note: avg.=average.

FIGURE 6. AISAR summary scores, by country

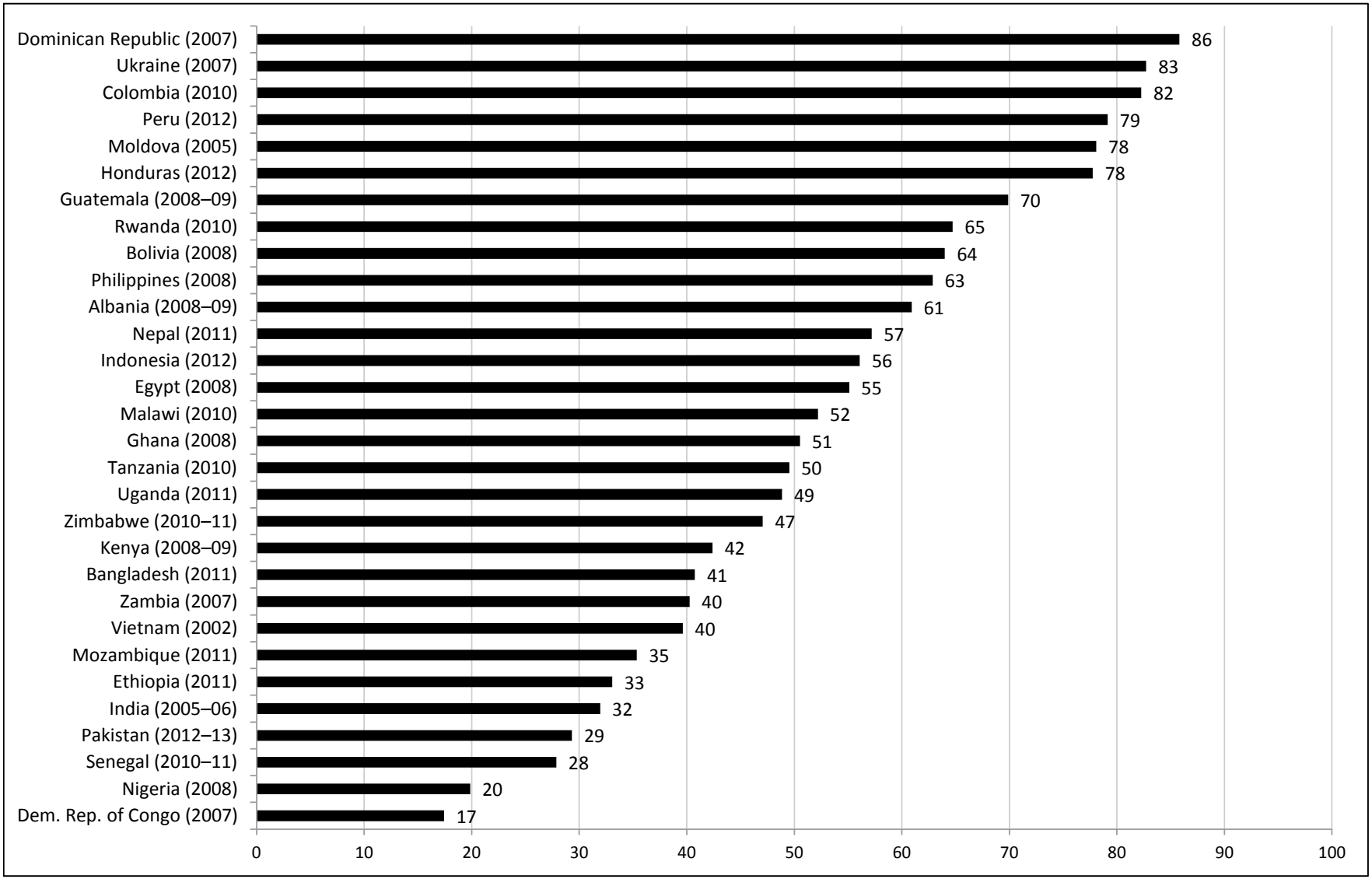
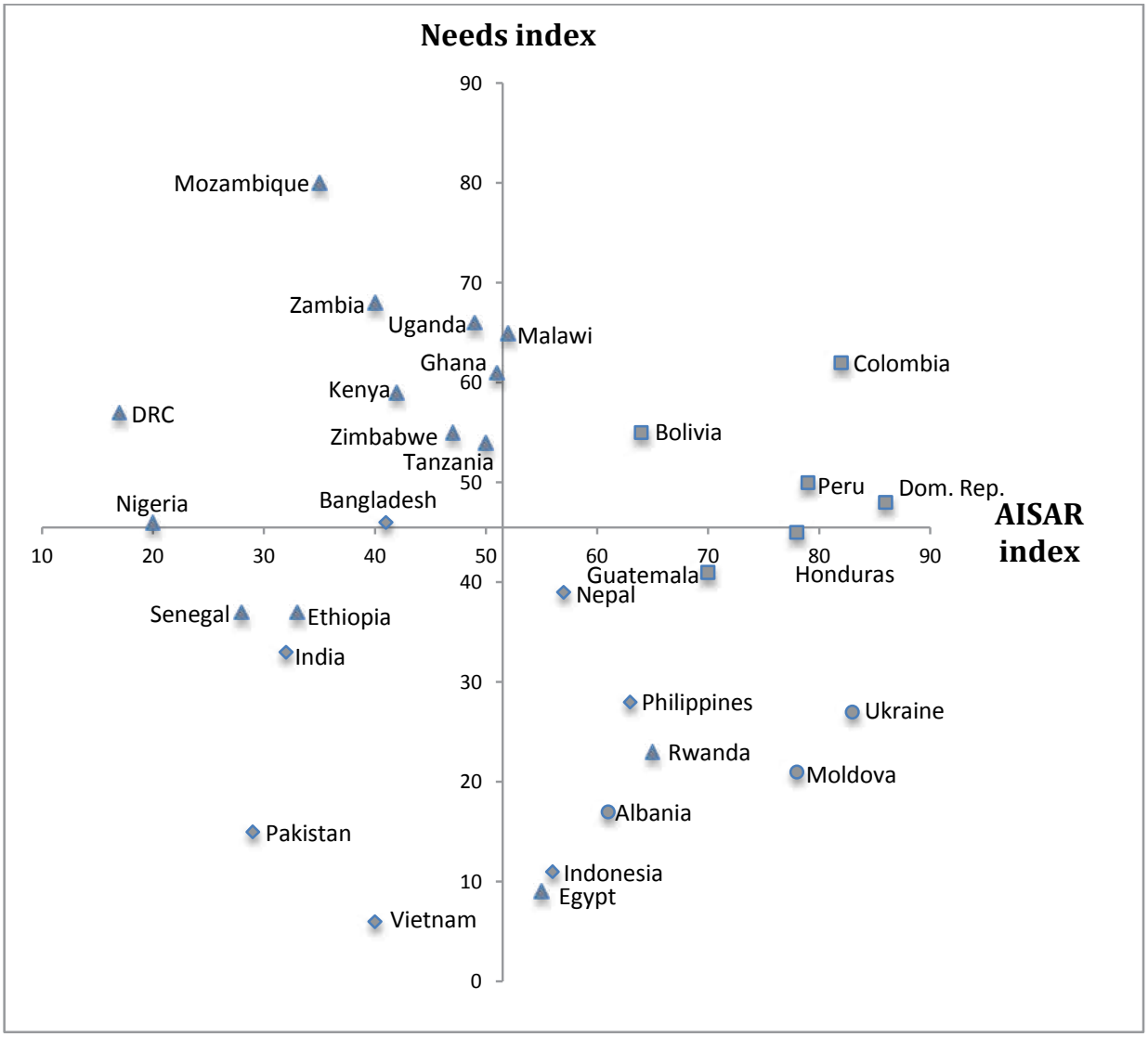


TABLE 6. Index on needs for information and services (needs index): indicators and score, by region and country

Region and country (survey year)	Indicators							Index score
	% who have ever had sexual intercourse among women 15–19*,†	% who have been married‡ before 18 among women 18–24	Average no. of years between median ages at first intercourse and first marriage§	% who have unmet need for contraception,** among married women 15–19	% of recent births to mothers <20 that were unplanned††	Age-specific fertility rate (annual number of births per 1,000 women 15–19)	HIV prevalence (% infected among women 15–24‡‡)	
Africa								
Dem. Rep. of Congo (2007)	52	34	2.1	26	31	124	0.8	**57**
Egypt (2008)	13	16	0.0	8	4	50	0.1	**9**
Ethiopia (2011)	25	38	0.0	33	28	79	0.5	**37**
Ghana (2008)	37	22	2.4	62	56	66	0.5	**61**
Kenya (2008–09)	37	23	1.9	30	46	103	3.6	**59**
Malawi (2010)	44	47	0.6	25	35	152	4.5	**65**
Mozambique (2011)	66	50	2.0	22	20	167	6.6	**80**
Nigeria (2008)	46	38	1.2	19	12	121	1.3	**46**
Rwanda (2010)	14	7	1.0	6	40	41	1.3	**23**
Senegal (2010–11)	30	32	0.5	31	20	93	0.3	**37**
Tanzania (2010)	46	33	1.5	16	27	116	3.6	**54**
Uganda (2011)	45	37	1.4	31	41	134	4.0	**66**
Zambia (2007)	48	38	1.3	22	44	146	4.6	**68**
Zimbabwe (2010–11)	34	30	0.6	17	33	115	6.3	**55**
Eastern Europe								
Albania (2008–09)	12	9	1.5	17	9	17	u	**17**
Moldova (2005)	21	17	0.9	13	22	34	0.2	**21**
Ukraine (2007)	18	9	1.9	30	23	24	0.5	**27**
South and Southeast Asia								
Bangladesh (2011)	46	69	0.0	14	21	118	0.1	**46**
India (2005–06)	28	42	0.0	27	14	90	0.1	**33**
Indonesia (2012)	14	17	0.0	7	6	48	0.5	**11**
Nepal (2011)	29	40	0.0	41	24	81	0.1	**39**
Pakistan (2012–13)	14	30	0.0	15	5	44	0.1	**15**
Philippines (2008)	14	14	0.8	36	30	54	0.1	**28**
Vietnam (2002)	4	9	0.0	13	12	25	0.1	**6**
Latin America and Caribbean								
Bolivia (2008)	30	20	2.3	38	62	88	0.1	**55**
Colombia (2010)	50	22	3.8	20	62	84	0.2	**62**
Dominican Republic (2007)	39	38	0.7	28	47	92	0.2	**48**
Guatemala (2008–09)	28	29	1.0	26	35	98	0.2	**41**
Honduras (2012)	39	33	1.1	16	45	101	0.2	**45**
Peru (2012)	29	18	3.1	17	68	64	0.2	**50**

*The surveys in four countries (Egypt, Bangladesh, Pakistan and Vietnam) interviewed ever-married women only and did not ask respondents about the timing of first sexual intercourse. For these countries, we assume that the percentage of 15–19-year-olds who have ever had sex is the same as the percentage who have ever been married (taken from the household survey questionnaire, which was administered to all 15–19-year-old women rather than the main reproductive health questionnaire, administered to ever-married women only). In such socially conservative countries, very few women likely have sex before marrying, so first marriage can be used as a proxy for first sex. †For India, Indonesia, Nepal and the Philippines, all women (including the never-married) were surveyed and asked direct questions about sexual activity and the age at first intercourse, and the measure presented is based on these data. However, it is likely that sexual activity before marriage is greatly underreported, given the strong stigma against this behavior in these societies. ‡The term married denotes both formal, legal unions and informal, consensual unions. §Medians were calculated on the basis of the youngest age-group at which at least 50% of women in that age-group had experienced both transitions. Thus, medians were calculated among 25–29-year-olds for 25 countries (Albania, Bolivia, Colombia, Dominican Republic, Egypt, Ethiopia, Ghana, Guatemala, Honduras, India, Indonesia, Kenya, Moldova, Nigeria, Pakistan, Peru, Philippines, Rwanda, Senegal, Tanzania, Uganda, Ukraine, Vietnam, Zambia and Zimbabwe) and among 20–24-year-olds for the other five countries (Bangladesh, Democratic Republic of Congo, Malawi, Mozambique and Nepal). **Unmet need among currently married adolescents (considered to be sexually active) is the proportion who are able to become pregnant, want to postpone pregnancy for at least two years, and are nonetheless not using any method of contraception. Because we use the recently revised (as of 2012) version of unmet need that made all DHS surveys' measures strictly comparable, the values presented here will not match those published in the 29 DHS survey reports (except for Pakistan, the country whose survey was fielded most recently of the 29). ††Measures on the planning status of recent births are based on live births during the five years before the interview, with the exception of Vietnam, which uses births during the past three years before the interview. ‡‡ All HIV prevalence data, from UNAIDS, are for the year 2012; see reference 15. ***Note:*** u=unavailable.

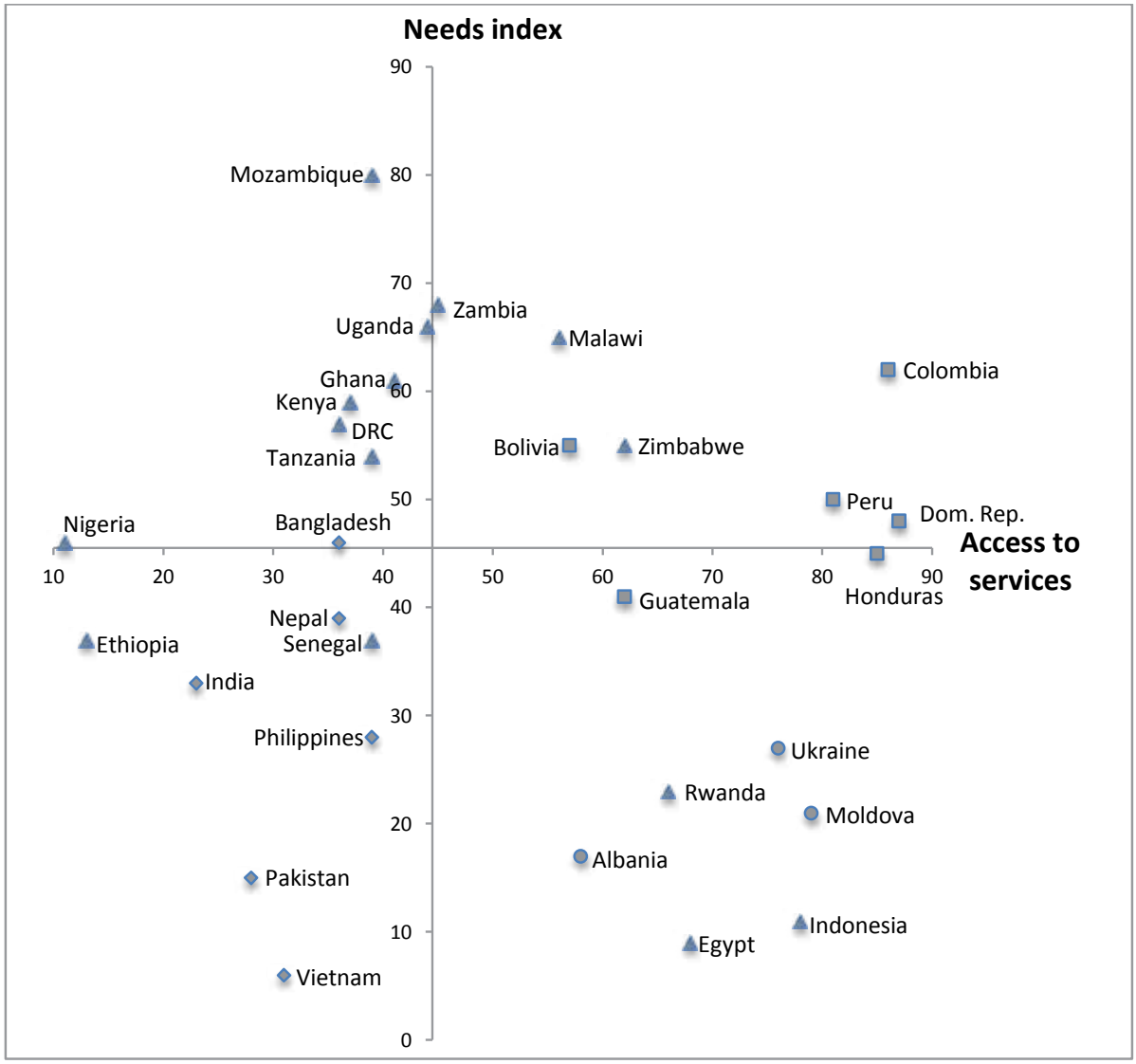
FIGURE 7. Crossing of AISAR index against needs index



- Africa
- Eastern Europe
- South and Southeast Asia
- Latin America and the Caribbean

Note: DRC=Democratic Republic of Congo.

FIGURE 8. Crossing of single AISAR component, access to services, against needs index



Africa
Eastern Europe
South and Southeast Asia
Latin America and the Caribbean

Note: DRC=Democratic Republic of Congo.

Discussion and Conclusions

We created the AISAR index to see if readily available survey data could be assembled into a meaningful tool for policymakers and program planners. Its summary score would ideally capture the current reproductive and sexual health situation of adolescents at a given time in a given country. These results could be of use for national governments and for specific ministries within countries (Ministry of Health, Ministry of Education, Ministry of Women's Affairs, etc.), depending on the component selected. Additionally, international agencies and donor organizations could benefit from cross-country assessments of adolescents' current situation to better understand which countries and regions need the most attention.

The results from this exploratory analysis of 30 countries show that most countries in Sub-Saharan Africa and South and Southeast Asia tend to cluster at the lower end of the range of the AISAR index, while Eastern Europe and Latin America had higher average scores on this index. Overall, these results indicate that adolescents in the three Eastern European countries and those in the included Latin American countries live in an environment that is relatively more favorable to their sexual and reproductive health, compared with counterparts in most of the Sub-Saharan African and South and Southeast countries we examined.

Limitations

This exercise served to highlight the many and serious gaps in the availability—and usability—of data on a wide range of indicators from a wide range of countries. Our desire for broad regional representation meant having to forgo many of the potential agency and rights indicators that were simply unavailable in a few very conservative societies (mostly in North Africa and in South and Southeast Asia) and in the one country that participated in a different survey program, Guatemala. Furthermore, the lack of data from never-married adolescents in many of these same countries means that results are just not as representative as those in the countries in which all adolescents, both married and single, participated in the survey.

The regions were less representative than we would have liked, for example, with just three countries making up the single region of Eastern Europe. The lack of data on a number of indicators for five countries* rendered these countries' scores on the affected components unreliable, so their values (shown in the tables but not in the figures or text) should be interpreted with caution. Overall, of the four components, the agency component is missing the most data (13% of data points are missing), followed by the rights component (9%) and the information component (3%). (As expected when using data from surveys designed primarily to collect data on behaviors such as contraceptive and maternal care use, no data are missing in the services component.) This variability across component data should be kept in mind when comparing overall summary scores and averages, since we did not remove those countries that were missing data on at least half of the indicators from country or regional averages.

It is important to clarify that several of these indicators do not measure actual behaviors, but instead opinions or attitudes. The use of such proxies highlights the need to develop better measures and to gather more specific information, especially in the area of agency and rights, and to do so through nationally representative surveys. Rights questions were sometimes unavailable in a given survey year, so we had to go further back in time. The result was that for some countries, data from different years were used in constructing their measures. And even when responses to questions on rights were available, surveys varied in how these questions were asked. Therefore, we sometimes had to rely on proxies, or when not all parts of a composite indicator were available, we had to use just one part of such measures. We also lacked several data points from the single country that participated in a survey program different from the DHS, Guatemala, whose questionnaires were not always strictly comparable. Another issue of comparability was the year of data collection: For 23 of the 30 countries, the main survey year was relatively recent (2008–2012), but for four countries, the year of survey was 2007, for two countries it was 2005–2006, and for one, 2002.

*A total of five countries were missing data for at least half of the indicators for the agency component (Bangladesh, Egypt, Guatemala, Pakistan and Vietnam) and four of those five—Bangladesh was the exception—were missing data for at least half of the indicators for the rights component.

Looking Ahead

The indicators included in the AISAR index were selected as the best among available measures on which to base a comprehensive tool to quantify several dimensions of the broad concept of adolescent sexual and reproductive health and rights. Development of better measures and coverage in national surveys of the very important dimensions of agency and rights, which proved the most problematic, is essential. Also essential is collection of data on receipt of comprehensive sexuality education—a prerequisite for adolescent women's ability to protect their health and exercise their rights—which is almost completely lacking in the large-scale surveys that were the source of our data. As mentioned before, we used variables that measure use of services to capture access, given that indicators that assess the actual degree of access—relative proximity, affordability, on-hand supply, friendly provider attitudes, etc.—are still rarely collected on nationally representative surveys. Developing all-encompassing dimensions of adolescents' sexual and reproductive lives, such as self-efficacy and gender equality, for inclusion in future surveys should be a top priority.

Within the limitations of what we could measure, the AISAR component and summary indices, paired with the needs index, proved to be valuable tools. They provide users with a quick understanding of multiple dimensions affecting the sexual and reproductive health and rights of adolescent women. At the country level, health planners and policymakers can use these indices to rapidly assess how their country is faring in specific aspects and how it compares with other countries.

Regional and global agencies may also find this summary index and its components useful in their planning. The resulting data could be very helpful in developing arguments for funding interventions in specific areas of adolescents' sexual health and rights that require immediate attention. The index can be expanded to incorporate many additional countries. In addition, the indicators (and thus their components and the resulting indices) can be periodically updated to allow analyses of trends over time. Including data for subgroups—such as urban and rural women, and poor and nonpoor women—would vastly enhance the index's utility in defining priorities and designating target groups. Knowing where needs are greatest and adolescents' situation is poorest would help direct resources to where they would make the most difference.

Of course, many political, social and cultural factors that influence the sexual and reproductive experiences of adolescent women have not been captured in the available data. In addition, our indices measure relative differences between countries, rather than their situation against an absolute standard of the highest quality of health and rights. Even though, to our knowledge, no such standard exists, it remains an important area for future investigation, one that would provide useful goals and targets for researchers to work toward.

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APPENDIX TABLE 1. Unweighted sample sizes of all 15–19-year-old women and married 15–19-year-old women, by region and country

Region and country (survey year)	Sample size	
	All	Married
Africa		
Dem. Rep. of Congo (2007)	2,084	509
Egypt (2008)	636	620
Ethiopia (2011)	3,835	784
Ghana (2008)	1,037	96
Kenya (2008–09)	1,767	251
Malawi (2010)	5,040	1,164
Mozambique (2011)	3,065	1,072
Nigeria (2008)	6,591	1,999
Rwanda (2010)	2,963	83
Senegal (2010–11)	3,604	996
Tanzania (2010)	2,221	346
Uganda (2011)	2,026	794
Zambia (2007)	1,598	270
Zimbabwe (2010–11)	1,980	412
Eastern Europe		
Albania (2008–09)	1,518	102
Moldova (2005)	1,403	135
Ukraine (2007)	830	54
South and Southeast Asia		
Bangladesh (2011)	1,911	1,865
India (2005–06)	23,955	4,817
Indonesia (2012)	7,207	969
Nepal (2011)	2,790	743
Pakistan (2012–13)	567	559
Philippines (2008)	2,766	298
Vietnam (2002)	67	65
Latin America and Caribbean		
Bolivia (2008)	3,505	512
Colombia (2010)	9,354	1,493
Dominican Republic (2007)	5,847	1,233
Guatemala (2008–09)	2,894	748
Honduras (2012)	5,227	1,237
Peru (2012)	4,489	604

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