

Intended and Unintended Pregnancies Worldwide in 2012 and Recent Trends

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Periodic estimation of the incidence of global unintended pregnancy can help demonstrate the need for and impact of family planning programs. We draw upon multiple sources of data to estimate pregnancy incidence by intention status and outcome at worldwide, regional, and subregional levels in 2012 and to assess recent trends using previously published estimates for 2008 and 1995. We find that 213 million pregnancies occurred in 2012, up slightly from 211 million in 2008. The global pregnancy rate decreased only slightly from 2008 to 2012, after declining substantially between 1995 and 2008. Eighty-five million pregnancies, representing 40 percent of all pregnancies, were unintended in 2012. Of these, 50 percent ended in abortion, 13 percent ended in miscarriage, and 38 percent resulted in an unplanned birth. The unintended pregnancy rate continued to decline in Africa and in the Latin America and Caribbean region. If the aims of the London Summit on Family Planning are carried out, the incidence of unwanted and mistimed pregnancies should decline in the coming years. (STUDIES IN FAMILY PLANNING 2014; 45[3]: 301–314)

In many countries, women have more pregnancies and children than they want and become pregnant much sooner than desired. The amount of time a woman typically spends avoiding unwanted or mistimed pregnancies has increased in recent decades, because urbanization and social and economic development have led many couples to want fewer children.

Although causal relationships are difficult to establish, numerous studies have indicated that unintended pregnancies are associated with an array of negative health, economic, social, and psychological outcomes for women and children (Brown and Eisenberg 1995; Marston and Cleland 2003; Hardee et al. 2004; Logan et al. 2007; Gipson, Koenig, and Hindin 2008; Tsui, McDonald-Mosley, and Burke 2010). Preventing unintended pregnancies is an integral component of achieving the UN Millennium Development Goals, most notably Goal 5: improving maternal health (UN 2006). Having the means to monitor levels and trends in the incidence of unintended pregnancy is that much more important in the wake of the 2012 London Summit on Family Planning, which called for heightened investments in programs that will reduce unintended pregnancy worldwide (Family Planning 2020 n.d.). Where investments

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are occurring at the national and subnational level, measures of impact will ideally take place at these levels as well. The goals set out at the Summit, however, including the goal of providing the services and methods required to satisfy the unmet need for contraception of 120 million additional women by 2020, calls for periodic estimations of unintended pregnancy at the global and regional level.

Estimates of the global and regional incidence of unintended pregnancy and pregnancy outcomes have been conducted for the years 1995 (AGI 1999) and 2008 (Singh, Sedgh, and Hussain 2010). During the interval between those two years, the global unintended pregnancy rate declined from 69 to 55 per 1,000 women aged 15–44. In the present study, we develop estimates of the numbers, rates, and distribution of all pregnancies by their planning status and outcomes for 2012, for developed and developing regions and for all major geographic regions and subregions of the world, employing methodologies that closely parallel those used for previous estimates (AGI 1999; Singh, Sedgh, and Hussain 2010).

METHODS AND DATA SOURCES

All Pregnancies

Total number of pregnancies is the sum of all live births, abortions,¹ and miscarriages.² Different data sources and methods are used to estimate the incidence of each of these events. Estimates are made for each subregion, and subregional estimates are summed to create estimates for major regions and the world. We use the United Nations Population Division (UNPD) classification of regions and subregions (UN 2013).

Live birth estimates for 2012 for each subregion are based on UNPD estimates for 2010–15 (UN 2013).³ To estimate abortion rates in 2012, we use estimates at the subregional level of the number of abortions and unplanned births in 2008 (Singh, Sedgh, and Hussain 2010; Sedgh et al. 2012),⁴ and assume that the ratio of abortions to unplanned births in 2008 persisted in 2012.⁵ We make an exception for Europe and its subregions, where estimates of the proportion of births that are unplanned in 2008 are based on a few studies that have limited geographic coverage. For Europe, we assume the abortion rate in 2008 persisted in 2012. This assumption is compatible with previous findings indicating that little change had occurred over time in the abortion rate in Northern, Southern, and Western Europe, and that the pace of decline in the rate in Eastern Europe had slowed between 2003 and 2008.

To estimate the number of miscarriages in each subregion, we employ a model-based approach derived from clinical studies of pregnancy loss by gestational age (Bongaarts and

1 Unless otherwise indicated, the term “abortion” refers to induced abortion.

2 Pregnancies that ended as a result of the death of the woman for reasons unrelated to the pregnancy are not included in the estimation of pregnancy incidence.

3 Pregnancy estimates previously developed for 2008 include births to women aged 15–44, whereas estimates for 2012 include all births. In 2012, 0.5 percent of all births occurred to women outside of this age range.

4 Estimates for 2008 for the total number of pregnancies and for unintended pregnancies have been revised to take into account the estimated abortion rates for 2008 published in 2012.

5 We use unrounded numbers of unplanned births provided by Singh, Sedgh, and Hussain (2010), and unrounded numbers of abortions provided by Sedgh and colleagues (2012).

Potter 1983).⁶ The model indicates that recognized miscarriages (those of five or more weeks gestation) are equal to approximately 20 percent of births plus 10 percent of induced abortions. Findings from recent surveys of women in the United States support these model-based estimates (Finer and Henshaw 2006).

Unintended Pregnancies

Unintended pregnancies consist of unplanned births, induced abortions, and miscarriages resulting from unintended pregnancies.

Unplanned Births

Unplanned births consist of those occurring two or more years sooner than desired (“mis-timed”) and those that were not wanted at all by the mother (“unwanted”). Subregional estimates of the proportion of births that are unplanned are calculated as the weighted average of data from the countries in each subregion for which data are available, with the number of births in each country serving as weights. The estimated proportions are applied to UN estimates of the number of births for 2012 to obtain the number of unplanned births in each geographic area.

For subregions in Africa, Asia, Latin America and the Caribbean, and Oceania, the proportion of births in 2012 that were unplanned is estimated on the basis of nationally representative Demographic and Health Surveys conducted among women in 64 countries by Macro International, Reproductive Health Surveys conducted in six countries by the Centers for Disease Control, and similar surveys conducted in Brazil and Mexico. Most of these surveys asked women about the intention status of current pregnancies and recent births at the time of conception. For the majority of countries, we calculate the proportion of births that were unplanned among all births in the three years prior to the survey. For a few countries, the data available pertain to the most recent birth three or five years prior to the survey; all births in the past five years; recent births combined with current pregnancies; or current pregnancies only. We deem that the improvement in the subregional and regional estimates gained by using these data outweighs the relatively small biases introduced by the different definitions.

For China, statistics regarding the proportion of births that were unauthorized are used as an indicator of unplanned birth incidence, and the most recent available estimate is a report published by the country’s National Population and Family Planning Commission for 2006 (NPFPC 2006). Because the data used here for China more closely approximate the incidence of unwanted births from the perspective of the government than unplanned births from the perspective of women, global and regional estimates are estimated both with and without China.

The proportion of births that were unplanned in North America (which is comprised of the United States and Canada according to the UN) is based on the most recent cycle of the National Survey of Family Growth of the United States (2006–10) (National Center for Health

⁶ We use the term “miscarriage” to refer to all spontaneous fetal losses, including stillbirths. Miscarriages before the fifth week of gestation are typically not measured in existing studies and are not part of the pregnancy estimates. The level of spontaneous abortion is believed to vary little across subregions and over time, though evidence to support or refute this assumption is needed.

Statistics 2011), which represents 92 percent of births in the region. For Europe, estimates of the incidence of unplanned births in 2012 are based on nationally representative surveys conducted between 2008 and 2012 in seven countries⁷ representing 55 percent of births in Europe, and surveys conducted in 2004 to 2007 in three countries (Moldova, Romania, and Ukraine) representing 9 percent of births in the region. Because some European subregions are under-represented by these studies, subregional averages are not computed; instead, a weighted average of the survey-based estimates is applied to all of Europe.

Most of the studies we draw upon were conducted after the establishment of global estimates of unintended pregnancy for 2008. For 33 countries in which new surveys were not conducted, we use surveys conducted between 2000 and 2007⁸ to achieve better regional and subregional representation. For Africa, the planning status of 59 percent of births is based on new data available after the prior global estimates were made; the planning status for 27 percent of births is based on data for 2000–07 that were used to make the prior estimates; and for the remaining 14 percent of births occurring in countries having no post-2000 survey, we apply the average planning status distribution of the appropriate subregion (see Table 1). In Latin America and the Caribbean, 77 percent of births are based on new data, 6 percent are based on data used in the prior estimates, and 17 percent are based on subregional averages. The corresponding figures for Asia are 22 percent, 63 percent, and 15 percent. A comparison of proportions of pregnancies that were unintended in Asia in 2008 and 2012 would not be meaningful because of the large overlap in data sources used to estimate proportions of births that were unplanned. Data sources used to measure unplanned births in Europe and North America in 2008 and 2012 did not overlap, but the quality and coverage of evidence concerning the proportion of births that were unplanned in Europe has improved in recent years, and trends should be interpreted with caution.

For 42 countries, at least two surveys have been conducted since 2000. The data from these surveys indicate that more countries have seen a decline than an increase in the proportion of births that were unplanned over time; however, on average across these countries the decline has been very small. This finding is not surprising because, whereas increases in contraceptive use might cause a decrease in the proportion of births that were unplanned, the growing desire to have smaller families can easily offset the effects of contraceptive use on this proportion. Thus,

TABLE 1 Percentage distribution of live births, by region, according to reference year of source data regarding planning status of births, 2000–12

Region	Country-level data		Subregional average ^b	Total
	2008–12	2000–07 ^a		
Africa	59	27	14	100
Asia	22	63	15	100
Europe	57	7	36	100
Latin America and the Caribbean	77	6	17	100
North America	91	0	9	100
Oceania	48	0	52	100

^a The Africa data pertaining to Egypt for 2008 is presented in the 2000–07 column because that survey was made available in time for inclusion in the earlier cluster.

^b Country-level data were unavailable.

7 The surveys were conducted in Albania, France, Germany, the Netherlands, Portugal, Russia, and Scotland. Findings from a survey of women in an antenatal clinic in Sweden are also used, although they are not nationally representative.

8 The one exception is a 2008 survey in Egypt, the findings from which were available in time for inclusion in the analysis of surveys from 2000–07.

we assumed that the proportion of births that were unplanned in the most recent survey prior to 2012 is a reasonable proxy for the value of this measure in 2012, for computation of subregional averages in most regions.

Unplanned birth rates are computed using overall birth rates and estimated proportions of births that were unplanned. Therefore, whereas the overlap in sources of information used for 2008 and 2012 regarding the proportion of births that were unplanned can lead to attenuated estimates of changes over time and comparisons should be made with caution, this does not preclude an assessment of trends in unplanned birth and unintended pregnancy rates.

Most surveys classified a birth as mistimed if it occurred at least two years before the woman wanted to have a child, except in Australia, Europe, and the United States, where all births that were wanted later were classified as mistimed, regardless of the time frame. For the United States, where data are available concerning preferred timing of mistimed births, 60 percent of all mistimed births were mistimed by at least two years.

Induced Abortions

All induced abortions are assumed to have been unintended pregnancies. Data for the United States indicate that fewer than 5 percent of abortions were performed for pregnancies that were intended at the time of conception (Finer and Henshaw 2006). According to a recent survey of women in Russia, slightly less than 8 percent of abortions were intended pregnancies at conception (CDC 2012). If 8 percent of abortions were reclassified as intended pregnancies at the global level, the proportion of all pregnancies classified as unintended would be only two percentage points lower than the current estimate.

Miscarriages

Miscarriages are estimated to equal approximately the sum of 20 percent of live births and 10 percent of induced abortions. The miscarriages that represent 10 percent of all abortions and 20 percent of unplanned births are classified as unintended pregnancies. According to a recent review of the evidence, some studies have found an increased risk of miscarriage among unintended pregnancies, whereas others have found mixed results or no association (Gipson, Koenig, and Hindin 2008). For this undertaking, both intended and unintended pregnancies are assumed to have the same probability of ending in pregnancy loss.

Pregnancy Rates

Total, intended, and unintended pregnancy rates per 1,000 women aged 15–44 in each subregion are estimated using UN estimates of the 2012 midyear population of women aged 15–44 for each subregion and region. Estimates presented here are based on empirical evidence and are not derived from statistical models. An advantage of the current approach is that it does not rely on the assumptions required by such models. Confidence intervals could not be computed, however. Small differences in estimates between geographic areas or over time are not considered meaningful.

We examine trends in the overall pregnancy rate in the major world regions and globally. We examine trends in the rates of unintended pregnancy and their outcomes in the regions where new data regarding planning status of unplanned births are available for at

least 50 percent of all births. Thus, we examine trends in unintended pregnancy in Africa, the Latin America and Caribbean region, Europe, and North America. We do not explore trends in unintended pregnancy incidence at the subregional level because the number of unintended pregnancies that are estimated on the basis of the same data sources for both time periods varies across the subregions, and because subregional estimates were not developed for 1995.

RESULTS

Number of Pregnancies

In 2012, approximately 213 million pregnancies occurred worldwide, of which 190 million (89 percent of all pregnancies)⁹ occurred in the developing world (see Table 2). More than half of all pregnancies (56 percent) took place in Asia, 25 percent in Africa, 8 percent in Latin America and the Caribbean, 7 percent in Europe, 3 percent in North America, and less than 1 percent in Oceania. The estimated global annual number of pregnancies increased slightly since 2008, from 211 million. This represents a net increase of 1.2 percent, which is smaller than the increase in the number of women aged 15–44 in the same interval (3.5 percent) (not shown).

Pregnancy Rates

The pregnancy rate controls for the size of the population of women aged 15–44. Worldwide, 133 pregnancies occurred for every 1,000 women of reproductive age in 2012 (see Table 2). The rate in the developed world was far lower than that in the developing world (94 and 140, respectively). Regional pregnancy rates ranged from 94 in Europe to 224 in Africa. The rate in North America (100) was higher than that in Europe (94). At the subregional level, pregnancy rates ranged from 80 in Western and Southern Europe to 279 in Middle Africa (see Table 3).

The global pregnancy rate was 160, 136, and 133 in 1995, 2008, and 2012, respectively. The rate decreased slightly between 2008 and 2012, after having declined 15 percent, or 1.2 percent per year on average, between 1995 and 2008 (see Table 2). The largest regional increase in the rate since 2008 took place in Europe (from 90 to 94).

Unintended Pregnancy Rates

The worldwide rate of unintended pregnancy in 2012 was 53 per 1,000 women aged 15–44 (see Table 3). If we exclude China, the global unintended pregnancy rate increases to 61 (not shown). The highest regional rate was in Africa (80) and the lowest were in Europe (43) and Oceania (43). The highest subregional rates were in Eastern and Middle Africa (108 each), and the lowest were in Northern, Southern, and Western Europe (35, 35, and 27, respectively) (see Table 3 and Figure 1.)

⁹ Percentages in text are based on computations with unrounded numbers and therefore might not correspond with percentages computed from tables.

TABLE 2 Number of pregnancies, overall and unintended pregnancy rate, and percent of pregnancies that were unintended, by major world regions, 1995, 2008, and 2012

Region	Total number of pregnancies (in millions)			Rate per 1,000 women aged 15–44						Percent of pregnancies that are unintended		
				All pregnancies			Unintended pregnancies ^a					
	1995	2008 ^b	2012	1995	2008 ^b	2012	1995	2008 ^b	2012	1995	2008 ^b	2012
Worldwide	209.5	210.9	213.4	160	136	133	69	57	53	43	42	40
More developed	27.9	23.4	23.4	108	92	94	59	44	44	55	44	47
Less developed	181.5	187.5	190.0	173	144	140	71	59	54	41	49	39
Africa	40.2	49.3	53.8	262	222	224	92	86	80	35	39	35
Asia ^c	122.8	122.1	119.7	156	127	120	64	49	46	41	39	38
Europe	18.5	13.7	14.1	116	90	94	65	41	43	56	46	45
Latin America and the Caribbean	18.3	17.7	17.8	159	128	122	96	76	68	60	60	56
North America	6.8	7.2	7.1	102	102	100	48	49	51	47	48	51
Oceania	1.1	0.9	0.9	134	118	116	45	44	43	34	37	37

NOTES: Pregnancies are comprised of planned births, unplanned births, abortions, and miscarriages. More developed regions include Australia, Europe, Japan, New Zealand, and North America; all others are classified as less developed. Because of limited data on which to base estimates in some geographic areas, differences between 2008 and 2012 in unintended pregnancy rates and the percentage of pregnancies that were unintended should be interpreted with caution. See text for detail.

^aUnintended pregnancies are comprised of unplanned births, abortions, and miscarriages of pregnancies that are unintended.

^bOverall and unintended pregnancy estimates for 2008 are revised from previously published estimates to include abortion rates for 2008 published in 2012.

^cEstimates for 1995 exclude Japan.

TABLE 3 Number of pregnancies, pregnancy rates by intention status, and percent of pregnancies unintended in major world regions and subregions, 2012

Region	Total number of pregnancies (in millions)	Pregnancy rate per 1,000 women aged 15–44			Percent of pregnancies that are unintended
		All pregnancies	Intended	Unintended	
Worldwide	213.4	133	80	53	40
More developed	23.4	94	50	44	47
Less developed	190.0	140	85	54	39
Africa	53.8	224	145	80	35
Eastern	19.4	246	138	108	44
Middle	7.8	279	171	108	39
Northern	7.1	144	103	41	29
Southern	1.8	124	55	69	55
Western	17.6	256	191	66	26
Asia	119.7	120	75	46	38
Eastern	36.6	99	62	37	37
South-central	56.5	134	86	48	36
Southeastern	18.8	127	71	56	44
Western	7.8	141	79	62	44
Europe	14.1	94	52	43	45
Eastern	7.0	110	52	57	52
Northern	1.8	93	58	35	38
Southern	2.4	80	45	35	44
Western	2.8	80	52	27	34
Latin America and the Caribbean	17.8	122	54	68	56
Caribbean	1.3	133	48	84	64
Central America	5.1	125	75	50	40
South America	11.4	120	45	74	62
North America	7.1	100	49	51 ^a	51 ^a
Oceania	0.9	116	73	43	37

^aIf mistimed births in North America were limited to those that occurred at least two years before they were wanted, as in Africa, Asia, and Latin America and the Caribbean, the unintended pregnancy rate would be 44 percent and the proportion of pregnancies that were unintended in North America would be 42 percent.

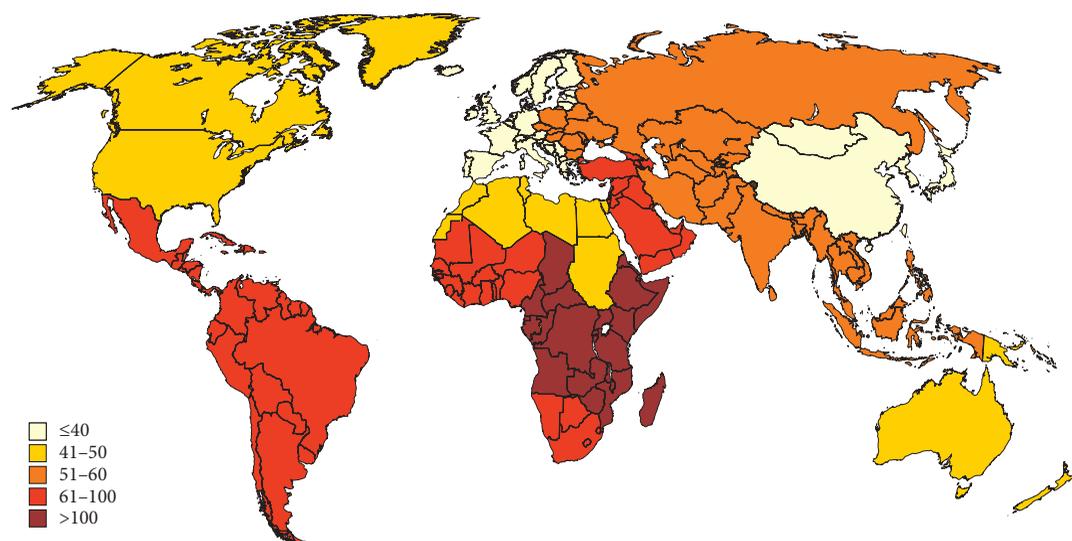
As noted above, all births in the United States that were wanted later were classified as mistimed. If the births that were wanted within two years of when they occurred were classified as intended in 2012 (as in developing countries), the estimated unintended pregnancy rate in North America would be 44 rather than 51, and 42 percent of pregnancies would be classified as unintended, rather than 51 percent. Corresponding estimates are not available for earlier time periods.

Unintended pregnancy rates continued to decline in Africa and in the Latin America and Caribbean region from 2008 to 2012, as they had from 1995 to 2008. The pace of decline increased in Africa, from about 0.5 percent per year to about 2.0 percent per year (not shown). The rate has changed very little in the remaining regions since 2008.

Distribution of Pregnancies by Planning Status and Outcome

Approximately 40 percent of pregnancies worldwide, or 85 million pregnancies, were unintended in 2012 (see Table 3). The region with the highest proportion of pregnancies that were unintended was the Latin America and Caribbean region (56 percent) and the lowest was Africa (35 percent).

FIGURE 1 Unintended pregnancies per 1,000 women aged 15–44, by subregion, 2012



Substantial variation exists in the proportion of pregnancies that end in induced abortions across the world's regions (see Table 4). Across African subregions, 22–39 percent of unintended pregnancies ended in induced abortion, whereas 44–75 percent of such pregnancies ended in abortion across European subregions, and 39–77 percent ended in abortion across Asian subregions. In North America, 39 percent of unintended pregnancies (or 20 percent of all pregnancies) ended in abortion. Overall, the proportion of unintended pregnancies that ended in abortion was higher in developed than in developing regions (54 and 49 percent, respectively). Among unplanned births, a substantially greater proportion was mistimed than was unwanted in 6 of the 13 subregions where information was available. In only two subregions (Northern Africa and Western Asia) was the proportion of births that were unwanted notably larger than the proportion mistimed.

DISCUSSION

The periodic reviews of global pregnancy incidence, of which this article is the most up-to-date installment, represent the only known estimates of pregnancy rates—overall and by planning status and outcome—globally and in the major world regions. We found that the global pregnancy rate has leveled off since 2008, after having declined between 1995 and 2008. Unintended pregnancy rates continued to decline in Africa and the Latin America and Caribbean region.

Although the short time interval between the estimation presented here and the most recent prior estimation of unintended pregnancy meant that the body of new evidence was limited for some regions, the update allows us to identify possible trends early on where new data do exist, and allows stakeholders to use the most recent possible evidence regarding unintended pregnancy incidence for related research, program, and policy efforts.

TABLE 4 Percentage distribution of unintended pregnancy outcomes in major world regions and subregions, 2012

Region	Number of unintended pregnancies (millions) ^a	Percentage distribution of unintended pregnancy outcome			Type of unplanned birth (as percent of all unintended pregnancies)	
		Abortions	Miscarriage	Unplanned births	Mistimed	Unwanted
Worldwide	84.9	50	13	38	na	na
More developed	12.3	54	12	34	na	na
Less developed	72.6	49	13	38	na	na
Africa	19.1	33	14	53	35	18
Eastern	8.5	32	14	54	37	17
Middle	3.0	33	14	53	39	15
Northern	2.0	39	13	48	21	27
Southern	1.0	22	15	63	32	31
Western	4.5	36	14	50	35	15
Asia	45.5	57	12	31	na	na
Eastern	13.7	77	10	12	na	na
South-central	20.1	47	13	40	20	20
Southeastern	8.3	57	12	31	16	15
Western	3.5	39	13	48	20	28
Europe	6.4	64	11	25	na	na
Eastern	3.6	75	10	15	7	7
Northern	0.7	48	13	39	na	na
Western	1.1	52	12	36	na	na
Southern	1.0	44	13	43	na	na
Latin America and the Caribbean	10.0	42	13	45	26	19
Caribbean	0.8	43	13	44	27	17
Central America	2.0	47	13	41	22	19
South America	7.1	40	13	46	27	19
North America	3.6	39 ^b	13	47 ^b	30 ^b	18 ^b
Oceania	0.3	40	13	47	na	na

na = Not available.

^a The sums of the subregional values may not equal the regional values because of rounding.

^b If mistimed births were limited to those that occurred at least two years before they were wanted in North America, the proportion of unintended pregnancies leading to unplanned, mistimed, and unwanted births in North America would be 44 percent, 22 percent, and 22 percent, respectively, and abortions would account for 43 percent of unintended pregnancies.

The overall pregnancy rate has increased in all subregions of Europe. Although economic development is generally associated with declining fertility rates, it has been suggested that in countries where advanced levels of development have already been achieved, and fertility has reached a very low level, an upturn in fertility can occur (Myrskylä, Kohler, and Billari 2009). A few reasons for this have been put forth, such as the increased labor-market flexibility that makes female labor-force participation more compatible with childbearing, and social policies aimed at increasing fertility rates by promoting gender equality and work–life balance. It has been suggested that greater acceptance of childbearing outside of formal marital unions has also promoted the upturn in fertility in Europe (Billari 2008). It has also been theorized that the fertility-depressing effects of delayed childbearing would be followed by a small, temporary increase of fertility rates, when women who had delayed childbearing begin to have children (Bongaarts 2002). Immigration to Northern, Southern, and Western European countries from countries having relatively high fertility rates could also have an upward influence on fertility rates in Europe; this increase is expected to diminish as the process of assimilation occurs (Sobotka 2008).

The observed increase in the unintended pregnancy rate in Europe could result in part from the use of noncomparable data sources and of data sources from different countries for the two time periods, and possibly from high unintended pregnancy rates in the growing population of immigrants.

The proportion of pregnancies that were unintended can be low in traditional societies, where many couples want large families, and in modern societies, where contraceptive prevalence is high. This proportion is relatively high in Eastern Europe, where many unplanned births are averted through abortion, and in South America, where desired family size has fallen considerably in recent decades and the level of contraceptive use does not fully meet demand. Thus, the proportion of pregnancies that were unintended does not necessarily decline linearly with progress in family planning program implementation.

Unintended pregnancies that lead to induced abortions can have deleterious consequences for women living in countries where abortions are generally unsafe. Thousands of women die each year as a result of unsafe abortions (WHO 2011), and millions more suffer nonfatal health consequences (Singh 2006). Reviews of studies examining the aftermath of unplanned births have recently been undertaken. The few international studies that have been conducted on neonatal outcomes, such as birth weight and gestational age, have yielded inconsistent results (Gipson, Koenig, and Hindin 2008; Tsui, McDonald-Mosley, and Burke 2010). In the United States, unplanned births are associated with delayed prenatal care, lower incidence and duration of breastfeeding, poorer maternal mental health, poorer mental and physical health and poorer educational and behavioral outcomes for the child, and lower-quality mother-child relationships (Logan et al. 2007). More research and innovative approaches to examining long-term maternal or child outcomes following unplanned births in developing countries are needed (Tsui, McDonald-Mosley, and Burke 2010).

In general, causal associations are not easily inferred from most studies of the events that follow unintended pregnancies. Indeed, some studies have found that observed associations were greatly attenuated after controlling for factors that precede unintended pregnancies, such as a woman's socioeconomic status (Joyce, Kaestner, and Korenman 2000a; Kearney and Levine 2012).

For the most part, our estimates of the incidence of unplanned births rely on women's retrospective reports up to three years after the birth occurred, and the results are likely influenced by changes in women's attitudes toward these births over time. Studies indicate that some women who say they do not want to become pregnant but then do become pregnant and have a child will later report that the pregnancy was intended (Bankole and Westoff 1998; Joyce, Kaestner, and Korenman 2000b). An alternate approach to measuring the incidence of unwanted births using DHS data avoids retrospective reports by using information concerning a woman's stated preference for another child at the time of the survey, her parity, and the dates of recent births (Casterline and El-Zeini 2007). Findings from six countries indicate that this approach to estimating the proportion of births that are unwanted yields estimates that are about 20–190 percent higher than estimates using retrospective reports. One reason for these differences is that some pregnancies that are unwanted at conception may be reported some months or years later as mistimed or wanted. Although this comparison provides compelling evidence that some women reclassify the planning status of births after they occur, one can also argue that the births women continue to claim are unintended, even retrospectively, represent

those that a woman had a particularly strong or persistent wish to avoid. Also important to note is that the alternate approach cannot be used to measure the incidence of mistimed births.

In the retrospective data, some mistimed births might also be reclassified by women as intended after they occur. Measures were limited to births that were mistimed by at least two years, and women might be less prone to rationalizing the planning status of such births over time.

Research is needed regarding how the strength of childbearing desires and the potential consequences of unintended pregnancies and unplanned births vary by a woman's age, her socioeconomic status and educational level, the number of children she already has, and her cultural milieu. Evidence of how the consequences of unplanned births vary across populations can play an important role in motivating and effectively allocating investments aimed at improving maternal and child health and, in the long term, social and economic development. Studies of the reasons why women wish to avoid these pregnancies—such as competing aspirations, limited financial resources, or lack of partner support—and how these factors are associated with the social, economic, and health consequences of such pregnancies can also help guide policies and programs.

Research regarding the incidence and consequences of unintended pregnancies and unplanned births must contend with many methodological constraints. Estimation at the country level could help stakeholders identify women who have the greatest need for services. Such estimations, however, would require a much more detailed evidence base than currently exists. In particular, reliable abortion estimates are available for very few developing countries (most of which have restrictive abortion laws), and estimates of the proportion of live births that are unplanned are available for few developed countries.

Disentangling causal factors from factors that may result in both unintended pregnancies and the adverse scenarios that follow can be difficult. Moreover, defining unintended pregnancies presents a critical methodological challenge because (a) the intensity of fertility intentions can vary between women and over time in a woman's life, (b) a woman's feelings about a specific pregnancy can change with the passage of time, and (c) the degree of mistiming used to define mistimed pregnancies varies across studies and affects resulting estimates. Also, men's attitudes continue to be excluded from most classifications of pregnancies by planning status. A number of studies have aimed at developing improved measures of unplanned birth, as was noted in the prior estimate of global unintended pregnancy rates (Singh, Sedgh, and Hussain 2010). These efforts are ongoing and include approaches to make better use of existing survey questions and obtain additional information from women and men in large-scale surveys (Casterline and El-Zeini 2007; Mosher, Jones, and Abma 2012; Moreau et al. 2013). Whereas the dichotomous measure employed here does not capture more nuanced elements of fertility intentions addressed in other research, it uses data that are available from nationally representative surveys conducted across many countries and allows for comparisons across regions and over time.

Estimates indicate that 222 million women in the developing world had unmet need for a modern contraceptive method as of 2012 (Singh and Darroch 2012). Estimates further indicate that if the unmet contraceptive need among all these women was satisfied, 54 million unintended pregnancies, including 21 million unplanned births and 26 million abortions, would be averted annually. Improving services for current users who are not using methods effectively would further reduce the incidence of unintended pregnancy.

We estimate that 85 million unintended pregnancies occurred worldwide in 2012. A key objective of the 2012 London Summit on Family Planning is “to revitalize global commitments to family planning and access to contraceptives as a cost-effective and transformational development priority” (Family Planning 2020 n.d.). If the promises of the summit are carried out, we can expect that the incidence of unwanted and mistimed pregnancies will decline in the coming years. Progress along these lines is much needed and cannot be achieved without the commitments of stakeholders at the global, regional, country, and local levels.

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