

# Unintended Pregnancy: Worldwide Levels, Trends, and Outcomes

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*Unintended pregnancy can carry serious consequences for women and their families. We estimate the incidence of pregnancy by intention status and outcome at worldwide, regional, and subregional levels for 2008, and we assess recent trends since 1995. Numbers of births are based on United Nations estimates. Induced abortions are estimated by projecting from recent trends. A model-based approach is used to estimate miscarriages. The planning status of births is estimated using nationally representative and small-scale surveys of 80 countries. Of the 208 million pregnancies that occurred in 2008, we estimate that 41 percent were unintended. The unintended pregnancy rate fell by 29 percent in developed regions and by 20 percent in developing regions. The highest unintended pregnancy rates were found for Eastern and Middle Africa and the lowest for Southern and Western Europe and Eastern Asia. North America is the only region in which overall and unintended pregnancy rates have not declined. We conclude with a brief discussion of global and regional program and policy implications. (STUDIES IN FAMILY PLANNING 2010; 41[4]: 241–250)*

Unintended pregnancies and unplanned births can have serious health, economic, and social consequences for women and their families (Brown and Eisenberg 1995; Gipson et al. 2008). One immediate outcome of some unintended pregnancies—induced abortion—is unsafe in many countries that have highly restrictive abortion laws. In these countries, abortion often damages women’s health and sometimes results in their death (Grimes et al. 2006). If the United Nations Millennium Development Goals of reducing child mortality and improving maternal health (United Nations 2006) are to be achieved, the incidence of unintended pregnancy and its consequences must be dramatically reduced. Information concerning unintended pregnancy levels can also point to gaps in access to and use of contraceptives. Moreover, this information can be used to estimate the costs and benefits of investing in family planning programs (Singh et al. 2009).

Estimates of the global incidence of unintended pregnancy and pregnancy outcomes were developed for the first time in 1995 and published more than a decade ago (AGI 1999). At that time, about 38 percent of all pregnancies were estimated to be unintended, and more than half of these (22 percent of all pregnancies) ended in abortion. (These estimates do not include unintended pregnancies that ended in miscarriage.)

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Since then, more recent information has become available on levels of unplanned births and induced abortion, making possible updated estimates of unintended pregnancies for the world and for each region and subregion. This study presents new estimates for 2008 of the numbers, rates, and distribution of all pregnancies by their planning status and outcomes: wanted births, unplanned (mistimed or unwanted) births, induced abortion, and miscarriages. We compare findings for developed and developing regions and for major geographic regions and subregions of the world. We also examine trends in unintended pregnancies and their outcomes between 1995 and 2008. We consider these trends in the context of contraceptive prevalence, contraceptive failure, and unmet need for contraception across regions and over time.

## Methods and Data Sources

We employ the classification of regions used by the United Nations (UN) Population Division (UNDESA 2009). This classification system is widely applied and recognized. Moreover, estimates of induced abortion incidence are available for this same set of regional groupings (Sedgh et al. 2007a). We use several data sources, and these are specified in the course of describing the methods employed to make our estimations.

As presented here, the number of pregnancies is the sum of all live births, induced abortions, and miscarriages. Unintended pregnancies are defined here as being comprised of unplanned births, induced abortions, and

miscarriages. Estimates were made for each subregion, and these were summed to create estimates for major regions and for the world.

### Estimating the Number of Live Births

Estimates of live births for each subregion for 2008 are derived by interpolating between UN estimates for the two periods that overlap in that year. UN estimates are available for five-year time periods, and the following two periods were used: 2005–10 and 2010–15 (UNDESA 2009). The reference dates for these two time periods are their midpoints—July 2007 and July 2012; interpolation between these midpoints provide estimates for July 2008.

### Estimating the Number of Unplanned Births

Unplanned births are those occurring two or more years sooner than desired, or not wanted at all. For subregions in Africa, Asia, and Latin America, the proportions of births that were unplanned were estimated from the findings of nationally representative Demographic and Health Surveys conducted in 62 countries, as well as from those of similar surveys carried out in eight countries in Latin America, the Caribbean, and Central Asia. All of the surveys employed two standard questions concerning the intention status of each birth at the time of conception: (1) “At the time you became pregnant with (*child’s name*), did you want to become pregnant then, did you want to wait until later, or did you not want to have any (more) children at all?” (2) “How much longer would you like to have waited before you became pregnant with (*child’s name*)?” The second question permits identification of those mistimed births that occurred two or more years sooner than desired.

Most of the surveys were fielded between 2000 and 2007. Ten surveys conducted before 2000 were included for countries lacking more recent information, in order to achieve better regional and subregional representation. The countries surveyed before 2000 (Brazil, Côte d’Ivoire, Gabon, Kazakhstan, Kyrgyz Republic, Mauritania, Togo, Turkmenistan, Uzbekistan, and Yemen) represent 3 percent of the population of Asia and Africa and 42 percent of the population of the Latin America region.<sup>1</sup>

These data were supplemented with findings from independent surveys conducted in China (National Population and Family Planning Commission 2006), Mexico (CONAPO 2006), and South Korea (Han et al. 2005).

Regional and subregional estimates of the proportions of births that are unplanned (shown in Appendix Table A1) represent the weighted averages of data from the countries in each subregion for which data are available. For Africa, the weighted averages are based on sur-

veys that cover 84 percent of the population of the region; for Latin America and the Caribbean, the weighted average represents 81 percent of the region’s population; and for Asia, the proportion represented is 89 percent.

For Eastern Europe, Center for Disease Central and Prevention (CDC) surveys were the main data source, and available surveys represent 75 percent of the subregion’s population. For Northern, Southern, and Western Europe, data from several independent, subnational studies were employed (BZGA 2000; Rasch et al. 2001; De Graaf and Loozen 2005; Lakha and Glaiser 2006; Régnier-Loilier et al. 2007; Font-Ribera et al. 2008; Katus et al. 2008). Because of the limitations in data coverage, the available data were used to compute a single weighted average of the planning status of births that is applied to all three subregions.

The proportion of births that are unplanned for North America (which is defined by the UN to include the United States and Canada) is based on the 2002 National Survey of Family Growth of the United States, which represents 90 percent of the region (Chandra et al. 2005). Data on the planning status of births in Oceania are not available, and a number of assumptions were invoked to fill this information gap. Australia, the United States, and New Zealand have had similar levels of abortion, contraceptive use, and fertility for the past 15 years (Sedgh et al. 2007b; UNDESA 2008). Because these demographic indicators are likely to be strongly correlated with the proportion of births that are unplanned, the proportion of births that were unplanned for the United States was assumed to apply to Australia and New Zealand. In the absence of data for Melanesia and Micronesia, the proportion of births that were unplanned in the eastern Indonesian province of Nusa Tenggara was applied to this subregion. East Nusa Tenggara has a similar total fertility rate (TFR) and level of contraceptive use as does Papua New Guinea, which constitutes 68 percent of the population of Melanesia, Micronesia, and Polynesia (BPS and ORC Macro 2003; WHO 2009).

The proportions of births that are unplanned were applied to UN estimates of the numbers of births estimated to have occurred in 2008 in each region and subregion to women aged 15–44 to obtain the numbers of unplanned births in those areas.

### Estimating the Number of Induced Abortions

All induced abortions are assumed to have been performed for unintended pregnancies. Some of these pregnancies are likely to have been intended when conceived and terminated because of health or other reasons, but this proportion is likely small. Data for the United States suggest that fewer than 5 percent of abortions are per-

formed for pregnancies that were intended at the time of conception (Finer and Henshaw 2006).

The number of induced abortions that women underwent in 2008 was estimated by projecting the trend in the abortion rates estimated for 1995 (Henshaw et al. 1999) and 2003 (Sedgh et al. 2007a) (see Appendix Table A1) and applying the projected 2008 rates to UN estimates of the number of women aged 15–44 in 2008. Two exceptions occurred to this general approach: (1) We assumed that the decline in the abortion rate in Eastern Europe did not continue at the same rapid pace after 2003 as was estimated for 1995–2003, when the net decline was more than 50 percent, from 90 to 44 abortions per 1,000 women. We assumed instead that the annual rate of decline in the abortion rate from 2003 onward was half that in the earlier period. The more recent rate of decline is assumed to be 3.2 percent, which is still rapid relative to other regions. Official statistics on abortion incidence up to 2008, which are now available for some countries in this region, indicate that the pace of decline has slowed greatly. For example in Russia, which accounted for about half of all abortions performed in this region in 2003, the abortion rate fell by 6 percent annually between 1996 and 2003, but by only 3 percent between 2003 and 2008 (Sedgh et al. 2007b; Russian Federation 2010). The earlier sharp decline in the region coincided with dramatic increases in contraceptive prevalence (Westoff 2005), which likely began to reach a plateau later. (2) For North America, abortion estimates were available for the United States for 2000 and 2005, and we used these figures to project to 2008. Details about the sources of abortion data and estimation methodologies are available elsewhere (Henshaw et al. 1999; Sedgh et al. 2007a; WHO 2007).

### Estimating the Number of Miscarriages

Separate estimates for miscarriage are made for each subregion.<sup>2</sup> The miscarriages that represent 10 percent of all abortions are classified as unintended pregnancies. The miscarriages that represent 20 percent of live births are classified according to the intention status of the births. Intended and unintended pregnancies are thus assumed to have the same probability of ending in miscarriage. Unintended pregnancies may be more likely than intended pregnancies to end in miscarriages if women whose pregnancies are unintended are more likely to engage in behaviors that are sufficiently risky to cause a miscarriage. Empirical information on the planning status of miscarriages is extremely scarce, however. A national survey conducted in the United States in 2002 found that the proportion of all fetal losses that were unintended was slightly higher than, but not markedly different from, the proportion of live births that were unintended (40

percent compared with 34 percent) (Finer and Henshaw 2006). According to a recent review of the literature on differences in maternal behavior during pregnancy by pregnancy-planning status, a few studies conducted in developed countries have found a positive association between unintended pregnancies and risky maternal behaviors (particularly alcohol and drug use, cigarette smoking, and caffeine intake), but most studies yielded mixed or no effects (Gipson et al. 2008). The review also noted a dearth of research from developing countries, and did not study differentials in the incidence of miscarriage directly. In the absence of sufficient empirical evidence on the miscarriages by their intention status, we assume that they are distributed in the same way as live births.

A model-based approach derived from clinical studies of pregnancy loss by gestational age was employed to estimate the number of miscarriages (Bongaarts and Potter 1983). The model indicates that these losses are equal to approximately 20 percent of the number of births and 10 percent of the number of induced abortions. Findings from a survey of women in the United States support these model-based assumptions (Finer and Henshaw 2006). Although a uniform proportion is applied across all regions and subregions, the miscarriage rate differs slightly from region to region because varying proportions of women's pregnancies result in births and induced abortions.

### Calculating Pregnancy Rates

Total intended and unintended pregnancy rates per 1,000 women aged 15–44 in each subregion (shown in Table 2) were estimated using United Nations estimates of the 2008 midyear population of women aged 15–44 for each subregion and region. Estimates for 1995 are taken from an earlier publication that used a methodology and sources similar to those described above (Henshaw et al. 1999; AGI 2001).<sup>3</sup> The earlier estimates are adjusted to account for the planning status of miscarriages so as to be comparable with estimates made for 2008.

### Results

Of the estimated 208 million pregnancies occurring in 2008, 185 million took place in the developing world (see Table 1). Of these, 119 million pregnancies took place in Asia, 49 million took place in Africa, and 17 million in Latin America. Thirteen million pregnancies took place in Europe and 7 million in North America. Globally, about 86 million pregnancies were unintended, of which 33 million resulted in unplanned births, 41 million in abortions, and the remaining 11 million in miscarriages (calculated from Table 1).<sup>4</sup>

**Table 1** Number of pregnancies, percentage distribution of all pregnancies and of unintended-pregnancy outcomes, and pregnancy rates by intention status in major world regions and subregions, 2008

| Region                      | Total number of pregnancies (millions) | Percentage distribution of pregnancies |            | Percentage distribution of unintended pregnancy outcomes (as a percent of all pregnancies) |           |              | Pregnancy rate per 1,000 women aged 15–44 |          |            |
|-----------------------------|--|--|------------|--|-----------|--------------|---|----------|------------|
|                             |  | Intended                               | Unintended | Births   | Abortions | Miscarriages | All pregnancies                           | Intended | Unintended |
| World                       | 208.2                                  | 59                                     | 41         | 16   | 20        | 5            | 134                                       | 79       | 55         |
| More developed regions      | 22.8                                   | 53                                     | 47         | 15   | 25        | 6            | 90  | 48       | 42         |
| Less developed regions      | 185.4                                  | 60                                     | 40         | 16   | 19        | 5            | 143                                       | 85       | 57         |
| Africa                      | 49.1                                   | 61                                     | 39         | 21   | 13        | 5            | 222                                       | 136      | 86         |
| Eastern                     | 17.4                                   | 54                                     | 46         | 25   | 14        | 6            | 258                                       | 140      | 118        |
| Middle                      | 6.9                                    | 64                                     | 36         | 22   | 8         | 5            | 263                                       | 169      | 94         |
| Northern                    | 7.4                                    | 62                                     | 38         | 15   | 18        | 5            | 147                                       | 91       | 56         |
| Southern                    | 2.0                                    | 41                                     | 59         | 34   | 20        | 8            | 140                                       | 57       | 83         |
| Western                     | 15.5                                   | 70                                     | 30         | 16   | 10        | 4            | 243                                       | 171      | 72         |
| Asia <sup>a</sup>           | 118.8                                  | 62                                     | 38         | 12   | 21        | 5            | 127                                       | 78       | 49         |
| Eastern <sup>a</sup>        | 31.7                                   | 67                                     | 33         | 4  | 25        | 3            | 93  | 63       | 30         |
| South-central               | 60.4                                   | 62                                     | 38         | 15   | 18        | 5            | 150                                       | 94       | 56         |
| Southeastern                | 19.2                                   | 52                                     | 48         | 14   | 28        | 6            | 136                                       | 70       | 66         |
| Western                     | 7.5                                    | 56                                     | 44         | 24   | 15        | 6            | 143                                       | 80       | 64         |
| Europe                      | 13.2                                   | 56                                     | 44         | 11   | 28        | 5            | 86  | 49       | 38         |
| Eastern                     | 6.4                                    | 52                                     | 48         | 5  | 38        | 5            | 97  | 51       | 47         |
| Northern                    | 1.8                                    | 59                                     | 41         | 17   | 18        | 5            | 88  | 52       | 36         |
| Western                     | 2.4                                    | 58                                     | 42         | 17   | 20        | 5            | 76  | 44       | 32         |
| Southern                    | 2.7                                    | 61                                     | 39         | 18   | 16        | 5            | 75  | 45       | 29         |
| Latin America and Caribbean | 17.1                                   | 42                                     | 58         | 28   | 22        | 8            | 123                                       | 52       | 72         |
| Caribbean                   | 1.2                                    | 37                                     | 63         | 31   | 23        | 9            | 127                                       | 48       | 80         |
| Central America             | 4.6                                    | 57                                     | 43         | 20   | 17        | 6            | 125                                       | 71       | 54         |
| South America               | 11.3                                   | 36                                     | 64         | 31   | 24        | 9            | 122                                       | 45       | 78         |
| North America               | 7.2                                    | 53                                     | 48         | 23   | 18        | 7            | 102                                       | 53       | 48         |
| Oceania                     | 0.9                                    | 63                                     | 37         | 16   | 16        | 5            | 117                                       | 74       | 44         |

<sup>a</sup>Excludes Japan.

**Notes:** Figures for pregnancies include planned births, unplanned births, abortions, and miscarriages. “More developed regions” are defined here as consisting of Australia, Europe, Japan, New Zealand, and North America; all other regions are classified as less developed.

## Pregnancy Rates

As shown in Table 2, worldwide, 134 pregnancies occurred for every 1,000 women of reproductive age in 2008—a decline of 16 percent since 1995, when about 160 pregnancies occurred per 1,000 women. The pregnancy rate declined by 17 percent in both the developed and developing worlds: in the developing world it fell from 173 to 143 pregnancies per 1,000 women, and in the developed world it declined from 108 to 90 pregnancies. In the major developing regions of Africa, Asia, and Latin America and the Caribbean, the pregnancy rate fell by 15–23 percent.

In 2008, the pregnancy rate ranged from a low of 86 per 1,000 women aged 15–44 in Europe to a high of 222 in Africa. The current rates in Asia and the Latin America and Caribbean region are essentially the same (123–127) and are slightly more than half of the pregnancy rate in Africa. The rate in North America (102) is almost halfway between the rate in Europe and the rates in Asia and the Latin America and Caribbean region.

Table 1 indicates that variation in the current pregnancy rate among subregions is greater in Africa and Asia than in Latin America and Europe. The rates in Northern and Southern Africa are 147 and 140, respectively, compared with rates of 243–263 in the other three subregions of Afri-

ca. In Asia, the rate of 93 pregnancies per 1,000 women in Eastern Asia (comprised mainly of China) is much lower than those of the other three Asian subregions (136–150). In Europe, the range is narrower (pregnancy rates of 75–97), and in Latin America almost no variation is found among subregions, with pregnancy rates of 122–127.

The rate of unintended pregnancy worldwide has declined by 20 percent, from 69 to 55 per 1,000 women, between 1995 and 2008 (shown in Table 2). The decline was greater in the developed world, where the unintended pregnancy rate fell by 29 percent (from 59 to 42); in the developing world it declined by slightly less than 20 percent, from 71 to 57 per 1,000 women. The unintended pregnancy rate in the developing world is about 36 percent higher (57 versus 42) than that of the developed world, as of 2008 (see Figure 1). The highest observed intended and unintended pregnancy rates are found in Africa (136 and 86 respectively), and the lowest rates are found in Europe (49 and 38). Intended pregnancy rates are higher than unintended pregnancy rates in all geographic regions except Latin America.

In the developed world, the decline in the pregnancy rate was comprised mostly of a decline in unintended pregnancies (see Table 2), and this decrease occurred most dramatically in Eastern Europe, where a sharp rise



**Table 2** Trends in pregnancy rates, by planning status for major world regions, 1995 and 2008

| Region                      | 1995                                   |                                  |          |            | 2008                                   |                                  |          |            | 1995–2008                         |          |            |
|-----------------------------|--|----------------------------------|----------|------------|--|----------------------------------|----------|------------|-----------------------------------|----------|------------|
|                             | Total number of pregnancies (millions) | Rates per 1,000 women aged 15–44 |          |            | Total number of pregnancies (millions) | Rates per 1,000 women aged 15–44 |          |            | Cumulative percent change in rate |          |            |
|                             |  | All pregnancies                  | Intended | Unintended |  | All pregnancies                  | Intended | Unintended | All pregnancies                   | Intended | Unintended |
| World                       | 209.5                                  | 160                              | 91       | 69         | 208.2                                  | 134                              | 79       | 55         | -16                               | -14      | -20        |
| More developed regions      | 27.9                                   | 108                              | 49       | 59         | 22.8                                   | 90                               | 48       | 42         | -17                               | -2       | -29        |
| Less developed regions      | 181.5                                  | 173                              | 102      | 71         | 185.4                                  | 143                              | 85       | 57         | -17                               | -17      | -20        |
| Africa                      | 40.2                                   | 262                              | 170      | 92         | 49.1                                   | 222                              | 136      | 86         | -15                               | -20      | -7         |
| Asia <sup>a</sup>           | 122.8                                  | 156                              | 92       | 64         | 118.8                                  | 127                              | 78       | 49         | -18                               | -15      | -23        |
| Europe                      | 18.5                                   | 116                              | 51       | 65         | 13.2                                   | 86                               | 49       | 38         | -26                               | -4       | -42        |
| Latin America and Caribbean | 18.3                                   | 159                              | 63       | 96         | 17.1                                   | 123                              | 52       | 72         | -23                               | -18      | -25        |
| North America               | 6.8                                    | 102                              | 54       | 48         | 7.2                                    | 102                              | 53       | 48         | 0                                 | -2       | 0          |
| Oceania                     | 1.1                                    | 134                              | 89       | 45         | 0.9                                    | 117                              | 74       | 44         | -13                               | -17      | -2         |

<sup>a</sup>Excludes Japan

**Notes:** Figures for pregnancies include planned births, unplanned births, abortions, and miscarriages. Figures for unintended pregnancies include unplanned births, abortions, and miscarriages of unintended pregnancies. "More developed regions" are defined here as consisting of Australia, Europe, Japan, New Zealand, and North America; all other regions are classified as less developed.

in contraceptive use since the early 1990s is credited for a dramatic fall in abortion rates (Westoff 2005). In the developing world, both intended and unintended pregnancy rates fell; this decline appears to reflect changes both in fertility desires and in couples' ability to realize their fertility aspirations.

At the regional level, we find that all but one of the major regions examined experienced a decline in the overall and unintended pregnancy rates between 1995 and 2008. The only region in which the overall and unintended pregnancy rates have not changed is North America (102 and 48 per 1,000 women, respectively). The unintended pregnancy rate in 2008 in North America is much higher than those of Northern, Southern, and Western Europe (29–36) (see Table 1).

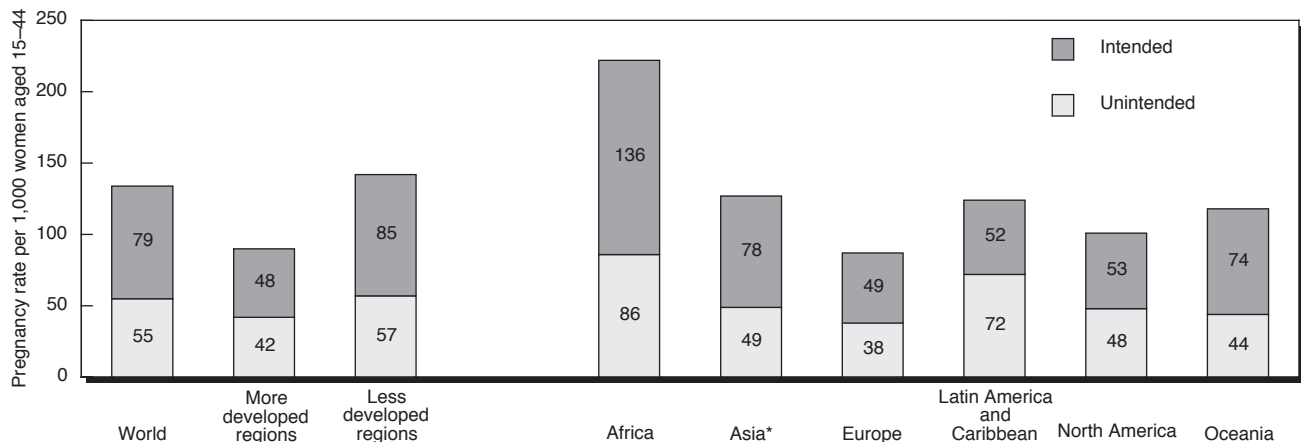
At the subregional level, the highest unintended pregnancy rates as of 2008 are in Eastern and Middle Africa (118 and 94, respectively). The lowest rates are in Western and Southern Europe (32 and 29) and Eastern Asia (30).

The rate of unintended pregnancy in North America (48) is similar to the rate in Eastern Europe (47). Although pregnancy rates vary little among the subregions of Latin America, the unintended pregnancy rate is much lower in Central America (54) than in South America or the Caribbean (78–80).

### Distribution of Pregnancies by Planning Status and Outcome

Despite declines in pregnancy rates and in unintended pregnancy rates, the proportion of all pregnancies that are unintended remains high. About four in ten pregnancies (41 percent) worldwide in 2008 were unintended (see Table 1). Roughly half of unintended pregnancies ended in induced abortion. The proportion of unintended pregnancies ending in abortion is higher in the more developed countries (53 percent [25 ÷ 47 percent]), compared with less developed countries (48 percent [19 ÷ 40 percent]).

**Figure 1** Rates of unintended and intended pregnancy, worldwide and by region, 2008



\*Excludes Japan.

The proportion of all pregnancies that are unintended is highest in the Latin America and Caribbean region (58 percent); 38 percent (22 ÷ 58) of unintended pregnancies in that region end in abortion. This finding might reflect a combination of the widespread desire for small families and, despite high levels of contraceptive use, continued constraints on couples' ability to practice contraception correctly and continuously. In Africa, where the desired family size is still relatively high, only 39 percent of pregnancies were unintended. One-third of unintended pregnancies in Africa ended in induced abortion (13 ÷ 39).

About 28 percent of all pregnancies in Latin America resulted in unplanned births in 2008—the highest regional proportion in the world. The proportions of pregnancies that led to unplanned births were moderately high in Africa (21 percent) and in North America (23 percent). The lowest incidence of unplanned births, as a percent of all pregnancies, occurred in Asia and Europe (12 percent and 11 percent, respectively), and especially in the subregions of Eastern Asia and Eastern Europe (4 percent and 5 percent).

Women facing unintended pregnancies in North America are more likely than their European counterparts to experience unplanned births: 48 percent (23 ÷ 48) of all unintended pregnancies led to unplanned births in North America, compared with only 25 percent (11 ÷ 44) in Europe overall. North American women are less likely than European women to undergo an abortion when they have experienced an unintended pregnancy.

## Discussion

This research represents the first evaluation of worldwide trends in pregnancy levels by their planning status and outcome. During the past 13 years, the pregnancy rate has declined globally, and more than half of this decline has been in the unintended pregnancy rate. Women continue to resolve about half of their unintended pregnancies with induced abortion.

Concurrent with the decreasing incidence of unintended pregnancy has been an increase in the use of contraceptives. Globally, the proportion of married women using a method of contraception increased at an annual rate of 1.3 percent, from 54 percent in 1990 to 63 percent in 2003 (UN 2004; UNDESA 2008). Use of both modern and traditional methods increased at the same pace, indicating that no significant shift has occurred toward using more effective methods during this period of time. Traditional methods continue to form a non-negligible proportion of contraceptive use globally (11 percent of all users), and at a higher proportion in the developed than in the developing world (17 percent and 10 percent of all users, respectively; UNDESA 2008).

Nevertheless, the unintended pregnancy rate remains high, particularly in developing regions, and especially in sub-Saharan Africa. Unintended pregnancies have many causes, including underlying factors such as poverty (having resources inadequate for rearing a child), stigma against unmarried mothers, a cultural preference for sons, competing demands on women's time (such as paid work or school), completion of family size, disagreement between spouses about family size, lack of support from one's partner (economic or otherwise), and poor access to family planning services. More proximate factors include discontinuation of contraceptive use due to problems with methods or supplies, nonuse of contraceptives because of fear of methods' side effects, poor understanding of the risk of pregnancy, partner's opposition to the use of contraceptives, problems with accessing contraceptive services and/or supplies, and unexpected changes in life circumstances (for example divorce or separation, unemployment, or illness).

A measure of the proportion of women who have an unmet need for contraception can both help explain variations in the levels of unintended pregnancy and provide direction to policy and programs on how to reduce the rate of unintended pregnancy. According to the prevailing definition, a woman has an unmet need for contraception if she is fertile, sexually active, and does not want to have a child in the next two years but is not using any form of contraception. Unmet need among married women fell in all of the major regions from the early 1990s to the mid-2000s as contraceptive use increased: from 18 percent to 13 percent in Asia, from 16 percent to 10 percent in Latin America, and from 24 percent to 22 percent in sub-Saharan Africa (Sedgh et al. 2007c). Nevertheless, in 2008, an estimated 140 million women in the developing world who would prefer to delay or cease childbearing were not practicing contraception, and an additional 75 million were using traditional methods that have high failure rates (Singh et al. 2009). The persistent high levels of unmet need in Africa correspond with the particularly high levels of and relatively small declines in unintended pregnancy there. Moreover, some women who use modern methods use them incorrectly or inconsistently.

According to recent estimates, if all of the unmet demand for effective contraception in the developing world were satisfied (that is, if all nonusers and all of those who are using traditional methods began to use modern methods), 54 million unintended pregnancies would be averted annually, including 22 million unplanned births, 25 million induced abortions, and 7 million miscarriages (Singh et al. 2009).<sup>5</sup>

Despite the decline in unintended pregnancies worldwide from 1995 to 2008, half of unintended pregnancies were resolved by induced abortion in 2008. More than

half of all abortions worldwide are considered unsafe, and, in fact, the unsafe abortion rate has declined little between 1995 and 2003 (Sedgh et al. 2007a). Unsafe abortions are the cause of about one in seven maternal deaths (WHO 2007) and are estimated to result in the hospitalization of approximately five million women annually in the developing world (Singh 2006). Unwanted and mistimed births can also pose health risks to mother and infant—for example, when births are closely spaced, when a woman is too young or too old to bear children safely, or when she already has several children or is ill-prepared to care for a child (Brown and Eisenberg 1995; Marston and Cleland 2003; Gipson et al. 2008). Unplanned births can also have broader negative consequences—for example, on the mother's psychological well-being (Hardee et al. 2004). For unmarried adolescents and young women, the consequences of an unplanned birth can include being forced to drop out of school, having to face rejection from one's family and community, and, in some highly conservative societies, being forced to marry or experiencing serious physical harm.

The incidence of unwanted pregnancy might decline more slowly than expected, and might even rise for a while, as countries move through the fertility transition (Bongaarts 1997). This increase can occur even as contraceptive use expands, if the trend toward a desire for small families and more precisely timed births outpaces increases in contraceptive use. Moreover, the worldwide trend toward a higher average age at marriage, combined with little change in the average age at first intercourse (Lloyd 2005), is likely to result in increased levels of unintended pregnancy among unmarried women if contraceptive use does not keep pace with growing demand.

Country-level estimates of unintended pregnancy are needed to inform government policies and programs, and estimates for subgroups and regions within countries would also greatly improve the ability of governments to identify the groups that are most in need of improved contraceptive services. Such estimates have been developed in recent years for a few countries, and these show that trends and levels of unintended pregnancy can vary widely. A study conducted in the Philippines showed that the national unintended pregnancy rate changed little between 1994 and 2000 (Juarez et al. 2005), although the rate rose in Metro Manila and dropped in the other three major regions. In Uganda, although data for trends are not available, a recent study shows that the region with the highest level of contraceptive use and the lowest level of unmet need nevertheless had one of the highest levels of unintended pregnancy in the country (Singh et al. 2005). These patterns likely occurred because the preference for small families and precisely timed births was more strongly held among women with unmet need in that region than elsewhere.

National and local policies and programs also influence the provision of contraceptive services, affecting the level and uptake in contraceptive use and thereby affecting the level of unintended pregnancy and, potentially, the induced abortion rate. The case of the Philippines is illustrative: decentralization of health care service provision combined with a highly conservative city government led to a sharp decline in public-sector provision of modern methods of contraception in Metro Manila, likely contributing to the increase in unintended pregnancy between 1994 and 2000 (Juarez et al. 2005). More recently, the phasing out of USAID support for family planning supplies between 2004 and 2008 (Guttmacher Institute and Likhaan 2010), combined with the lack of a complementary increase in support from the government, may well lead to increased levels of unintended pregnancy and of induced abortion.

Measuring the planning status of births is a difficult task and a subject of ongoing methodological work (Bachrach and Newcomer 1999; Klerman 2000; Stanford et al. 2000; Barrett and Wellings 2002; Barrett et al. 2004; Brückner et al. 2004; Casterline and El-Zeini 2007). Variations exist in the strength of women's need or desire to avoid having a child, and these differences are difficult to capture (Lifflander et al. 2007; Santelli et al. 2009). Moreover, women's reports of the planning status of their births can depend on when they are surveyed, relative to the time of their pregnancies. Research indicates that women are more likely to report that a particular pregnancy was wanted as time passes (Bankole and Westoff 1998; Joyce et al. 2000; Marston and Cleland 2003; Koenig et al. 2006). Most available information from developing countries on the proportion of live births that are unplanned is based on retrospective surveys and not on prospectively collected data. Therefore, the levels of unintended pregnancy presented here are underestimated. Estimates for the developed world are based on a variety of data sources, including facility-based studies that survey women about the planning status of their current pregnancies.

These estimates do not take into account the preferences of male partners regarding the intention status of births. Men's and women's preferences may differ, and the disparities in partners' aspirations are likely to be larger in some parts of the world than in others. Few studies have been conducted concerning this issue, but the limited literature has identified substantial differences in fertility aspirations of men and women in many countries, especially in sub-Saharan Africa (Bankole and Singh 1998; Carter and Speizer 2005; Bronte-Tinkew et al. 2007; Gebreselassie 2008). The evidence available to date shows that in many sub-Saharan African countries, men are more likely than women to want large families, and, therefore, they might be less likely to classify births as unintended. More

research is needed to explore the potential impact of these differences on estimates of unintended pregnancy.

In order to estimate pregnancy incidence in each of the major regions and subregions of the world, we have had to make assumptions so as to fill in gaps where data are not available. Thus the estimates presented here are approximations. Perhaps surprisingly, data on measures of fertility intentions are more sparse in developed regions than in developing regions. So, for example, we had to estimate the proportion of births that are unplanned for the three subregions of Europe (other than Eastern Europe) based on small-scale studies, and for Australia and New Zealand based on the assumption that their situation is similar to that of the United States. Another limitation of the current measure of unintended pregnancy is that it does not distinguish between degrees of unintendedness. Improved approaches that measure the different dimensions of intention status would make possible a more refined measure of pregnancy-intention status.

The findings presented here offer a comprehensive and detailed picture of the current incidence and recent trends worldwide in unintended pregnancies according

to their outcome. Although the measurement of unintended pregnancy should be further refined in the future, the information now available can provide useful guidance—especially to international and regional agencies—for setting priorities and for formulating policies and programs to improve reproductive health by helping women and couples prevent unintended pregnancies and achieve a safe resolution of such pregnancies when they occur. That unintended pregnancies have declined in recent years is encouraging. Many fundamental initiatives are required, however, to further reduce the incidence of unintended pregnancy in light of the complex set of factors that contribute to its occurrence. One immediate means of reducing unintended pregnancy is to improve the coverage and quality of contraceptive care, which will likely also involve increasing the allocation of resources to family planning service provision, especially in poor and low-income countries and among poor women in all countries. Efforts to improve family planning services on a global scale would go a long way toward alleviating existing unmet need for contraception, and would make a large contribution to reducing unintended pregnancy.

## Appendix

**Table A1** Global induced abortion rates and planning status of births, by major regions and subregions

| Region/country                   | Induced abortion rate per 1,000 women aged 15–44 |      |  | Unplanned births <sup>a</sup>           |                             |
|----------------------------------|--|------|--|---|-----------------------------|
|                                  | 1995   | 2003 | Average annual percent change in rate, 1995–2003 | Percent of region represented by survey | Percent of births unplanned |
| World                            | 35   | 29   | –2.1   | 86                                      | 22                          |
| More developed regions           | 39   | 26   | –4.2   | na                                      | 22                          |
| Less developed regions           | 34   | 29   | –1.8   | 88                                      | 22                          |
| Africa                           | 33   | 29   | –1.5   | 84                                      | 30                          |
| Eastern                          | 41   | 39   | –0.6   | 93                                      | 32                          |
| Middle                           | 35   | 26   | –3.2   | 81                                      | 36                          |
| Northern                         | 17   | 22   | 3.7  | 54                                      | 23                          |
| Southern                         | 19   | 24   | 3.3  | 97                                      | 51                          |
| Western                          | 37   | 28   | –3.0   | 97                                      | 22                          |
| Asia <sup>b</sup>                | 33   | 29   | –1.5   | 89                                      | 17                          |
| Eastern <sup>b</sup>             | 36   | 28   | –2.8   | 98                                      | 9                           |
| South-central                    | 28   | 27   | –0.4   | 92                                      | 22                          |
| Southeast                        | 40   | 39   | –0.3   | 74                                      | 25                          |
| Western                          | 32   | 24   | –3.1   | 55                                      | 34                          |
| Europe                           | 48   | 28   | –1.9   | 67                                      | 18                          |
| Eastern                          | 90   | 44   | –6.4   | 75                                      | 10                          |
| Other than Eastern               | 18   | 15   | –1.1   | na                                      | 26 <sup>c</sup>             |
| Latin America and Caribbean      | 37   | 31   | –2.0   | 81                                      | 44                          |
| Caribbean                        | 50   | 35   | –3.8   | 55                                      | 50                          |
| Central America                  | 30   | 25   | –2.1   | 95                                      | 30                          |
| South America                    | 39   | 33   | –1.9   | 78                                      | 50                          |
| North America                    | 22   | 21   | –1.8 <sup>d</sup>                                | 90                                      | 35                          |
| Oceania                          | na   | 17   | 1.8  | na                                      | 27 <sup>e</sup>             |
| Australia and New Zealand        | 17   | 20   | 2.6  | na                                      | na                          |
| Melanesia, Micronesia, Polynesia | na   | 10   | 0.0  | na                                      | na                          |

na = Not available.

<sup>a</sup> In this article, the terminology “unplanned births” is used, rather than “unintended births.” <sup>b</sup> Excludes Japan. <sup>c</sup> Figures are based on subnational and national surveys for a number of countries. <sup>d</sup> Annual rate of change for North America is based on information for 2000 and 2005. <sup>e</sup> Figures for Australia and New Zealand are based on data for the United States in 2002 and for Melanesia, Micronesia, and Polynesia based on estimates for East Tenggara, Indonesia, 2003.

**Note:** “More developed regions” are defined here as consisting of Australia, Europe, Japan, New Zealand, and North America; all other regions are classified as less developed.



## Notes

- 1 Brazil comprises 42 percent of the population of the Latin America region. Because contraceptive prevalence in that country was fairly high (77 percent) and the total fertility rate low (2.6 births) in 1996, the proportion of births that are unintended in this country is assumed to have changed little since that time.
- 2 We use the term “miscarriage” to refer to all spontaneous fetal losses, including stillbirths. Clinical studies generally document miscarriages starting from the fifth or sixth week of gestation; miscarriages before the fifth week are not typically included in existing studies and are not part of the pregnancy estimates. The level of spontaneous abortion is believed to vary little at the aggregate level over time and across countries, but no recent works have been found on this topic. Future research should confirm whether levels have remained unchanged over time and whether they remain similar across countries.
- 3 We adjusted the 1995 data for Oceania as follows: we used 1994 DHS findings from Irian Jaya to estimate the planning status of births in Melanesia, Micronesia, and Polynesia. The published estimates for 1995 are based upon the assumption that the planning status of births in this subregion was the same as that of Australia and New Zealand.
- 4 Calculations in Table 1 are based on unrounded numbers and may not match calculations using the rounded numbers shown.
- 5 Allowing for population growth and small declines in unintended pregnancy levels between 2003 and 2008, the values for 2008 are likely to be very similar to those for 2003. These estimates include unmarried sexually active women as well as married women.

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