Chapter 2

Burden of Reproductive Ill Health

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INTRODUCTION

This chapter presents the burden of global reproductive ill health and, where data permit, regional estimates for selected conditions. *Ill health* refers to morbid conditions such as infections and injury and to nonmorbid measures of reproductive health that directly contribute to adverse reproductive health outcomes, including unwanted pregnancies and violence against women. The chapter is organized into six subsections: unintended pregnancies, unsafe abortions, non-sexually transmitted reproductive tract infections (RTIs), infertility, violence against women, and female genital mutilation (FGM). Unintended pregnancies lead to unintended births and induced abortions. Unintended births often occur among young women who are emotionally and physiologically not mature, which has effects on the health of the mother, the pregnancy, and its outcome. Induced abortions in countries where the practice is illegal are often provided in unsafe environments and by untrained personnel, which contribute to the high maternal death from abortion complications. Sexually transmitted infections (STIs) of the reproductive tract receive attention in programming and research, but little attention is focused on other infections that affect fertility and increase the risk of transmission of other infections. Violence against women violates their rights, including limiting access to and use of prevention and treatment services in addition to physical injury and death. FGM causes bodily disfigurement and may present immediate surgical complications and long-term risk of poor reproductive outcomes, especially during delivery.

Approach to Data Presentation and Limitations

The greatest challenge in undertaking this work is the lack of appropriate data at the global, regional, national, and subnational levels. Even available data are often not adequately disaggregated by important characteristics. Differences in methods and designs adopted by the various studies often limit the comparative value. In many low- and middle-income countries (LMICs), sexual concerns are often not discussed with third parties, which impedes health care seeking. Measuring and quantifying most of these conditions is logistically difficult, and the reliability of responses given by respondents is often poor (Allotey and Reidpath 2002). Because most reproductive conditions are more prevalent during prime ages, missed cases are likely to lead to serious underestimation of the burden of disease as measured by disability-adjusted life years (DALYs) of health lost (AbouZahr and Vaughan 2000).

UNINTENDED PREGNANCIES

Premarital sexual abstinence, prolonged breastfeeding, and abortion all influence fertility; however, contraceptive practice has been the most important driver of

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falling fertility and population growth rates in the past half century. Because of its direct link to family sizes and population change, contraception has a wide range of social, economic, and environmental benefits, in addition to its well-documented health advantages for women and children. It enables women to escape the incessant cycle of pregnancies and infant care and represents progress toward gender equality and enhanced opportunities for women. At the national level, a fall in birth rates brings about declines in dependency ratios and increases potential opportunities for economic growth.

Contraception has wider social and economic benefits, but its immediate purpose is to avoid unintended pregnancies. The majority of these pregnancies stem from the non-use of contraceptive methods among women wishing to avoid or postpone childbearing. This section discusses the measurement of unintended pregnancies, both levels and trends, and reasons for and consequences of unintended births.

Measurement

Measurement of unintended pregnancies is complicated because many are terminated, and these terminations are underreported. Because most induced abortions are from unintended pregnancies, the solution is to combine survey data on unintended births with indirect estimates of abortion incidence available for all subregions and many countries.

Demographic and Health Surveys (DHS) are the main source of data on unintended births. The measurement of unintended births or current pregnancies from this source has been approached in three ways:

- Answers to questions on total desired family size
- Prospective questions on whether another child is wanted
- Retrospective questions on each recent birth to ascertain whether the child was wanted, unwanted, or mistimed by two or more years.

In the first approach, births that exceed total desired family size are defined as unwanted; if they are equal to or less than total desired family size, they are considered wanted. This classification can be expressed as unwanted or wanted fertility rates. No account is taken of mistimed births. A more serious problem stems from the likelihood that desired total family sizes are, in part, a rationalization of actual family sizes, with the consequence that unwanted births are likely to be underestimated.

The second approach is straightforward in prospective studies, but its application is severely limited by the lack of studies. This method has been adapted to single and successive cross-sectional surveys to provide aggregate estimates of unwanted fertility (Casterline and El-Zeini 2007). As with the first approach, mistimed births are ignored.

The third approach uses retrospective questions concerning the wantedness and preferred timing of recent births. It has the advantage of incorporating mistimed as well as unwanted births, but estimates are vulnerable to post factum rationalization due to an understandable reluctance of mothers to report children as unwanted or mistimed. Prospective studies in India, Malawi, Morocco, and Pakistan indicate that a large proportions of births to women who reported at baseline a desire to have no more children were subsequently classified by mothers as wanted or mistimed (Baschieri and others 2013; Jain and others 2014; Speizer and others 2013; Westoff and Bankole 1998). Similarly, an appreciable fraction of births that occur as the result of accidental pregnancy while using a contraceptive method or after abandoning a method are reported as wanted. (Ali, Cleland, and Shaw 2012; Curtis, Evens, and Sambisa 2011; Trussell, Vaughan, and Stanford 1999). These inconsistencies are usually interpreted as the consequence of rationalization, but they may reflect a genuine difference between a more abstract preference before childbirth and a more emotional reaction after the event.

The three approaches to measurement yield very different results. No consensus exists on how best to obtain valid estimates of unintended births, even in the United States, where the topic has attracted considerable attention (Campbell and Mosher 2000; Santelli and others 2003). This section presents results based on the retrospective method because studies using this method are the sole source of global and regional estimates, but the results are presented with the caveat that they may be downwardly biased. Another approach that has been tried, but on a limited scale, is the London Measure of Unplanned Pregnancy (Morof and others 2012; Wellings and others 2013).

Prevalence and Incidence

By combining regional estimates on induced abortion and retrospective survey data on mistimed and unwanted births with allowances for miscarriages, Sedgh, Singh, and Hussain (2014) derive global and regional estimates on the incidence of unintended pregnancies and the proportion of all pregnancies that are unintended (table 2.1). Globally, their prevalence data indicate that 40 percent of all pregnancies in 2012 were unintended. The prevalence of unintended pregnancies is higher, and such pregnancies are more likely to be

Table 2.1 Indicators of Unintended Pregnancies, 2012

Region	Total number of pregnancies (millions)	Pregnancy rate per 1,000 women ages 15–44 years			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

Source: Sedgh, Singh, and Hussain 2014.
Note: In this table, "more developed" comprises Australia, Europe, Japan, New Zealand, and North America. "Less developed" comprises all others.
a. If 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.

terminated, in high-income countries (HICs) than in LMICs. However, when expressed as annual rates per 1,000 women of reproductive age, unintended pregnancies are more common in LMICs.

There is little relationship between the prevalence or incidence of unintended pregnancy and the level of contraceptive use or unmet need. The reason for this apparently counterintuitive observation is that exposure to risk of unintended pregnancy increases as desired family size and fertility fall. In societies in which sexual activity starts early and couples want two or fewer children, the risk of an unintended pregnancy spans 20 years or more. The use of effective contraception for so many years is a daunting prospect. In societies in which the preference for larger families remains high, as in much of Sub-Saharan Africa, the risk span is shorter. Despite this upward pressure from increasing exposure to risk, unintended pregnancy rates per 1,000 women of reproductive age fell by an estimated 4.8 percent and 5.3 percent in HICs and LMICs, respectively, between 2008 and 2012 (Sedgh, Singh, and Hussain 2014). There was a 5.6 percent decline in Latin America and the Caribbean,

and a 6 percent decline in both Asia and Africa. Intended pregnancy rates in LMICs did not change during the period (85 per 1,000 women of reproductive age).

In Sub-Saharan Africa, the proportion of mistimed births is about twice that of unwanted pregnancy among all unplanned births. In Latin America and the Caribbean, mistimed births are about 37 percent higher than unwanted pregnancy as a percentage of all unplanned births (Sedgh, Singh, and Hussain 2014). An application of the standard DHS measure of unwanted fertility, based on total desired family size, shows that unwanted fertility rates are strongly related to household poverty. Averaged across 41 LMICs, the poorest quintile recorded 1.2 unwanted births, compared with about 0.5 such births among the richest quintile (Gillespie and others 2007).

Reasons for Unintended Pregnancies

Approximately 70 percent of unintended pregnancies in LMICs are the direct result of no use or discontinued use of contraceptives; the balance results from accidental pregnancy while using contraception inconsistently or incorrectly and from method failure (Bradley, Croft, and Rutstein 2011; Singh, Darroch, and Ashford 2014). Accordingly, the reasons for unintended pregnancy should be sought primarily in reasons for non-use of contraceptives. In-depth studies confirm survey evidence that health concerns and low perceived risk of conception are genuine and common reasons for non-use but also suggest that lack of knowledge and social obstacles, including fear of others' disapproval, are more important barriers than the survey data imply (Sedgh, and Hussain 2014; Westoff 2012).

Consequences

Insufficient data exist to indicate whether unintended pregnancies carried to term are disadvantaged in health or schooling, compared with intended births. Other effects of unintended pregnancies on family health are easier to document. A reduction in the number of unintended pregnancies is the greatest health benefit of contraception. In 2008, contraception prevented an estimated 250,000 maternal deaths, and an additional 30 percent of maternal deaths could be avoided by fulfillment of the unmet need for contraception (Cleland and others 2012). By preventing high-risk pregnancies, especially in women of high parities, and those that would have ended in unsafe abortion, increased contraceptive use has also reduced the maternal mortality ratio—the risk of maternal death per 100,000 live births—by 26 percent in little more than a decade. The reduction in unintended pregnancies represents major savings in the costs of maternal and neonatal health services (Singh and Darroch 2012).

The reduction of mistimed and unwanted births also improves perinatal outcomes and child survival by lengthening interpregnancy intervals. In LMICs, the risk of prematurity and low birth weight doubles when conception occurs within six months of a previous birth; children born within two years of an older sibling are 60 percent more likely to die in infancy than are those born three years or more after their sibling. In early childhood, children who experience the birth of a younger sibling within two years have twice the risk of death than other children. In high-fertility countries, where most children have younger and older siblings, ensuring an interval of at least two years between births would reduce infant mortality by 10 percent and early childhood deaths by 20 percent (Cleland and others 2012; Cohen and others 2012; Hobcraft, McDonald, and Rutstein 1985; Kozuki and Walker 2013; Kozuki and others 2013).

The reduction of teenage pregnancies is an international priority, both because of the excess risk to maternal health of pregnancy and childbirth before age 18 and because it may curtail schooling and blight aspirations. In most Sub-Saharan African countries, more than 25 percent of women become mothers before age 18 years; equally high probabilities of early childbearing are recorded in Bangladesh, India, the Republic of Yemen, and several countries in Latin America and the Caribbean (Dixon-Mueller 2008). However, the primary cause is early marriage, and first births within marriage are unlikely to be considered unintended.

With respect to perinatal and child health and survival, evidence of an adverse effect of large family sizes is weak (Desai 1995). Excess risk of death is restricted to children of birth order seven or higher, and the relationship between birth order and malnutrition is small and irregular in Sub-Saharan Africa (Mahy 2003; Mukuria, Cushing, and Sangha 2005).

Finally, evidence from Matlab, Bangladesh, suggests the long-term benefits of reduced fertility. In the experimental area in which an early decline in fertility occurred, women had better nutritional status, more assets, and higher earnings than in higher fertility areas. Boys' schooling and girls' nutrition benefited from low fertility (Canning and Schultz 2012).

UNSAFE ABORTION

The World Health Organization (WHO) defines unsafe abortion as the termination of an unwanted pregnancy, either by persons lacking the necessary skills or in an environment lacking minimal medical standards or both.

Unsafe abortion is a major cause of maternal morbidity and mortality, especially in LMICs. About 7 million women are treated for complications from unsafe abortion procedures annually in LMICs (Singh and Maddow-Zimet 2015). Two studies, using different methodologies, indicate that at least 8 percent of maternal mortality is due to unsafe abortion, and the contribution of abortion may be as high as 18 percent of these deaths (Kassebaum and others 2014; Say and others 2014).

Measurement

In countries in which abortion is legally restricted or socially stigmatized, official statistics on abortion are usually nonexistent; those that do exist are typically incomplete and unreliable (Ahman and Shah 2012). Approaches that directly measure unsafe abortion, such as sample surveys and in-depth interviews, are unreliable. Accordingly, efforts to better measure incidence have largely used indirect methods (Ahman and Shah 2012), including surveys of abortion providers, complications statistics, anonymous third-party reports, estimates from experts, and regression equation approaches (Rossier 2003; Singh, Prada, and Juarez 2011).

The WHO's indirect approach involves using available information on unsafe abortion and associated mortality from hospital records and surveys of abortion providers, women's abortion-seeking behavior, postabortion care, and laws regarding abortion to obtain country estimates of unsafe abortion rates. The country-level estimates are then aggregated at the regional and global levels to ensure robust estimates that can potentially offset underestimation or error at the level of individual countries (Ahman and Shah 2012; WHO 2011). The WHO has used this methodology to produce global and regional estimates of unsafe abortion for 1990, 1993, 1996, 2000, 2003, and 2008. These estimates are likely to be conservative (Ahman and Shah 2012).

Much of what is known about the magnitude of unsafe abortion at the country level is from indirect methods, particularly the residual method (Johnston and Westoff 2010), and the Abortion Incidence Complications Methodology (AICM) (Singh, Prada, and Juarez 2011). The AICM relies primarily on data from two surveys: a nationally representative survey of health facilities likely to provide postabortion care, and a purposive sample of health professionals knowledgeable about abortion in the country. The methodology yields estimates of the incidence of unsafe abortion and abortion-related morbidity (table 2.3, columns 1 and 3). The rates tend to be higher in Latin America and the Caribbean than in Asia and Sub-Saharan Africa. Although AICM has been an important source of knowledge in countries with restrictive abortion laws, its limitations include high costs, dependence on a number of assumptions, and reliance on the opinions of health professionals (Juarez, Cabigon, and Singh 2010).

Incidence

An estimated 21.6 million unsafe abortions, or 14 per 1,000 women ages 15–44 years, were performed in 2008 (WHO 2011). These unsafe procedures constituted nearly 49 percent of all abortions, which totaled 43.8 million, or 28 per 1,000 women ages 15–44 years that year (Sedgh and others 2012). Virtually all of the unsafe abortions (98 percent) occurred in LMICs; the highest rates were found in Latin America and the Caribbean (31 per 1,000), followed by Sub-Saharan Africa (28) and Asia (11). The rate of unsafe abortion in HICs is only one per 1,000 (WHO 2011).

The global incidence has remained virtually unchanged since 1995, at 15 per 1,000 women ages 15–44 years in 1995 and 14 per 1,000 in 2003 and 2008 (table 2.2). In LMICs, unsafe abortion is highest among women ages 20–24 years and 25–29 years, with rates of 30 and 31, respectively, per 1,000 women in these age groups (Ahman and Shah 2012). The rate is lowest among women ages 40–44 years (13 per 1,000), and the rate among adolescent women is moderate (16 per 1,000).

Consequences

Maternal Mortality

Unsafe abortion involves health, economic, and social sequelae (Singh and others 2006). The WHO estimates that in 2008, 47,000 women died from unsafe abortion, translating to 30 unsafe abortion deaths per 100,000 live births (WHO 2011). Nearly two-thirds of the deaths (29,000) occurred in Sub-Saharan Africa.

Worldwide, the abortion case fatality rate is 220 per 100,000 unsafe abortions. The rate is highest in Sub-Saharan Africa (460 per 100,000); it is 160 in Asia and 80 in Latin America and the Caribbean. This wide variation across regions is not surprising, since the measure is largely a function of the risks associated with prevalent abortion methods and access to emergency care. Accordingly, while the incidence of unsafe abortion is similar for Sub-Saharan Africa and Latin America and the Caribbean, the procedure is less deadly in Latin America and the Caribbean because of widespread use of medical abortion and better access to health care (WHO 2011). In 2015, the estimated number of maternal deaths worldwide was 303,000 (Alkema and others 2015). According to two more recent parallel studies, the proportion of these deaths that is due to unsafe abortion ranges between

Table 2.2 Trends in Rates of Unsafe Abortion and the Proportion of All Abortions That Are Unsafe: 1995–2008

Region and subregion	2008		2003		1995	
	Rate of unsafe abortion*	Percentage of all abortions that are unsafe	Rate of unsafe abortion*	Percentage of all abortions that are unsafe	Rate of unsafe abortion*	Percentage of all abortions that are unsafe
World	14	49	14	47	15	44
HICs	1	6	2	7	4	9
LMICs	16	56	16	55	18	54
Africa	28	97	29	98	33	99
Asia	11	40	11	38	12	37
Europe	2	9	3	11	6	12
Latin America and the Caribbean	31	95	30	96	35	95
North America	<0.5	<0.5	<0.5	<0.5	<0.5	<0.5
Oceania	2	15	3	16	5	22

Source: Sedgh and others 2012.
Note: HICs = high-income countries; LMICs = low- and middle-income countries.
*Abortions per 1,000 women ages 15–44 years.

Table 2.3 Incidence of Abortion and Complications from Unsafe Abortion in Low- and Middle-Income Countries

Country, date	Annual number of women who had abortions (a)	Abortion rates per 1,000 women (b)	Number of women with complications from unsafe abortion treated in health facilities (c)	Annual rate of complications treated in health facilities per 1,000 women (d)
Africa				
Burkina Faso, 2008 (a)	87,200	25.0	22,900	6.6*
Egypt, Arab Rep. 1996 (b)	324,000	23.0	216,000	15.3
Ethiopia, 2008 (c)	382,450	23.1	52,600	3.2
Kenya, 2013 (d)	464,700	48.0	119,900	12.4*
Malawi, 2009 (e)	67,300	23.0	18,700	6.4*
Nigeria, 1996 (f)	610,000	25.0	142,200	6.1
Rwanda, 2009 (g)	60,000	25.0	16,700	7.0
Uganda, 2002 (h)	296,700	54.0	85,000	16.4
Asia				
Bangladesh, 2010 (i)	647,000	18.2	231,400	6.5
Pakistan, 2002 (j)	890,000	29.0	197,000	7.0
Philippines, 2000 (k)	78,900	27.0	78,150	4.4
Latin America and the Caribbean				
Brazil, 1991 (f)	1,444,000	40.8	288,700	8.1
Chile, 1990 (f)	160,000	50.0	31,900	10.0
Colombia, 2008 (l)	400,400	39.0	93,300	9.0

table continues next page

Table 2.3 Incidence of Abortion and Complications from Unsafe Abortion in Low- and Middle-Income Countries (continued)

Country, date	Annual number of women who had abortions (a)	Abortion rates per 1,000 women (b)	Number of women with complications from unsafe abortion treated in health facilities (c)	Annual rate of complications treated in health facilities per 1,000 women (d)
Dominican Republic, 1990 (f)	82,000	47.0	16,500	9.8
Guatemala, 2003 (m)	65,000	24.0	21,600	8.6
Mexico, 2009 (n)	874,700	33.0	159,000	5.9
Peru, 1989 (f)	271,000	56.1	50,000	8.6

Sources: (a) = Sedgh and others 2011; (b) = Henshaw and others 1999; (c) = Singh and others 2010; (d) = African Population and Health Research Center and Ministry of Health Kenya 2013; (e) = Levandowski and others 2013; (f) = Henshaw and others 1999; (g) = Basinga and others 2012; (h) = Singh and others 2005; (i) = Singh and others 2012; (j) = Sathar, Singh, and Fikree 2007; (k) = Juarez and others 2005; (l) = Prada, Biddlecom, and Singh 2011; (m) = Singh, Prada, and Kestler 2006; (n) = Juarez and Singh 2012.
*Figures were not reported in original source; they are derived as d = [(c/a)×100].

8 percent and 18 percent, excluding late maternal death (Kassebaum and others 2014; Say and others 2014).

Abortion-Related Morbidity

Each year, 7 million women receive treatment for complications from unsafe abortions in the developing world (Singh 2006, 2010; Singh and others 2009). The annual rate of treatment after unsafe abortions is 6.9 per 1,000 women of reproductive age, which means 4.6 million women receive needed treatment in Asia, as do 1.6 million in Sub-Saharan Africa and 757,000 in Latin America and the Caribbean (Singh 2006). The incidence and severity of unsafe abortion complications are closely related to the training of the providers and the abortion methods used. A substantial proportion of the procedures are performed by untrained providers, including by pregnant women. In each country in which the AICM has been applied to estimate abortion incidence, a substantial number of women are admitted annually for treatment of complications resulting from unsafe abortions. These estimates are approximations based on the best guesses of health care providers and professionals, as well as on a number of assumptions. Table 2.3 shows abortion rate and abortion complication rate.

Health complications typically associated with unsafe abortion include hemorrhage; sepsis; peritonitis; RTIs; and trauma to the cervix, vagina, uterus, and abdominal organs (Grimes and others 2006; Henshaw and others 2008). Beginning with an effort sparked by a seminal WHO-led study in 1986, a fairly standard method has been developed and used to measure the nature and severity of unsafe abortion complications based on nationally representative surveys (Benson and Crane 2005; Fetters 2010; Figa-Talamanca and others 1986).

Table 2.4 Prevalence of Severe Symptoms from Unsafe Abortion in Low- and Middle-Income Countries

Country, date	Percentage of women with severe symptoms among those presenting with unsafe abortion complications
South Africa, 2000 (a)	10
Malawi, 2009 (b)	21
Ethiopia, 2008 (c)	27
Kenya, 2012 (d)	37
Cambodia, 2005 (e)	42

Sources: (a) = Jewkes and others 2005; (b) = Kalilani-Phiri and others 2015; (c) = Gebreselassie and others 2010; (d) = African Population and Health Research Center and Ministry of Health Kenya 2013; (e) = Fetters and others 2008.

Studies report that among women presenting with unsafe abortion complications in health facilities, the proportion diagnosed with severe symptoms varies widely (table 2.4).

Severe complications, if not well managed, may result in anemia, RTIs, elevated risk of ectopic pregnancy, premature delivery or miscarriage in subsequent pregnancies, and infertility (WHO 2004). Almost 5 million women are living with temporary or permanent disabilities associated with unsafe abortion; more than 3 million of these women suffer from the effects of RTIs, and close to 1.7 million experience secondary infertility (WHO 2007).

Economic and Social Consequences

Unsafe abortion has direct and indirect costs. Direct costs include expenses related to the provision of medical care to women presenting with abortion-related complications, such as cost of medicine, providers' time, and hospital stays. Indirect costs are opportunity

costs due to death or disability stemming from the complications.

Direct costs. In 2006, the average direct per-patient costs of treating abortion-related complications were US$130 in Latin America and the Caribbean and US$114 in Sub-Saharan Africa (Vlassoff, Walker, and others 2009). After including indirect costs, per-patient costs of treating postabortion complications in the two regions rose to US$227–US$320.

Indirect costs. A study in Uganda (Sundaram and others 2013) finds that most women treated for unsafe abortion complications experienced one or more adverse effects, including loss of productivity (73 percent); deterioration in household economic circumstances (34 percent); and negative consequences for their children, such as inability to eat well or go to school (60 percent).

Unsafe abortion also has social costs, including social stigma, sanctions, divorce, and spousal and family neglect (Levandowski and others 2012; Moore, Jagwe-Wadda, and Bankole 2011; Rossier 2007; Shellenberg and others 2011).

Unintended pregnancy, unmet need for contraception, and unsafe abortion. Meeting the contraceptive needs of all 225 million women in LMICs who had unmet need for modern contraception in 2014 would have prevented an estimated 52 million unintended pregnancies and averted 24 million abortions, 14 million of which would have been unsafe (Singh, Darroch, and Ashford 2014). Similar associations have been found at the country level (Darroch and others 2009; Sundaram and others 2009; Vlassoff, Sundaram, and others 2009; Vlassoff and others 2011). The demand for family limitation may not be fully satisfied by the use of contraceptives, and some women and couples may resort to abortion. In such situations, both contraceptive use and abortion rates may rise, while fertility declines (Marston and Cleland 2003).

NON-SEXUALLY TRANSMITTED INFECTIONS OF THE REPRODUCTIVE SYSTEM

RTIs may be classified as either transmitted sexually, as with syphilis and gonorrhea, or non-sexually, for example, bacterial vaginosis (BV); others, such as yeast infections, may be both. The focus in this section is on non-STIs of the reproductive tract, specifically two neglected reproductive health morbidities: BV and vulvovaginal candidiasis (VVC). These RTIs are increasingly identified as having substantial public health importance because of the increased risk of STI transmission, including human immunodeficiency virus (HIV) (Cohen and others 2012; Martin and others 1999; Myer and others 2005; Namkinga and others 2005).

Vulvovaginal Candidiasis

VVC is characterized by excessive growth of a normal vaginal flora fungus, candida, often associated with vulval itching, abnormal vaginal discharge, vulval excoriation, and dyspareunia. It is common among women of reproductive age. VVC is relatively more common among women who are pregnant, have poorly controlled diabetes mellitus, or have compromised immunity due to human immunodeficiency virus/acquired immunodeficiency syndrome (HIV/AIDS) or other causes (Buchta and others 2013; de Leon and others 2002; Duerr and others 2003). It is also common in women receiving antibiotic treatment and those using vaginal douching and other forms of vaginal applications (Brown and others 2013; Ekpenyong and others 2012).

Measurement

Measurement of prevalence and incidence of VVC in most settings is challenging. Clinical diagnosis based on symptoms is inadequate owing to the low sensitivity and specificity of criteria used to identify clinically important candida infections. Estimates from such studies cannot be depended upon to generate a reliable epidemiologic profile to act as a basis for public health planning of interventions (Geiger, Foxman, and Gillespie 1995; Rathod and others 2012). In a study of women in India, the positive predictive value for candidiasis was only 19 percent, implying a high likelihood of confusing VVC with BV, since the two are common and may occur together (Rathod and others 2012). However, not all positive laboratory tests for candida constitute clinically important cases of VVC. In response to this challenge, the Centers for Disease Control and Prevention (CDC) has provided diagnostic criteria that include symptoms and laboratory findings (CDC 2010; Ilkit and Guzel 2011). According to these criteria, a patient must have (1) one or more symptoms, such as vaginal itching or discharge; and (2) a positive wet preparation or gram stain or positive culture (CDC 2010).

Given the challenges involved in conducting community-based studies using gynecologic specimens, most studies that have assessed prevalence or incidence have been clinic-based among symptomatic women. Only a few studies have been population based (Ahmad and Khan 2009; Goto and others 2005; Oliveira and others 2007). Estimates derived from clinic-based studies cannot be generalized. Even where community-based studies have been conducted, the tendency is to report the prevalence of candida species recovered from the specimens and symptoms separately; no effort is made to use the criteria that integrate laboratory findings and symptoms to derive the proportion of women with clinically significant candida infection.

Prevalence of Vulvovaginal Candidiasis

The prevalence of VVC varies between subpopulations along characteristics such as age, sexual activity, and socioeconomic status. The proportion of candida species–positive women among women attending clinics with symptoms is generally higher than levels observed in the general population. In some clinic-based studies, results have shown prevalence as high as 40 percent to 60 percent (Ibrahim and others 2013; Nwadioha and others 2013; Okungbowa, Isikhuemhen, and Dede 2003).

Table 2.5 summarizes community-based studies of the prevalence of candida species from vaginal or cervical specimens and of VVC. In the few studies reporting VVC based on clinical and laboratory findings, prevalence seems to be generally less than 10 percent. This result implies that studies and estimates based on only clinical diagnoses tend to overdiagnose, and possibly result in overtreatment of, vaginal candidiasis. The consequences may include unnecessary treatment costs, side effects, and development of resistance to commonly prescribed antifungal drugs.

Consequences of Vulvovaginal Candidiasis

Although VVC might be considered a nuisance, the inflammatory process of VVC puts women at increased risk of transmission of RTIs, including STIs and HIV (Hester and Kennedy 2003; Rathod and others 2012). Against this background, like STIs, VVC should always be managed for the extra benefit of reducing the risk of contracting other STIs. The fact that treatment for VVC is cheap and available over the counter in many countries presents another challenge of overtreatment and potential drug resistance. In most settings, the diagnosis is clinical; however, this diagnosis has a low specificity resulting in cases of BV being treated as VVC, leaving BV untreated.

Bacterial Vaginosis

In BV, normal vaginal *lactobacilli* are replaced by other bacteria, especially *Gardnerella vaginalis* and other anaerobic bacteria (Hay and Taylor-Robinson 1996). There is a link between BV and known risk factors for STIs, including multiple sexual partnerships and early onset of sexual activity (Fethers and others 2008; Foxman 1990; Morris, Rogers, and Kinghorn 2001; Reed and others 2003). Indeed, the debate about whether BV is sexually transmitted or enhanced remains unsettled. Other factors associated with BV include black race (Hay and others 1994; Koumans and others 2007; Ness and others 2003; Wenman and others 2004), use of intrauterine devices (Baeten and others 2001; Madden and others 2012), menses (Eschenbach and others 2000), lack of male circumcision (Gray and others 2009), and douching (Brotman and others 2008).

Measurement

Clinical diagnosis is difficult because symptoms have low predictive values, yet laboratory facilities are not always available, especially in developing countries (Landers and others 2004; Rathod and others 2012). There has been debate on the clinical presentation of BV and isolation of causative bacteria (Hay and Taylor-Robinson 1996).

Table 2.5 Prevalence of Candida Species and Vulvovaginal Candidiasis from Community-Based Studies

Study	Prevalence of candida species (%)	Prevalence of vulvovaginal candidiasis* (%)
Epidemiologic features of vulvovaginal candidiasis among reproductive-age women in India (a)	35.0	7.1
Reproductive tract infections among young married women in Tamil Nadu, India (b)	10.0	10.0
Sexually transmitted infections, bacterial vaginosis, and candidiasis in women of reproductive age in rural Northeast Brazil: a population-based study (c)	12.5	
Prevalence and risk factors for bacterial vaginosis and other vulvovaginitis in a population of sexually active adolescents from Salvador, Bahia, Brazil (d)	22.0	
Sexually transmitted infections in a female population in rural Northeast Brazil: prevalence, morbidity, and risk factors (e)	5.8	
Community-based study of reproductive tract infections among women of the reproductive age group in the Urban Training Centre Area in Hubli Kamataka, India (f)	16.1	
Prevalence of and factors associated with reproductive tract infections among pregnant women in 10 communes in Nghe An Province, Vietnam (g)	17.0	
Prevalence and risk factors for vaginal candidiasis among women seeking primary care for genital infections in Dar es Salaam, Tanzania (h)	45.0	

Sources: (a) = Rathod and others 2012; (b) = Prasad and others 2005; (c) = Oliveira and others 2007; (d) = Mascarenhas, Machado, and others 2012; (e) = de Lima Soares and others 2003; (f) = Balamurugan and Bendigeri 2012; (g) = Goto and others 2005; (h) = Namkinga and others 2005.

*According to Centers for Disease Control and Prevention criteria—one or more symptoms and signs and positive lab test or culture.

The commonly used clinical criteria are the Amsel criteria, with reported sensitivity of more than 90 percent and specificity of more than 75 percent as judged against gram staining (Landers and others 2004). The Nugent Scoring System criteria are considered the gold standard, with better sensitivity and specificity (Mota and others 2000; Nugent, Krohn, and Hillier 1991); however, few studies have used these criteria.

Little systematic effort has been made to estimate the global prevalence of BV. The few systematic reviews that have been conducted reveal that the current evidence is based on small studies (Kenyon, Colebunders, and Crucitti 2013). Estimates from these studies are discussed here in the context of where the study was conducted rather than as global or regional estimates (Kenyon, Colebunders, and Crucitti 2013). International comparisons are difficult because of differences in the populations studied, as well as in the methods used in selecting participants. Also, because of the associations between BV, VVC, pregnancy status, and sexual activity, we only present estimates from studies that include participants from the general adult female population. We exclude those that only focus on pregnant women, those attending sexually transmitted diseases clinics, and those restricted to only sexually experienced women.

Prevalence of Bacterial Vaginosis

Estimates presented here are from studies that use the Nugent Scoring System. A diagnosis of BV is defined as a Nugent score of 7 or higher out of 10 (Nugent, Krohn, and Hillier 1991). Table 2.6 summarizes population-based studies from regions with estimates of BV prevalence.

Although there are no global estimates, it is clear that BV is common and variations exist across countries and subpopulations. The variation within regions makes interpretation of spatial distribution difficult.

Consequences of Bacterial Vaginosis

Although the etiologic mechanism of anaerobic bacteria found in BV-causing pelvic inflammatory disease (PID)

Table 2.6 Prevalence of Bacterial Vaginosis from Population-Based Studies

Region	Country, location, year	Study population	Prevalence of bacterial vaginosis* (%)
Latin America and the Caribbean			
	Brazil, Alagoas, 1997 (a)	Random sample of 341 women	15.3
	Brazil, Serra Pelada, Para, 2004 (b)	Random sample of 209 women	18.7
	Brazil, Pacoti, Ceara, before 2007 (c)	Random sample of 592 women	20.1
	Peru, rural areas, 1997–98 (d)	Random sample of 752 women	40.8
	Peru, Lima, Trujillo, Chiclayo (e)	Random sample of 779 women	26.6
North America			
	United States, NHANES, 2001–04 (f)	Random sample of 3,739 women	29.2
Western Europe			
	Finland, Aland Islands, 1993–2008 (g)	Random sample of 819 women in 1993 and 771 women in 2008	15.6 (1993) 8.6 (2008)
South and Southeast Asia			
	Vietnam, Bavi District, 2006 (h)	Random sample of 1,012 women, excluded menstruating women	11.0
	Vietnam, Haiphong, before 2006 (i)	Random sample of 284 women	27.4
Sub-Saharan Africa			
	The Gambia, Farafenni, 1999 (j)	Random sample of 1,348 women	37.0
	Burkina Faso, Ouagadougou, 2003 (k)	Random sample of 883 women	7.9

Sources: (a) = de Lima Soares and others 2003; (b) = Miranda and others 2009; (c) = Oliveira and others 2007; (d) = Garcia and others 2004; (e) = Jones and others 2007; (f) = Koumans and others 2007; (g) = Eriksson and others 2010; (h) = Lan and others 2008; (i) = Go and others 2006; (j) = Walraven and others 2001; (k) = Kirakoya-Samadoulougou and others 2011.
Note: NHANES = National Health and Nutrition Examination Survey.
*Based on the Nugent Scoring System.

has not been demonstrated, studies have recovered anaerobic bacteria from PID cases. PID is a major cause of tubal factor secondary infertility, therefore identification and treatment of BV is important (van Oostrum and others 2013). BV is also known to facilitate transmission of other STIs including HIV (Kinuthia and others 2015). Like VVC, clinical diagnosis of BV has low sensitivity and a high likelihood of misdiagnosis and mistreatment; efforts to have a confirmed laboratory diagnosis should always be made. BV has also been associated with miscarriages, premature delivery, and postpartum infection (Nelson and others 2015).

INFERTILITY

Involuntary infertility may bring about much psychological, economic, and social distress to affected individuals, especially in societies in which childbearing is highly expected of any couple. Causes of infertility are many, ranging from ovulation dysfunction, tubal factor (often sequelae), implantation disorders in the uterus, and male factors. Secondary infertility, the more prevalent type, often results from complications following miscarriage, delivery, untreated STI, and induced abortion in low-resource settings (Cates, Farley, and Rowe 1985; Cates, Rolfs, and Aral 1990; Larsen, Masenga, and Mlay 2006). Untreated STIs such as gonorrhea, chlamydia, and PID are responsible for the majority of tubal factor infertility cases (Boivin and others 2007; Bunnell and others 1999; Che and Cleland 2002; Desai, Kosambiya, and Thakor 2003; Heiligenberg and others 2012; Inhorn 2003).

Definition and Measurement

There are disciplinary variations in the definition and operationalization of measurement of infertility, including clinical, epidemiologic, and demographic (Gurunath and others 2011; WHO 2006a; Zegers-Hochschild and others 2009).

The key issues in operationalization of the definition of infertility or childlessness that make comparison and interpretation of estimates from various studies difficult include the following:

- **Exposure to risk of pregnancy as captured by union status, intention of getting pregnant, and contraceptive use**: The nature of a union has implications for frequency and regularity of sexual intercourse, which translates into risk of pregnancy. Similarly, variations occur in measurement of contraceptive use (Gurunath and others 2011).
- **Exposure time**: Sensitivity analysis using DHS data show that using a period of less than five years was likely to result in misclassification of fertile unions as infertile (Mascarenhas, Cheung, and others 2012). Shorter periods of one year help identify individuals and couples who may benefit from earlier intervention; epidemiological studies use two-year time frames that allow the problem of infertility to be quantified at the population level and limit misclassification of either fertile or infertile unions (WHO 2006a).
- **Outcome measure**: The medical literature focuses on failure to achieve or to maintain a clinical pregnancy, which misclassifies women as fertile who have repeat early miscarriage, or endometrial insufficiency resulting in repeat late fetal death or stillbirth. Demographers often use live birth as a more easily measurable outcome that defines childlessness (Gurunath and others 2011). Generally, the clinical definition and its operationalization are best suited for purposes of early diagnosis and management of infertility, whereas the epidemiological definition is best suited for population-level estimates, and demographic definitions for trend analysis.
- **Populations studied**: Some studies have examined women ages 15–44 years and 20–44 years, while others have examined women ages 15–49 years. In countries with high levels of voluntary childlessness, this difference needs to be accounted for because older women (older than age 44 years) may likely be considered infertile although menopausal, and younger women (younger than age 20 years) may likely be considered fertile, yet they may already suffer from tubal factor infertility (Rutstein and Shah 2004; Larsen 2005; Mascarenhas, Cheung, and others 2012).

The definitions of infertility used in the WHO Trend Analysis are as follows:

- ***Primary infertility*** is the absence of a live birth for women who desire a child, have been in a union for at least five years, and who did not use contraceptives during that time. The prevalence of primary infertility is calculated as the number of women in infertile union divided by the total number of fertile and infertile women.
- ***Secondary infertility*** is the absence of a live birth for women who desire a child, have been in a union for at least five years since their last live birth, and who did not use contraceptives during that time. The prevalence of secondary infertility is calculated as the number of women in a secondary infertile union divided by all fertile and infertile women who have had at least one live birth.

Prevalence of Primary and Secondary Infertility

The estimates reported here are derived from a global study that evaluates trends, and adjusts downward based on the lowest ranking of the disease as part of the DALY exercise by the Global Burden of Disease group, and reported in the *World Report on Disability* (WHO and World Bank 2011). The WHO, as part of the Global Burden of Disease exercise (Mascarenhas, Flaxman, and others 2012), developed an algorithm that included live birth and a registered desire to have a child. More than 277 health surveys were analyzed to produce trend estimates of infertility at national, regional, and global levels, for the years closest to 1990 and 2010.

The estimates for both primary and secondary infertility are presented by seven regions (high income, Central and Eastern Europe and Central Asia, East Asia and Pacific, Latin America and the Caribbean, North Africa and the Middle East, Sub-Saharan Africa, and South Asia) for the two time frames, 1990 and 2010, for comparative purposes (tables 2.7 and 2.8). Secondary fertility is more prevalent than primary infertility at regional and global levels. Overall, an estimated 48.5 million women worldwide were infertile (involuntarily childless) in 2010. About 1.9 percent of women ages 20–44 years who were exposed to risk of pregnancy had primary infertility, and an additional 10.5 percent had secondary infertility.

Sub-Saharan Africa and South Asia showed declines in the prevalence of primary infertility of 0.8 percentage points and 0.6 percentage points, respectively. Sub-Saharan Africa also recorded a 1.9 percentage point decline in secondary infertility over the period. The only region with an increase in primary infertility was Central and Eastern Europe and Central Asia, where primary infertility went from 1.9 percent in 1990 to 2.3 percent in 2010.

Consequences of Infertility

The consequences of primary and secondary involuntary childlessness in LMICs, where having biological children is highly valued, include stigmatization, economic deprivation, denial of inheritance, divorce, and social isolation (Chachamovich and others 2010; Cui 2010; Dyer and Patel 2012; Fisher and Hammarberg 2012; Hasanpoor-Azghdy, Simbar, and Vedadhir 2014). In many LMICs, family ties are highly valued, and having own biological children is seen as a form of insurance in old age. Women who are unable to bear children feel insecure in their marital unions with respect to inheritance, and they face the possibility of their husbands getting a second wife and divorce.

Prevention and treatment of some of the major causes of infertility, such as STIs, is effective and affordable; treatment of infertility itself is expensive and often inaccessible. Advanced infertility treatment technologies, such as in vitro fertilization, which is the only intervention that can overcome tubal factor infertility, are mainly available in the private sector where the costs are high (Katz and others 2011). Because most affected individuals suffer in silence and the cost of treatment is high, governments have not prioritized the treatment of infertility; insurance either charges high premiums

Table 2.7 Global and Regional Prevalence Estimates for Trend Analysis of Primary Infertility in Women Exposed to the Risk of Pregnancy

Percent

	Age-standardized prevalence of primary infertility					
	Estimate (percent)	Lower 95% CI	Upper 95% CI	Estimate (percent)	Lower 95% CI	Upper 95% CI
Region	1990			2010		
Central and Eastern Europe and Central Asia	1.9	1.2	2.7	2.3	1.6	3.4
Sub-Saharan Africa	2.7	2.5	3.0	1.9	1.8	2.1
Middle East and North Africa	2.7	2.3	3.1	2.6	2.1	3.1
South Asia	2.9	2.5	3.3	2.3	1.9	2.7
East Asia and Pacific	1.5	1.3	1.7	1.6	1.3	2.0
Latin America and the Caribbean	1.6	1.4	2.0	1.5	1.2	1.8
High-income	1.9	1.6	2.3	1.9	1.3	2.6
World	2.0	1.9	2.2	1.9	1.7	2.2

Source: Mascarenhas, Flaxman, and others 2012.
Note: CI = confidence interval.

Table 2.8 Global and Regional Prevalence Estimates for Trend Analysis of Secondary Infertility in Women Exposed to the Risk of Pregnancy, Who Have Had a Previous Live Birth

	Age-standardized prevalence of secondary infertility					
	Estimate (percent)	Lower 95% CI	Upper 95% CI	Estimate (percent)	Lower 95% CI	Upper 95% CI
Region	1990			2010		
Central and Eastern Europe and Central Asia	16.3	12.0	21.4	18.0	13.8	24.1
Sub-Saharan Africa	13.5	12.5	14.5	11.6	10.6	12.6
Middle East and North Africa	6.7	5.8	7.8	7.2	5.9	8.6
South Asia	11.5	9.7	13.6	12.2	10.1	14.5
East Asia and Pacific[a]	10.1	9.0	11.4	10.9	9.1	13.0
Latin America and the Caribbean	7.3	6.2	8.4	7.5	6.1	9.0
High-income	6.8	5.5	8.4	7.2	5.0	10.2
World[a]	10.2	9.3	11.1	10.5	9.5	11.7

Source: Mascarenhas, Flaxman, and others 2012.
Note: CI = confidence interval.
a. Estimates exclude China.

or does not cover fertility treatment. As a result, cost of treatment of infertility is almost always borne by those affected; in many cases, the available treatment is basic and ineffective (Dyer and Patel 2012).

VIOLENCE AGAINST WOMEN

Violence against women is a serious health problem and a violation of human rights. It has significant impacts on women's health and development, and its consequences are individual as well as intergenerational and societal. Violence affects women's health and well-being, productivity, and ability to bond with and care for their children. Although violence against women has been accepted as an important public health and clinical care issue, it remains unaddressed in the health care policies of many countries.

This section focuses on violence against women and, in particular, on intimate partner violence (IPV) and sexual violence because these are the most common forms of violence experienced globally, and they have important sexual and reproductive health consequences.

Definitions and Measurements

The United Nations Declaration on the Elimination of Violence against Women (1993) defines violence against women[1] as "any act of gender-based violence that results in, or is likely to result in, physical, sexual, or mental harm or suffering to women, including threats of such acts, coercion, or arbitrary deprivation of liberty, whether occurring in public or in private life." The declaration describes the many forms this violence can take, including the following:

> Intimate partner violence (IPV), sexual violence, including abuse of female children, dowry-related violence, killings in the name of "honor," forced marriages, FGM and other traditional practices harmful to women, violence related to exploitation, sexual harassment and intimidation in workplaces, educational institutions, and elsewhere, trafficking, forced prostitution, and violence perpetrated or condoned by the state.

According to Heise and García-Moreno (2002), IPV is behavior by an intimate partner or ex-partner that causes physical, sexual, or psychological harm, including physical aggression, sexual coercion, psychological abuse, and controlling behaviors.

Sexual violence is any sexual act, attempt to obtain a sexual act, or other act directed against a person's sexuality, using coercion, by any person, regardless of their relationship to the victim, in any setting. It includes rape, defined as the physically forced or otherwise coerced penetration of the vulva or anus with a penis, other body part, or object (Jewkes and others 2002).

There are many challenges to measuring violence against women; studies are often not comparable because they use different samples (all women, married women, ever-partnered women, currently partnered), different measures of violence, different time frames (ever, last 12 months, last month). There are also specific ethical and safety concerns related to asking women about partner violence. However, a consensus exists that the best way to measure violence

against women is by asking about behavioral acts; standardized methodologies are being developed, particularly for partner violence and sexual violence. Measuring violence against women in conflict settings is even more challenging. Gaps remain in the measurement of other forms such as trafficking, honor killings, and violence in conflict.

The methodology and ethical and safety guidelines developed for the Multi-country Study on Women's Health and Domestic Violence against Women (García-Moreno and others 2005) has contributed substantially to a standardized methodology. They have informed the UN Statistics Division guidelines for measuring violence against women and the violence against women module of the DHS. The past 10 years have seen growing numbers of population-based prevalence surveys using either DHS or the WHO methodology.

In 2013, slightly more than 80 countries had data on IPV; data on nonpartner sexual violence are more limited (WHO, LSHTM, and MRC-SA 2013).

Magnitude of the Problem

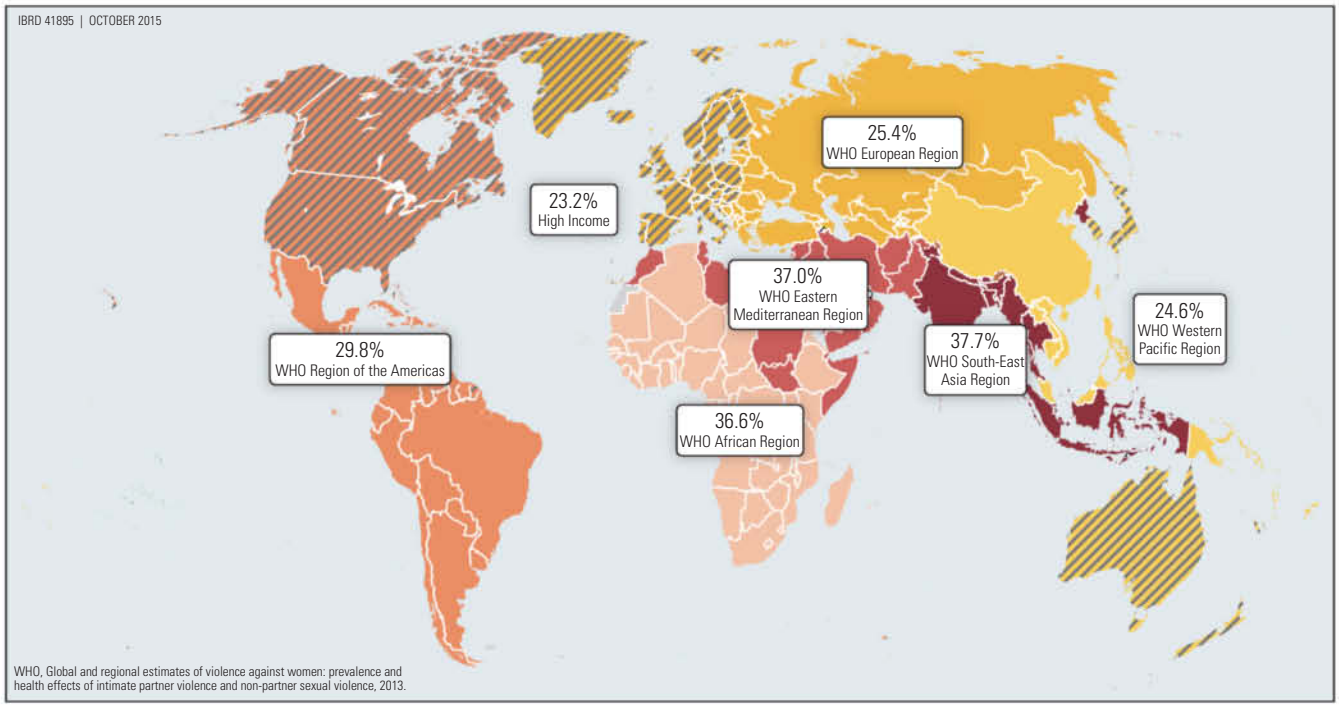
Worldwide, 35 percent of women have experienced physical or sexual IPV or nonpartner sexual violence; 38 percent of women who were murdered were murdered by their intimate partners (WHO, LSHTM, and MRC-SA 2013). Estimates of IPV by World Health Organization region are shown in map 2.1; South-East Asia (37.7 percent), the Eastern Mediterranean (37.0 percent), and Africa (36.6 percent) have the highest rates (WHO, LSHTM, and MRC-SA 2013). A systematic review of sexual violence among women who were refugees and internally displaced people in complex humanitarian emergencies in 14 countries finds that 21 percent of women had experienced sexual violence (both intimate partner and nonpartner) (Vu and others 2014).

Sexual abuse during childhood affects boys and girls. A systematic review of population-based studies suggests that 8.1 percent of women and 5.5 percent of men experienced some form of sexual abuse before age 15 years. The prevalence was higher among women than men in every region (Devries and others 2014).

Violence among young people, including dating violence, is a common problem. The WHO multicountry study finds that the first sexual experience for many women was reported as forced, for example, 17 percent in rural areas of Tanzania, 24 percent in rural Peru, and 30 percent in rural Bangladesh (García-Moreno and others 2005).

Many women do not report their experiences of IPV or sexual violence or seek help for cultural and service-related reasons, including fear of being stigmatized, shame, or nonexistence or lack of trust in services.

Map 2.1 Rates of Intimate Partner Violence, by World Health Organization Region, 2010



Source: WHO 2013.
Note: Regional prevalence rates are presented for each WHO region, including low- and middle-income countries. High-income countries are analyzed separately.

Health and Other Consequences

The direct consequences of violence against women are injury, disability, or death. Indirect consequences include physical, mental, and sexual and reproductive health problems, such as stress-induced physiological changes, substance use, and lack of fertility control and personal autonomy (WHO 2013). Women who experience violence are more likely to have STIs, HIV/AIDS, unintended pregnancies, unsafe abortions, and gynecological problems, compared with women who do not experience such violence (Campbell 2002; Ellsberg and others 2008; Plichta and Falik 2001). Women who have experienced IPV are 1.5 times more likely to have STIs and, in some regions, HIV/AIDS; more than twice as likely to have an abortion; almost twice as likely to report depressive episodes and alcohol use problems; and 4.5 times more likely to have attempted suicide, compared with women who have not been exposed to violence (WHO 2013). IPV has been associated with chronic pelvic pain and other pain syndromes, hypertension, obesity, and other noncommunicable diseases (Campbell 2002; Ellsberg and others 2008; Plichta and Falik 2001). Sexual violence is also associated with higher rates of mental health disorders, such as depression and anxiety disorders (WHO 2013).

IPV can begin or persist during pregnancy and result in serious maternal and perinatal health problems. In the WHO multicountry study, between 1 percent and 28 percent of ever-pregnant women reported being physically abused during at least one pregnancy, with most sites falling between 4 percent and 12 percent (García-Moreno and others 2006). Violence during pregnancy is associated with increased risk of miscarriage, premature labor, perinatal death, and low–birth weight babies (Campbell 2002; Fanslow and others 2008; Janssen and others 2003). Women who have experienced IPV are 16 percent more likely to have a low–birth weight baby (WHO 2013). IPV during pregnancy is also significantly associated with adverse health behaviors during pregnancy, including smoking, alcohol and substance abuse, and delay in prenatal care, even after controlling for other mediating factors (Campbell 2002).

Violence against women can also lead to death from suicide; homicide, including in the name of honor, usually committed by family members for cultural reasons; female infanticide; maternal death from unsafe abortion; and deaths from HIV/AIDS. Up to 38 percent of murders of women are committed by their partners, compared with 6 percent of murders of men (Stockl and others 2013).

Sexual abuse during childhood is associated with higher rates of sexual risk taking, substance use, and additional victimization. Each of these behaviors increases the risks of subsequent health problems.

There are often long-term intergenerational health consequences for those who witness violence, especially children, with negative consequences for their health and development. IPV is associated with increased mortality in infants and children younger than age five years (Ahmed, Koenig, and Stephenson 2006; Asling-Monemi, Tabassum, and Persson 2008; Boy and Salihu 2004), and with behavioral problems among children, as well as low educational attainment. Health systems and health care providers can play a critical role in identification, assessment, treatment, documentation, referral, and follow-up; this role needs to be integrated into national health programs and policies (WHO 2013).

FEMALE GENITAL MUTILATION

FGM comprises all procedures that involve the partial or total removal of external genitalia or other injury to the female genital organs for nonmedical reasons (OHCHR and others 2008). Although FGM is internationally recognized as a violation of human rights, and legislation to prohibit the procedure has been put in place in many countries, the practice has still been documented in many African countries and several regions in Asia and the Middle East (OHCHR and others 2008). Some forms of FGM have also been reported in other countries, including among certain ethnic groups in Central and South America, as well as among some migrants living in HICs (Yoder, Abderrahim, and Zhuzhini 2004). The importance of FGM from a public health perspective arises from the fact that, in addition to medical and psychological complications, the practice violates human rights and child rights, given that it is almost always carried out among minors (Yoder and Wang 2013).

Measurement

Data on FGM at the population level have become increasingly available, mainly from population-based surveys that include questions on the practice among women ages 15–49 years and their daughters, such as the DHSs and the UNICEF Multiple Indicator Cluster Surveys (MICS) (Yoder and Wang 2013; Yoder, Abderrahim, and Zhuzhini 2004). Before the DHSs, there were no national population-level data on FGM. Currently, many Sub-Saharan African countries have national-level prevalence data, as do some in the Middle East, including the Republic of Yemen and Iraq (Yoder and Wang 2013).

The prevalence of FGM is calculated from survey questions in the following areas:

- Circumcision status of respondents
- Information on the event among those who were circumcised
- Circumcision status of one's daughters
- Women's and men's opinions of the practice.

Although the phrasing and level of depth of inquiry vary by country, the key question used to estimate prevalence is often phrased, "Have you (yourself) been circumcised?" The current global estimate of FGM is derived from weighted averages of FGM prevalence among girls ages 0–14 years and girls and women ages 15–49 years, using DHS, MICS, and Household Health Survey data. The number of girls and women who have been cut was calculated using 2011 demographic figures produced by the UN Population Division (UNPD 2013). The number of cut women ages 50 years and older is based on FGM prevalence in women ages 45–49 (UNICEF 2013).

Prevalence of Female Genital Mutilation

An estimated 125 million girls and women concentrated in 29 countries in the Middle East and Sub-Saharan Africa have undergone FGM (UNICEF 2013). The global estimate of FGM is unknown because the exact number of those with FGM among migrants from countries with the practice is unknown. Although prevalence estimates among migrants have been computed in some host countries, the overall burden is unknown (Dorkenoo, Morison, and Macfarlane 2007; Dubourg and others 2011; Exterkate 2013).

Table 2.9 shows the national prevalence estimates of FGM in 29 countries by age category and place of residence. The prevalence varies across countries from as low as less than 5 percent in Cameroon, Ghana, Niger, Togo, and Uganda, to more than 90 percent in Djibouti, the Arab Republic of Egypt, Guinea, and Somalia. With the exception of Chad, Iraq, Mali, Nigeria, and the Republic of Yemen, the prevalence of FGM is higher in rural areas than in urban areas. In most countries, older age groups have higher prevalence of FGM.

Consequences of Female Genital Mutilation

FGM is painful, traumatic, and emotionally distressful. Immediate and long-term health consequences include gynecological complications, such as the following:

- Structural complications of the genitourinary system, such as vaginal stenosis, urethral strictures, labial fusion, and fistulae involving the genital tract
- Postprocedural complications of the skin and subcutaneous tissue, such as keloids, sebaceous cysts, scars and fibrosis, and nonhealing ulcers
- Disorders of the urinary system, such as acute or chronic urinary tract infections, meatus, urinary crystals, pyelonephritis, urinary retention and incontinence, and kidney failure
- Infections
- Hemodynamic complications, such as hemorrhage, hypovolemic or septic shock, and anemia
- Procedural and everyday life difficulties, such as gynecological examination, cytology testing, evacuation of the uterus postabortion, intrauterine device placement, and tampon usage
- Pain associated with the female genital organs or menstrual cycle, such as hematocolpos, vulvodynia, dyspareunia, acute or chronic lower abdominal pain, hypersensitivity of the genital area, and clitoral neuroma
- Injury of neighboring organs and structures, such as the urethra, bladder, urinary meatus, vaginal wall, anus, and rectum
- Death.

FGM has been associated with obstetric complications. Studies, including a large WHO study in African countries, show that women with FGM are significantly more at risk of cesarean section, postpartum hemorrhage, episiotomy, extended maternal hospital stay, resuscitation of infants, low–birth weight infants, and inpatient perinatal death (Kaplan and others 2013; Lovel, McGettigan, and Mohammed 2000; WHO 2006b).

Several sexual and mental health complications are also associated with FGM, including sexual aversion and lack of sexual enjoyment or desire, vaginal dryness, orgasmic dysfunction, nonorganic vaginismus, apareunia, posttraumatic stress disorder, depression, somatization disorder, neurasthenia, anxiety disorders, specific phobias, psychosomatic disorders, and eating disorders (Berg, Denison, and Rappaport 2010).

Although health care professionals are aware of FGM and some of its health consequences, their ability to identify and manage complications remains suboptimal (WHO 2001). Moreover, some health care providers still consider certain forms of FGM as not harmful; some perform medical FGM (Ali 2012). The WHO has condemned medicalization of FGM and recognizes that its cessation is an essential component of the human rights–based approach.

Table 2.9 Prevalence of Female Genital Mutilation among Girls and Women

Country (data source)	Reference year	FGM prevalence among girls and women (%)	FGM prevalence among girls and women by age and residence (%)								
			Age category							Residence	
			15–19	20–24	25–29	30–34	35–39	40–44	45–49	Urban	Rural
Benin (DHS)	2006	13	8	10	14	14	16	17	16	9	15
Burkina Faso (DHS and MICS)	2010	76	58	70	78	83	85	88	89	69	78
Cameroon (DHS)	2004	1	0.4	3	2	1	1	2	2	1	2
Central African Republic (MICS)	2010	24	18	22	25	26	28	30	34	18	29
Chad (MICS)	2010	44	41	43	46	45	46	45	47	46	44
Côte d'Ivoire (MICS)	2006	36	28	34	38	43	44	41	40	34	39
Djibouti (MICS)	2006	93	90	94	93	96	95	93	94	93	96
Egypt, Arab Rep. (DHS)	2008	91	81	87	94	95	96	96	96	85	96
Eritrea (DHS)	2002	89	78	88	91	93	93	94	95	86	91
Ethiopia (DHS)	2005	74	62	73	78	78	81	82	81	69	76
The Gambia (MICS)	2010	76	77	77	78	75	73	75	79	75	78
Ghana (MICS)	2011	4	2	2	3	4	6	7	6	3	5
Guinea (DHS)	2005	96	89	95	97	97	99	98	100	94	96
Guinea-Bissau (MICS/RHS)	2010	50	48	49	51	50	49	54	50	41	57
Iraq (MICS)	2011	8	5	8	9	9	10	9	10	9	6
Kenya (DHS)	2008–09	27	15	21	25	30	35	40	49	17	31
Liberia (DHS)	2007	66	44	58	68	70	73	78	85	45	81
Mali (MICS)	2010	89	88	88	88	89	90	89	89	89	88
Mauritania (MICS)	2011	69	66	66	67	71	72	76	75	57	81
Niger (DHS/MICS)	2006	2	2	2	2	2	3	3	3	2	2

table continues next page

Table 2.9 Prevalence of Female Genital Mutilation among Girls and Women (continued)

Country (data source)	Reference year	FGM prevalence among girls and women (%)	FGM prevalence among girls and women by age and residence								
			Age category							Residence	
			15–19	20–24	25–29	30–34	35–39	40–44	45–49	Urban	Rural
Nigeria (MICS)	2011	27	19	22	26	30	32	35	38	33	24
Senegal (DHS/MICS)	2010–11	26	24	24	26	25	29	27	29	23	28
Sierra Leone (MICS)	2010	88	80	87	92	93	96	95	96	81	92
Somalia (MICS)	2006	98	97	98	98	99	99	98	99	97	98
Sudan (SHHS)	2010	88	84	87	90	88	90	90	89	84	90
Tanzania (DHS)	2010	15	7	11	12	19	22	22	22	8	17
Togo (MICS)	2010	4	1	2	4	5	6	5	7	3	5
Uganda (DHS)	2011	1	1	1	2	2	1	2	2	1	1
Yemen, Rep. (DHS)	1997	23	19	22	21	23	24	25	25	26	22

Source: UNICEF 2013.

Note: DHS = Demographic and Health Survey; FGM = female genital mutilation; MICS = Multiple Indicator Cluster Survey; RHS=Reproductive Health Survey; SHHS = Sudan Household Health Survey.

CONCLUSIONS

This chapter focuses on selected reproductive health diseases and their predisposing factors that lead to morbidity and mortality but that are generally neglected in research and public health programming. Although the data remain scant, these conditions are clearly pervasive; some are predisposing factors for other conditions.

Part of the challenge to policy makers is in measurement. Variations in definitions and reference populations affect the comparability of data. Unwanted pregnancies, abortions, infertility, infections of the reproductive tract, and violence against women are associated with stigmatization, especially in LMICs, and are often underreported or misreported in surveys and health care facilities. There are few global, regional, or national estimates of some of these conditions. Some estimates are based on indirect methods, and questions arise about their validity.

Most of these conditions have cost-effective interventions. Most unwanted pregnancies can be averted through the provision of proven family-planning technologies; safe abortion services are associated with low complication rates. Treatment for RTIs is available and affordable, yet many women never receive treatment, predisposing them to the risk of other infections, including HIV/AIDS. Violence against women is equally prevalent; while preventive interventions pose challenges, health systems can do much more for prevention, provision of care and services, and mitigation of consequences.

The poor integration and mainstreaming of these cost-effective interventions in public health prevention and management programs exacerbates their public health impacts. The counterargument might be that the burden of these conditions and their economic costs are vague, and no concrete evidence exists for advocacy within and across countries and regions. However, the evidence of the substantial burden of violence against women has yet to translate into significant policy and programmatic action to address the problem in many LMICs.

NOTES

World Bank Income Classifications as of July 2014 are as follows, based on estimates of gross national income (GNI) per capita for 2013:

- Low-income countries (LICs) = US$1,045 or less
- Middle-income countries (MICs) are subdivided:
  a) lower-middle-income = US$1,046–US$4,125
  b) upper-middle-income (UMICs) = US$4,126–US$12,745
- High-income countries (HICs) = US$12,746 or more.

For consistency and ease of comparison, *DCP3* is using the World Health Organization's Global Health Estimates (GHE) for data on diseases burden, except in cases where a relevant data point is not available from GHE. In those instances, an alternative data source is noted.

1. Violence against women is also referred to as *gender-based violence* because most of the violence that women experience is rooted in gender inequality. More recently, however, gender-based violence has come to be understood by some as also including violence against men and on the basis of sexual orientation or gender identity.

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