

## REVIEW ARTICLE

# The Health of Young People in a Global Context

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**Purpose:** To examine the chief causes and influences of morbidity and mortality among young people throughout the world.

**Methods:** A comprehensive literature search was conducted that included WHO's Global Burden of Disease, UNFPA's State of the Worlds' Population, Medline, Popline, Sociological Abstracts, as well as data collected from UNICEF, UNAIDS, Population Reference Bureau, and the United Nations Headquarters. Experts in the fields of substance use, suicide, and infectious diseases were also contacted for unpublished and published sources. Studies were restricted to those completed after 1985, had a sample size of at least 100, focused primarily on the age group of 10–24 years, and examined trends related to unintentional injuries, HIV/AIDS, suicide, homicide, war, maternal mortality, pregnancy, abortion, sexually transmitted diseases, substance abuse, and infectious diseases.

**Results:** Trends in adolescent morbidity and mortality have shifted over the past decade from predominately infectious to social etiologies. Currently, unintentional injury is the leading killer of young people in nearly every region of the world, with homicide, war, and interpersonal violence following closely behind.

**Conclusions:** The changes in population, migration, age of marriage, and education have had profound impact on the mortality and morbidity among adolescents. As we come to learn about the factors that influence adolescent morbidity and mortality, we begin to have a better understanding of how to improve the health of youth throughout the world. © Society for Adolescent Medicine, 2004

**KEY WORDS:**

Adolescents  
Gender differences  
Health risk behaviors

Over the past 20 years, dramatic social, political, and economic shifts, together with medical and public health interventions, have radically altered the landscape of adolescent health around the world. A generation ago AIDS was unknown; today between a quarter and a third of adolescent females in Botswana, South Africa and Zimbabwe are infected. A generation ago, infectious diseases predominated as the major sources of morbidity and mortality globally; today social, behavioral, and environmental factors predominate. A generation ago, the age of marriage was significantly lower than today; more people lived in rural communities and fewer young people attended school.

These transitions, as well as others, have had, and will continue to have, profound impact on the health of youth. This article will review briefly the key social transitions that affect adolescent and young adult health globally. Subsequently, the leading causes of morbidity and mortality will be discussed; and finally, implications for the future of adolescent health and well-being will be identified.

## Methods

To gather the information for this paper, a comprehensive literature search was conducted using a variety of different data sources. First, the World Health Organization's (WHO) Global Burden of Disease's mortality tables were collected, which estimate the causes of death by age and gender using vital registration data, verbal autopsy reports, demo-

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**Table 1.** Five Leading Causes of Mortality in 15- to 29-Year-Olds

World Regions	Leading Causes of Death <sup>a</sup>				
	Unintentional Injuries	AIDS	Other Infectious Causes	Homicide/War/Other Intentional Injuries	Suicide/Self-Inflicted Injuries
All world regions	1(531,000)	2(326,000)	3(229,000)	4(227,000)	5(124,000)
South America/Caribbean	2(64,000)	5(11,000)	4(12,000)	1(72,000)	3(14,000)
Africa	4(56,000)	1(225,000)	2(104,000)	3(66,000)	5(6,000)
Southeast Asia	1(178,000)	3(72,000)	2(81,000)	5(33,000)	4(37,000)
Western Pacific	1(119,000)	5(8,000)	3(19,000)	4(17,000)	2(32,000)
Eastern Mediterranean	1(40,000)	4(7,000)	2(21,000)	3(15,000)	5(5,000)
Europe	1(74,000)	5(2,000)	4(10,000)	3(23,000)	2(30,000)
North America <sup>b</sup>	1	6	5	3	2

<sup>a</sup> Data on maternal mortality among 15- to 29-year-olds not available.

<sup>b</sup> In North America, cancer is the fourth leading cause of death in the adolescent/young adult years.

graphic and health surveys, UN population estimates, and published and unpublished reports on mortality. In addition, databases such as the United Nation Population Fund's (UNFPA) State of the World's Population, Medline, Popline, and Sociological Abstracts, as well as reports and tables from the United Nations Children's Fund (UNICEF), the Joint United Nations Programme on HIV/AIDS (UNAIDS), Population Reference Bureau, and the United Nations Headquarters were used to collect articles and statistics on adolescent morbidity and mortality [1]. Finally, experts in the fields of substance use, suicide, and infectious diseases were contacted for unpublished and published sources. Criteria for choosing the studies for this literature were that: (a) they were published after the year 1985, (b) had a sample size of at least 100, (c) focused primarily on the age group between 10 and 24 years, and (d) examined trends related to one of the following: unintentional injuries, HIV/AIDS, suicide, homicide, war, maternal mortality, pregnancy, abortion, sexually transmitted diseases (STDs), female genital mutilation, nutrition, substance abuse, and infectious diseases. Data were synthesized from all published and unpublished literature and statistical tables to generate a comprehensive description on the health of youth throughout the world. Given limitations in available data, it was not always feasible to report trends; neither was it always accurate to disaggregate by age.

Throughout this article, it is important to note that the terms "adolescents," "youth," and "young people" are used interchangeably. WHO defines adolescents as those between the ages of 10 and 19 years, whereas youth are aged 15–24 years, and young people include all those between the ages of 10 and 24 years. The studies that were collected for this review are inclusive of all of these age categories;

therefore, it was necessary for us to use all three terms. The only exception to this, as will be noted, is in Causes of Mortality (Table 1), which estimates the leading causes of mortality among adolescents throughout the world, where the age group had to be extended to include 15–29-year-olds.

The first section presents an overview of the key social transitions that affect adolescent and young adult health globally. The second discusses the leading causes of morbidity and mortality among young people; and finally, the third section of the article identifies the implications for the future of adolescent health and well-being.

## Population and Social Trends

### Growing Youth Population

Today adolescents comprise 20% of the world's population, with more than 85% residing in developing countries. Over the 50-year period between 1970 and 2025, it is estimated that the number of urban youth will increase 600% [2]. Table 2 presents

**Table 2.** Population of Young People Ages 10–24 Years by Region

Region	Population <sup>a</sup> 10 to 24 Years in Millions	
	2000	2025
The World	1663	1796
Africa	256	401
Asia	1031	1048
North America	64	65
Latin America	155	163
Europe	149	109
Western Pacific	7	8

<sup>a</sup> Population Reference Bureau, Washington, DC, 2002.

**Table 3.** Median Age of Populations in Countries Where It Is the Lowest

Country	Median Age of the Population <sup>a</sup>
Yemen	15.0
Nigeria	15.1
Uganda	15.4
Burkina Faso	15.6
D. Republic of the Congo	15.6
Angola	15.9
Somalia	16.0
Burundi	16.0
Zambia	16.5
Benia	16.6

<sup>a</sup> Source: UN Population Division, 2001.

the current and projected populations of young people ages 10 to 24 years, by region.

### Child Survival

Of all the social changes that have had a major impact on adolescent health in the world, none has been as profound as that resulting from improved child survival. Because of global child survival initiatives implemented in the 1970s and 1980s, there has been a dramatic increase in the number of young people, especially in the developing regions of the world. By 2015, infant and child mortality will fall from 14.6 million to 7.5 million deaths per year, and that of school-age children will decline from 1.6 to 1.3 million deaths annually [3].

### Shifting Demographics

As the absolute number of youth changes, so too, the distribution of youth globally will continue to drift toward developing countries and especially toward sub-Saharan Africa and Asia. As noted by the United Nations Department of Economic and Social Affairs [4], of the 77 million people added to the world each year, 97% live in less developed regions. In Africa, the growth is greatest with a projected population increase from 794 million in 2000 rising to 2.0 billion 50 years from now.

Compared with industrialized countries where the median age is between 28 and 41 years, in much of sub-Saharan Africa, the median age of the population is less than half that. In fact, all of the 10 youngest countries of the world are in sub-Saharan Africa (Table 3).

### Migration

Beyond population growth are demographic shifts that are the result of both rural-to-urban and cross-national migration. Cross-national migration has accelerated dramatically over the past 20 years, in part, as a function of economic imperatives, war, natural disasters, and famine. In the 25 years between 1970 and 1995, industrialized countries absorbed 35 million refugees. In 1965, there were 75 million international immigrants. Today, there are over 125 million. In 2000, the United Nations High Commission on Refugees (UNHCR) estimated that 22.3 million people are world refugees, returnees, or displaced people.

The shift from rural-to-urban dwelling has also increased substantially over the past few decades. For example, in 1980, approximately 30% of the world's population lived in urban settings; today it is more than 50%. To put numbers to the rural flight, in 1960 two-thirds of the world's population lived in rural communities; by 2000, it had declined to 53.0% and by 2030 it is projected to be 39.7%.

Not only is there an absolute growth in urban populations, but migratory patterns have shifted as well. Over the past 20 years, large numbers of rural young women, aged 18 to 24 years, have come looking for work in major urban areas [5,6]. The result is that in a number of cities in Latin America and Asia, young adult females outnumber their male counterparts [7,8]. Elsewhere, the demand (real or perceived) for laborers in the city has resulted in a significant influx of males seeking employment. Youth migration is a major cause of rural-to-urban migration. It also predisposes to significant behavioral health risks that stem from unemployment and poverty, such as violence, prostitution, STDs/HIV, and substance use.

More than a decade ago, Over and Piat [9] identified the interrelationships among economic development, urbanization, high male-to-female ratios, rising prostitution, and HIV/AIDS in 18 sub-Saharan African cities. This "web of causation," coupled with relatively low levels of education among young females, fueled the HIV pandemic. Today, these deadly linkages are played out in many newly industrialized zones of Asia.

### Marriage

Marriage is of particular importance because of the high percentage of young people who marry and its special impact on the quality of adolescent girls'

**Table 4.** Percent Enrolled in Secondary School by Region: 1980 and Most Recent Available Year

Region	1980		Most Recent Year	
	Males	Females	Males	Females
The World	54	44	63	56
Africa	26	15	38	33
Sub-Saharan Africa	19	10	29	23
Asia	48	34	62	51
South Central Asia	38	20	55	37
Southeast Asia	40	35	53	49
East Asia	59	45	77	70
North America	91	92	99	98
Latin America	41	43	N/A	N/A
Europe	86	88	97	102

Source: Population Reference Bureau, Washington, DC, 2002.

lives. Typically, in many societies, the transition to marriage can consume many years of adolescence for a girl, often compromising her schooling and livelihood choices. Demographers have been especially interested in the age at first marriage because, for most females in the developing world, it is closely linked to their age at childbirth [10]. Further, early marriage is associated with limited education and work experience, as well as higher rates of divorce and separation [11]. Today, young people are marrying at older ages than did their parents; and data suggest that substantially smaller percentages of women marry before the age of 20 years than in previous generations. During the past few decades, age at marriage has risen most rapidly in Asia, the Middle East, and some parts of Latin America. Changes, however, are less striking in sub-Saharan Africa, where early marriage is still particularly prevalent [12]. Even in countries where the average age of marriage is relatively high, national figures mask the fact that early marriage may still be prevalent in some districts. Contrary to the general trend, there is evidence to suggest that early marriage may be increasing even in societies under stress. For example, there are some reports from HIV/AIDS researchers in Eastern Africa that demonstrate that early marriage is quite prevalent, as it is seen as an option for orphaned girls by caregivers who find it hard to provide for them [13].

### Education

Another trend that has had a major impact on the health of young people over the last 20 years has been the rising value of education, as reflected in government policies around the world. As Mensch et al [10] note, in nearly half of all countries for which

UNESCO maintains data ( $N = 103$ ), schooling is now mandated through at least age 14 years. Table 4 reflects the shifts in education over the past 20 years by regions of the world.

As can be seen from the table, there have been dramatic educational gains in every region of the world, and although a gender gap remains, it is narrowing. For example, for sub-Saharan Africa in 1980, there was a 9% spread between males and females enrolled in secondary school; most recently it was 4%. In Asia, a 14% gender gap in 1980 narrowed to 11% most recently. Additionally, and most importantly, the percentage of girls being educated has gone up dramatically since 1980, more than doubling for Africa from 15% to 33%; from 34% to 51% in Asia; and in Latin America there is essentially no gender gap in schooling through age 18 to 19 years [10].

Girls' education, in particular, has been shown to have strong links to improvements in health and to falling fertility rates. In fact, one of the strongest and most consistent relationships is between a mother's education and infant mortality; children of women with more years of schooling are much more likely to survive infancy [14]. It has also been shown that more-educated mothers have better health care, marry later, and are more likely to use contraception and space their children [15]. Education increases girls' knowledge of, and exposure to, the outside world; it strengthens their decision-making power within the family, promotes their social and physical mobility, and increases their economic independence and control over resources, all of which enhance their autonomy [15].

### Globalization

Another trend that cannot be ignored when discussing adolescent health in the world is globalization, both economic and cultural. In economic terms, globalization has led to the expansion of global markets and technology transfers, which in turn has created hundreds of new jobs for people, particularly in Asia. At the same time, economic globalization has led to even wider income disparities both within, and between, countries, leaving large pockets of impoverished communities. Adolescents in these poor families never enter school or are pulled out of school to help support their families; and substantial numbers work in illegal or exploitative conditions [16]. This has been the case for many living in Latin America and Africa.

Parallel to economic globalization is cultural globalization, which is having a large influence on adolescents' values and lifestyles. As a result of marketing by multinational firms, adolescents around the globe are learning to consume products with brand names such as Nike™ and Coca Cola™. Ironically, although the main themes of the commercial youth culture are freedom and empowerment, the impact of globalization on adolescents from traditional societies is often one of "cultural disenfranchisement," whereby adolescents want to lose their cultural values and traditional systems of support [17].

Although globalization has been going on for ages, its pace has been greatly accelerated in the past 15 years by the opening of free trade between developed and developing countries. Corresponding to these changes has been the emergence of new patterns of disease in the world. Tobacco-related morbidities, for instance, have risen, largely owing to multinational cigarette companies targeting adolescents in developing countries, where fewer restrictions are placed on marketing and distribution. In South Korea, the smoking rate among teenage boys was 18% in 1988, a year later, after cigarette imports were allowed, it increased to 30%. Similarly, the increasing prevalence of obesity among adolescents worldwide, even among those in the lowest income groups, is a fairly recent development in malnutrition. Much of the increase can be explained by a nutrition transition to fat-rich diets and a decrease in physical activity, particularly among urban populations [18]. Globalization has made cheap vegetable oils and fats widely available, greatly increasing fat consumption in all nations [19].

Chief among all the adverse health effects of globalization, however, is the AIDS epidemic, which has spread to every part of this world through travel and migration. Over [20], for example, finds a positive relationship between the presence of immigrants in the population and the HIV prevalence rate. The relationship is not only international. In China, where recent economic reforms have increased migration within the country, STDs that were nearly eliminated in the 1960s have now spread rapidly [21].

And so it is with every cause of adolescent mortality and morbidity. As we look at mortality and morbidity trends, we must view them within the economic and social contexts of young people. In doing so, we understand that the health of adolescents is not the sole responsibility of health care facilities or adolescents themselves, but rather is

shaped by multiple contexts, and the changes that take place within these contexts.

### *Causes of Mortality*

Table 1 depicts the five leading causes of death for young adults aged 15 to 29 years, both globally and by region. In it we see that unintentional injury is the leading killer of young people in nearly every region of the world, with HIV/AIDS and other infectious diseases still the second leading cause of death in much of the developing world (in most industrialized nations, it is suicide). Homicide, war, and interpersonal violence follow.

### **Unintentional Injuries**

For industrialized countries, unintentional injuries is the number one killer for those aged 15 to 29 years. In the United States, injuries kill more adolescents than all diseases combined, with at least one adolescent (aged 10–19 years) dying of an injury every hour of every day [22]. In developing countries, where industry is increasing and infectious diseases increasingly are being controlled, unintentional injury will soon become just as great a cause for concern [23]. In a survey of the causes of death among adolescents in South Africa, unintentional injuries were found to account for 57% of all mortality in the 10–19-year age group, and similar results have been found in Papua New Guinea, Nigeria, Singapore, and a number of South American countries [24]. Within the category of unintentional injuries, traffic-related fatalities are by far the most prevalent in most world regions. For adolescents aged 15 to 24 years, traffic-related injuries are the leading cause of injury deaths among 11 industrialized countries, ranging from a low of 12 to 15 per 100,000 in England, The Netherlands, Norway, and Israel to a high of 49 deaths per 100,000 in New Zealand [25].

In developing countries, where the number of vehicles has been increasing every year, traffic safety conditions are becoming more precarious. For example, in Africa, road traffic mortality increased more than 200%, and in Asia, it increased 150% between 1968 and 1983 [26]. In Latin America, an even more alarming increase was found among adolescents. Between 1980 and 1990, adolescent mortality caused by road traffic accidents increased by 600% in Mexico, 250% in Venezuela, and 210% in Chile, in part, because of the increased population density of urban settings and, in part, because of increased access to vehicles [27].

**Table 5.** Prevalence of HIV/AIDS by Regions of the World (2000)<sup>a</sup>

Region	Number
Sub-Saharan Africa	25,300,000
Latin America	1,400,000
North America	920,000
Eastern Europe and Central Asia	700,000
Eastern Asia and Pacific	640,000
Australia and New Zealand	390,000
Caribbean	390,000

<sup>a</sup> UNAIDS, 2001.

Traffic accidents, however, are not the only cause of injuries threatening the lives of young people. Recreational and sports accidents in the developed countries, burns and poisonings in the developing countries, and falls and drowning in every region also represent major risks [28]. In Brazil, drowning is second only to traffic accidents as a cause of death in young people aged 10 to 14 years. Drowning also accounts for 15% of all adolescent deaths in Uruguay, 10% in Paraguay, 8.3% in Costa Rica, and 7% in Argentina and Mexico [27]. In Asia, drowning is the leading cause of accident mortality in children and young adults, and in many countries of the continent, it accounts for up to 30% of accidental deaths, although some of these may be disguised suicides [28].

## HIV/AIDS

The second leading important killer of young people worldwide is HIV/AIDS. In Africa, it is the number one killer of young adults between the ages of 15 and 29 years [29]. Globally, in the past 20 years, more than 60 million people have been infected with HIV, half of whom became infected between the ages of 15 and 24 years. Today, nearly 12 million young people are living with HIV/AIDS [29]. Although prevalence rates demonstrate that young people are frequent victims of HIV/AIDS, the epidemic among youth still remains largely invisible, both to young people themselves and to society as a whole [18]. Young people often carry HIV for years without realizing they are infected. Consequently, the epidemic spreads beyond high-risk groups to the broader population of young people, making it more difficult to control.

The prevalence of HIV/AIDS among young people varies greatly among regions and countries (Table 5). Although only 10% of the world's youth live in sub-Saharan Africa, the region contained almost

75% of all youth living with HIV/AIDS in 2001, with a total of 8.6 million infected young people [29]. Even within this region, there are substantial differences in HIV prevalence. Botswana has the highest proportion of infected youth, with an estimated 30% of women aged 15 to 24 years being infected. Other countries in eastern and southern Africa have high prevalence rates as well. In a study conducted in Rwanda, over 25% of pregnant women aged 17 years or younger tested positive for HIV [30]. Similarly, in Zimbabwe, 30% of pregnant girls aged 15 to 19 years were HIV-positive [31].

In contrast, HIV prevalence in West Africa is comparatively lower. Within Asia and the Pacific regions, the only countries that have HIV prevalence rates greater than 1% among youth are Cambodia, Myanmar, and Thailand. Meanwhile, the Caribbean region has some of the most serious AIDS epidemics outside sub-Saharan Africa. At least 2% of young women are infected with HIV in the Bahamas, Dominican Republic, Guyana, and Haiti. In Eastern Europe and Central Asia, HIV prevalence is relatively low. Only in the Ukraine are over 1% of young men aged 15 to 24 years infected. Similarly, in North Africa and the Near East, HIV infection among young people is rare; however, injection drug use may soon create a new wave of infections in the region [32].

Gender differences in patterns of HIV infection among young people vary substantially around the world. In regions where heterosexual transmission of HIV dominates, often more young women than men are infected. This is especially true in sub-Saharan Africa, where HIV infection rates among young women are over five times higher than young men. In Kenya, nearly one teenage woman in four is living with HIV, compared with one teenage male in 25 [33]. Likewise, in Botswana, about one-third of women aged 15 to 24 years is estimated to be HIV-positive, twice the proportion of infected men in the same age group. A number of social, cultural, and biological factors contribute to the greater vulnerability of girls to HIV. Young women may be at a disadvantage in negotiating condom use or the fidelity of their partners because of age differences, economic disparities, and gender norms. Biologically, the risk of becoming infected with HIV during unprotected sex is two to four times greater for a woman than for a man, and for the young adolescent female the cells of the cervix are still maturing, predisposing them to infection [29]. Male-to-female transmission is more likely because during vaginal intercourse, a female has a larger surface area of her

genital tract exposed to her partner's sexual secretions than does a man [34]. Also, HIV concentration is generally higher in a man's semen than in a woman's sexual secretions [29].

### Other Communicable Diseases

Beyond HIV/AIDS, other infectious diseases represent the third leading cause of death in the world, and especially in developing countries. The World Health Organization estimates that among children aged 5 to 14 years, communicable diseases claim 693,000 deaths annually: 548,000 infectious and parasitic, 116,000 respiratory, and 28,000 owing to nutritional deficiencies. Among those ages 15 to 29 years, the burden of communicable diseases rises to an estimated 1,647,000 deaths/year, most of which are infectious or parasitic (1,292,000) and the remainder, maternal (270,000), respiratory (66,000), or nutritional (18,000).

### Homicide and War

Health statistics from many parts of the world confirm that injuries resulting from violence are also among the chief causes of mortality for young people, but particularly for adolescent males. Available statistics indicate that the most violent region in the world is the Americas, where homicide rates are highest among young men aged 15 to 24 years [35,36]. According to PAHO, homicide is the second leading cause of death among young males aged 15 to 24 years in 10 out of 21 countries with populations greater than 1 million, with the highest being in Colombia (267 per 100,000 in 1994), Puerto Rico, Venezuela, and Brazil (72 per 100,000). The United States is considered to have an intermediate adolescent homicide rate in this region; however, at 38 per 100,000 it is four times higher than the next highest rate among the 21 industrialized countries, and highest when compared with Western European countries, Canada, Australia, and New Zealand [37,38].

In the Americas region, one-third of all deaths owing to homicides are among adolescents aged 10 to 19 years [37]. In Colombia, between 1991 and 1995, there were 112,000 homicides. Young people accounted for 41,000 deaths, with the vast majority among young males [35]. Between 1977 and 1994, the specific death rate among 15- to 19-year-olds owing to homicide increased by 160% in Brazil, and currently homicide is responsible for 30% of all deaths among this age group [39]. In approximately half of

all Latin American countries, homicides are included among the five leading causes of death for adolescents with a peak incidence among 15- to 29-year-old males [27].

Mortality as a result of war probably claims more adolescent lives in developing countries than do other forms of homicide, as young people (aged 10 to 24 years) are the majority of soldiers in most developing country wars. A 1996 UNICEF report found that adolescents have been used as combatants in many conflicts in countries such as Liberia, Mozambique, Cambodia, Myanmar, and Sierra Leone [40]. In fact, according to WHO (1998), more than 100 million young people have been involved in armed conflict, either as soldiers, civilians, or refugees. With the recent widespread availability of hand-held weapons, more adolescents have been drawn into battles that previously would have been fought only by men able to carry heavy weaponry. Also, many claim that involving children and adolescents in war is relatively simple to do, as they are easier to intimidate, they do not ask for salaries, they are less likely than adults to run away, and they question less what they are expected to do [40]. However, because monitoring systems are generally weak and records are poorly kept or hidden in wartime, there is a lack of accurate global statistics on child and adolescent casualties related to war. Current estimations are usually made by examining the figures in casualty wards at hospitals, or by interviewing staff of military training camps, which typically results in gross underestimations [41].

### Suicide

In most industrialized countries, suicide ranks after injuries as the second leading cause of death among adolescents; however, globally it ranks fifth as an identifiable cause of death for youth and young adults. Worldwide, between 100,000 and 200,000 young people commit suicide annually, and the rates appear to be rising more quickly than in all other age groups for both developed and developing countries [26,28]. However, suicide rates vary tremendously worldwide, from a high in Hungary and Sri Lanka to a low in Egypt and Kuwait. In general, Arabic and Latin American countries have relatively low rates of suicide, whereas countries of primarily European descent, such as Australia, United States, and Canada, tend to have relatively high rates [42]. For example, suicides are responsible for 5% of all deaths among adolescents in Chile, Uruguay, Costa Rica,

and Ecuador compared with approximately 10% in the United States for the same year [27].

In most regions of the world, suicide is more common for males than females. In the United States, where suicide is currently the second leading cause of death among young people aged 13 to 19 years, and the third leading cause of death among young people aged 15 to 24 years, boys are four times as likely to commit suicide as girls [43]. This is largely explained by the fact that when young men attempt suicide, they are far more likely to use a gun [32]. In fact, more people in the United States kill themselves with guns than by all other methods combined. In 1998 there were approximately 30,000 suicide deaths among Americans, 57% of which were caused by guns [44].

In a review of the prevalence of adolescent suicide, Ryland and Kruesi concluded that in the past 40 years there has been a fourfold increase in the rate of adolescent suicide in most Western countries, including the United States, Australia, and New Zealand [45]. In Brazil, India, and Mexico, suicide rates among adolescents also increased from 5% to 62% over the past two decades [46]. It is unclear, however, as to why young people should be so much more likely to kill themselves today than in the past. One possible explanation is that they have greater access to lethal weapons. Similarly, research has shown that for youth, there is a direct correlation between percent of the population that owns guns and suicide rates. For example, in the United States, among children aged 5 to 14 years, the suicide rate was, on average, twice as high as the suicide rate among other industrialized countries. This twofold increased risk of suicide among U.S. children was accounted for by a U.S. firearm suicide rate that was 10 times higher than firearm suicide rates in other industrialized countries [44].

### Maternal Mortality

Another prominent cause for mortality among adolescent women, particularly in developing countries, is maternal mortality [28]. Young women who have not reached full physical and physiological maturity are almost three times as likely to die from complications in childbirth as older women [28]. Because of pelvic immaturity they are much more likely than older women to experience cephalo-pelvic disproportion, toxemia, and placental abruption leading to hemorrhage and death. Data from studies in several countries consistently show a higher risk of maternal death among teenage girls compared with women

aged 20 to 34 years [28]. The risk for very young teenagers (10 to 14 years) is much greater than for older teenagers (15 to 19 years). A study in Bangladesh showed that girls aged 10 to 14 years had a maternal mortality ratio five times that of women aged 20 to 24 years, whereas for 15- to 19-year-olds the rate was twice that of the 20- to 24-year-olds [47]. Similarly, in Jamaica and Nigeria, it has been found that pregnant women under age 15 years were four to eight times more likely to die during pregnancy and childbirth than those aged 15 to 19 years [28]. Also, community-based studies of the age-specific maternal mortality ratio (MMR) in seven developing countries found the MMR to be higher among 15- to 19-year-olds than in 20- to 24-year-olds, with the MMR in 15- to 19-year-olds ranging from under 50 per 100,000 live births in areas of two Latin American countries, to over 100 per 100,000 live births in areas of two Asian countries [24]. These high rates of maternal mortality make a substantial contribution to the overall mortality among these age groups in developing countries. In Bangladesh, for example, the excess of female deaths over that of males in the 15 to 24 years age group, and even throughout the reproductive period, can be attributed mainly to maternal mortality causes [48].

### Morbidity Trends

#### Reproductive Health Issues

*Pregnancy and early childbearing.* A substantial number of sexually active unmarried young women experience pregnancy, which is typically both unplanned and unwanted. In Jamaica, approximately 40% of women experienced an unwanted pregnancy at least once before they reached the age of 20 years [49]. In general, it appears that in-school youth are less likely to experience an unwanted pregnancy than those from the general population. For example, among students in the final three years of secondary school in Buenos Aires, Argentina, only 3% of all females reported a pregnancy, whereas 2% of males reported making a partner pregnant [50].

Although the majority of adolescents who give birth are married, a substantial proportion is not. In much of sub-Saharan Africa, one-third of births to women aged 15 to 19 years occur among unmarried adolescents; the proportion is quite low (4% to 6%) in Burkina Faso, Mali, Niger, and Nigeria, but exceeds three-quarters in Botswana and Namibia [51]. Typically in Latin America and the Caribbean, 12% to 25% of adolescent births are to unmarried women.

As access to education has increased and the benefits of postponing childbearing have become more widely known, adolescent childbearing has declined in some countries where it once was common. Women aged 20 to 24 years in parts of Asia are about 80% as likely as those 40 to 44 years to have had their first child during adolescence; elsewhere in the region, they are only one-half to two-thirds as likely to have done so. In North Africa and the Middle East, adolescent childbearing has fallen by about one-quarter to one-half. In contrast, smaller declines have occurred in sub-Saharan Africa; in fact, in some African countries, adolescents are more likely to give birth than they were a generation ago [51]. Typically, adolescent childbearing rates range between 120 and about 160 per 1000 in most countries in sub-Saharan Africa. At the extreme, annual age-specific fertility rates of more than 200 births per 1000 women aged 15 to 19 years are found in Mali and Niger. In Latin America and the Caribbean, changes in levels of teenage childbearing have varied. For example, there has been a 37% decline in the Dominican Republic, no change in Bolivia, and a slight increase in Brazil [51].

As a result of teenagers' physiological and social immaturity and their lack of prenatal care, health risks associated with pregnancies and childbearing are more pronounced than are those among older women [52,53]. Hypertension is one such complication. Also, because of their pelvic immaturity, obstructed labor is another common pregnancy-related complication among young adolescents. This is reflected in the increased proportion of labor in this age group that ends in Cesarean section or destructive operations [54]. Not uncommonly, obstructed labor leaves women with vagino-rectal or urethral fistulae. The result is continual leakage of urine or feces, constant irritation, and social ostracism. Although not well-documented, such fistulae are estimated to range from 55 to 100 per 100,000 deliveries in Africa and may be as high as 4% of all deliveries in Afghanistan [55].

*Abortion.* Data on levels of induced abortion in developing countries are notoriously difficult to gather, either because abortion is restricted or because the issue is too sensitive. Total estimates of abortions among women under age 20 years in developing countries range from 1 million to 4.4 million a year.

The health risks of unsafe abortion include sepsis (infection) caused by unsanitary instruments or incomplete abortion, hemorrhage, injuries such as cer-

vical laceration and uterine perforation, and toxic reactions to chemicals or drugs used to induce abortion. Hirsch and Barker compiled abortion data from 27 studies in developing countries (drawn largely from urban, hospital-based samples) and found that adolescent admissions accounted for 60% of females admitted with abortion-related complications in developing countries each year [56]. Several small-scale studies conducted in Africa substantiate their findings. For example, it was found in Zambia that 80% of women with induced abortion-related complications admitted to hospitals were younger than 19 years [57]. Similarly, in Nairobi, a study found that at Kenyatta National Hospital, abortion was the leading cause of admission to the emergency gynecological ward, and women aged 15 to 19 years accounted for one-third of all post-abortion care cases admitted. Results from another study conducted in Nigeria indicated that in five hospitals, 55% of post-abortion patients were under the age of 20 years, and 85% of the cases reported were single women [58]. Latin American studies have also shown that women under age 20 years account for more than their share of abortion complications and related deaths. For example, in six Latin American countries, 14% to almost 40% of women hospitalized for abortion complications in the 1980s were under age 20 years [59].

*STIs.* Another major sequela of unprotected sexual activity in adolescence is the acquisition of a sexually transmitted infection (STI), often with devastating effects on future fertility. In fact, of the estimated 333 million new STIs that occur in the world every year, at least 111 million occur in young people under age 25 years [60]. According to WHO estimates, 1 in 20 adolescents worldwide acquires an STI each year.

Compared with the extensive efforts devoted to research and intervention on HIV and AIDS, very little attention has been paid to other STIs. In particular, there has been limited discussion of the role of young and adult men in the transmission of human papilloma virus (HPV), which can be transmitted even with condom use. With women, however, it has been estimated that nearly 10 million have active HPV infections, with the majority in their late teens and early 20s. In parts of Africa and Asia, where regular Papanicolaou testing is less common than in industrialized countries, cervical cancer from HPV is the most common cause of cancer-related mortality. HPV is implicated in 95% of cervical cancer. In men, HPV is frequently asymptomatic, and men fre-

quently infect young women without even knowing it [26].

STIs deserve attention not only because of their high prevalence, but also because they frequently go undetected and untreated, and can result in serious reproductive morbidity and mortality. However, reporting of STIs is often poor, and the actual prevalence among adolescents may be higher than inadequate figures indicate [61]. As a result of the underreporting of STIs, their immediate effects on adolescents are not always apparent. In northern Nigeria, Bello surveyed 1104 asymptomatic males and females and found that 24% of college females had laboratory evidence of gonorrhea [62]. Moreover, WHO-sponsored research on STIs has found an increasing number of young men are contracting chlamydial urethritis, which is asymptomatic in up to 80% of cases. Prevalence studies on chlamydial urethritis in Chile with 154 asymptomatic adolescent males found that 3% of sexually active males tested positive [26].

Small-scale studies have shown that for both behavioral and biological reasons, STIs are more prevalent among adolescents than among adults. In Kenya, 36% of pregnant women aged 15 to 24 years suffered from an STI, compared with only 16% of their older counterparts [63]. In Brazil, nearly 30% of sexually active adolescent males in low-income areas said they have had an STI at least once [64]. A study in Ethiopia showed that young women having first sex before menarche were more likely to acquire an STI than those who had first sex at later ages [65]. Similarly, in Burkina Faso, a study among adolescent commercial sex workers revealed a higher rate of infection than in older prostitutes, a pattern which has also been shown in the United States [66].

Adolescents who know that they are infected frequently fail to obtain timely treatment. Most initial STIs are associated with annoying but not worrisome local symptoms that do not appear to warrant a clinic visit [67]. In Zambia, young people said that when they had an STI, they used home remedies first and formal health services "as a last resort" [68]. Health services in most areas do not accommodate the special needs of adolescents and often discourage attendance even when the need for care is well-understood [69]. In Zimbabwe, more than half of the health providers interviewed said that parents should be notified if a young, unmarried client comes in for STI treatment [70].

*Female genital mutilation.* Traditional reproductive practices that specifically affect adolescents are com-

mon in many developing countries. The most serious of these is female genital mutilation (FGM), which is a traditional practice that involves cutting away parts of the female external genitalia as a rite of passage for young girls to womanhood and marriage. FGM is known to be practiced in one form or another in 28 sub-Saharan countries, in a few countries on the Arab Peninsula, among some minority communities in Asia, and among migrants from these areas who have settled in Europe, Australia, and North America [71]. The tradition may have originated 2000 years ago in southern Egypt or northern Sudan, but in many parts of West Africa, the practice began in the 19th or 20th century [72].

The availability of reliable figures on the prevalence of FGM has increased greatly in recent years: it is estimated that more than 130 million girls and women worldwide have undergone FGM, and nearly 2 million more girls are at risk each year. National data have now been collected in the Demographic and Health Survey (DHS) program for six countries: the Central African Republic, Cote d'Ivoire, Egypt, Eritrea, Mali and Sudan. In these countries, 43% to 97% of reproductive-age women have experienced FGM [73]. Within countries, prevalence may vary across ethnic groups; in Mali, where the overall proportion of women who have undergone FGM is 94%, only 17% of women of Tamachek ethnicity have had it done. Estimates for other countries are generally based on local surveys or anecdotal information. The estimated proportion of women who have undergone FGM in these countries ranges from 5% in Uganda and the Congo to 98% in Djibouti and Somalia [73].

These procedures are generally performed on girls between the ages of 4 and 12 years, although they are practiced in some cultures as early as a few days after birth, or as late as just before marriage, pregnancy, or after the first birth [74]. Typically, a traditional birth attendant or an elder village woman with little or no medical training performs the procedure. Instruments used include razor blades, glass, kitchen knives, sharp rocks, scissors, and scalpels. During these procedures, infections such as tetanus occur frequently owing to unsanitary conditions and the lack of medical follow-up [75]. Uncontrolled bleeding can also occur if the wound is not well-sealed. Long-term consequences include painful intercourse, damage to the urinary system, and scarring of the tissue, which often seals the edges of the wounds together and shrinks the genital passage [75]. Infibulation is particularly likely to cause serious long-term health problems. Because the urethral opening

is covered, repeated urinary tract infections are common, and stones may form in the urethra and bladder because of obstruction and infection. If the opening is very small, menstrual flow may be blocked, leading to reproductive tract infections and lowered fertility or sterility. One early study estimated that 20% to 25% of cases of sterility in northern Sudan could be linked to infibulation [76]. Without deinfibulation before childbirth, obstructed labor may occur, causing life-threatening complications for both mother and infant. In addition to physical damage resulting from genital mutilation, psychological trauma has been implicated in young women's future emotional functioning [63]. Although such sequelae are difficult to attribute and quantify, they cannot be discounted. They can result from the trauma of the event, or occur later when subsequent difficulties arise as a result of the procedure.

## *Violence*

### **Sexual Coercion and Abuse**

Given the sensitive nature of the topic, nonconsensual sexual activity is difficult to study. The topic is particularly sensitive among youth, the age group in which coercion and abuse is most likely to occur. Accurately estimating the prevalence of sexual coercion and abuse in the world, especially in developing countries, is complicated primarily because there have been relatively few studies to address this, and cultural mores against reporting abuse make it difficult to collect from records. However, according to information from justice systems and rape crisis centers in Chile, Peru, Malaysia, Mexico, Panama, Papua New Guinea, and the United States, it has been shown that between one-third and two-thirds of known sexual assault victims are aged 15 years or younger [77].

The majority of case studies that have examined this issue show that between 5% and 15% of all young females report a forced or coerced sexual experience [78]. In some cases, the figure is even higher. For example, among in- and out-of-school adolescents in three cities in Botswana, 21% experienced forced/coerced sex; in Peru, this figure was 20% among secondary school students, and 41% among young females attending urban night study centers in Lima [21,79]. In rural Malawi, 55% of adolescent girls surveyed report that they were often forced to have sex [80]. In a case study in Manila, Philippines, 6% of unwed mothers report a pregnancy as a result of rape, and another 7% reported

that a pregnancy resulted from sex in exchange for money to support a drug habit [80,81].

The younger a woman is at first intercourse, the more likely that sex is forced. In New Zealand, one girl in four who had intercourse before the age of 14 years reported that she was forced to do so, often by a much older man. Similarly, in the United States, 24% of those who had intercourse before age 14 years reported having been forced [77].

Young girls are particularly vulnerable to coercion into sexual relationships with older men. The "sugar daddy" phenomenon is frequently cited as a common reason why young girls will have sex against their will. In Botswana, about one in five adolescent females report that it is difficult to refuse sex when money and gifts are offered [49,80]. Similarly, a study of female adolescents in Kenya revealed that 50% of the girls admitted receiving gifts in the form of money, ornaments, and clothes from their partners when they engaged in sex for the first time [79,82].

Although most studies confirm that girls are more likely to be victims of sexual abuse or coercion, there are also several studies that show that large numbers of boys suffer from sexual abuse. In Kenya, a national survey of youth found that 28% of boys and 22% of girls reported that forced sex was attempted with them. In addition, 31% of boys and 27% of girls reported having been pressured to have sex [83]. In the Caribbean, 7.5% of boys aged 16 to 18 years reported having experienced some kind of sexual abuse [24,84]. In Zimbabwe, 30% of secondary school students interviewed reported that they had been sexually abused; half were boys being abused by female perpetrators [85].

Sexual abuse and coercion can lead to a wide variety of negative health consequences, including behavioral and psychological problems, sexual dysfunction, relationship problems, low self-esteem, depression, thoughts of suicide, alcohol and substance abuse, and sexual risk-taking [79]. Victims of sexual coercion and abuse are generally less likely to feel they have power in sexual relationships. A longitudinal comparative study of sexual violence during adolescence in South Africa, Brazil, and the United States found that sexual coercion and abuse in adolescent intimate relationships are associated with lower condom use [80]. In addition, sexual violence has been linked to many serious physical health problems, such as injury, chronic pain syndromes, and gastrointestinal disorders [77]. For example, a variety of studies have found that women suffering from chronic pelvic pain are consistently more likely

to have a history of childhood sexual abuse, sexual assault, or sexual abuse by their partners [77].

### *Mental Health*

Until recently, the magnitude of the burden of disease related to adolescent mental disorders has been difficult to quantify. Now, with the global crisis involving adolescents affected by war, orphaned by AIDS, and forced to migrate for economic and political reasons, the dimensions of the burden of compromised mental health are increasingly evident and alarming. Worldwide, up to 20% of children and adolescents suffer from a disabling mental illness. The World Health Organization indicates that by the year 2020, adolescent psychiatric disorders will increase by more than 50% worldwide to become one of the five leading causes of disability among adolescents [86].

The U.S. Surgeon General announced that the United States is facing a public crisis in the mental health of children and adolescents [87]. Currently, 1 in 10 young people in the United States suffers from a mental illness severe enough to cause some level of impairment, yet fewer than one in five receives the needed treatment. The situation in developing countries is even worse. According to a recent WHO survey, 41% of developing countries do not have treatment facilities for severe mental disorders and 37% do not have community health care facilities [86]. Thus, it is likely that a high proportion of psychiatric conditions in young people never reach the notice of health services, and even among those who do go to a health care facility, a high proportion will not be diagnosed as having any type of mental health disorder. Especially for young people, most sufferers of a psychiatric disorder in developing countries present themselves to a health care facility with a physical complaint, when usually the true underlying cause of psychological complaint goes undetected. For example, a clinic-based study in Kenya found that at least 30% of 11–15-year-old attendees had a primarily psychiatric disorder, although all presented with a physical complaint [88].

One of the most common mental disorders affecting adolescents and young people worldwide is depression. When comparing depressive symptoms among adolescents in 28 developed countries, it was shown that adolescents in the United States had the highest levels of depressive symptoms, whereas Austrian teens reported the lowest level of weekly depressive symptoms [89]. The primary concern

with depression among adolescents is that it is often combined with substance abuse, which puts adolescents at even greater risk for suicide. In a U.S. longitudinal study, adolescents diagnosed with major depressive disorder were more likely to commit suicide and attempt suicide than adolescents without depression [90].

### *Tobacco and Substance Use*

#### **Tobacco Use**

Currently, smoking remains one of the most important preventable causes of death in the world. According to the World Health Organization, approximately 4 million people a year die from tobacco-related illnesses, a figure that is expected to rise to 10 million by the year 2030 [91]. By that time, approximately 70% of these deaths will be occurring in developing countries.

Studies conducted in industrialized countries indicate that most people begin using tobacco before the age of 18 years [92,93]. Recent trends show an even earlier age of initiation and rising smoking prevalence rates among children and adolescents. For example, according to the Global Youth Tobacco Survey, the highest prevalence of early initiation of cigarette smoking is in China, Poland, and Zimbabwe, where nearly one-third of the students who ever smoked cigarettes started smoking before the age of 10 years [94]. Moreover, nearly 70% of students aged 13 to 15 years have ever smoked cigarettes in the Ukraine, Poland, and the Russian Federation [93]. Generally, in most countries, boys are more likely than girls to use tobacco. However, where this tendency is reversed, there may be a successful advertising campaign by the tobacco industry in making cigarettes look fashionable [95].

Notably, most young people who start smoking report that they want to stop, and worldwide, over two-thirds of youth between the ages of 13 to 15 years have tried to stop smoking [94]. However, the traditional focus of youth prevention programs has been on preventing youth from starting to smoke. Relatively few have offered smoking cessation programs to those who may already be smoking. Programs that target tobacco use among young people, therefore, need to expand their focus to include both preventing starting and offering smoking cessation programs to youth.

## Alcohol and Drug Use

In most industrialized countries, alcohol is generally accessible to everyone, including young people. Although moderate use of alcohol by adults and teenagers is socially accepted in many countries, excessive use is invariably considered to be a problem with severe social and physical consequences [81]. According to the Global Burden of Disease 2000, alcohol is now the number one killer of young men in Europe. In fact, one in four deaths of European men in the age group of 15–29 years is related to alcohol. In Eastern Europe, the figure is as high as one in three [96]. In the United States, there is a large body of literature that has demonstrated how alcohol use is significantly associated with road traffic accidents among young people [28].

Although most young people in industrialized countries try alcohol, the numbers that abuse it are much smaller, and the numbers that go on to have an alcohol problem later in life are also relatively small [13]. Countries that have the highest rates of teen drunkenness (having been drunk 20 times or more) are Denmark, where 41% of students reported this, followed by Finland, Ireland, and the United Kingdom, where approximately one in four students gave this answer [97]. Studies from the United States have indicated that those with the potential for becoming alcoholics are identifiable by environmental, genetic, and social factors, which means that prevention programs can use targeted measures that are more effective than general warnings to the entire population of youth [24,98].

In Latin America, alcohol use and abuse is increasing rapidly among young people. A study in Chile, for example, showed that 80% of 9-year-olds were reported to have drunk alcoholic drinks at least once a week [99]. Moreover, among 15- to 19-year-olds, it is estimated that approximately 12% of Chilean youth drink in excess [28]. In sub-Saharan Africa, studies among high school students in Kenya, Ghana, and Zambia have shown that between 70% and 80% of students use alcohol, whereas 10% to 14% could be classified as abusing it. Patterns of use in these countries are linked to changes in the social context of using alcohol, from being primarily associated with traditional ceremonies to its more widespread use in daily socializing [24]. Studies conducted in Nigeria (which revealed that approximately 52% of high school students use alcohol) also link the extensive use of alcohol by youth to the ready availability and lack of sanctions on its production, distribution, and consumption. For in-

stance, there is no age or time restriction on alcohol use in most parts of the country [100]. Similar situations can be found in other African countries as well.

Research has also shown that important differences exist between the genders with regard to alcohol use and the physical effects of alcohol. A national survey of adolescents in the United States found that 20% of males compared with 16% of females report using alcohol 2 days or more a month [101]. Studies in developing countries have also demonstrated that females are less likely to use alcohol than males. Part of the reason for this is that alcohol use is frequently part of a constellation of externalizing risk-taking behaviors often associated with males, including interpersonal violence and acting-out behaviors [97]. In many countries, drinking by young men is viewed as reinforcing an image of courage, toughness, and maturity. In Brazil, for example, alcohol use was associated with having the "courage" to propose sexual relations [26,56].

Moreover, physical factors, such as body water content, make females much more susceptible than males to the effects of alcohol [28]. Consequently, consumption of the same amount of alcohol is likely to result in more serious health effects for females, even when their body weight is taken into account [28].

In addition to alcohol use, there has been a tremendous amount of interest in the use of drugs among young people. Worldwide, marijuana appears to be the most widely used illicit substance. Fifteen percent of young people in Mexico and Chile, and 40% of youth in Brazil report regular use of marijuana. In the United States, almost 60% of youth between the ages of 15 and 18 years have ever used marijuana, whereas in the United Kingdom, Canada, and the Netherlands, less than 20% of young people have used marijuana [28,102].

Similar to tobacco and alcohol use, studies have also shown that more boys than girls engage in illicit drug use. For instance, in Ecuador, 80% of narcotic users are men, with the majority in their late teen years to early 20s [26,95]. In Jamaica, lifetime and current use of marijuana for young and adult men is two to three times greater than usage rates for young women [103]. In the United States, boys are also more likely than girls to say that they use drugs to be "cool" [104].

## Conclusions

When we look across the world, a number of conclusions can be drawn with significant consequences for

the future of young people. First, in both relative terms and absolute numbers, more young people are living now than ever before. These numbers will continue to increase over the next 50 years, especially in developing countries, whereas the relative proportion of youth in industrialized countries will decline. In addition, transnational migration means that what were viewed as distant concerns are frequently now in our backyard affecting domestic as well as international health.

Trends that have and will continue to have a major impact include: the decline of infectious causes of mortality, the rise of urban living, globalization, education, and the delay in the age of marriage. Issues that were not on the global radar for youth a generation ago that are now of increasing salience include traffic-related mortalities, clandestine abortion, physical and sexual abuse, mental health disorders, suicide, homicide, tobacco- and alcohol-related morbidities, and most importantly, HIV/AIDS.

Although the HIV/AIDS epidemic has, in large part, helped to increase the attention of governments worldwide to develop reproductive health programs for adolescents, far less attention has been given to addressing the issues of traffic-related mortalities, mental health disorders, suicide, and tobacco- and alcohol-related morbidities for adolescents.

However, to be effective in creating new youth policies and programs for these new issues, it is important that we pay attention to the influence that adolescent morbidity and mortality has on the broader social context. Depending on the country and region of the world, the priority health problems and issues will differ to some extent between countries and regions of the world. This is in part because of the differences in disease prevalence and frequency of related health behaviors, and also because of the enormous differences in cultural, social, and economic contexts. In some settings, the rapid social changes are destabilizing the traditional developmental paths of youth, which often results in thrusting youth and society into an uncertainty of how to move forward. In addition, economic decline in developed countries and competition for financial resources in developing countries almost universally affects health care services. Even worse are services for mental health disorders, because priority is most often given to those illnesses labeled as physical.

For young people themselves, health may not even be a top priority. The views of young people have rarely been studied or taken into consideration for designing policy and programs, particularly in the developing world. Studies on young people's

assessments of their health needs in industrialized countries have shown that they tend to focus more on physical concerns such as acne, menstruation, and weight, and psychosocial concerns such as relationships with their family and peers [105]. However, few, if any of these would feature among the priorities established by government health planners on the basis of quantitative assessments of need. Yet, if interventions that target young people are going to be accepted by them and salient to them, the viewpoint of young people must be investigated and incorporated into programs [24]. In a recent exhibit at the United Nations featuring the artwork of young people from Kenya, one drawing by a teenage girl portrayed a young woman running and screaming to avoid female genital mutilation. The caption read, "Stop harmful traditional practices." It is quite clear that making adolescents an integral part of society can yield many positive outcomes. Youth need to be seen as part of the solution; in doing so, we increase the likelihood that not only will our interventions be accepted, but that they will be more effective because they will be more consistent with the health priorities of young people.

### *Limitations*

There are several limitations to this literature review that need to be mentioned. First, comparing international rates of suicide, abortion, STIs, and homicide is inherently problematic given that different methods are used to classify each of these outcomes. The classification of suicide, for example, is to some degree culturally determined. The same applies to abortion and homicide. Classifying STIs is also problematic, given that many of these infections have wide variation in symptoms and signs, as well as the fact that many are asymptomatic. In many developing countries STIs are often clinically diagnosed without laboratory confirmation, which lends itself to errors and misdiagnosis. Finally, with regards to diagnosing mental health disorders among adolescents, it is often difficult to draw clear boundaries between phenomena that are a part of normal development and others that are abnormal. Many studies have used behavioral checklists, which are typically completed by parents and teachers, to detect cases. This information, although useful in identifying teens that need special attention, may not always correspond to a clear diagnosis [95].

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