Chapter 7. Interpersonal Violence: Global Impact and Paths to Prevention

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Abstract

Interpersonal violence is a global public health problem that disproportionately impacts low- and middle income countries (LMICs). Children, adolescents and young adults, both males and females, are its primary victims. The consequences of experiencing interpersonal violence are pervasive and enduring, increasing the risk of injury, infectious diseases such as HIV, mental health problems, reproductive health problems, and non-communicable diseases. Given the high prevalence of interpersonal violence and its extensive consequences, the associated economic impact is substantial. The evidence base for preventing interpersonal violence is growing, but is largely based on research conducted in high-income countries. Key challenges moving forward include building the evidence base for cost effective programs and policies in LMICs as well as the infrastructure needed to support the dissemination, scaling up, and sustenance of effective programs and policies. Interpersonal violence can be prevented if governments, their citizens, and the global community start now, act wisely, and work together.

Introduction

Interpersonal violence is a pervasive public health, human rights, and development challenge (Rosenberg and others 2006). Its effects reverberate through families, communities, nations, and across generations. It is a leading cause of death among adolescents and young adults in most parts of the world. The exposure to interpersonal violence increases lifelong vulnerability to a broad range of emotional, behavioral, and physical health problems. Interpersonal violence directly affects health care expenditures worldwide; indirectly, it affects national and local economies—stunting development, increasing inequality, and eroding human capital (WHO 2008).

Attention to interpersonal violence as a global issue has expanded dramatically since the World Health Assembly identified violence as a public health priority in 1996. Reports by the United Nations (UN) have contributed greatly to increased awareness (Krug and others 2002; Pinheiro 2006; UN 2006). These and other efforts culminated in proposals to include specific targets for eliminating interpersonal violence against woman and children in the UN Post-2015 Action Agenda for Sustainable Development (UN 2013).

Nature and Burden of Interpersonal Violence

The three primary forms of violence globally are *interpersonal violence*; *self-directed violence*, including suicide; and *collective violence*, including war, terrorism, and state-perpetrated violence in the forms of genocide or torture (Dahlberg and Krug 2002). This chapter focuses on interpersonal violence.

Definitions of Interpersonal Violence

The WHO defines *violence* as follows: "The intentional use of physical force or power, threatened or actual, against oneself, another person, or against a group or community that either results in or has a high likelihood of resulting in injury, death, psychological harm, mal-development, or deprivation" (Dahlberg and Krug 2002, p. 5). This definition encompasses interpersonal, self-directed, and collective violence.

Interpersonal violence involves the intentional use of physical force or power against other persons by an individual or small group of individuals. It may be physical, sexual, or psychological, and it may involve deprivation and neglect. Acts of interpersonal violence can be further divided into *family/partner violence* or *community violence*.

- *Family/partner violence* refers to violence within the family and by intimate partners and includes child maltreatment, dating and intimate partner violence (IPV), and elder maltreatment.
- *Community violence* occurs among individuals who are not related by family ties, but who may know each other; it includes youth violence, bullying, assault, rape or sexual assault by acquaintances or strangers, and violence that occurs in institutional settings such as schools, workplaces, and prisons.

The Burden of Interpersonal Violence

Information on the magnitude, nature, and consequences of interpersonal violence is critical for program and policy development.

Deaths Resulting from Interpersonal Violence

The WHO's global burden of disease estimates indicate that approximately 1.4 million people died in 2011 as a result of all three major forms of violence (table __.1); 35.5 percent of those deaths—486,493—were due to interpersonal violence. Global burden of disease estimates find that over 86 percent of all violence-related deaths occur in low- and middle-income countries (LMICs), including 94.4 percent of deaths due to interpersonal violence. The estimated rate of deaths due to interpersonal violence or homicide in LMICs was 7.9 per 100,000 people in 2011, compared with 2.5 per 100,000 in high-income countries (HICs).

Table __.1 Estimated Violence-Related Deaths, by Type andIncome Level, 2011

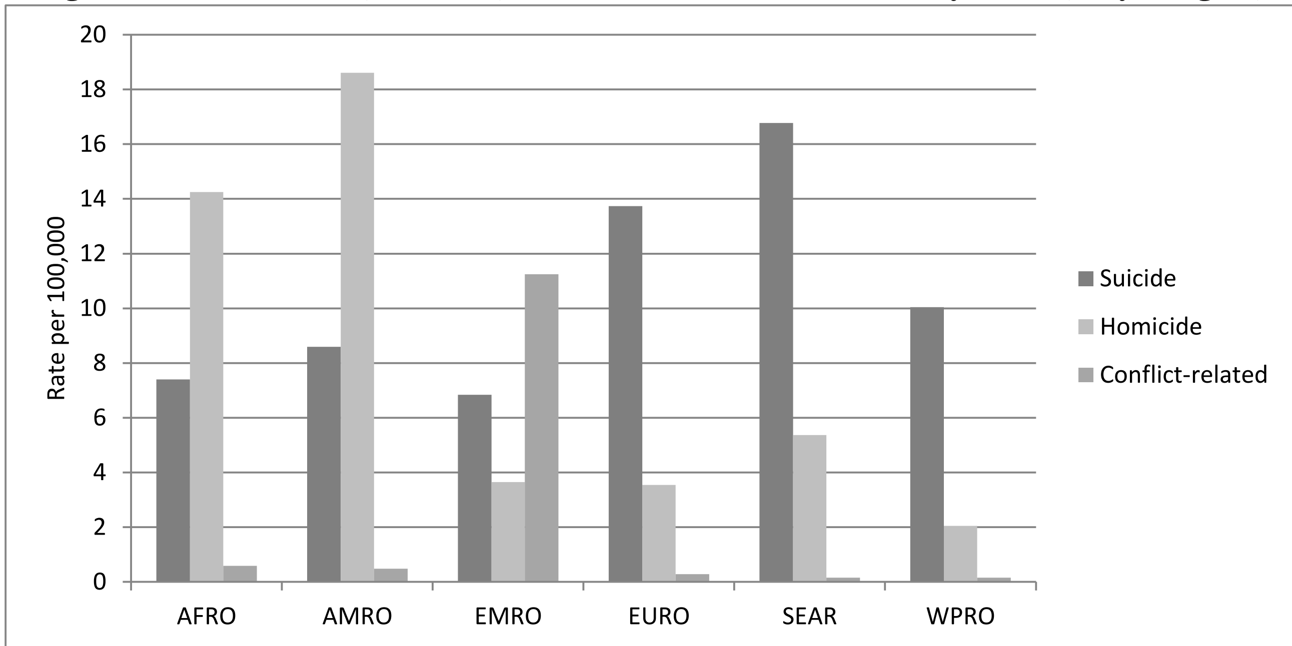
Category	Number	Rate per 100,000 population[a]	Proportion of total (percent)
Suicide	797,823	11.5	58.2
LMICs	645,800	11.1	80.9
HICs	152,023	13.9	19.1
Interpersonal	486,493	7.0	35.5
LMICs	459,285	7.9	94.4
HICs	27,208	2.5	5.6
Conflict-related	86,307	1.2	6.3
LMICs	85,166	1.5	98.7
HICs	1,140	0.1	1.3
All types of violence	1,370,623	19.8	100.0
LMICs	1,190,251	20.4	86.9
HICs	180,372	16.5	13.1

Source: World Health Organization. 2013a. Global health estimates summary tables: deaths by cause, age and sex, by WHO region. Geneva, World Health Organization. http://www.who.int/healthinfo/global_burden_disease/en/ (accessed 22 July 2013).

Note:
[a] = age standardized.
HIC = high-income country; LIMC = low- and middle-income country.

Rates and patterns of violent death varied by country and income level (figure __.1). Homicide rates were highest in developing countries in Latin America and the Caribbean and in Sub-Saharan Africa, and lowest in East Asia and the Pacific, and some countries in northern Africa. In 2010, homicide was the leading cause of years of life lost (YLL) in tropical and central Latin America**,** the fourth leading cause in southern Sub-Saharan Africa, and the eighth leading cause in the Caribbean and Eastern Europe (Lozano and others 2012). Poorer countries, especially those with large gaps between the rich and the poor, tend to have higher rates of homicide than wealthier countries (Butchart and Engstrom 2002).

Figure __.1 Homicide, Suicide, and Conflict-Related Fatality Rates, by Region, 2011



Source: World Health Organization. 2013a. Global health estimates summary tables: deaths by cause, age and sex, by WHO region. Geneva, World Health Organization. http://www.who.int/healthinfo/global_burden_disease/en/ (accessed 22 July 2013).

Note: AFRO = African Regional Office; AMRO = Americas Regional Office; EMRO = Eastern Mediterranean Regional Office; EURO = European Regional Office; SEAR = South East Asia Regional Office; WPRO = Western Pacific Regional Office.

Homicide rates differed markedly by age and gender (table __.2). Infanticide in the first month of life accounted for the highest age-specific rate of homicide in females and the third highest rate in males. Gender differences were least marked for the 0-14-year age group. For the 15- to 29-year age group, rates for males were nearly five times those for females; for the remaining age groups, rates for males were from two to four times those for females. Homicide rates for females doubled between the ages of 5-14 and 15-29 years and then decreased, until increasing again in women aged 70 years and over. Rates for males increased more than 10 times after age 14, peaked in the 15- to 29-year age group, and then decreased with age. Overall, homicides resulted in the deaths of 4.1 males per female. Recent estimates indicate that about one in seven homicides globally, and more than one in three homicides of females, are perpetrated by an intimate partner (Stockl and others 2013).

Firearms are associated with a substantial number of homicides around the world. In 2010, there were an estimated 196,200 firearm homicides in non-conflict situations (Lozano and others 2012). Firearm suicides are also an important problem in many countries—such as in the United States, where over 60% of all firearm deaths are suicides—the number of suicides committed with firearms globally is unknown.

Table __.2 Estimated Global Homicide and Suicide Rates, by Age Group, 2011

Age	Homicides per 100,000 population		Suicides per 100,000 population	
	Males	Females	Males	Females
0–27 days	13.7	18.4	0	0
1-59 months	2.1	2.1	0	0
5–14 years	1.8	1.4	1.3	1.3
15–29 years	19.0	4.0	16.2	12.1
30–49 years	15.3	2.9	18.0	8.4
50–69 years	8.5	2.1	22.3	10.6
70+ years	6.1	3.4	42.0	20.1
Total	11.2	2.8	14.5	8.4

Source: World Health Organization. 2013a. Global health estimates summary tables: deaths by cause, age and sex, by WHO region. Geneva, World Health Organization. http://www.who.int/healthinfo/global_burden_disease/en/ (accessed 22 July 2013).

Nonfatal Interpersonal Violence

In recent years, multiple reports using household survey data have characterized the prevalence of interpersonal violence.

Violence Against Children and Youth

For violence against children, UNICEF Multiple Indicator Surveys from 24 LMICs find that physical violence is high, with 64 percent of children experiencing moderate violent discipline at home, and over 80 percent experiencing psychological aggression (Lansford and Deater-Deckard 2012). Violence Against Children Surveys in five countries (Haiti, Kenya, Swaziland, Tanzania, Zimbabwe) found that the prevalence of sexual violence ranged from 26 percent to 38 percent in girls, and 9 percent to 21 percent in boys (CDC, INURED, and the Comite de Coordination, forthcoming; Reza and others 2009; UNICEF, CDC, and KNBS 2012; UNICEF, CDC, and Muhimbili University 2012; ZIMSTAT 2011); the prevalence of physical violence ranged from 61percent to 74 percent in girls, and 57 percent to 76 percent in boys; the prevalence of emotional violence to range from 24 percent to 35 percent in girls and 27 percent to 39 percent in boys. Regardless of the type of violence, perpetrators are largely known, and violence tends to occur in homes.

In meta-analyses of studies from across the world, 11 percent to 22 percent of girls and 4 percent to 19 percent of boys have experienced child sexual abuse; 14 percent to 55 percent experienced child physical

abuse; 12 percent to 22 percent experienced physical neglect, and 13 percent to 25 percent experienced emotional neglect (Stoltenborgh 2011; Stoltenborgh and others 2013a; Stoltenborgh and others 2013b). The hidden nature of child sexual and physical abuse was poignant; when compared with official reports, self-reported prevalence of child sexual abuse was over 30 times higher (Stoltenborgh 2011); and self-reported prevalence of physical abuse was over 75 times higher (Stoltenborgh and others 2013).

In youth ages 10-24 years, interpersonal violence was the fifth leading cause of disability adjusted life-years (DALYs) in 2004, accounting for 3.5 percent of all DALYs in this age group (Gore and others 2011). Unfortunately, few LMIC studies examine the non-fatal consequences of youth violence; this is a research gap that urgently requires filling.

Violence Against Women

For violence against women, Demographic Health Surveys (DHS) conducted in Sub-Saharan African countries (Cameroon, Kenya, Malawi, Rwanda, Uganda, Zambia, and Zimbabwe) and Reproductive Health Surveys (RHS) focused primarily in Central and South American countries (Ecuador, El Salvador, Guatemala, Jamaica, Nicaragua, and Paraguay) have documented the prevalence of this problem. In Sub-Saharan Africa, the prevalence of physical violence among women in the DHS ranged from 30 percent in Malawi to 60 percent in Uganda, with most perpetrators being intimate partners; the prevalence of sexual and emotional violence by intimate partners was also high (Borwankar, Diallo, and Sommerfelt 2008). For Central and South America, RHS findings report prevalences of physical violence among women ranging from 17 percent in Jamaica to 31 percent in Ecuador (Bott and others 2012). Global and regional estimates of violence against women demonstrate that 35 percent of women worldwide have experienced physical and/or sexual violence; most of this violence was perpetrated by intimate partners (WHO 2013b).

Violence Against Elderly People

Elder maltreatment has been examined using population-based surveys and records from adult protective services (APS). In surveys, 6 percent of older people reported significant abuse in the past month, and 5.6 percent of couples reported physical violence in their relationship in the past year (Cooper, Selwood, and Livingston 2008). In studies involving vulnerable elders, nearly one-fourth reported significant levels of psychological abuse. Rates of abuse reported to APS are generally very low (1 percent to 2 percent).

Consequences of Interpersonal Violence

The consequences of experiencing interpersonal violence are pervasive and enduring. Evidence confirms that exposure to violence increases the risks of injuries, infectious diseases, mental health problems, reproductive health problems, and noncommunicable diseases (NCDs).

Cause of Physical Injury

Although *injury* historically has been defined as the experience of physical damage by an individual, the definition has been expanded to include damage that is psychological in nature, with the potential to lead to maldevelopment or deprivation (Norton and Kobusingye 2013). Whether physical or psychological, violence-associated injuries commonly go unrecognized. These injuries occur along a continuum, ranging from self-limited to severe, and include lacerations, bruises, wounds, fractures, broken teeth, ocular damage, burns, internal injuries, and head injuries. Such injuries, especially those associated with highly lethal means such as firearms may lead to disability, including brain damage, amputations, or paralysis (Buchanan 2013).

Link to Infectious Diseases

The association between sexual and physical violence and infectious diseases, particularly sexually transmitted infections (STIs) and HIV, is well supported, with evidence across multiple studies demonstrating that these associations are strong, largely consistent, graded, and biologically plausible (Anderson, Cockcroft, and Shea 2008; Machtinger and others 2012a). Emerging evidence suggests violence may be associated with HIV transmission and progression, presumably due to violence-associated increases in antiretroviral failure, HIV transmission risk behaviors, as well as to an independently elevated risk of HIV-associated death (Machtinger and others 2012b). The importance of gender-based violence as a driver of HIV in women is so prominent that multilateral donors view elimination of violence against women and children as a key strategy for advancing HIV prevention (IOM 2013).

Increased Risk of Reproductive Issues

Multiple studies document the reproductive consequences of exposure to child maltreatment and IPV. These forms of violence are associated with unintended pregnancy, teen pregnancy, and associated risk behaviors, such as multiple partners and early initiation of sexual activity (Hillis and others 2004). The intergenerational effects of exposure to childhood violence may be extreme. For example, violence to girls increases the future risk of adverse pregnancy outcomes, such as fetal death (Hillis and others 2004). In addition, mortality for young children is significantly higher when their mothers are victims of IPV (Silverman and others 2011). A review of studies from 17 LMICs shows that IPV leads to an increased prevalence of pregnancy-associated mental health disorders, such as postpartum depression, which impair a mother's ability to provide a safe, stable, and nurturing environment for her children (Fisher and others 2012).

Increased Risk of Mental Health Problems

Globally, studies from high, middle, and low-income countries document that violent experiences lead to various mental health consequences. The WHO World Mental Health Survey findings from 21 countries demonstrate that violence during childhood is associated with mood, anxiety, behavior, and substance disorders during adulthood (Kessler and others 2010). Furthermore, studies involving 21,000 women from Asia, Sub-Saharan Africa, and Latin America and the Caribbean confirm strong associations between various forms of violence—including IPV, non-partner physical violence, childhood sexual abuse, and witnessing IPV—and suicides (Devries and others 2011).

Increased Risk of Future Violence

Exposure to violence during childhood increases the risk of experiencing or perpetrating violence later in life. Experiencing child maltreatment and witnessing partner abuse have consistently been shown to increase the risk of becoming either a perpetrator or victim of sexual and IPV as an adult (Capaldi and others 2012; Tharp and others 2012). This intergenerational impact of childhood violence increases the risk that men will become perpetrators and that women will become victims. An assessment of reproductive health surveys in six countries in the Americas found that the proportion of women reporting IPV was more than twice as high for those who experienced sexual or physical abuse in childhood as for those who did not (Bott and others 2012).

Increased Risk to Special Populations

While most reports addressing interpersonal violence focus on the general population, recent studies address infectious, reproductive, and mental health consequences of violence for children outside of family care, including street children, trafficked children, those affected by crises and armed conflict, and those living in institutions, such as orphanages. For street children, studies from LMICs report HIV seroprevalences of 40 percent and higher among those who experienced childhood violence, in contrast to general population prevalences of 1 percent (Kissin and others 2007; Robbins and others 2010). Associations between violence and elevated risks of HIV/STIs, pregnancy, psychiatric pathology, depression, anxiety, posttraumatic stress disorder, and suicide have been reported among victims of sex trafficking and armed conflict, as well as among those in orphanages (Reed and others 2012; Silverman and others 2009; Zapata and others 2011; Zapata and others 2013).

Increased Risk of Noncommunicable Diseases (NCDs)
Violence during childhood is also associated with NCDs that often only become evident decades later. Exposure to childhood violence leads to consistent and graded increases in each of the four NCDs—cardiovascular disease, cancer, chronic lung disease, and diabetes—that accounted for nearly 60 percent of the 53 million deaths globally in 2010 (Lozano and others 2012; Norman and others 2012). In both developed and developing countries, childhood violence has been associated with major risk factors for these diseases, including alcohol abuse, tobacco use, physical inactivity, and obesity (Anda and others 2010). Beyond health effects, serious psychosocial effects of childhood violence observed decades later include severe problems with finances, family, jobs, anger, and stress (Hillis and others 2004).

Basic Science Evidence
The biological underpinnings of the empirical associations between exposure to violence and subsequent major causes of mortality in adulthood have been established at the basic science level. Recent evidence demonstrates that traumatic stress, such as that associated with violence in childhood, impairs brain architecture (both structure and function), immune status, metabolic systems, and cellular inflammatory responses (Anda and others 2010). It is clear that early exposure to toxic stress in childhood confers lasting damage at the most basic levels of the nervous, endocrine, and immune systems, and that such exposures can influence genetic alteration of DNA (Danese and McEwen 2012). Importantly, research summarizing the epigenetic effects of early childhood experiences suggests that those multifaceted gene-environment interactions that cause negative health consequences after exposure to chronic stress also appear to confer positive health consequences after exposure to early environments that are engaging and nurturing (Heim and others 2012). Epidemiologic research complements these findings, demonstrating that early nurturing in the home leads to sustained positive economic and psychosocial consequences up to five decades later (Hillis and others 2010).

Economic Burden of Interpersonal Violence

Given the high prevalence of interpersonal violence and its extensive consequences, the associated economic impact is substantial. However, no comprehensive framework for estimating the total economic burden of violence exists. Challenges in creating such a framework include "weaknesses in the knowledge base both in economic costing and in violence prevention, difficulty in creating a universal algorithm for diverse settings, and disagreements in types of costs to include" (IOM and NRC 2012, p.7). Although no methodology exists to enumerate the full impact of violence, costs commonly considered include *direct costs*, which arise proximal to the violent event, and *indirect costs*, which result as a consequence, externality, or lost opportunity (IOM and NRC 2012). Current approaches that largely confine estimates of health-related costs to proximal consequences lead to marked underestimates, for they fail to incorporate costs of HIV, chronic diseases, and other conditions

attributable to violence. A comprehensive approach to cost estimation will strengthen global efforts to elevate the urgency of violence prevention (WHO 2004).

Comparisons among countries of the costs of interpersonal violence are complicated by variations in definitions, types of costs, discount rates, comparable data, and methodology. There is great variability between reports in types of costs included, in whether such costs are disaggregated, and in whether there is clarity regarding inclusion of costs associated with both victimization and perpetration. Generally speaking, costs can be divided into direct costs, which typically include those associated with medical care, psychological care, property damage, policing, incarceration, and residential treatment, and indirect costs which include those commonly associated with lost wages and decreased productivity. While the absolute costs appear to be higher in HICs than LMICs, the relative costs of violence as a proportion of government spending are often high in both settings (table __.3). Reports of direct and indirect societal costs of interpersonal violence in general vary widely, ranging from US$75.2 million (estimates converted to 2013 dollars) for homicide in New Zealand in 1992 to US$579.4 billion (2013) for homicide, child abuse, sexual and other assault, and robbery in the United States in 1993 (Fanslow and others 1997; Miller, Cohen, and Wiersema 1996). Estimates of the costs of both interpersonal and collective violence in the Americas show that direct and indirect economic losses incurred to society ranged from 5.1 percent of 1997 GDP in Peru to 24.9 percent in El Salvador (Buvinic, Morrison, and Shifter 1999); other estimates found that interpersonal violence accounted for 4.0 percent of GDP in Jamaica, 1.2 percent in Brazil, and 0.4 percent in Thailand (Butchart and others 2008).

Reports estimating the national costs of child maltreatment are largely from HICs, while those addressing IPV also include LMICs. For example, Fang and others (2012) estimated the total lifetime economic burden resulting from new cases of child maltreatment in the United States in 2008 to be US$135 billion (estimates converted to 2013 dollars); for Germany, an analysis using similar methods showed total costs of US$19.0 billion (**2013**) (Habetha and others 2012). HIC estimates of the annual direct and indirect costs of IPV against women exceeded US$8.9 billion (**2013**) in the United States and US$1.7 billion (**2013**) in Canada (CDC 2003; Day 1995). For LMICs, costs of the lost productive capacity of abused women as a percent of GDP were equivalent to 2.0 percent in Chile, 1.6 percent in Nicaragua, and 22 percent in Morocco (table __.3) (International Center for Research on Women 2009; Morrison, Andrew, and Orlando 1999). Although adolescents and young adults commit a disproportionate share of all violence and, therefore, account for a high proportion of its cost, youth violence has been the subject of few economic cost studies (WHO 2004).

<<Insert table __.3 about here>>

Risk and Protective Factors for Violence

Violence results from the interplay of risk and protective factors. Identifying these factors is key, since increasing protection and decreasing risk underlies effective prevention. Several cross-cutting risk factors for violence perpetration are described in table __.4. Many of these factors also increase the likelihood of being a victim; for example, young men ages 15-44 years are most likely to be both victims and perpetrators in any country. Additional factors, such as having a disability (Hughes and other 2012), increase the risk of becoming a victim but not a perpetrator.

Table __.4 Risk for Perpetrating Violence

Level of the ecological model	Risk factors

Individual	• Early exposure to violence, adverse events, including child maltreatment and intimate partner violence • Male gender • Youth • Neuropsychological deficits, including attention-deficit hyperactivity disorder and learning disabilities • Personality disorders • Substance misuse • History of violence
Household	• Intimate partner violence • Household members with criminal records • Harsh, cold, inconsistent parenting • Low socioeconomic status
Peer group	• Associating with others who use and endorse the use of violence
Community	• High residential mobility • High unemployment • High population density • Poverty • Drug trade • Inadequate victim care services
Societal	• Rapid social change • Economic inequality • Gender inequality • Policies that sustain or increase inequalities • Patriarchal norms that prioritize men's power over women and adults' power over children • Societal norms that support violence • Poor rule of law • Weak criminal justice system • Availability of lethal means, for example, firearms

Source: Krug and others 2002.

The recognition that different types of interpersonal violence share common risk factors, often occur in combination, and may be causal factors for one other, is important (Reza, Mercy, and Krug 2001). For example, child maltreatment is a risk factor for youth violence and IPV. Three cross-cutting risk factors bear particular mention, for they represent factors that, if successfully addressed by prevention initiatives, could have substantial impact: parenting, substance abuse (particularly alcohol), and the availability of lethal means.

Harsh, cold, and inconsistent parenting has been linked to youth violence (van der Merwe, Dawes, and Ward 2012), IPV (Ireland and Smith 2009), and the increased risk of abuse of one's own children (Thornberry, Knight, and Lovegrove 2012). By contrast, children who receive warm, consistent parenting tend to have better outcomes (Eisenberg and others 2005; Smith, Landry, and Swank 2010).

Substance abuse, and particularly alcohol abuse, is implicated in a number of ways in both victimization and perpetration of violence (WHO 2006). Maternal use of alcohol during pregnancy can result in fetal alcohol spectrum disorders, with their attendant executive functioning disorders (Mattson and others 2013), which increase the risk of aggression in affected children. Alcohol use also reduces self-control and the ability to process information (Giancola 2000), making it more likely both that drinkers will use violence in response to perceived threats and that they will be vulnerable to victimization (Klosterman and Fals-Stewart 2006). Alcohol misuse has been implicated across all forms of violence, including perpetration of child maltreatment (Gilbert and others 2009) and elder abuse (Lachs and Pillemer 2004), and both victimization and perpetration of youth violence (van der Merwe, Dawes, and Ward 2012), and IPV (Jewkes 2002).

Access to lethal means of perpetrating interpersonal violence, such as firearms and sharp objects, contributes substantially to the likelihood that such violence will result in death or serious injury (Beaman and others 2000). In the United States, the presence of a firearm in the home is associated with an increased risk of homicides, especially among women (Miller, Azrael, and Hemenway 2013). In cross-national comparisons of HICs, higher homicide rates have been associated with greater access to firearms (Miller, Azrael, and Hemenway 2013).

Interventions and their Applicability to Low-and Middle-Income Countries

Public health interventions aim to prevent violence from occurring. Prevention efforts addressing common underlying risk factors have the potential to decrease several different forms of violence simultaneously. Such efforts include two broad groups of interventions.

- The first group targets documented risk and protective factors (for example, enhancing support for parents; reducing the availability and abuse of alcohol; reducing access to lethal means) in well-defined target groups, such as adolescents. This group includes specific violence prevention programs implemented at the community, state and provincial and national levels.

- The second group consists of policies and programs that address the social determinants of violence, including efforts to improve the conditions of daily life and to promote more equitable distribution of power, money, and resources.

The design, targeting, monitoring, and evaluation of both groups of interventions is enabled by the availability of timely and reliable surveillance information about outcomes of interest, including homicides, nonfatal injuries treated in emergency departments, and self-reported violence recorded through surveys. Indeed, one program that has significantly reduce violence-related injuries in Cardiff, Wales, is based on the systematic sharing of anonymous data from hospital emergency rooms and the police, to better identify high-risk locations for violence (Florence and others 2013). These locations become the focus of situation-specific interventions to reduce such risks, for example, by increasing the presence of police patrols at high-risk times, and altering practices around the serving of alcohol (e.g., mandatory use of plastic barware) and crowd control at public transportation stops.

Specific Violence Prevention Programs

Most of the scientific evidence for specific prevention programs to date is from HICs. Although conditions differ in LMICs, table __.5 lists seven categories of violence prevention programs that are scientifically credible, the types of violence they prevent, and considerations for their applicability in LMICs.

Table __.5 Overview of Violence Prevention Strategies Showing Evidence for Effectiveness and Applicability in Low- and Middle-Income Countries

Intervention	Type of violence					LMIC applicability
	Child maltreatment	Intimate partner violence	Sexual violence	Youth violence	Elder abuse	
Developing safe, stable and nurturing relationships between children and their parents and caregivers						
Parent training, including home visitation by nurses	●			○		These programs are likely to be highly applicable in LMICs. Few such programs in LMICs have been evaluated for violence prevention outcomes; several such studies are underway. Programs are resource-intensive and need to be adapted to the requirements of and assets available in LMICs.
Parent-child programs	○			○		
Developing life skills in children and adolescents						
Preschool enrichment programs				○		Most programs are delivered in schools and depend on the school system to deliver the program and reinforce its effects. Oversight and management structures must be in place before such programs are implemented.
Social development programs				●		
School-based programs to address gender norms and attitudes		●	○			
Reducing the availability and harmful use of alcohol						
Regulation of alcohol sales			○			Alcohol is an established risk factor for all types of violence. Some LMICs shave seen rapid increases in alcohol consumption. Strategies to address alcohol may eventually be relevant to LMICs that are alcohol free.
Increases in alcohol prices			○			
Interventions for problem drinkers		●				
Well managed and designed drinking environments				○		
Reducing access to lethal means						
Restrictive firearm licensing and purchase policies				○		There is limited evidence of the effectiveness of programs and policies to reduce access to lethal means of perpetrating violence in LMICs. Emerging evidence from LMICs that have changed policies will shed light on the effectiveness of strategies for firearm injury prevention.
Enforced bans on carrying firearms in public				○		
Promoting gender equality to prevent violence against women						
Microfinance combined with gender equity training		○				Strong evidence for the effectiveness of such programs is limited to outcome evaluation studies in low-resource, rural communities in South Africa. Several outcome evaluation studies of similar programs are underway in other LMICs.
Life skills interventions		○				
Changing cultural and social norms that support violence						
Social marketing to modify social norms		○	○			Programs that aim to change social norms supportive of violence through standalone mass-media campaigns are popular in LMICs. However, there is no evidence that such standalone programs are effective. They should be delivered in cor that address risk and protective factors more directly.
Victim identification, care and support programs						
Screening and referral		○				Stark differences exist in access to services (for example, between high- and low-income groups, and between urban and rural settings). The shortage of highly trained, well-supervised staff has been a barrier
Advocacy support programs		●				
Psychosocial interventions			○			

Protection orders		○				to the implementation of services in LMICs. However, in the psycho-social arena, new approaches using community health workers are promising.

Source: World Health Organization (WHO). 2009. *Violence Prevention: The Evidence. Overview.* Geneva: World Health Organization.

Note:
●: Well-supported by evidence (multiple randomized controlled trials with different populations)
○: Emerging evidence**.**

Developing Safe, Stable, and Nurturing Relationships Between Parents or Caregivers and Children

Interventions that support the development of safe, stable, and nurturing relationships between parents or caregivers and children in their early years can prevent child maltreatment and reduce childhood aggression (Bilukha and others 2005; Kaminski and others 2008). Emerging evidence suggests that such relationships can also reduce violence in adolescence and early adulthood; theoretical grounds exist for assuming they decrease IPV and self-directed violence in later life (Caldera and others 2007; Olds and others 1998). In addition, these relationships offer the potential to prevent problem behaviors, such as substance misuse, eating disorders, and unsafe sex, which are important risk factors for NCDs; sexually transmitted diseases (STIs), including HIV; and unintentional injuries.

Although most evidence for the effectiveness of parenting programs comes from HICs (Knerr, Gardner, and Cluver 2013; Mikton and Butchart 2009), several initiatives to evaluate such programs in LMICs have recently been established, for example, the Children and Violence Evaluation Challenge Fund. In addition, parenting programs are quite widely implemented in LMICs to support early child development, raising the possibility that violence prevention components could be integrated into them.

Developing Life Skills in Children and Adolescents

Social development programs to build social, emotional, and behavioral competencies can prevent youth violence (Hahn and others 2007; Hawkins and others 1999). Preschool enrichment programs providing children with academic and social skills at an early age appear promising (Nelson, Westhues, and MacLeod 2003). However, outcomes vary greatly across programs, and relatively few programs have been evaluated for their impacts on violence (Durlak, Weissberg, and Pachan 2010). School-based programs can address gender norms and attitudes with the aim of preventing dating violence. The Safe Dates program in the United States (Foshee and others 2005) and the Youth Relationship Project in Canada (Wolfe and others 2009) are evidence-based approaches that could be adapted to LMICs. Life skills and social development training programs are popular in LMICs; some include evaluations of effectiveness (for example, PREPARE in South Africa). However, because programs are typically delivered in schools, they depend on the readiness of the educational system to implement the program and reinforce its effects. Oversight and management structures must be in place before such programs are implemented.

Reducing the Availability and Harmful Use of Alcohol

Alcohol availability can be regulated by restricting the hours of sale and reducing the number of alcohol retail outlets (Cohen 2007; Duailibi and others 2007; Nemtsov 1998). Reduced sales hours have been associated with reduced violence, and higher outlet densities have been associated with higher levels of violence. Empirical evidence has shown that higher prices for alcohol can decrease consumption and reduce alcohol-attributable mortality (Zhao 2013). Moreover, economic modelling suggests that price increases can reduce violence (Markowitz and Grossman 1998; Markowitz and Grossman 2000). Brief interventions and longer-term treatment for problem drinkers have been shown to reduce child maltreatment and IPV (Dinh-Zarr 2004). Interventions in and around drinking establishments that target crowding, management practice,

physical design, staff training, and access to late night transport also show promise in reducing violence (Bellis and Hughes 2008; Graham and Homel 2008).

Although most evidence for the effectiveness of interventions to prevent violence comes from HICs, there are several success stories from LMIC, including the reduced trading hours in Brazil (Duailibi and others 2007). Given that LMICs show some of the greatest increases in alcohol consumption, more outcome evaluations of strategies to address alcohol-related violence in these settings are urgently needed. Two areas that should be explored are the effectiveness of minimum drinking age laws and efforts to regulate the marketing of alcohol. However, in many LMICs, a large proportion of alcohol consumed is produced at home. In such settings, the establishment of policies to regulate alcohol production and sale is an important prerequisite for effective prevention (World Health Organization and Liverpool John Moores University 2006). As WHO Member States, all LMICs are committed to implementing the global plan of action on alcohol and health (WHO 2010); this plan includes the interventions described.

Reducing Access to Lethal Means

Based primarily on evidence from North America, two systematic reviews and one meta-analysis summarize the effects of various strategies to prevent firearm-related violence.

One systematic review (Hahn and others 2005) concluded that the evidence is insufficient to determine whether firearm laws have any effect on violence. Such laws include bans on specified firearms or ammunition; restrictions on the acquisition of firearms; waiting periods for acquisition; firearms registration; licensing of owners; “shall issue” carry laws that allow people who pass background checks to carry concealed weapons; child access prevention laws; and zero tolerance laws for firearms in schools. Another systematic review (Koper and Mayo-Wilson 2009) found that directed police patrols focusing on illegal gun carrying can prevent gun crimes (including murders, shootings, gun robberies, and gun assaults). One meta-analysis (Makarios and Pratt 2012) suggests that bans on the sale of firearms had small effects, and law enforcement strategies had moderate effects in reducing gun violence.

More recent evidence suggests that the use of street outreach workers to mediate conflicts and provide social support, such as job referrals and access to social services in the U.S. context, may be effective in reducing youth homicides and firearms offences (Webster and others 2012). In addition, a study from South Africa found that stricter licensing and reduced circulation of firearms accounted for a significant decrease in firearm homicide (Matzopoulos, Thompson and Myers, 2014). In summary, these reports suggest, from a limited evidence base, that some strategies addressing access to firearms show promise, but additional research is needed.

Public health can make a critical contribution to preventing firearm injuries and deaths by collecting data and evidence. A range of strategies exists for reducing firearm-related violence, but further research and evidence are needed to assess their effectiveness (IOM, 2013). Strategies that have been identified by the Institute of Medicine (IOM) and others as being in particular need of additional research include the following:

- Increasing efforts to control access to firearms by persons at risk of harming themselves or others (for example, the safe storage of guns, waiting periods, and background checks)

- Changing how firearms are used (for example, where firearms may be carried and provision of safety education)
- Reducing the lethality of guns (for example, designing firearms to make them safer, addressing magazine size).
- Evaluating strategies to reduce the use of military firearms in the aftermath of war or conflict, including those to disarm former combatants, disband armed groups, and reintegrate former combatants into civilian society.

Sound data and evidence on firearm injuries are needed to determine what programs and policies actually work in preventing these injuries while preserving the rights of legitimate gun owners. One single intervention or policy will not solve the whole problem, nor will one sector solve it alone; as with automobile safety, the solutions will be incremental and require multisectoral collaboration among policy makers in criminal justice, public health, education, and other areas.

Promoting Gender Equality To Prevent Violence Against Women

Several outcome evaluation studies demonstrate the effectiveness of multisector interventions to prevent violence against women by promoting gender equality. The Intervention with Microfinance and Gender Equity in South Africa, which combines microloans and gender equity training, reduced rates of self-reported violence by over 50 percent (Pronyk and others 2006). The Stepping Stones program implemented in Asia and Sub-Saharan Africa is a life skills training program that addresses gender-based violence, relationship skills, assertiveness training, and communication about HIV and has shown promising results (Jewkes and others 2008; Paine and others 2002). The popularity of microfinance and conditional cash transfer programs in LMICs, into which violence prevention objectives could be integrated, further underscores their applicability.

Changing Cultural and Societal Norms That Support Violence

Interventions that challenge cultural and social norms supportive of violence are widely used, and their relatively low cost makes them a popular option. Such interventions are often restricted to standalone mass media campaigns intended to raise awareness about the harmful effects of violence and thereby reduce the likelihood of future acts of violence. There is no evidence that such campaigns are effective. By contrast, some evidence suggests the effectiveness of programs combining awareness-raising with other mechanisms to change norms (for example, social development and life skills training, and legislation). In South Africa, the Soul City initiative used television (through a soap opera series), radio, and nationally distributed information booklets to raise awareness of new IPV laws. The intervention increased the proportion of people who saw such violence as unacceptable (Usdin and others 2005).

Implementing Victim Identification, Care, and Support Programs

Interventions to identify victims of interpersonal violence and provide effective care and support are critical for protecting health and breaking cycles of violence from one generation to the next. Evidence of effectiveness is emerging in several areas:

- Screening tools to identify victims of IPV and refer them to appropriate services (Ramsay and others 2002)
- Psychosocial interventions, such as trauma-focused cognitive behavioral therapy, to reduce mental health problems associated with violence (Bass and others 2013; Kornør and others 2008)
- Protection orders, which prohibit perpetrators of IPV from contacting victims (Holt and others 2003) to reduce repeat victimization.

Several trials have shown that advocacy support programs—which offer services such as counseling, safety planning, and referral—increase victims' safety behaviors and reduce the risk of further harm (MacFarlane and others 2006).

Policies and Programs to Address the Social Determinants of Violence

Violence is strongly associated with social determinants, such as employment, income equity, rapid social change, and access to education. The likely effectiveness of policies and programs to address social determinants in preventing violence derives from ecological studies using cross-sectional and time-series methods to document associations between social determinants and violence. Comprehensive violence prevention strategies should not only address the risk factors targeted by the specific programs, but these programs should be integrated with policies directed at the inequities that fuel violence. This integration is particularly important in LMICs, where daily living conditions undermine the opportunities for positive early child development; the context can include economic and social policies that exacerbate gaps between rich and poor, and between men and women.

Economic Evaluation of Interventions

Economic evaluation provides a way to compare gains of an intervention with its costs and risks. Given the high prevalence and costs of interpersonal violence, identifying effective, low-cost interventions to reduce violence is an urgent priority. However, the same challenges that complicate measuring the costs of violence also complicate the measurement of the benefits associated with its prevention (Barnett 1993; WHO 2004). Despite widely varying methodologies, most studies show that behavioral, legal, and regulatory interventions are cost-effective (WHO 2004). Evidence addressing specific types of violence, largely from HICs, has identified a variety of cost-effective interventions to prevent child maltreatment, IPV, and youth violence (table __.6). Despite the disproportionate impact of violence in LMICs, the economic evaluations of interventions are rare; systematic research addressing the economic benefits of violence prevention efforts in LMICs would fill a critical gap.

Table __.6 Summary of Economic Evaluations of Interventions To Prevent Interpersonal Violence, by Type of Violence

Type of Violence	Intervention Type	Intervention Details	Cost-effectiveness
Child Maltreatment	Home visiting	Nurse-family partnerships provide home visiting for low-income mothers to improve prenatal health-related behaviors, provide more responsible and competent care of infants and toddlers, and improve parents' economic self-sufficiency (Lee and others 2012) Location: United States	Net benefit (in 2011 dollars) for each program participant of US$13,181 ($13,617 in 2013 dollars) and a benefit-to-cost ratio of US$2.37 for every $1.00 spent ($2.46 in 2013 dollars)
	Parent-child interaction therapy	Empirical treatment for conduct disorders based on behavioral interventions to improve parent-child interaction (Lee and others 2011) Location: United States	Net benefit (in 2011 dollars) for each program participant of US$5,617 ($5,820 in 2013 dollars) and a benefit-to-cost ratio of US$4.62 for every $1.00 spent ($4.79 in 2013 dollars)
	Educational and family support	Child-Parent Center Program is a program for economically disadvantaged children and parents that provides a stable early learning environment and educational and support services for parents (Temple and Reynolds 2007) Location: Chicago Illinois	Benefit-to-cost ratio (in 2002 dollars) of US$5.98 ($7.76 in 2013 dollars) to US$10.15 ($13.18 in 2013 dollars) for every $1.00 spent.
Intimate Partner Violence (IPV)	Microfinance with gender and HIV training	The Intervention with Microfinance for AIDS and Gender Equity (IMAGE) provides a combination of microfinance with gender and HIV training for women to improve health, income, behavioral skills, communication, and norms (Jan and others 2011)	Cost per disability-adjusted life year averted for the initial scale-up was US$2,307 (in 2004 dollars) ($2,852 in 2013 dollars)
	Education for primary care providers	Training for clinicians to increase their identification and referral of survivors of IPV (Norman and others 2010)	Incremental cost-effectiveness ratio of £2,450 per quality adjusted life year (in £2005) ($4,228 in 2013 dollars)
	Shelters for victims	Provision of a safe haven for women and child victims of IPV, including support and safety planning (Chanley, Chanley and Campbell 2001) Location: Arizona	Net social benefit of US$3.4 million dollars (in 1999 dollars) and a minimum benefit-to-cost ratio of $4.60 for every $1.00 spent ($6.45 in 2013 dollars)

Youth Violence	Anonymized information sharing between police and hospital emergency department	Cardiff Model provides information to direct targeted prevention measures; youth were among those most likely to benefit (Florence and others 2013) Location: Cardiff, United Kingdom	The cumulative social benefit to cost ratio was £82 (in £2003) for every £1.00 spent ($163 in 2013 dollars)
	Multi-component, long-term school and family-based program	Fast Track, a program for at-risk children in grades 1-10; includes tutoring, parent support, child social-skills training, and home visits (Foster, Jones, and the Conduct Problems Prevention Research Group 2006) Location: Durham, North Carolina; Nashville, Tennessee; Seattle, Washington; and rural central Pennsylvania	The intervention was not cost effective at a threshold of $50,000 willingness to pay (in 2004 dollars) ($61,817 in 2013 dollars) for an act of interpersonal violence
	Mobilization of community stakeholders to implement evidence-based systems	Communities That Care (CTC) mobilizes stakeholders to collaborate on preventing adolescent substance use, delinquency, and interpersonal violence (Kuklinski and others 2012) Location: 24 communities in 7 U.S. states	Very cost-beneficial in the United States; net present benefit of CTC was US$5,250 per youth (in 2004 dollars) ($6,491 in 2013 dollars) with a benefit-to-cost ratio of US$5.30 for every $1.00 spent ($6.55 in 2013 dollars)
	Educational incentives	Four years of cash and other incentives to induce disadvantaged high school students to graduate (Greenwood and others 1996) Location: California	For every US$1 million (in 1993 dollars) ($1.62 million in 2013 dollars), 258 serious crimes were prevented
	Parent training/therapy	Training for parents and therapy for families with young school-age children who have shown aggressive behavior (Greenwood and others 1996) Location: California	For every US$1 million (in 1993 dollars) ($1.62 million in 2013 dollars), 157 serious crimes were prevented
	Supervision	Monitoring and supervising high-school-age youth who have exhibited delinquent behavior (Greenwood and others 1996) Location: California	For every US$1 million (in 1993 dollars) ($1.62 million in 2013 dollars), 72 serious crimes were prevented
	Home visiting/day care	Home visits by child care professionals from birth through the first two years of childhood, followed by four years of day	For every US$1 million (in 1993 dollars) ($1.62 million in 2013 dollars), 11 serious crimes were prevented

		care (Greenwood and others 1996) Location: California	

Implementation of Prevention Strategies

The gap between the science and practice of violence prevention is growing. Although numerous effective programs, policies, and innovations have been identified, this emerging evidence base is unlikely to have a substantial public health impact unless it is widely disseminated, implemented with quality and scale, and sustained over the long term (Rhoades, Bumbarger, and Moore 2012). The infrastructure needed to support the dissemination, scaling up, and sustenance of effective programs and policies is slowly emerging.

Given the rapid expansion of and increasing demand for evidence-based violence prevention innovations, especially in LMICs, building an infrastructure that can more effectively move innovations from research to action is increasingly important. This infrastructure requires attention to three interrelated sets of functions and activities that should be coordinated across global, country, and local levels: prevention synthesis and translation, prevention support, and prevention delivery (Wandersman and others 2008).

Prevention Synthesis and Translation

The greater the extent to which innovations about violence prevention are accessible (both from information and financial perspectives), user-friendly, and clearly communicated, the more likely it is that effective approaches will be successfully disseminated and implemented (Clancy and Cronin 2005). The seven-part series on *Violence Prevention: The Evidence* is an example of an effort to synthesize and translate the scientific evidence for the effectiveness of interventions to prevent interpersonal and self-directed violence into easily understandable and accessible briefing documents (Liverpool John Moores University 2013; WHO 2009).

Prevention Support

Synthesizing and translating information about violence prevention innovations, while important, is likely to be insufficient to change prevention practices. Countries, districts, and communities seeking to apply violence prevention innovations need the capacities to be successful in scaling up effective programs with fidelity (Wandersman and others 2008). A growing body of research suggests that support in the form of specialized training, monitoring of fidelity, technical assistance, and coaching, as well as increasing the skills and motivation of implementing organizations, increases the use and successful implementation of innovations (Fixsen and other 2005; Mihalic and Irwin 2003; Wandersman and others 2008).

An example of a well-functioning prevention support system in the United States is the state of Pennsylvania's Evidence-based Prevention and Intervention Support Center (EPISCenter) at the University of Pennsylvania (Rhoades, Bumbarger, and Moore 2012). The EPISCenter uses flexible, targeted, and research-based technical assistance to develop the capacity of communities to support the implementation of evidence-based violence prevention programs.

Prevention Delivery

The successful implementation of evidence-based innovations requires that they must be carried out and sustained in organizational settings (Wandersman and others 2008). Capacities that facilitate prevention delivery include maintaining a well-functioning organization; recruiting and maintaining well-trained staff members; developing community support; working with other organizations; and improving skills in selecting, implementing, and sustaining an innovation over time (Mihalic and Irwin 2003; Wandersman and others 2008). The Parent Centre in South Africa and Raising Voices in Uganda are two examples of organizations in LMICs seeking to sustain the implementation of interventions to prevent violence against women and children (Butchart and Hendricks 2000; The Parent Centre 2013; Raising Voices 2013).

Conclusions

The primary rationale for addressing interpersonal violence as a public health problem has been its role in causing physical injury and homicide. We now understand that interpersonal violence also plays an important role in the etiology of mental illness, chronic disease, and even infectious diseases such as HIV. Unfortunately, these wide-ranging impacts remain largely invisible to public health leadership, policy makers, and the public. This is partly due to the fact that violence is often hidden, victims rarely come into contact with official or service agencies, and many of the health and social consequences are not evident until years after exposure. Greater awareness of these impacts is now leading to actions that can reduce the enormous health and social burden of violence.

Many LMICs face daunting challenges, including the HIV epidemic, ongoing wars and conflicts, cardiovascular and other chronic diseases, suicide, and traffic injuries. Given the impact of violence on these outcomes, the prevention of interpersonal violence can be viewed as a powerful lever that, if successfully engaged, can have a cross-cutting impact on a broad range of the challenges facing LMICs. Progress in preventing interpersonal violence is advancing rapidly. The involvement of foundations, multilateral agencies, and corporations in violence prevention activities is also expanding.

There is every reason to believe that our understanding and capacity to prevent interpersonal violence will make a difference. The lessons learned during the public health community's short experience with violence prevention are consistent with the lessons from the community's much longer experience with the prevention of infectious and chronic diseases. Violence can be prevented if governments, their citizens, and the global community start now, act wisely, and work together.

Notes

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention or the World Health Organization.

The World Bank classifies countries by income group: economies are divided according to 2012 GNI per capita, calculated using the World Bank Atlas method. The groups are: low income, $1,035 or less; lower middle income, $1,036 - $4,085; upper middle income, $4,086 - $12,615; and high income, $12,616 or more.

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