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PREFACE

The Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat convened an *Expert Group Meeting on Adolescents, Youth and Development* at the United Nations Headquarters in New York, from 21 to 22 July 2011. The meeting was organised in order to commemorate the International Year of Youth established by resolution A/RES/64/134 of the General Assembly and as a preparatory meeting for the forty-fifth session of the Commission on Population and Development scheduled to take place in April 2012 and whose theme would be "Adolescents and youth".

The meeting brought together experts from different disciplines and regions to present and discuss research on two broad themes: (*a*) the demographic dynamics that shape the number and characteristics of adolescents and youth, and (*b*) the ways in which adolescents and young people can be agents of socio-economic development. Selected papers prepared by the experts participating in the meeting are being issued under the Expert Paper Series published on the website of the Population Division (www.unpopulation.org).

The Population Division is grateful to Dr. George Patton, Professor of Adolescent Health Research at the University of Melbourne in Australia for having participated in the meeting and prepared this paper. It provides an overview of mortality among adolescents and youth and a discussion of the main causes of death among persons aged 10-24 across world regions. The paper shows that, although mortality at ages 10-24 is generally low, major disparities exist among the world's regions, with the death rate of adolescents and youth being four times higher in low- and middle-income countries than in high-income countries. The causes of death among young people also vary markedly across regions and by sex. Among males, injuries caused by road traffic accidents, suicide and homicide are the main causes of death in most regions, although infectious diseases, particularly HIV/AIDS, tuberculosis and lower respiratory infections are also important causes of death among young males, especially in sub-Saharan Africa. Among adolescent girls and young women, the major overall causes of death are also those three infectious diseases plus suicide and road traffic accidents. In addition, maternal causes are significant causes of death of young women, particularly in sub-Saharan Africa and in Southern Asia.

The *Expert Paper Series* aims at providing access to government officials, the research community, non-governmental organizations, international organizations and the general public to overviews by experts on key demographic issues. The papers included in the series are mainly those presented at Expert Group Meetings organized by the Population Division on the different areas of its competence, including fertility, mortality, migration, urbanization and population distribution, population estimates and projections, population and development, and population policy. The views and opinions expressed in the papers published under this series are those of their authors and do not necessarily reflect those of the United Nations. The papers in the series are released without undergoing formal editing.

For further information concerning the papers in this series, please contact the office of Hania Zlotnik, Director, Population Division, Department of Economic and Social Affairs, United Nations, New York, 10017, USA, telephone (212) 963-3179, fax (212) 963-2147.

GLOBAL PATTERNS OF MORTALITY IN YOUNG PEOPLE

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Since 1950, advances in the treatment and prevention of communicable diseases coupled with improved nutrition and sanitation and with effective methods to control the vectors of disease have brought about major shifts in the pattern of disease across the globe in a process that has been called the "epidemiological transition". These shifts have been particularly marked in middle-income countries but low-income countries have also benefitted (Beaglehole and Bonita, 2004). Thus most countries have experienced major reductions in mortality caused by communicable diseases. As a result, the mortality of infants and children has declined in every country, although it remains moderate or high in many countries of sub-Saharan Africa and in some countries of Asia. Reducing mortality among children in those countries remains an over-riding priority, as the international community has clearly indicated by making the reduction of mortality in childhood one of the Millennium Development Goals. In countries where mortality in childhood is already low, there are reasons to look beyond age 10 to assess the relevance of health among adolescents and young people (Viner and others, 2011).

Adolescence has commonly been regarded as a healthy period of life, when human beings reach peaks in strength, speed, fitness and many cognitive abilities. Yet, puberty is also a period when major physiological changes occur and health risks with potentially life threatening consequences become prominent (Kleinert, 2007; Patton and Viner, 2007; Resnick and others, 1997). Reproductive maturity and the initiation of sexual activity expose young people to the risk of contracting sexually transmitted infections, including the human immunodeficiency virus (HIV). For adolescent women, early pregnancy and childbearing are associated with higher risks of maternal morbidity and mortality, particularly in developing countries (Ronsmans and Graham, 2006). The risks of injury also change with physical maturity especially in the cases of adolescent and young adult males who are more likely than their female counterparts to suffer the consequences of traffic accidents, violence or war. Puberty also heralds the onset of many mental disorders and with them, increased risk of suicide (Patel and others, *2006*). The result is a morbidity profile that changes markedly from early adolescence to young adulthood.

Social and economic changes associated with development can also affect the health of adolescents and young people by modifying the risks to which they are exposed. Development is associated with an increase in human capital achieved by longer periods of schooling. As norms change and adolescents remain longer in school, marriage is delayed and so is parenthood, thereby reducing the risks of maternal morbidity and mortality (Gluckman and Hanson, 2006). Increased access by adolescents and young people to motor vehicles that they are allowed to operate can also increase their risks of suffering from road traffic accidents (Kopits and Cropper, 2005). So too, easier access to psychoactive substances may increase their risk of developing mental disorders and of committing suicide (Patel and others, 2006). Furthermore, the combination of inexperience and ongoing neurodevelopment may leave adolescents comparatively more vulnerable than adults to the health risks associated with development (Krug and others, 2000).

The first comprehensive global study of mortality among persons aged 10 to 24 was published in 2009 (Patton and others, 2009) and it has been followed by two reports documenting trends in the mortality of children and youth as well as global patterns of disease and disability in adolescents and young adults (Gore and others, 2011; Meltzer and others, 2003)

This paper provides an overview of mortality trends among persons aged 10-24 and their major causes of death. It is based on the estimates produced by the *2004 Global Burden of Disease* prepared by the World Health Organization (2008). This paper analyses the changes in death rates with age, that is, between early adolescence and young adulthood. By focusing on the major regional groups used by the World Health Organization (WHO), it discusses regional differences in the overall levels

of mortality of young people as well as differences in the major causes of death among adolescents and youth by sex. For purposes of this paper, early adolescence is considered to span the period that includes all years of age from 10 to 14, late adolescence spans the period from 15 to 19 years of age, and young adulthood that going from 20 to 24 years of age.

In this paper, countries are classified into seven groups based on income and region. High-income countries are those that had a gross national income per capita equal or greater than US$10,066 in 2004, as estimated by the World Bank (2004). They include Australia, Bahrain, Brunei Darussalam, Canada, Hong Kong and Macao Special Administrative Regions of China, Israel, Japan, Kuwait, New Zealand, Qatar, the Republic of Korea, Saudi Arabia, Singapore, the United Arab Emirates, the United States of America, the western part of Europe and the Bahamas. The remaining countries, which are low- or middle-income countries according to the classification used by the World Bank, are grouped according to the six administrative regions used by the World Health Organization, namely, Africa, the Americas, Europe and Central Asia, the Mediterranean, South Asia and the Western Pacific (see annex table). Africa includes sub-Saharan Africa plus Algeria. The Americas include Latin America and the Caribbean. Europe and Central Asia include the countries of Eastern Europe, Turkey and the successor States of the former USSR. The Mediterranean includes Djibouti, Egypt, the Libyan Arab Jamahiriya, Morocco, Somalia, Sudan and Tunisia in Africa plus Afghanistan, Jordan, the Islamic Republic of Iran, Iraq, Lebanon, Pakistan, the Syrian Arab Republic and Yemen. South Asia is composed of Bangladesh, Bhutan, the Democratic People's Republic of Korea, India, Indonesia, the Maldives, Myanmar, Nepal, Thailand and Timor-Leste. The Western Pacific includes China, Cambodia, the Lao People's Democratic Republic, Malaysia, Mongolia, the Philippines, Singapore and Viet Nam plus all of Oceania with the exception of Australia and New Zealand.

The paper presents average measures for the regions just described. In interpreting those measures one must bear in mind that they reflect mostly the values for the most populous countries in each region. Thus, the data for South Asia reflect mainly the experience of India and the data for the Western Pacific reflect mostly that of China. In the case of Europe and Central Asia, the data reflect mainly the experience of the Russian Federation or, more generally, that of all the successor States of the former USSR.

A. ESTIMATING LEVELS OF ALL-CAUSE MORTALITY

The World Health Organization has produced life tables for 192 countries relative to 2004 on the basis of the data available, including registered deaths by age and sex and deaths registered by the sample registration systems of China and India. In countries lacking such data, life tables were produced by using models to derive life tables from estimates of child mortality and, if available, estimates of selected measures of adult mortality derived indirectly from data gathered by censuses or surveys (Mathers, Lopez and Murray, 2006). The data produced by civil registration systems or sample registration systems were adjusted for underreporting when necessary. The models used to derive life tables from indirect estimates are described in Murray an others (2003).

No information on adult mortality was available for 55 countries, 42 of which were in sub-Saharan Africa. For those countries, estimates of mortality for aged over 5 were obtained by using models to fit available estimates of child mortality referring to 2004. Given a level of child mortality, the most likely corresponding level of adult mortality (excluding mortality caused by HIV/AIDS where necessary) was estimated, along with uncertainty ranges, based on regression models of child versus adult mortality fitted to a set of almost 2000 empirical life tables judged to be of good quality (Murray *and others,* 2003).

For China, recorded age-specific death rates for ages over 5 derived from the data gathered by the 2000 census were adjusted for an estimated underreporting of 11.3 per cent for males and 18.1 per cent for females. They were then projected to 2004 assuming an annual rate of mortality decline of 1.5 per cent derived from an analysis of mortality change during the two intercensal periods, 1982–1990

and 1990–2000 (Bannister and Hill, 2004). The projection took into account estimates derived from other data sources, including those produced by the Child Mortality Surveillance System (Yang *and others*, 2005). For India, the life table was derived from a time series of age-specific mortality rates obtained from the data yielded by the Sample Registration System for the period 1990–2002, after correction for an estimated completeness of coverage of 88 per cent (Mari Bhat, 2002)

An earlier version of the WHO life tables was published in the *World Health Report 2006* and the data and methods on which they were based were described in the Statistical Annex Notes of that publication (World Health Organization, 2006). In countries highly affected by the HIV/AIDS epidemic, the life tables derived by the methods described above were further adjusted by using independent estimates of HIV mortality and, in countries affected by war or major disasters, adjustments to take account of their effects on mortality were also introduced (World Health Organization, 2008). Total deaths by age and sex were estimated for each country by applying the resulting life table estimates to the *de facto* population of each country derived from the *2006 Revision* of *World Population Prospects* (United Nations, 2007).

B. Estimating Mortality by Cause

In 2004, only 78 countries had data on deaths by age, sex and cause that were estimated to be at least 85 per cent complete (table 1). In most of those countries, the data on cause of death were coded to the third or fourth digit of the International Classification of Diseases 10 (ICD-10). In addition, there were 34 countries with less complete data on deaths but with usable distributions by cause of death. In total, therefore, data on cause of death generated by a registration system were available for 114 countries, 35 of which were high-income countries and the rest were low- and middle-income countries, including 30 in the Americas, 27 in Europe and Central Asia, 10 in the Western Pacific, 6 in the Mediterranean, 3 in Africa and 3 in South Asia.

Countries report cause-of-death statistics to WHO annually. The data are classified by age, sex and cause. Deaths coded "symptoms, signs, and ill-defined conditions" under ICD-10, as well as deaths with ill-defined causes within the cancer, cardiovascular disease and injury categories in ICD-10 were re-distributed across well-defined causes within major categories of deaths. The percentage of deaths that had to be thus redistributed varied from 4 per cent in New Zealand to more than 30 per cent in Sri Lanka and Thailand (Mathers, Lopez and Murray, 2006). In cases where the most recent data available referred to some year prior to 2004, the time series starting with 1980 data up to the most recent date available was used to project cause-specific mortality to 2004. The estimation of distributions of deaths by cause for countries with small populations was carried out using a three-year moving average of deaths by cause to reduce random variation.

For the 34 countries with some information of deaths by cause but whose data on deaths were less than 85 per cent complete, the distribution of deaths by cause was adjusted using cause-of-death modelling based on 1,613 sets of deaths by cause derived from the yearly statistics of countries with good data (Mathers, Lopez and Murray, 2006). The model named CodMod was then used to adjust the proportions of deaths in the major categories by cause for those 34 countries so as to reduce the likely bias associated with differences in the distributions by cause between registered deaths and those that were not reported. The major categories of causes of death are denominated Group I, Group II and Group III. Group I includes maternal deaths (Group Ia) and deaths from communicable diseases including nutritional disorders (Group Ib). Group II includes all deaths from non-communicable diseases, whereas Group III includes deaths caused by external causes, which comprise injuries caused by accidents as well as suicides and homicides.

TABLE 1. DISTRIBUTION OF COUNTRIES ACCORDING TO DATA AVAILABLE TO ESTIMATE CAUSES OF DEATH IN THE 2004 GLOBAL BURDEN OF DISEASE STUDY AND BY REGION

	Number of countries							
		Low- and middle-income countries by WHO region						
Data and method of estimation	*High-income countries*	*Africa*	*The Americas*	*Mediterr-anean*	*Europe and Central Asia*	*South Asia*	*Western Pacific*	*World*
Deaths from civil registration with coverage of at least 85 per cent	33	3	18	-	17	1	6	78
Deaths from civil registration with coverage below 85 per cent, where causes were estimated by modelling	2	-	12	6	10	1	3	34
Sample registration system	-	-	-	-	-	1	1	2
Causes were estimated by using a regional pattern and cause-specific estimates from a variety of sources†	4	43	2	10	-	8	11	78
Total	39	46	32	16	27	11	21	192

† Epidemiological estimates obtained from studies, WHO technical programmes and UNAIDS for the following conditions: AIDS, TB, diphtheria, measles, pertussis, poliomyelitis, tetanus, dengue, malaria, schistosomiasis, trypanosomiasis, Japanese encephalitis, Chagas, maternal conditions (including abortion), cancers, drug use disorders, rheumatoid arthritis and war.

For the 43 low- and middle-income countries in Africa lacking death registration data, the regional distribution of deaths by major category of causes of death was used. That distribution was based on data for South Africa in 2004 derived from civil registration, from the Zimbabwe National Burden of Disease Study of 1997 (Chapman and others, 2006), from verbal autopsies relative to seven sites in Africa for the period 1999–2002 compiled by the INDEPTH network (Adjuik and others, 2006), from death registration in Antananarivo, Madagascar, relative to 1976–1995, and from deaths registered in the Maputo Central Hospital Mortuary in Mozambique for the period 1993–2004. The proportional distributions of deaths in urban populations by major category of causes, that is Groups I, II and III but excluding deaths caused by HIV/AIDS, wars and disasters, were based on averages of the distribution of deaths registered in urban Madagascar, in urban South Africa in 2004, and the 1997 estimated distribution for Zimbabwe projected to 2004. Because the INDEPTH sites in Africa are in rural areas, the data they generated were taken as representative of rural populations in the continent. Thus, the distribution of deaths in rural areas by major category of causes was based on an average of the distributions derived from data generated by the INDEPTH sites projected to 2004 and the distribution of deaths in the rural provinces of South Africa for 2004. In calculating urban and rural distributions of deaths by cause, CodMod was used to project distributions to 2004.

To estimate deaths by cause for the remaining 35 low- and middle-countries outside Africa that also lacked registration data, CodMod was used to derive country-level distributions of deaths by major category of causes, age and sex. CodMod was fitted taking account of a country's overall mortality level (excluding the impact of HIV/AIDS, war and disasters), gross national income per capita and region (Murray and Lopez, 1997).

Once the distributions by major category of causes of death were available, the distributions of countries affected by HIV/AIDS, wars or disasters were adjusted to include such causes of death and, for all countries lacking adequate data by cause of death, deaths were further distributed among 21 specific causes on the basis of evidence from population-based epidemiological studies, disease registers, notifications systems, and analyses by WHO programmes. Such additional information in-

included more that 2,700 datasets. The causes reported in the datasets available included HIV/AIDS, malaria, tuberculosis, cancers, drug dependence, war and natural disasters. Almost a third of those datasets related to sub-Saharan Africa.

This review of the data sources and methods used to estimate mortality levels and mortality by cause show that there remain major barriers to presenting an adequate global profile of mortality for any age group (AbouZahr and others, 2007). Less than a third of the world population lives in countries having complete and reliable data on deaths by cause. The countries having the highest mortality, particularly early in life, are also those with the most limited data (Murray and Lopez, 1997; Setel and others,2007). For the two most populous countries, China and India, data on deaths by cause are available only through sample registration systems. For most low-income countries, particularly those in Africa, data from verbal autopsies collected via household surveys have been the main source of information on mortality by cause (Hill and others, 2007a).

The analysis of death rates by cause presented in the following sections is based on estimates obtained from limited data that are subject to high levels of uncertainty. Yet, those estimates are the only ones permitting a global assessment of mortality among adolescents and youth. According to the 2001 Global Burden of Disease, the uncertainty surrounding the 2001 estimates of overall mortality ranged from ±1 per cent for those relative to high-income countries to ±15 to 20 per cent for the estimates referring to sub-Saharan Africa (Mathers and others, 2006). Confidence intervals were wider for death rates by specific cause. The uncertainty surrounding deaths rates from road traffic accidents, for instance, ranged from ±3 per cent for those referring to high-income countries to ± 25 per cent for those relative to sub-Saharan Africa and the confidence intervals for death rates from stroke ranged from ±10 per cent in the case of high-income countries to ±30 per cent for the estimates for sub-Saharan Africa. The confidence intervals for the estimates presented in the rest of this paper are likel to be wider than those relative to the 2001 estimates which refer to all ages combined (Bryce and others, 2005). Improving the registration of deaths and their causes as well as developing alternative methods for the estimation of mortality among persons under 25 remains an important challenge (AbouZahr and others, 2007). Given that progress in improving and extending civil registration is likely to be slow, especially in low-income countries, developing alternative methods to gather data about the health and mortality of young people will be essential to fill our gaps in knowledge over the medium-term future (Boerma and others, 1994; Chandramohan and others, 2008).

C. MORTALITY AMONG PERSONS AGED 10-24

In 2004, there were 1.8 billion persons aged 10-24 globally and they experienced 2.6 million deaths (table 2). The majority of adolescents and young people lived in low- an middle-income countries (89 per cent), but deaths of persons aged 10-24 were more concentrated in those countries than the population. Thus, 97 per cent of all deaths of persons aged 10-24 occurred in low- and middle-income countries. On the whole, mortality among adolescents and young people is low. Globally, there were only 150 deaths for every 100,000 persons aged 10-24 in 2004. But the death rate among adolescents and youth in low- and middle-income countries was much higher than that in high-income countries: 162 deaths per 100,000 vs. 45 deaths per 100,000, implying that the relative risk of dying at ages 10-24 was nearly four times higher in low- and middle-income countries than in high-income countries.

Among low- and middle-income countries, those in South Asia account for 28 per cent of the population aged 10-24 but for 35 per cent of the deaths in those countries occur in that region. Similarly, although the low- and middle-income countries of Africa have 14 per cent of all adolescents and youth in the world, they account for 28 per cent of deaths of persons aged 10-24. The share of deaths of adolescents and youth in the low- and middle-income countries of the Mediterranean (11 per cent) is also higher than their share of the population aged 10-24 (9 per cent). For all other groups of low- and middle-income countries, their shares of deaths of people aged 10-24

TABLE 2. ESTIMATED NUMBER OF DEATHS AND ALL-CAUSE MORTALITY RATES AMONG PERSONS AGED 10-24 FROM THE 2004 GLOBAL BURDEN OF DISEASE STUDY CLASSIFIED BY MAJOR COUNTRY GROUPS

Country groups	*Population*		*Deaths*		*Death rate (deaths per 100,000 population)*	*Death rate relative to that of high-income countries*
	Number (thousands)	*Percentage*	*Number (thousands)*	*Percentage*		
High-income	189 869	11	86 111	3	45	1.0
Low- and middle-income countries	1 575 878	89	2 560 220	97	162	3.6
Low- and middle-income countries						
Africa	243 735	14	744 222	28	305	6.7
The Americas	157 273	9	171 796	6	109	2.4
Mediterranean	166 731	9	282 320	11	169	3.7
Europe and Central Asia	118 428	7	119 568	5	101	2.2
South Asia	498 093	28	929 092	35	187	4.1
Western Pacific	391 618	22	313 222	12	80	1.8
World	1 765 746	100	2 646 331	100	150	-

are lower than their respective shares of the population of adolescents and youth. Such differences translate themselves into marked differences in mortality rates among adolescents and youth. Thus, low- and middle-income countries in Africa have the highest death rate among persons aged 10-24, at 305 deaths per 100,000 persons, nearly 7 times higher than the equivalent mortality rate in high-income countries. The second and third highest death rates among adolescents and youth are recorded in South Asia and the Mediterranean, where mortality risks among the population aged 10-24 are nearly 4 times as high as in high-income countries. In all other groups of low- and middle-income countries, the risks of death among adolescents and youth are just about twice those in high-income countries.

There are major differences in mortality by sex among persons aged 10-24 (table 3). The male to female ratio of mortality rates for high-income countries is twice that in low- and middle-income countries (2.4 vs. 1.2) and in both major groups of countries, male adolescents and male youths have, on average, higher mortality than their female counterparts. Among low- and middle-income countries, mortality among males aged 10-24 is much higher than that among females aged 10-24 in Europe and Central Asia (2.7 times higher) and in the Americas (2.6 times higher). In the low- and middle-income countries of the Western Pacific, male mortality among those aged 10-24 is twice as high as female mortality for the same age group and male mortality is also higher than female mortality among adolescents and youth in the low- and middle-income countries of the Mediterranean. The low- and middle-income countries of Africa and South Asia stand out because they have, on average, higher mortality among adolescent and young women than among their male counterparts, largely because of high mortality associated with pregnancy and childbirth.

TABLE 3. MORTALITY RATES BY SEX FOR PERSONS AGED 10-24 FROM THE 2004 GLOBAL BURDEN OF DISEASE STUDY BY COUNTRY GROUP

	Deaths per 100,000 persons aged 10-24			
Country group	*Both sexes*	*Male*	*Female*	*Male to female ratio of mortality rates*
High-income countries	45	63	27	2.40
Low- and middle-income countries	162	174	150	1.20
Low- and middle-income countries				
Africa	305	281	330	0.85
The Americas	109	157	61	2.60
Eastern Mediterranean	169	198	139	1.40
Europe and Central Asia	101	147	54	2.70
South Asia	187	181	192	0.94
Western Pacific	80	105	52	2.00
World	150	162	137	1.20

Table 4 shows mortality rates by sex and five-year age group among persons aged 10-24. Both at the world level and for every group of countries, the risk of dying increases markedly with age. The increase in death rates by age is steepest in the high-income countries, where the death rate among young people aged 20-24 is more than four times higher (4.3 times) than that among adolescents aged 10-14. In contrast, in low- and middle-income countries, the ratio between the death rate of people aged 20-24 and that of people aged 10-14 is just 2.4. Within the regional groups of low- and middle-income countries, that ratio is highest among the countries of Europe and Central Asia where the death rate among those aged 20-24 is 4.3 times higher than that among those aged 10-14. In the Americas as well, the death rate among people aged 20-24 is nearly four times as high as that among adolescents aged 10-14 (their ratio is 3.9). In all other regional groups of low- and middle-income countries, the death rate among persons aged 20-24 is between 2.2 times and 2.6 higher than that among adolescents aged 10-14.

The ratio of the death rate among persons aged 20-24 to that of persons aged 10-14 is higher among males than among females. In high-income countries, the death rate among young women aged 20-24 is 2.8 times higher than that among adolescent girls aged 10-14, but for males that ratio is almost double, at 5.3 times. In low- and middle-income countries the difference between the sexes is less marked, with women aged 20-24 having a death rate that is just twice that of girls aged 10-14 whereas for their male counterparts that ratio is 2.7.

Among groupings of low- and middle-income countries, the ratio of the death rates at ages 20-24 to that at ages 10-14 ranges from 2.2 to 5.2 among males and from 1.7 to 2.6 among females. For males, the low and middle-income countries of Europe and Central Asia as well as those in the Americas have the highest ratios (5.2 in both cases). The male ratios are also high for low- and middle-income countries in the Western Pacific (3.1) and in the Mediterranean (2.9), and they are lowest in Africa (2.5) and South Asia (2.2). For females, the ratios of the death rate at 20-24 to that at 10-14 are highest among the low- and middle-income countries of Europe and Central Asia (2.6) and in those in Africa (2.4). Slightly lower ratios are estimated for females in the Americas and in South Asia (2.1 in both cases) and the lowest ratios are found in the Western Pacific (1.8) and the Mediterranean (1.7).

TABLE 4. MORTALITY RATES BY SEX FOR PERSONS AGED 10-24 FROM THE 2004 GLOBAL BURDEN OF DISEASE STUDY BY FIVE-YEAR AGE GROUP AND COUNTRY GROUPING

Country group	*Deaths per 100,000 persons*									*Male to female ratio of mortality rates*		
	Both sexes			*Male*			*Female*					
	10-14	*15-19*	*20-24*	*10-14*	*15-19*	*20-24*	*10-14*	*15-19*	*20-24*	*10-14*	*15-19*	*20-24*
High-income countries	16	49	69	19	67	101	12	29	34	1.60	2.30	2.90
Low- and middle-income countries	103	150	244	103	156	275	104	143	211	1.00	1.10	1.30
Low- and middle-income countries												
Africa	205	249	505	196	202	488	215	296	522	0.91	0.68	0.93
The Americas	45	113	175	52	160	269	39	66	81	1.30	2.40	3.30
Mediterranean	113	146	264	119	158	341	104	131	179	1.10	1.20	1.90
Europe and Central Asia	39	90	168	49	125	257	30	54	77	1.60	2.30	3.30
South Asia	122	184	264	117	176	261	127	192	266	0.92	0.92	0.98
Western Pacific	44	85	114	50	114	156	37	52	67	1.40	2.20	2.30
World	95	139	224	95	147	255	94	131	191	1.00	1.10	1.30

Male mortality is generally higher than female mortality among both adolescents and young people classified by five-year age group. Furthermore, in most regions, the ratio of male to female death rates increases by age. In high-income countries, that increase is steeper than in low- and middle-income countries (table 4). Among the latter, the steepest increases in the sex ratios of death rates are observed in the Americas and in Europe and Central Asia. In both of those regions, the sex ratio of death rates at ages 20-24 are at least twice as high as that at ages 10-14. The increase in the sex ratio with age is less marked but still substantial in the low- and middle-income countries of the Western Pacific and the Mediterranean. The low- and middle-income countries of Africa and of South Asia stand out because they have higher mortality among females than among males at all ages between 10 and 24. Furthermore, in Africa, the sex ratios decline between ages 10-14 and 15-19, indicating a more rapid increase in female mortality relative to that of males between those for age groups. The prevalence of early marriage, high fertility at young ages and the resulting high maternal mortality in those two regions are likely responsible for such trends.

In sum, although mortality levels among adolescents and youth are fairly low in high-income countries, there is evidence of a significant degree of excess male mortality, especially after age 15. In the low- and middle-income countries, regional disparities are evident. Death rates among adolescents and youth are lowest in the Americas, Europe and Central Asia, and the Western Pacific, and in all those regions there is marked excess male mortality in all ages groups within the range 10-24. In the low- and middle-income countries of the Mediterranean, where mortality levels among adolescents and youth are high, excess male mortality also prevails. In contrast, in the high-mortality regions of Africa and South Asia, adolescent girls and young women are subject to higher mortality than their male counterparts. Higher female mortality is especially marked in Africa

D. MAJOR CAUSES OF DEATH AMONG PERSONS AGED 10-24

The World Health Organization groups causes of death into three major categories. Group 1 includes communicable diseases, including nutritional and perinatal disorders, as well as maternal

causes. Group II includes all non-communicable diseases and Group III includes external causes, such as injuries from accidents, homicides, suicides. Group I causes can be separated into Group Ia, which includes only maternal causes, and Group Ib, which excludes maternal causes (figure I).

At the world level, deaths from Group I causes accounted for 48 per cent of all deaths of females aged 10-24. The death rate from Group I causes among female adolescents and youth was almost 50 per cent higher than that among their male counterparts, largely because of the incidence of maternal deaths at ages 10-24. When only deaths related to Group Ib causes are considered, the ratio of the death rate of females aged 10-24 to that of males in the same age group is close to 1. Deaths from Group II causes accounted for 22 per cent of all female deaths at ages 10-24 and those from Group III causes accounted for a further 30 per cent. Female death rates from Group II and Group III were almost twice as high among women aged 20-24 than among girls aged 10-14.

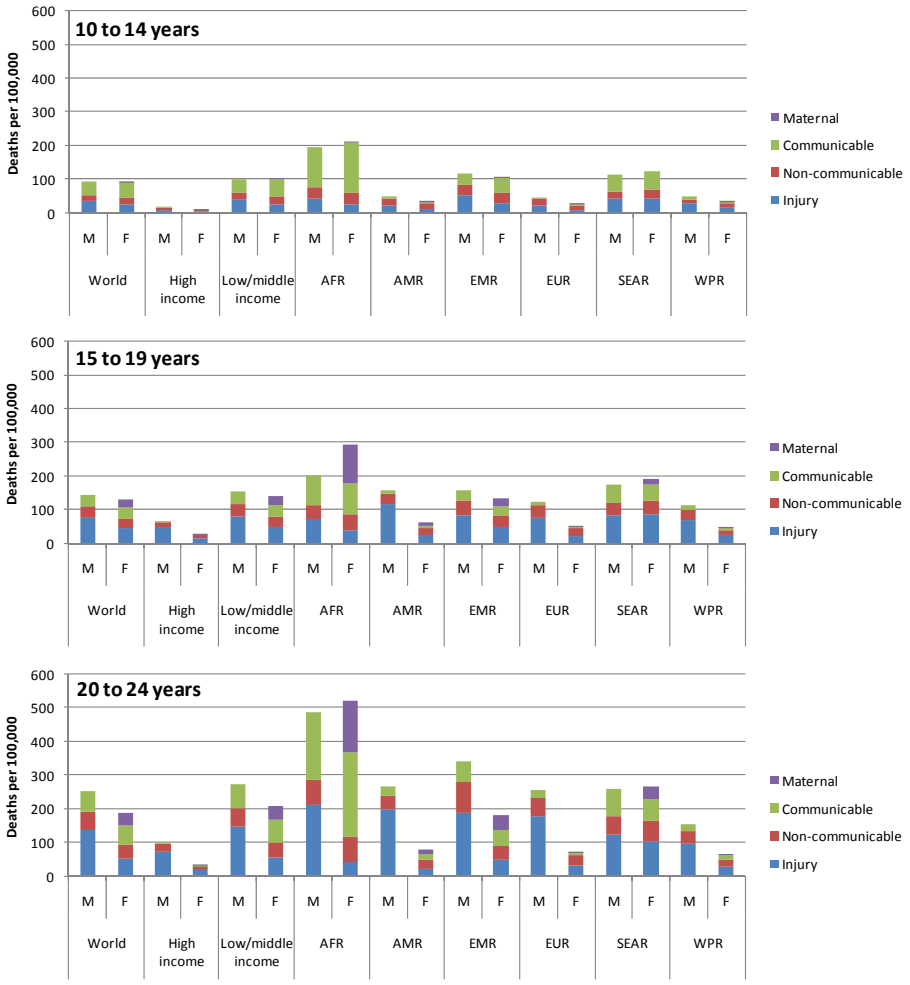
Among males, deaths from Group I and Group II causes accounted for 28 per cent and 21 per cent of all deaths, respectively. Deaths from external causes (Group III) accounted for over half of all male deaths in the world (51 per cent). Whereas the male death rates associated with death due to Group I causes (communicable diseases) and Group II causes (non-communicable diseases) were 1.7 times and 2.6 times higher, respectively, at ages 20-24 than at ages 10-14, that associated with Group III causes was four times higher among young adults than among young adolescents. Clearly, the major causes of excess male mortality among males aged 10-24 are the external causes, including those related to traffic accidents, other injuries and violence.

Death rates from all major categories of causes of death are lower in high-income countries than in low- and middle-income countries. The largest differences in death rates among persons aged 10-24 between high-income countries and low- and middle-income countries are found with respect to mortality related to Group I causes. In high-income countries, Group I causes account for only 4 per cent of all deaths of persons aged 10-24, whereas they are still major causes of death in the low- and middle-income countries taken as a group.

Among the low- and middle-income countries, there are major regional differences. Africa has the highest death rates associated with Group I causes for both males and females. Among young females, death rates associated with maternal causes are particularly high. Partly because of them, female death rates from Group I causes increase by a factor of 2.6 from age group 10-14 to 20-24. Death rates from Group I causes are also moderately high in South Asia, and once more they are higher for females after age 15 largely because of the contribution of maternal causes.

Death rates associated with external causes (Group III) are important contributors of mortality among males aged 10-24. In the low- and middle-income countries of the Americas, deaths from Group III causes accounted for 52 per cent of all deaths of male adolescents aged 10-14 and for 72 per cent of deaths of males aged 20-24. The death rate associated with Group III causes among males aged 20-24 was nearly eight times higher than that among males aged 10-14. In the low- and middle-income countries of Europe and Central Asia, deaths associated with Group III causes accounted for 48 per cent of deaths of young adolescents (10-14) and for 65 per cent of those to males aged 20-24. In addition, death rates from Group III causes increased eight-fold between males in early adolescence and those in young adulthood.

Figure I. Death rates at ages 10-24 by sex, five-year age group, major category of causes of death and country groupings obtained from the 2004 Global Burden of Disease Study (per 100,000 population)



Among the low- and middle-income countries of the Mediterranean, death rates among adolescent and young males and females are moderately high largely because of the contribution of deaths from Group III causes which are responsible for a large proportion of mortality at all ages from 10 to 24 but especially among males aged 20-24. Among the low- and middle-income countries in the Western Pacific, deaths from Group III causes accounted for 62 per cent of male deaths and 42 per cent of all deaths of young people. In the low- and middle-income countries in South Asia, deaths from Group III causes accounted 43 per cent of deaths among persons aged 10-24, whereas those associated with Group I causes accounted for 36 per cent and those related to Group II causes for 21 per cent.

E. SPECIFIC CAUSES OF DEATH AMONG ADOLESCENTS AND YOUTH

In 2004, deaths due to maternal causes at the global level accounted for 15 per cent of all female deaths and for 7 per cent of all deaths of females aged 10-24. HIV/AIDS and tuberculosis accounted for 11 per cent of all deaths of persons aged 10-24. Together, death rates from HIV/AIDS and tuberculosis increase five-fold between early adolescence (10-14) and young adulthood (15-19). In

contrast, death rates due to lower respiratory tract infections are lower in young adults aged 20-24 than in young adolescents aged 10-14.

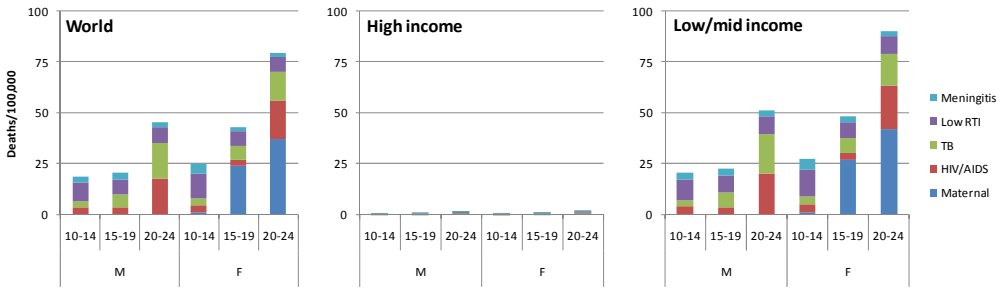
Globally, deaths due to cardiovascular disease constituted in 2004 the largest sub-group within deaths caused by Group II causes, accounting for 6 per cent of all deaths among persons aged 10-24. Cancer accounted for a further 5 per cent of deaths of persons aged 10-24 and neuro-psychiatric disorders and epilepsy accounted for another 5 per cent.

Road traffic accidents were the largest single contributor to deaths associated with Group III causes among persons aged 10-24, accounting for 14 per cent of all male deaths and for 5 per cent of female deaths in that age group. Violence accounted for 9 per cent of deaths of males aged 10-24. Suicide accounted for a further 6 per cent of both male and female deaths among persons aged 10-24. For females, burning was the third most common cause of death among Group III causes, accounting for 4 per cent of deaths of females aged 10-24. Drowning was common among both males and females aged 10-24, accounting for 5 per cent and 2 per cent of deaths of males and females in that age group, respectively.

In high-income countries, road traffic accidents accounted for 32 per cent of deaths of males aged 10-24. Violence accounted for 10 per cent and suicide for 15 per cent of all male deaths in that age group. Compared to young male adolescents, death rates from traffic accidents among young adult males were 7.7 times higher, those from suicide, 16 times higher, and those from violence, 18 times higher. Among females aged 10-24, traffic accidents accounted for 27 per cent of all deaths while suicide, the other major single cause of death among young females, accounted for a further 12 per cent of deaths of females aged 10-24. In high-income countries, traffic accidents, violence and suicide together accounted for close to 80 per cent of all deaths of persons aged 10-24 associated with Group III causes and for over 50 per cent of all deaths of persons in that age group.

In low- and middle-income countries, deaths of persons aged 10-24 due to Group I causes were mostly caused by HIV/AIDS and tuberculosis and, among females, to maternal causes (figure II). Violence and traffic accidents were the most prominent causes of death in Group III among males aged 10-24, whereas suicide and burning were the major Group III causes of death among females in the same age group. Deaths caused by cardiovascular diseases accounted for a major share of all deaths due to non-communicable diseases (Group II causes) among persons aged 10-24. Among males aged 10-24, death rates from cardiovascular diseases in low- and middle-income countries were 3.4 times those in high-income countries, and the equivalent ratio among females aged 10-24 was 4.7 (figure III). Death rates from epilepsy among persons aged 10-24 were 4.3 times higher in low- and middle-income countries than in high-income countries and those from diabetes were 3.4 times higher.

Figure II.Cause-specific death rates for persons aged 10-24 for selected causes in Group I, obtained from the 2004 Global Burden of Disease Study, by sex and country groupings (per 100,000 persons)



Low- and middle-income countries of Africa (AFR), Mediterranean (EMR), Europe and Central Asia (EUR), South Asia (SEAR) and the Western Pacific (WPR)

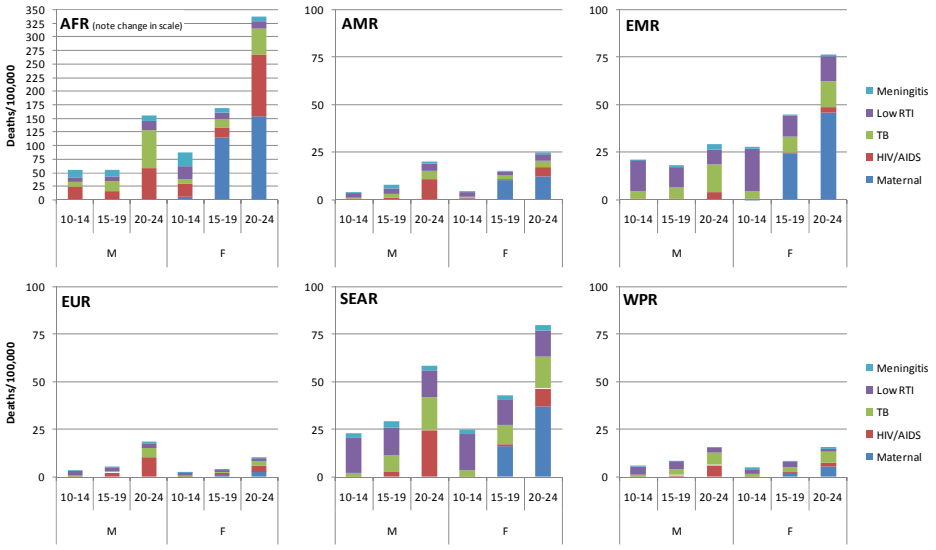
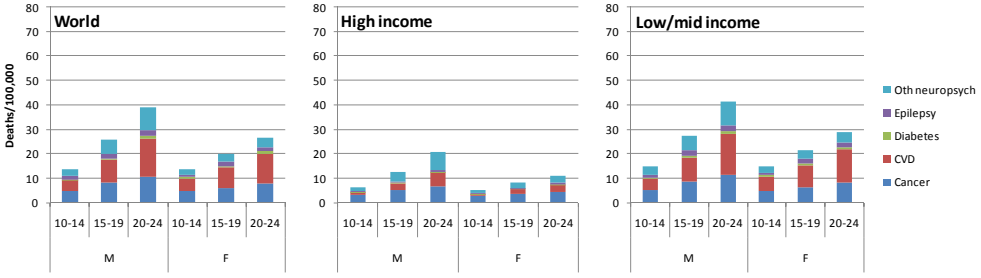
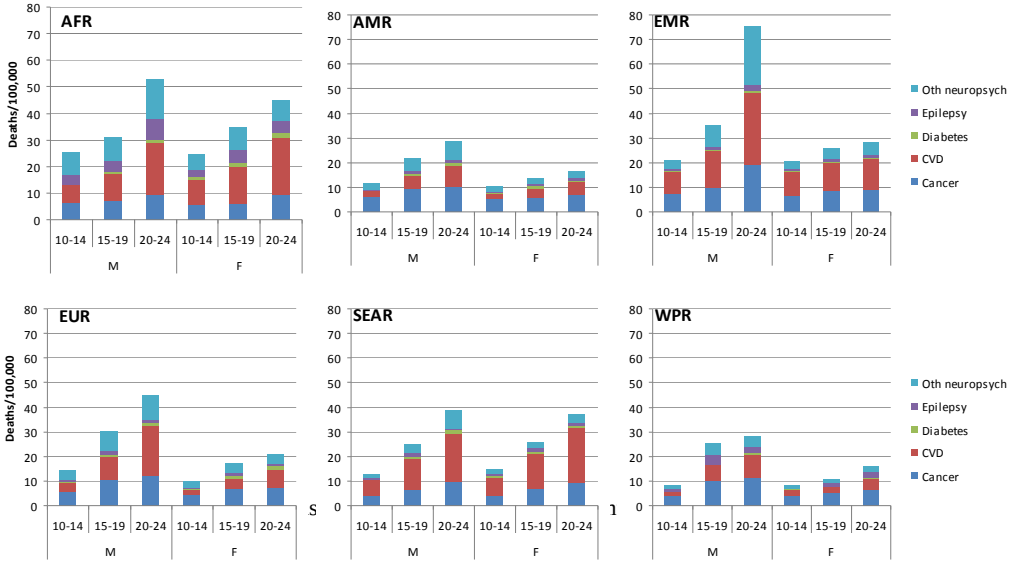


Figure III. Cause-specific death rates for persons aged 10-24 for selected causes in Group II,obtained from the 2004 Global Burden of Disease Study, by sex and country groupings (per 100,000 persons)



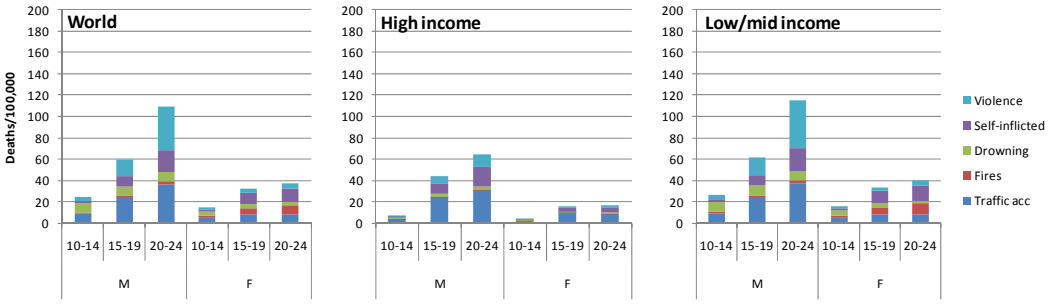
Low- and middle-income countries of Africa (AFR), Mediterranean (EMR), Europe and Central Asia (EUR), South Asia (SEAR) and the Western Pacific (WPR)



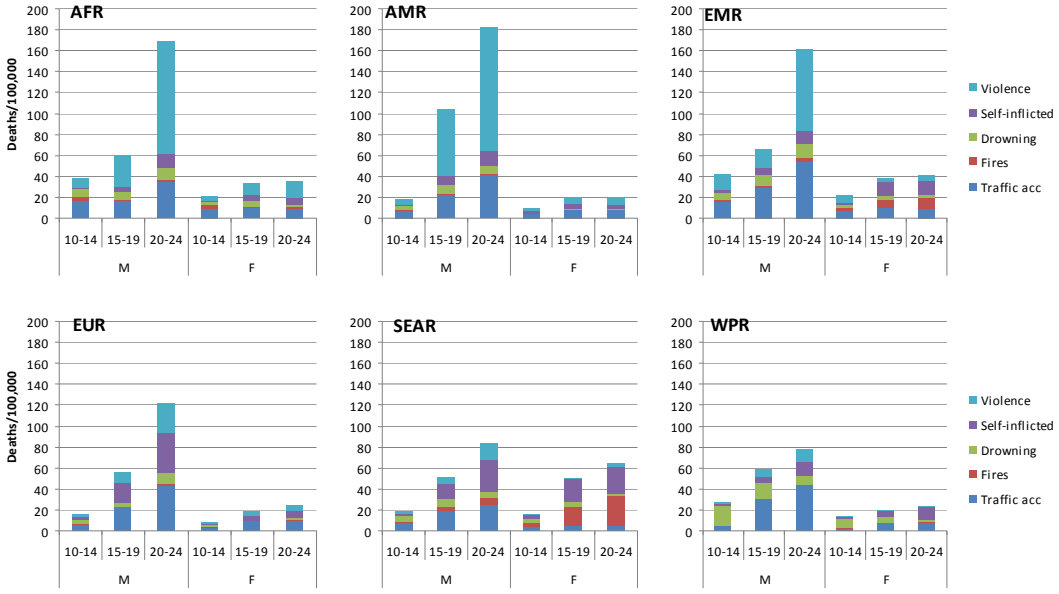
Among low- and middle-income countries in Africa, maternal causes of death accounted for 26 per cent of deaths among females aged 10-24 and maternal mortality increased markedly with age. Deaths due to HIV/AIDS and tuberculosis accounted for roughly 20 per cent of all deaths of persons aged 10-24 in Africa and death rates from those causes also increased markedly with age. Deaths caused by violence and war accounted for the largest share of male deaths related to Group III causes (16 per cent of deaths among males aged 10-24). In addition, traffic accidents, drowning and suicide accounted for 8 per cent, 3 per cent and 2 per cent, respectively, of all deaths among males aged 10-24 (figure IV).

Among the low- and middle-income countries of the Americas, high death rates due to violence among males were the main reason for the high overall mortality among males aged 15-24. Death rates from violence were 26 times higher among males aged 20-24 than among those aged 10-14. Violence accounted for over 42 per cent of all deaths among males aged 15-24 and 9 per cent among females in the same age group. In addition, death rates due to traffic accidents were 6 time higher among males aged 20-24 than among those aged 10-14, and deaths due to suicide were 9 times higher.

Figure IV. Cause-specific death rates for persons aged 10-24 for selected causes in Group III, obtained from the 2004 Global Burden of Disease Study, by sex and country groupings (per 100,000 persons)



Low- and middle-income countries of Africa (AFR), Mediterranean (EMR), Europe and Central Asia (EUR), South Asia (SEAR) and the Western Pacific (WPR)



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In the low- and middle-income countries of the Mediterranean, deaths due to Group III were a major contributor to mortality among young men. Violence and traffic accidents accounted for 17 per cent and 16 per cent, respectively, of all deaths of males aged 10-24. Increases in the incidence of deaths due to Group III causes were largely responsible for the increases in male death rates with age. Among females aged 10-24, the leading causes of death in Group III were suicide, which accounted for 6 per cent of deaths of females aged 10-24; traffic accidents, which accounted for a further 6 per cent; burns, which accounted for 5 per cent, and violence, which accounted for 4 per cent of deaths among adolescent girls and young women. In addition, maternal causes accounted for 16 per cent of deaths of females aged 10-24 and was the main contributor to the rise of female death rates with age. Among males, several infectious diseases were important contributors to mortality from Group I causes, with tuberculosis prominent.

In the low- and middle-income countries of Europe and Central Asia, the leading causes of death in Group III among males aged 10-24 were road traffic accidents, suicide and violence, which accounted respectively for 17 per cent, 14 per cent and 9 per cent of all deaths of males aged 10-24. The increase with age of male death rates from Group III causes were predominantly caused by the rising incidence of deaths from those causes.

In the low- and middle-income countries of South Asia, deaths due to Group I causes were more numerous than in other regions. Among males, deaths due to HIV/AIDS and tuberculosis constituted 10 per cent of all deaths of males aged 10-24. Among females, the major causes of death among Group I were maternal causes, which largely accounted for the rise of death rates with age. Also relevant were the shares of HIV/AIDS and tuberculosis as causes of death among young women. Regarding deaths due to Group III causes, traffic accidents, suicide and violence were the most common causes of death among males aged 10-24, accounting for 9 per cent, 8 per cent and 4 per cent, respectively, of their deaths. Among females, burns and suicide were the major causes of death in Group III, each accounting for 8 per cent of deaths of females aged 10-24.

In the low- and middle-income countries of the Western Pacific, major causes of death among males aged 10-24 belonged to Group III and included road traffic accidents, drowning, and suicide and violence, which accounted for 24 per cent, 14 per cent, 7 per cent and 6 per cent, respectively, of all deaths of males aged 10-24. The increasing incidence of deaths caused by traffic accidents was mostly responsible for the rising male death rates with age. Deaths due to traffic accidents constituted almost half of all deaths due to Group III causes among males aged 20-24. Death rates from drowning among males halved between ages 10-14 and 20-24. Among females, the major causes of death in Group III were suicide, which accounted for 12 per cent deaths of females aged 10-24; road traffic accidents, which accounted for 11 per cent, and drowning, which accounted for another 11 per cent. Among Group II causes, cancer accounted for 9 per cent of all deaths of persons aged 10-24 and cardiovascular disease accounted for another 5 per cent.

Table 5 shows the 10 most common causes of death among persons aged 10-24, which together accounted for about half of all deaths of adolescents and youth. Three causes belonging to Group III were the main causes of death among adolescents and youth, namely, road traffic accidents, self-inflicted injuries (i.e., suicide) and violence, which together accounted for 22.3 per cent of all deaths of persons aged 10-24. Three sets of infectious diseases belonging to Group I were the next most important causes of death of young people, namely, lower respiratory infections, tuberculosis and HIV/AIDS, which together accounted for nearly 17 per cent of all deaths of persons aged 10-24.

Table 6 presents the 10 major causes of death for males and females aged 10-24 separately by sex. For males, those 10 causes accounted for 56.6 per cent of all deaths of male adolescents and youth. Four causes belonging to Group III were the major killers of young males, namely, road traffic accidents, violence, self-inflicted injuries (i.e., suicide) and drowning, which together accounted for 35 per cent of all deaths of males aged 10-24. Three types of infectious diseases belonging to Group I,

TABLE 5. LEADING CAUSES OF DEATH AMONG PERSONS AGED 10-24 ACCORDING TO THE 2004 GLOBAL BURDEN OF DISEASES STUDY

		Both sexes	
Rank	*Cause*	*Death rate (per 100,000)*	*Percentage of deaths of persons aged 10-24*
1	Road traffic accidents	517	10.0
2	Self-inflicted injuries	329	6.3
3	Violence	313	6.0
4	Lower respiratory infections	306	5.9
5	Tuberculosis	284	5.5
6	HIV/AIDS	284	5.5
7	Drowning	211	4.1
8	Fires	134	2.6
9	Meningitis	105	2.0
10	War	93	1.8

TABLE 6. LEADING CAUSES OF DEATH AMONG PERSONS AGED 10-24 BY SEX ACCORDING TO THE 2004 GLOBAL BURDEN OF DISEASES STUDY

	Male			*Female*	
Rank	*Cause*	*Death rate (per 100,000)*	*Percentage*	*Cause*	*Death rate (per 100,000)*	*Percentage*
1	Road traffic accidents	403	13.9	Lower respiratory infections	155	6.7
2	Violence	266	9.2	Self-inflicted injuries	142	6.2
3	Self-inflicted injuries	186	6.4	HIV/AIDS	142	6.1
4	Drowning	155	5.3	Tuberculosis	133	5.8
5	Tuberculosis	152	5.2	Road traffic accidents	114	5.0
6	Lower respiratory infections	151	5.2	Fires	99	4.3
7	HIV/AIDS	143	4.9	Maternal haemorrhage	73	3.2
8	War	82	2.8	Complications of abortion	61	2.6
9	Leukaemia	55	1.9	Drowning	57	2.5
10	Meningitis	52	1.8	Meningitis	54	2.3

namely, tuberculosis, lower respiratory infections and HIV/AIDS were the next most important causes of death for males, and they together accounted for about 15 per cent of all deaths of males aged 10-24. It is noteworthy that one non-communicable disease belonging to Group II, namely leukaemia, was the ninth most important cause of death among male adolescents and youth.

Among females aged 10-24, there is more variety in the major causes of death than among their male counterparts. The 10 major causes identified in table 6 account for just 45 per cent of all deaths of females aged 10-24. Three types of infectious diseases appear among the four major causes of death of female adolescents and youth, namely, lower respiratory infections, HIV/AIDS and tuberculosis, which together account for nearly 19 per cent of all deaths of females aged 10-24. Among the causes belonging to Group III, self-inflicted injuries (i.e. suicides) occupy the most prominent place and account for 6 per cent of all deaths of females aged 10-24. Two maternal causes of death, namely, maternal haemorrhage and the complications of abortion are also among the 10 major causes of death of young women and adolescent girls. Together, they account for just under 6 per cent of all deaths of females aged 10-24.

Table 6 also shows that the death rates associated with the major causes of death from Group III are much higher for males than for females aged 10-24. The male death rate from traffic accidents, for instance, is three and a half times higher for males than for females. The death rate from drowning is 2.7 times higher for males than for females, and the rate for suicide (self-inflicted injuries) is 30 per

cent higher for males than for females. Furthermore, neither violence nor war are major causes of death for females. In contrast, the death rates associated with the communicable diseases that are major causes of death for both young males and young females are similar. Even with regard to HIV/AIDS, the death rate for males aged 10-24 is 143 per 100,000 persons, while that for females is 142 per 100,000. Consequently, to reduce differences in mortality by sex at younger ages, the focus has to be on reducing the risks of dying from external causes among males and from maternal causes among females.

F. IMPLICATIONS FOR THE HEALTH OF ADOLESCENTS AND YOUTH

Although mortality at ages 10-24 is generally low, there remain major disparities among the world's regions and countries. Mortality among adolescents and youth is particularly low in the high-income countries. Thus, whereas those countries account for 11 per cent of the population aged 10-24, only 3 per cent of all deaths of persons aged 10-24 occur in high-income countries. Death rates at ages 10-24 are nearly four times higher in low- and middle-income countries than in high-income countries.

There are also important differences among the group of low- and intermediate fertility countries. Low mortality among adolescents and young people is characteristic of the Western Pacific region, which is dominated by China. In that region, just as in the high-income countries, deaths from road traffic accidents and suicide are major contributors to the mortality of the young, especially of young males.

Regions with intermediate levels of mortality in adolescence and youth include the low- and middle-income countries of Europe and Central Asia, which are mostly the successor States of the former USSR, and most of Latin America. In those regions, deaths from Group III causes were prominent, especially those caused by road traffic accidents, homicides and suicides. Relative to the mortality of males, the mortality rates of females aged 10-24 in those regions were generally low.

Lastly, the regions where mortality in adolescence and youth is high include the low- and middle-income countries of Africa, those of the South Asia (which include the Indian subcontinent), and those in the Mediterranean. Together those regions accounted for around two thirds of all deaths of persons aged 10-24, although their share of that population is just 42 per cent. In those regions, even the death rates among persons aged 10-14 were on the high side and death rates among females were either closer to the death rates of males or even surpassed those of males, as in Africa or in South Asia. In those regions the leading causes of death were still infectious diseases, including tuberculosis and HIV/AIDS, as well as maternal causes among females. Although the proportion of deaths of adolescents and youth attributable to violence, suicide and traffic accidents was lower than in regions with lower mortality among young people, the death rates associated with those causes were high. In both South Asia and in the Mediterranean, females aged 10-24 experienced high death rates from Group III causes.

Some caution is needed in interpreting the regional mortality estimates presented in this paper, since the average values for some regions are heavily influenced by the estimates referring to the most populous countries in them. Thus, in the case of the Western Pacific, the regional estimates are heavily influenced by the estimates for China and do not reflect well the situation in smaller low-income countries in that region, such as Papua New Guinea whose level of mortality is comparable to that of high-mortality regions (Duke and others, 2002).

This paper has shown that mortality rises from early adolescence to young adulthood in all regions of the world. Most of the deaths of adolescents and youth occur at ages 20-24 and male mortality is generally higher than female mortality, except in the low- and middle-incomes countries of Africa and those of South Asia.

The increase in mortality between ages 10-14 to 20-24 is related to different causes in the various regions. In Africa and in South Asia, maternal deaths accounted for a major portion of the female rise in mortality with age, with further contributions from HIV/AIDS, tuberculosis and injuries of various types. Regional differences in the age of onset of sexual activity as well as the availability and accessibility of condoms and other methods of contraception as well as access to antenatal and obstetric care, safe abortion services, and HIV testing are key factors in determining the level of maternal mortality among young people (Bearinger and others, 2007; Ronsmans and Graham, 2006). High maternal mortality continues to be prevalent in low-income countries and in some middle-income countries and reducing it is one of the Millennium Development Goals (Hill and others, 2007b). The importance of maternal deaths among adolescent girls and young women in low-income countries should be a further incentive for promoting developmentally appropriate sexual and reproductive health services for adolescents and young adults (Bearinger and others, 2007). Given the high number of deaths due to abortion, ensuring not only that contraception is available but that all abortions are safe would go a long way in reducing mortality among women under 25 (Sedgh and others, 2007). In regions where maternal mortality is low, death rates among females aged 10-24 generally remain low throughout adolescence and young adulthood.

Among males, deaths due to external causes (i.e. mostly deaths because of injuries) were the clearest contributors to the rise in mortality with age in almost every region of the world. Yet, both the levels of mortality caused by injuries and their pattern by specific causes varied substantially across regions. Injuries accounted for a little over 10 per cent of all deaths in the world but they accounted for over 40 per cent of deaths of persons aged 10-24 and for just over 50 per cent of male deaths in that age group (Lopez, 2008; Murray and Lopez, 1997). The relatively high incidence of deaths caused by injuries among adolescents and youth in high-income countries is well known (Schlueter and others, 2008; Singh and Yu, 1996). Yet there is less recognition of their relevance in low- and middle-income countries. In all regions, but especially in those experiencing the highest mortality, there is an urgent need to implement programmes that prevent deaths from external causes among young people (Stuckler and others, 2008). Because the exact causes of deaths from injuries vary among regions, diverse strategies to reduce their number will be needed. In high-income countries, for instance, mortality caused by road traffic accidents rose during the 1980s but, after the implementation of coordinated inter-sectoral policies to reduce traffic accidents, it has been falling (Krug and others, 2000; Sells and Blum, 1996). Preventive measures include investments in road infrastructure, the compulsory use of seat belts in cars and other vehicles, and the compulsory use of helmets when using motorcycles, as well as the enforcement of legislation prohibiting driving after drinking alcohol or under the influence of drugs.

In the Western Pacific, where drowning accounted for the great majority of deaths due to external causes among persons aged 10-14, providing swimming lessons in childhood and teaching about the hazards in ocean swimming could prevent many deaths (Yang and others, 2007; Wang and others, 2008). In other instances policy responses are likely to be more complex and extend beyond adolescents and youth although they may be particularly benefited (Karkhaneh and others, 2006). In Latin America, for instance, violence is a major cause of death among young males. Firearms are responsible for up to 97 per cent of homicides in countries of the region, suggesting that strengthening gun control would make an important contribution to reducing mortality among young people (Falbo and others, 2001). Yet gun control is unlikely to be effective without addressing the illicit drug industry as well as the lack of employment opportunities, urban segregation and a culture of machismo in the region (Briceño-León and others, 2008).

In Europe and Central Asia, especially in the successor States of the former USSR, deaths due to external causes among males are caused mainly by road traffic accidents, homicides and suicides. The emergence and expansion of a ‘black’ economy in connection with a ‘criminological transition’ and exposure to violence are reasons for the high mortality among young males that has accompanied the rapid socio-economic transition experienced by those countries (Ahmed and Andersson, 2000; Pridmore, 2007). In addition, high levels of alcohol abuse are linked to changing rates of suicide, accidental injury and homicide, suggesting a further target for prevention (Bye, 2008; McKee and Shkolnikov, 2001; Nemtsov, 2006).

In South Asia, a high death rate from external causes among females reflects in large part deaths from burning and suicide. Earlier studies in India have attributed burning deaths to suicide and accidents but the role of intra-family violence may also be important (Ambade and Godbole, 2006; Batra, 2003; Murray and Lopez, 1997). Because suicides in India are often the result of ingesting poisonous compounds, such as pesticides, limiting access to those substances in rural India could help reduce the incidence of suicide (Aaron and others, 2003; Kanchan and Menezes, 2008; Wang and others, 2008).

The increase in mortality between early adolescence and young adulthood reflects major shifts in the underlying causes of death (Gore and others, 2011), To date, those shifts have attracted little policy attention. In Africa as well as in South Asia, deaths due to Group I causes are still of major importance and their incidence rises from early adolescence to young adulthood. In those regions, strategies to prevent infectious disease, particularly HIV infection, as well as those that expand access to information and services for sexual and reproductive health are those most likely to yield the greatest benefits (Caldwell, 2001). Also of importance in those regions is combatting tuberculosis and lower respiratory tract infections which still account for more deaths of persons 10-24 than does HIV/AIDS but have yet to attract similar policy attention.

In the low- and middle-income countries of other regions, the relevance of Group I causes of death is lower. Thus, in the Western Pacific, Europe and Central Asia, and in the Americas the pattern of causes of death among persons 10-24 is more similar to that in high-income countries, although death rates were higher in the low- and middle-income countries of those regions. The major causes of death among adolescents and youth in those regions require different policy responses than those for Africa or South Asia. Several authors have remarked that relative to the burden of disease by cause, communicable diseases, maternal, perinatal and nutritional conditions attract a greater proportion of both regular and extra-budgetary expenditure (Lopez, 2008; Stuckler and others, 2008). In contrast, external causes, which account for over 40 per cent of all deaths of persons 10-24, receive as little as 1 per cent of available funds even in regions where they are major causes of death (Stuckler and others, 2008). Clearly, maintaining the policy focus mainly on HIV infection and maternal causes of death will not be sufficient to reduce mortality among adolescents and youth across the world and will not address the full spectrum of health needs of young people. In particular, the current policy focus will do little to reduce mortality among young people in regions such as the Americas, or Europe and Central Asia where mortality due to injuries and suicide are common among adolescents and youth. It is urgent, therefore, that policy priorities be rebalanced and that measures to reduce the incidence of death and morbidity associated with external causes be given greater attention.

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ANNEX TABLE. COUNTRIES INCLUDED IN EACH OF THE REGIONS USED

High-income countries

Andorra	Greece	Norway
Australia	Iceland	Portugal
Austria	Ireland	Qatar
Bahamas	Italy	Republic of Korea
Bahrain	Israel	San Marino
Belgium	Italy	Singapore
Brunei Darussalam	Japan	Slovenia
Canada	Kuwait	Spain
Cyprus	Luxembourg	Sweden
Denmark	Malta	Switzerland
Finland	Monaco	United Arab Emirates
France	Netherlands	United Kingdom
Germany	New Zealand	United States of America

Africa

Algeria	Ethiopia	Niger
Angola	Gabon	Nigeria
Benin	Gambia	Rwanda
Botswana	Ghana	Sao Tome and Principe
Burkina Faso	Guinea	Senegal
Burundi	Guinea-Bissau	Seychelles
Cameroon	Kenya	Sierra Leone
Cape Verde	Lesotho	South Africa
Central African Republic	Liberia	Swaziland
Chad	Madagascar	Togo
Comoros	Malawi	Uganda
Congo	Mali	United Republic of Tanzania
Côte d'Ivoire	Mauritania	Zambia
Dem. Rep. of the Congo	Mauritius	Zimbabwe
Equatorial Guinea	Mozambique	
Eritrea	Namibia	

The Americas

Antigua and Barbuda	Dominican Republic	Panama
Argentina	Ecuador	Paraguay
Barbados	El Salvador	Peru
Belize	Grenada	Saint Kitts and Nevis
Bolivia	Guatemala	Saint Lucia
Brazil	Guyana	St. Vincent and the Grenadines
Chile	Haiti	Suriname
Colombia	Honduras	Trinidad and Tobago
Costa Rica	Jamaica	Uruguay
Cuba	Mexico	Venezuela (Bolivarian Rep. of)
Dominica	Nicaragua	

ANNEX TABLE (*continued)*

Europe and Central Asia

Azerbaijan	Kazakhstan	Russian Federation
Belarus	Kyrgyzstan	Serbia
Bosnia and Herzegovina	Latvia	Slovakia
Bulgaria	Lithuania	Tajikistan
Croatia	Montenegro	TFRY Macedonia
Czech Republic	Poland	Turkey
Estonia	Portugal	Turkmenistan
Georgia	Republic of Moldova	Ukraine
Hungary	Romania	Uzbekistan

Mediterranean

Afghanistan	Lebanon	Somalia
Djibouti	Libyan Arab Jamahiriya	Sudan
Egypt	Morocco	Syrian Arab Republic
Iran (Islamic Republic of)	Oman	Tunisia
Iraq	Pakistan	Yemen
Jordan	Saudi Arabia	

South Asia

Bangladesh	Indonesia	Sri Lanka
Bhutan	Maldives	Thailand
Democratic People's Rep. of Korea	Myanmar	Timor-Leste
India	Nepal	

Western Pacific

Cambodia	Marshall Islands	Philippines
China	Micronesia (Federated States of)	Samoa
Cook Islands	Mongolia	Solomon Islands
Fiji	Nauru	Tonga
Kiribati	Niue	Tuvalu
Lao People's Democratic Rep.	Palau	Vanuatu
Malaysia	Papua New Guinea	Viet Nam