Review Article

MORTALITY PATTERNS OF ADOLESCENT AND YOUTH IN SAARC COUNTRIES:FINDINGS FROM THE GLOBAL BURDEN OF DISEASE STUDY

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Adolescence and youth are the healthiest period of life. Despite being a healthy period of life, the people of this age group also suffer significantly higher deaths and disease conditions. This paper analyzes level, trend of all causes mortality and causes of mortality among population aged 10-24 years. Datasets on population aged 10-24 years; number of deaths and cause-specific mortality were obtained from the Global Health Data Exchange platform (GHDx) of the Institute of Health Metrics and Evaluation. This paper utilized broad causes of mortality and the variables: number and death rates for the years 2000, 2005, 2010 and 2015.

The estimated number of deaths for aged 10-24 years in SAARC countries is 640,000.About 80% of the deaths occurred in Afghanistan and India. Maldives has the lowest mortality rate. In Bangladesh, India, Nepal and Pakistan,the combination of injuries and non-communicable diseases are the major causes of deaths whereas in Afghanistan, Maldives and Sri Lanka, injuries. Majority of female population in all countries died from communicable, maternal, neonatal, causes.In addition to those causes, natural disaster, war also significantly attributed to adolescent and youth mortality in SAARC region. Overall SAARC region data shows that adolescent and youth death rate has declined between 2000 and 2015. There should be regional priorities for the prevention of adolescent and youth deaths recognizing these causes of deaths. Since these findings are based on GBD estimates, there is an urgent need for new evidence based research to examine the validity.

Keywords: SAARC, adolescent and youth, mortality, death rates and cause.

INTRODUCTION

Mortality is one of the basic components of population change (Bhende&Kanitkar, 1994) and the related data is essential for health sector planning and development, evaluation of health service and programs, epidemiological studies (Jha, 2014). Lack of reliable estimates for mortality and causes of deaths in most of the low and middle income countries is one of the biggest challenges (Jha, 2014). Vital registration system, which provides information about birth, death and migration in the population, is not functioning in many poor countries. In this context, the Global Burden of Disease (GBD) studies have been playing important role in providing information required to guide global and regional mortality and disease pattern (Lopez, Mathers, Ezzati, Tamison, &Murray, 2006).

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Adolescent and youth are a major demographic group in population. They represent one-thirds of the global population (Population Reference Bureau, 2013). About 9 out of 10 of them live in less developed countries (UNFPA,2014). SAARC countries contain 27% of the world's adolescent and youth population (UNFPA,2014). There are 8 member countries in the SAARC - Afghanistan, Bangladesh, Bhutan, India, Maldives, Nepal, Pakistan and Sri Lanka. The SAARC region is a diverse and heterogeneous community in terms of geography, size and composition of the population. The proportion of the adolescent and youth population in all SAARC member countries ranges from 23% to 36% of their populations (UNFPA, 2014). India has the highest number of adolescent and youth population in the world(UNFPA, 2014).

Despite being a healthy period of life, the people of adolescent and youth population suffer significantly higher deaths and disease conditions (Jha, 2014). Adolescent and youths are dying due to major biological changes and lifestyle behaviours that they adopted (WHO,2014).Overall mortality from all causes has been declined over the period meanwhile non-communicable disease (NCD) and injury related deaths have increased (United Nations, 2012).Globally, the leading causes of death among adolescents were road injury, complication during pregnancy and child birth, HIV, suicide, lower respiratory infections and interpersonal violence (UNFPA, 2014).

In Northern Africa, Eastern Asia and Western Asia about one percent or less of 15 year olds do not survive to their 25^{th} birthday and this proportion is more than double for the SAARC countries (Patton, Coffey, Sawyer, Viner, Haller, Bose, Vos, Frguson, & Mathers, 2009). An analysis on the global pattern of mortality in young people showed that 2.6 million adolescent and youths (10-24 years) died in 2004 (Patton et.al. 2009). The Global Burden of Disease study 2015 includes SAARC countries in 3 different groups of countries: Bangladesh, Bhutan, India, Nepal and Pakistan (South Asia); Maldives, and Sri Lanka (Southeast Asia), Afghanistan (North Africa and Middle East). A study based on 2004 global burden of disease estimate showed that South East Asia comprises of 35 percent of the global deaths of adolescents and youths (Patton etal., 2009).

In recent years, SAARC region has exhibited a very complex transition in terms of shift in diseases and injuries. Some studies (Patton etal., 2009; WHO, 2010) have analyzed mortality of developed countries, or used GBD data for global mortality pattern of adolescent and youths. Although, the adolescent and youth population occupies one-thirds of the SAARC population (CBS, 2016), there is lack of reliable estimates for mortality and diseases of this region. The aim of this paper is to study important component of demographic study; mortality and disease patterns of adolescent and youth population of the SAARC regional countries. In these contexts, it is anticipated that this study will provide essential information required to guide the regional problems.

METHODS

This study attempted to analyze the mortality pattern in adolescent and youths (10-24 years) in SAARC region. Trend in mortality rates and three broad causes of deaths for the age group 10-24 years were also presented.

Data presented in this study retrieved Global Burden of Disease study for 2000, 2005, 2010 and 2015 (Global Burden of Disease Study, 2015).Population aged 10-24 years, numbers of deaths, deaths rates and causes of deaths were extracted from the database. Analyses of total number of deaths and mortality rates per 100,000 population were conducted on all-cause of deaths for people aged 10-24 years. Descriptive analysis was carried out to present the information. The Institute of Health Metrics and Evaluation (IHME) at Washington University provides the dataset freely with user-friendly interface of GHDx[1] to download the variables of interest. Global Burden of Disease (GBD) study generates most up-to-date account of the causes of deaths and disability using a number of available datasets and statistical models, registration data and sample registration system, data from census and surveys.Details on GBD methodologies are published elsewhere (Wang et al., 2016).

RESULTS

In SAARC member countries, over 13 million deaths occurred in the year 2015, of which 5 percent were among the people aged 10-24 years. This region shares almost a quarter of global deaths and the nearly one-third of the world's total population. India, Bangladesh and Pakistan are the most populous countries in the region. Over 72% of SAARC countries' deaths were in India, followed by Pakistan (12.1%). Death rate was higher for Afghanistan; Pakistan has the second highest death rate in SAARC member countries. Maldives has the lowest adolescent and youth all-causes deaths rate 39.8 per 100,000 (Table 1).

Table 1: Estimated total number of deaths and all-cause mortality rates (per 100,000) in people aged 10–24 years across SAARC member countries in 2015

Country	Number of deaths	Population	Death rates in 100,000
Afghanistan	38,912	11,356,555	342.6
Bangladesh	46,171	47,757,725	96.7
Bhutan	178	221,919	80.2
India	462,716	368,321,944	125.6
Maldives	40	100,695	39.8
Nepal	11,407	9,332,065	122.2
Pakistan	77,607	57,075,062	136.0
Sri Lanka	3,214	4,818,204	66.7
SAARC Total	640,245	498,984,169	128.3

Source: Author's calculation from Global burden of disease study 2015 data, available from http://ghdx.healthdata.org/gbd-results-tool.

In overall, adolescent and youth death rate has largely declined in SAARC countries (Table 2). During 2000, the death rate was highest for Afghanistan (338.46 per 100,000 population), followed by India (193.15 per 100,000). Throughout the mortality estimated years rates were

1 Data can be downloaded from the link http://ghdx.healthdata.org/gbd-results-tool?params=querytool-permalink/3f7f216c1a5a319b9f5ad961657b4840.

highest for Afghanistan. During 10 years' period (2000 to 2010), mortality rate was declining in trend except Afghanistan. Bangladesh, Bhutan, India, Maldives experienced similar continuous decline in adolescent and youth mortality rate. In Nepal, the highest mortality rate was in 2000 (140.2 per 100,000 adolescent ad youth population) and it was declining till 2010 and during 2015, Nepal experienced increased adolescent and youth mortality rate (122.2per 100,000 population). Similarly, Sri Lanka experienced its' highest adolescent and youth mortality rates in 2005, after 2005 it followed the declining trend.

Table 2: Trend in death rates per 100,000 population SAARC member countries (10-24 years, both sexes)

Country	2000	2005	2010	2015	% Change
Afghanistan	338.46	296.40	290.57	342.6	1
	(284.79 - 400.61)	(246.56 - 357.51)	(244.32 - 348.72)	(271.89 - 474.1)	
Bangladesh	139.80	123.58	109.54	96.7	-31
	(125.97 - 151.59)	(112.9 - 133.38)	(99.96 - 119.1)	(85.51 - 110.04)	
Bhutan	157.34	102.84	88.36	80.2	-49
	(130.21 - 184.17)	(88.22 - 120.95)	(73.84 - 105.3)	(64.42 - 97.38)	
India	193.15	171.30	148.08	125.6	-35
	(185.87 - 201.51)	(164.58 - 179.22)	(142.56 - 154.49)	(121.61 - 133.4)	
Maldives	75.32	55.53	44.85	39.8	-47
	(71.16 - 79.02)	(53.12 - 58.07)	(42.04 - 47.75)	(32.64 - 44.55)	
Nepal	140.24	125.89	107.55	122.2	-13
	(126.64 - 152.63)	(111.43 - 141.25)	(90.43 - 126.32)	(102.81- 149.16)	
Pakistan	165.52	204.88	150.38	136.0	-18
	(151.69 - 181.92)	(177.04 - 233.86)	(133.44 - 168.08)	(118.56- 156.72)	
Sri Lanka	137.18	83.57	109.99	66.7	-51
	(128.37 - 146.21)	(81.95 - 85.19)	(82.34 - 138.52)	(54.29 - 84.41)	

Source: Institute for Health Metrics and Evaluation (2016),available from http://ghdx.healthdata.org/gbd-results-tool.

The overall decline in adolescent and youth mortality was 23 percent in SAARC countries. About half of the mortality rate was declined for Bhutan, Maldives and Sri Lanka. The lowest decline in mortality rate was in Nepal (13%) and Afghanistan had one percent increment in death rate between 2000 and 2015. Similarly, there was sharp increase in death rates in Afghanistan and Nepal between the years 2010 and 2015.

In the GBD study, all adolescent and youth mortality causes were categorized into three broad groups; a) Communicable, maternal, neonatal, and nutritional diseases (infectious diseases), b) Non-communicable diseases (NCDs) and c) Injuries which are further classified into 249 individual causes.[20] There are inequalities in mortality causes for males and females. Table 3 shows that significant percentage of male adolescent and youths died from the preventable causes (injuries). The communicable, maternal, neonatal, and nutritional causes (Infectious diseases) were the main causes of deaths for 10-24 years female adolescent and youth in SAARC member countries.

In Afghanistan majority (83%) of the male adolescent and youth died from injuries, the corresponding value for the female was about 36%. In Bangladesh, India, Nepal and Pakistan, the burden of non-communicable diseases (NCDs) and injuries appeared to be the major cause whereas, for Maldives and Sri Lanka, injuries and NCDs affected many adolescent and youths. Except Maldives (15%) and Sri Lanka (18%), majority of female died from communicable, maternal, neonatal, and nutritional diseases in SAARC countries; i.e. Afghanistan (37%), Bangladesh (43%), Bhutan (52%), India (51%), Nepal (58%) and Pakistan (53%).

Table 3: Percentage distribution of causes of deaths by SAARC member countries and sex (10-24 years)

Country	Sex	Causes		
		Communicable, maternal, neonatal, and nutritional diseases (%)	Non-communicable diseases (%)	Injuries (%)
Afghanistan	Both	20	17	63
	Female	37	27	36
	Male	7	10	83
Bangladesh	Both	32	31	38
	Female	43	28	29
	Male	24	32	44
Bhutan	Both	42	26	32
	Female	52	24	24
	Male	34	27	38
India	Both	43	23	33
	Female	51	22	27
	Male	37	25	39
Maldives	Both	11	32	57
	Female	15	34	52
	Male	10	31	60
Nepal	Both	47	21	32
	Female	58	19	24
	Male	39	23	38
Pakistan	Both	38	25	37
	Female	53	29	18
	Male	26	22	52
Sri Lanka	Both	11	19	70
	Female	18	25	57
	Male	8	17	75

Source: Institute for Health Metrics and Evaluation (2016),available from http://ghdx.healthdata.org/gbd-results-tool.

South Asia is the second most violent place on earth after Iraq (David, 2017). Following Table 4 provides trends in adolescent and youth mortality data on the deaths due to natural disasters and conflict between 2000 and 2015. Pakistan has experienced high number of deaths during all the period between 2005 and 2015, followed by Afghanistan and India. In 2005 large number of adolescent and youths were died from natural disasters and conflict. Similarly, Nepal experienced larger deaths in 2015; which was attributed by the devastating earthquake. Results in Table4 reveal that Afghanistan has been suffering from deaths related to natural disasters and conflict for all the period.

Table 4: Deaths attributed to forces of nature, war and legal intervention

Country	2000	2005	2010	2015
Afghanistan	1,948	824	2,523	14,045
Bangladesh	46	42	-	-
Bhutan	69	-	-	-
India	1,913	1,680	786	101
Maldives	-	-	1	-
Nepal	172	471	47	2,732
Pakistan	-	24,539	3,062	1,531
Sri Lanka	777	34	1,758	10
SAARC	4,925	27,590	8,177	18,419

Source: Institute for Health Metrics and Evaluation (2016),available from http://ghdx.healthdata.org/gbd-results-tool.

In 2005 October, a strong earthquake hit Pakistan with 7.6 magnitudes, where thousands of deaths reported. Similarly, in 2015 October a 7.5 magnitude earthquake hit Afghanistan. People living in Hindu-Kush Mountain region are highly vulnerable to earthquake and other natural disasters.

DISCUSSION

There is lack of SAARC level studies on adolescent and youth mortality. The Global Burden of Disease 2015 Study (GBD 2015) provides a comprehensive assessment of all-cause and cause-specific mortality for 249 causes in 195 countries and territories from 1980 to 2015 (GBD, 2015).This study utilized GBD database to present the situation of adolescent and youth mortality of SAARC member countries. This study found significant reductions in mortality among adolescent and youth population between 2000 and 2015 and this finding was similar to the youth mortality pattern of African countries (Phillips-Howard et al., 2012) and at the global level as well (Patton et al., 2009).Death rates were highest for Afghanistan and India; these two countries accounted for 80% of SAARC member countries' deaths for population aged 10-24 years. Maldives has the lowest adolescent and youth mortality among SAARC member countries. Advancement of the medicine and improvement in general condition of life of population contributed for the significant reduction in mortality in Maldives (United Nations, 2004).

Decline in adolescent and youth mortality rate was noticeable in all SAARC member countries. Bhutan, Maldives and Sri Lanka have experienced sharp declining mortality trend and Afghanistan and Nepal have relatively slower decline in mortality. Afghanistan and Nepal have experienced increased adolescent and youth mortality in 2015.

Causes of deaths were grouped into three broad categories. Table 3 shows broad cause specific death percentage for SAARC member countries. For all these member countries deaths, three causes (Communicable, maternal, neonatal, and nutritional diseases; Injuries and Non-communicable diseases) contributed differently by countries and sex. In most countries today, communicable diseases cause a low proportion of all deaths. Major exceptions are countries in sub-Saharan Africa and South Asia, where communicable diseases are still major causes of death (UN, 2012).In South Asia, communicable diseases cause 40 percent of female deaths and 29 percent of male deaths of those aged 10-24 (UN, 2012).This study also showed that except in Maldives and Sri Lanka, majority of the female deaths were from communicable diseases followed by injury which was similar to analysis by Patton etal. Injuries are a major killer of young people and are a special threat for young men (UN, 2012). Overall injuries related death percent were greater for male than female; this finding was similar to the previous studies in the different places(Patton et al., 2009; Sorenson, 2015; Phillips-Howard et al., 2012). In Afghanistan majority of male died from injuries (83%). Mortality from non-communicable diseases was very similar to male and female.

Conflict and natural disaster also had impact on adolescent and youth mortality in Afghanistan (David, 2017).In Afghanistan, youth mortality was further exacerbated by the conflict (United Nations, 2004). World Data Atlas also showed that Afghanistan has more than 600 death rates per 100,000(World data atlas, 2017).

Similarly, India has been suffering from diverse ethnic, linguistic, and religious groups related conflicts(David, 2017). Sri Lanka has experienced violence from leftist insurgencies in the south; where thousands of people died in 2005 (David, 2017). Decade-long armed conflict (1996-2006), led by the Communist Party of Nepal (Maoist) claimed more than 13,000 lives in Nepal (United Nations Office of the High Commissioner for Human Rights, 2012). Result of the conflict in adolescent and youth mortality reflected for the period 2005 to 2010 in India, Pakistan Sri Lanka and Nepal. Besides conflicts, number of natural disasters taken place in South Asia in which adolescent and youth are most vulnerable (Lim et al., 2012). Particularly, Nepal experienced devastating earthquake in 2015 and substantially increased adolescent and youth mortality for 2015. Findings presented in this study reveals that number of adolescent and youth died from forces of nature, war, and legal intervention in South Asia. Therefore, forces of nature, war, and legal intervention also contributed significantly in fluctuation of adolescent and youth mortality trends. The data clearly shows gender disparities related to various causes of deaths and natural and man-made disasters.

CONCLUSION

This study identified that SAARC region has high adolescent and youth mortality. It showed that overall mortality rate have declined among adolescent and youth in the SAARC member countries. Large number of adolescent and youths were dying in these countries, and many of them were dying from the preventable causes (injuries). In SAARC region, communicable diseases were still contribute significant number of deaths. Similarly, number of adolescent and youths were suffering from the forces of nature, war, and legal intervention. Above all, the findings of this study were the estimated deaths from Global Burden of Disease Study, so it highlights the necessity for new research to examine the validity.

REFERENCES

Bhende, A.A., &Kanitkar,T. (1994). Mortality. *Principle of population studies.*Delhi: Himalayan Publishing House.

Central Bureau of Statistics (CBS). (2016). *SAARC in figures 2016,*accessed on August 2016 http://cbs.gov.np/image/data/2016/SAARC%20in%20Figures%202016.pdf.

David, S. (2017). Conflict in South Asia and its impact on health. *British Medical Journal. 2017*.357. Retrieved from doi: https://doi.org/10.1136/bmj.j1537.

Ghani, E. (2010). *Conflict and development.*VoX CEPR's policy portal,research based-policy and commentary from leading economist.Retrieved from http://voxeu.org/article/conflict-and-development-lessons-south-asia.

Institute for Health Metrics and Evaluation (IHME).(2016). *Global burden of disease study 2015*:*Results*. Retrieved from http://ghdx.healthdata.org/gbd-results-tool,accessed on 1 June 2017.

Jha, P. (2014).Reliable direct measurement of causes of death in low- and middle-income countries.*BMC Medical Journal*, 12,19. doi: 10.1186/1741-7015-12-19.

Lim, et al. (2012). A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990–2010: A systematic analysis for the global burden of disease study 2010. *TheLancet.*380(9859), 2224–2260.doi: 10.1016/S0140-6736(12)61766-8.

Lopez, A.G., Mathers, C.D., Ezzati, M., Tamison,D.T., & Murray, C.J.L. (2006). *Global burden of disease and risk factors*. Washington/New York: Oxford University Press.

National Bureau of Statistics Maldives. (2016). *Maldives population and housing census 2014*. Retrieved fromstatisticsmaldives.gov.mv/nbs/wp.../2016/07/Statistical-Release-IV-Housing-FINAL.pdf.

Patton, C.G., Coffey, C., Sawyer, S.M., Viner, M.R., Haller, D.M., Bose,K., Vos, T., Frguson, J., &Mathers, C.D. (2009). Global patterns of mortality in young people: A systematic analysis of population health data.*The Lancet*, 374.Retrieved from https://www.thelancet.com/action/showPdf?pii=S0140-6736%2809%2960741-8.

Phillips-Howard, P.A., Odhiambo, F.O., Hamel, M., Adazu, K., Ackers, M., et al.(2012). Mortality trends from 2003 to 2009 among adolescents and young adults in rural western Kenya using a health and demographic surveillance system. *PLoS ONE* 7(11), e47017. doi:10.1371/journal.pone.0047017.

Population Reference Bureau (PRB). (2013). *The world's youths2013 data sheet*.Retrieved from http://www.prb.org/pdf13/youth-data-sheet-2013.pdf9.

Sjogren, H., Valverius, P., & Eriksson, A. (2006). Gender differences in role of alcohol in fatal injury events. *European Journal of Public Health*, 16(3), 266–270. doi:10.1093/eurpub/ckl039.

Sorenson, S.B. (2015). Gender disparities in injury mortality: Consistent, persistent, and larger than you'd think. *American Journal of Public Health*. 101(Supplement 1), S353–S358.doi: 10.2105/AJPH.2010.300029.

United Nations. (2012). World population monitoring adolescents and youth: A concise report. Retrieved from http://www.un.org/en/development/desa/population/publications/pdf/fertility/12_66976_adolescents_and_youth.pdf.

_____ (2004). *World youth report 2003: The global situation of the young people*. Retrieved from https://books.google.com.np/books?isbn=9211302285.

United Nations Office of the High Commissioner for Human Rights (UNOHCHR).(2012). *Nepal conflict report*. Retrieved fromhttp://www.ohchr.org/Documents/Countries/NP/OHCHR_Nepal_Conflict_Report.

United Nations Population Fund (UNFPA). (2014). *State of world population 2014*. New York: UNFPA. Retrieved fromwww.unfpa.org/sites/default/files/pub-pdf/EN-SWOP14-Report _FINAL-web.pdf.

Wang, Haidong et al. (2016). Global, regional, and national life expectancy, all-cause mortalityand cause-specific mortality for 249 causes of death, 1980–2015: A systematic analysis for the global burden of disease study 2015. *The Lancet*, 388, Issue 10053, 1459-1544.

WDA. (2017).*World data atlas, 2015*. Retrieved fromhttps://knoema.com/atlas/Afghanistan/topics/Demographics/Mortality/Total-deaths-0-24.(10/05/2017).

World Health Organization (WHO). (2014). *Health for the world's adolescents: A second chance in the second decade*. Geneva: WHO.

_____ (2010). *Global status report on non-communicable disease 2010*. Geneva: WHO. Retrieved fromhttp://www.who.int/nmh/publications/ncd_report_full_en.pdf.