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# Terrorism, civil war and related violence and substance use disorder morbidity and mortality: A global analysis

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**KEYWORDS**
Civil war; Terrorism; One-sided violence; Substance use disorders; Disability-adjusted life years

**Abstract** *Introduction:* The purpose of this study is to examine associations between deaths owing to terrorism, civil war, and one-sided violence from 1994–2000 and substance use disorder disability-adjusted life years (DALYs).

*Methods:* The relationship between terrorism, and related violence and substance use disorder morbidity and mortality among World Health Organization Member States in 2002, controlling for adult per capita alcohol consumption, illicit drug use, and economic variables at baseline in 1994.

*Results:* Deaths as a result of terrorism and related violence were related to substance use disorder DALYs: a 1.0% increase in deaths as a result of terrorism, war and one-sided violence was associated with an increase of between 0.10% and 0.12% in alcohol and drug use disorder DALYs. Associations were greater among males and 15–44 year-old.

*Conclusion:* Terrorism, war and one-sided violence may influence morbidity and mortality attributable to substance use disorders in the longer-term suggests that more attention to be given to rapid assessment and treatment of substance use disorders in conflict-affected populations with due consideration of gender and

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age differences that may impact treatment outcomes in these settings. Priorities should be established to rebuild substance abuse treatment infrastructures and treat the many physical and mental comorbid disorders.



## 1. Introduction

Terrorism, civil war, and one-sided violence (e.g. genocide) have not received the attention from substance abuse researchers as they have other causes of substance use disorder morbidity and mortality. This is surprising in view of the increasing recognition of the indirect or longer-term consequences of civil war and related violence on morbidity and mortality associated with substance use disorders in conflict-affected populations [1—4].

Terrorism and related violence influences substance use disorder morbidity and mortality in the longer-term through several mechanisms. Terrorism and related violence damages health and economic infrastructures vital to the prevention of morbidity and premature mortality [5—6]. Substance abuse health care services are disrupted through damage to water supplies, electricity, and sewage disposal necessary for health services to operate, coupled with injury, death and disappearance of health care workers [7—9]. Agricultural systems are disrupted resulting in food rations, an important ingredient that has been implicated in facilitating home-brewed alcohol production in conflict-affected populations [7—10].

Other longer-term influences of terrorism and related violence on substance use disorders morbidity and mortality are demographic, that is, displacement and forced resettlement of a large number of persons resulting in reduced access to health resources, food, safe water and adequate sanitation [11]. Refugees are exposed to extreme trauma including witnessing and experiencing physical and sexual violence, murder of family and friends, loss of livelihood, self-esteem, social roles, cultural and social support, overcrowding, and poor living conditions [3,12—14]. Exposure to these severe stressors may result in excessive substance use as a coping strategy [4,15].

Populations affected by civil war and related violence also suffer from high rates of a variety of physical [16—18] and mental illnesses including depressive [13,16,19], psychotic [20], and anxiety disorders, especially post-traumatic stress disorder [1,21,22], conditions that have been shown to be highly comorbid with substance use disorders [18,23—25]. Health problems associated with substance use disorders in conflict-affected populations have also been documented, including alcohol-related suicide [26], increased human immunodeficiency virus (HIV) and other blood-borne viruses [27], and gender-based violence [6,28].

To date, two studies have addressed the broader, longer-term health consequences of armed conflict using a summary measure of health that combined information on both morbidity and mortality for a variety of specific diseases [29,30]. The measure was the disability-adjusted life year (DALY) that is derived as the sum of years of life lost to premature mortality and years of life lost due to disability in a population [31]. Ghobarah et al. [29,30] examined the relationship between civil war deaths from 1991—1997 and DALYs in 1999 attributable to all causes and specific diseases, controlling for an array of economic factors (e.g. health expenditures, urban growth), but substance use disorder DALYs were not examined as outcome measures.

Although the work by Ghobarah et al. [29,30] has increased the knowledge of the relationship between civil war and longer-term morbidity and mortality, limitations are noted. This research did not control directly for two major determinants of global morbidity and mortality, that is, the number of refugees/asylum seeker/displaced persons in the host country and the number of persons affected by natural disasters, nor did it consider contributing or pre-existing disease-specific factors that relate differently to different diseases. Foremost, Ghobarah et al. [29,30] also did not assess the impact of terrorist actions and one-sided violence (e.g. genocide, summary execution of prisoners) on longer-term morbidity and mortality. Between 1989 and 2004, the vast majority of fatalities from one-sided violence has taken place in countries experiencing armed conflict and terrorism [32—33]. Less than 1% of the total one-sided violence fatalities took place in countries that did not experience armed conflict and/or terrorism, suggesting that these three forms of intimately-related violence be counted to better reflect the nature and intensity that have increasingly characterized civil conflict.

Since the severity and scope of civil war have changed over the last three decades to increasingly include fatalities arising from terrorist actions and one-sided violence [32,34], the major exposure