Original Article

Burden of Drug and Alcohol Use Disorders in Iran: findings from the Global Burden of Disease Study 2010

Babak Moazen BSc[1,2], Mostafa Shokoohi MSc[3], Atefeh Noori MSc[3,1], Shadi Rahimzadeh MSc[4,1], Sahar Saeedi Moghaddam BSc[5,1], Farimah Rezaei MD[6], Masoud Lotfizadeh PhD[7], Mohammad Reza Kazemi MD[8], Hamid Reza Jamshidi PhD[9], Forough Pazhuheian[5,1], Setareh Rabbani PharmD[1,2], Shohreh Naderimagham PhD•[2,1]

Abstract

Background: Due to its specific socio-cultural and geographical situation, Iran has a major public health problem in terms of drug and alcohol use. The aim of this study is to report and critique the burden of drug and alcohol use disorders in Iran, and to compare these measurements with similar findings.

Methods: This study used data for Iran for the years 1990, 2005, and 2010 derived from the Global Burden of Disease study conducted by the Institute for Health Metrics and Evaluation (IHME) in 2010. The burden of drug and alcohol use disorders was evaluated in terms of disability adjusted life years (DALYs), years of life lost to premature mortality (YLLs), and years lived with disability (YLDs).

Results: All rates were reported per 100,000 individuals. Death rates attributed to drug and alcohol use disorders were 7.7 and 0.16 for men, and 0.62 and 0.02 for women, respectively. YLL rates regarding drug use disorders were 351.8 and 24.8 for men and women, while these figures were 5.8 and 1.0 for alcohol use disorders for men and women, respectively. YLD rates of drug use disorders were 452.6 for men and 202.1 for women, and 105.8 for men and 23.7 for women for alcohol use disorders. DALY rates attributed to drug use disorders were 804.5 for men and 227 for women, while these rates were 111.7 for men and 24.7 for women, related to alcohol use disorders.

Conclusions: Similar to the cases in many other countries, the burden of both drug and alcohol use disorders is higher for men than women in Iran. Although prevention policies and programs for drug and alcohol use are required for both genders, the need for drug and alcohol use intervention seems more urgent for men in Iran.

Keywords: Alcohol, Burden, Iran, Substance-related disorder

Cite this article as: Moazen B, Shokoohi M, Noori A, Rahimzadeh S, Saeedi Moghaddam S, Rezaei F, et al. Burden of Drug and Alcohol Use Disorders in Iran: findings from the Global Burden of Disease Study 2010. *Arch Iran Med.* 2015; 18(8): 480 – 485.

Introduction

Drug and alcohol use can lead to numerous undesirable social, psychological, and physical consequences.[1–3] However, due to the association between addiction and other factors, such as risky behaviors (e.g., unsafe sex and drug injection), different types of cancer, and cardiovascular diseases, as well as impaired driving behaviors, more attention needs to be paid to drug and alcohol dependents as one of the most important health risk target populations around the globe.[4–6]

Its shared borders with Afghanistan and Pakistan make Iran one of the main routes for global drug trafficking. This proximity creates easy drug accessibility and has resulted in a considerable number of drug users in the country.[7] Increasing illicit drug use in new forms in recent years[8] and the higher possibility of engaging in high-risk sexual and injection-related behaviors has led to a higher prevalence of major infectious diseases (e.g., HIV/AIDS and different types of viral hepatitis) among drug users, and especially among intravenous drug users.[6,9,10] This may partly explain the great burden of illicit drug abuse imposed on the Iranian healthcare system.

Due to the existing socio-cultural setting in the country, alcohol use is banned in Iran. Therefore, not surprisingly, access to data regarding this issue is limited. One of the few existing reports—a population-based cross sectional study conducted in 2010—demonstrated that the prevalence of alcohol use among Iranian adolescents is about 15%.[11] In another study, results of alcohol and drug assessment tests were positive among 20% of Iranian drivers killed in traffic accidents between 2009 and 2010.[12] Results from another study among a group of students in a medical university in Iran showed a 9% alcohol consumption over six months in 2001.[13]

Authors' affiliations: [1]Non-communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran University of Medical Sciences, Tehran, Iran. [2]Endocrinology and Metabolism Research Center, Endocrinology and Metabolism Clinical Sciences Institute, Tehran University of Medical Sciences, Tehran, Iran. [3]Regional Knowledge Hub, and WHO Collaborating Centre for HIV Surveillance, Institute for Futures Studies in Health, Kerman University of Medical Sciences, Kerman, Iran. [4]Department of Epidemiology, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [5]Department of Biostatistics, Faculty of Paramedical Sciences, Shahid Beheshti University of Medical Sciences, Tehran, Iran. [6]Obstetrics and Gynecologist, Shahid Beheshti Hospital, Isfahan University of Medical Sciences, Isfahan, Iran. [7]Department of Community Health, Shahrekord University of Medical Sciences, Shahrekord, Iran. [8]Department of Psychiatry, AJA University of Medical Sciences, Tehran, Iran. [9]School of Medicine, Department of Pharmacology, Shahid Beheshti University of Medical Sciences, Tehran, Iran.
•Corresponding author and reprints: Shohreh Naderimagham MPH PhD, Non-communicable Diseases Research Center, Endocrinology and Metabolism Population Sciences Institute, Tehran University of Medical Sciences, Tehran, Iran. **Address:** 4th floor, No. 4, Ostad Nejatollahi St., Enqelab Ave., Tehran, Iran. Postal code: 1599666615, Tel: +98-21-88913543, Fax: +98-21-88913549; E-mail: shohrehnaderimagham@ncdrc.info
Accepted for publication: 22 July 2015

These studies shed light on the fact that alcohol use is hidden, but is still a major public health problem in Iran.

Recently, the Institute for Health Metrics and Evaluation (IHME) has conducted a comprehensive systematic review to calculate the Global Burden of Disease study (the GBD study 2010) and has provided the results for the years 1990, 2005, 2010, and published the results in 2013.[14] The aim of the present study is to report the burdens of drug and alcohol use disorders in Iran according to the GBD study 2010 results. The data will be provided in terms of disability-adjusted life years (DALYs), years of life lost to premature mortality (YLLs), and years lived with disability (YLDs). In addition, we will discuss some limitations of the GBD study 2010 and provide some recommendations for promoting the estimation of the burden of drug and alcohol use disorders in Iran.

Materials and Methods

Components of data, data quality, and statistical models for the GBD Study 2010 estimation are described in detail elsewhere.[15–21] The basic objective of the GBD Study 2010 comparative risk assessment was to compute the proportion of deaths or disease burden caused by specific risk factors. In the present study, for the first time in Iran, we provide a summary of drug and alcohol use disorders and specific methods utilized in the GBD Study 2010 to derive the attributed risk factors.

The global estimation of disease burden attributed to drug and alcohol use disorders had five steps. The first step was to select risk-outcome pairs to be included in the analysis, based on causal association criteria. The distributions of exposure to each risk factor in the population were estimated during the next step. A systematic review was conducted from 1990 to 2010, identifying published and unpublished data sources in order to estimate the distribution of risk factor exposure. At the end of this stage, a mixed effects regression method[22] was used for estimating alcohol use and DisMod-MR version 3 was used to estimate drug use. The third step was to estimate etiological effect sizes, which is often a relative risk per unit of exposure for each risk-outcome pair. The proportional reduction in diseases that lead to certain death, after a reduction in risk factor exposure level, was computed for each risk factor and disease causally linked with its exposure, known as the population attributable fraction (PAF). The next stage was to choose a counterfactual exposure distribution for comparison with the current exposure distribution. The global team was selected with an optimum exposure distribution and termed the theoretical-minimum-risk exposure distribution for this purpose. No alcohol consumption and non-use of cannabis, opioid, or amphetamines and non-use of injected drugs were the counterfactual exposure distributions for alcohol and drug use, respectively. The last step for risk assessment was calculation of the burden of deaths and diseases attributed to each risk factor including uncertainty from all sources. Published studies[23,24] were included for alcohol use, while new meta-analyses as well as published studies[25,26] were included for drug use; these were used for the calculations of the burdens of the risk factors. Figures were prepared using R software for windows. The entire measures have been reported with a 95% Uncertainty Interval (UI).

In the present paper, we extracted data related to the burdens of drug and alcohol use disorders in Iran based on the GBD Study 2010, analyzed and reformulated data, drew new graphs, and critiqued the results.

Results

The highest death rates (deaths per 100,000 individuals) due to drug use disorders among men were related to those aged 70 and higher, which was 6.3 [95% UI: 1.5–14.8] in 1990 and increased to 15.5 [6.4–39.5] in 2010. Similarly, death rates were higher among female drug users in the same age groupsat0.97 [0.3–2.4] per 100,000 in 1990, and 0.62 [0.37–1.2] in 2010. Compared to the other age groups, alcohol-related deaths were also higher among men 70 years old and higher (0.66 [0.19–1.67] and 0.99 [0.29–2.68]), and women (0.07 [0.01–0.24] and 0.09 [0.03–0.2]) in 1990 and 2010, respectively (Table 1 and Figure 1).

An increasing trend was evident from 1990 to 2010, with the highest rates of YLDs related to drug and alcohol use among both genders found among people between 15 and 49 years old. Rates of YLLs due to alcohol use disorders were higher among people aged 50 to 69 and showed a slight increase from 1990 to 2010. Drug-related YLLs were also higher among people between ages15 and 49 and these rates increased during the years of the study (Figure 2).

Total DALY rate (per 100,000 population) was higher among drug user men between 15 to 49 years old in 1990 (858.7[505.1–1467.1]), rose to 1199.7 [730–1995] in 2010. Drug-related DALYs were also higher among women in the same age group in 1990 (291.6 [171.5–466.4]) which increased to 342.5 [190.5–573.7] in 2010. Similar to the drug use disorders, alcohol-related DALYs were higher among men (151[78.4–266.4] and 152.6[78.1–267.9]) and women (33.2[17–57.5] and 33.4[17.2–57.3]) aged 15 to 49, in 1990 and 2010, respectively (Table 2 and Figure 3).

The number of DALYs due to drug disorders among men for all ages was 110605 in 1990, which increased dramatically over the time, ultimately reaching 301996 in 2010. These numbers among women were 37,626 and 82,689, respectively. The number of deaths among men for all ages attributed to drugs was 819 in 1990 and increased to 2912 in 2010. For women, the numbers were 47 and 226, respectively. The number of DALYs related to men for all ages due to alcohol use in 1990 and 2010 were 21947 and 41917, respectively. The numbers of DALYs for women were 5020 and 9005, respectively. The number of deaths among men for all ages attributed to alcohol use was 27 in 1990, which increased over time to reach 61 in 2010. For women, these numbers were 5 and 10, respectively.

Discussion

Drug-related measures for all ages, including rates of YLLs, YLDs, and DALYs, were higher among Iranian men than women in 2010. Similarly, worldwide results from the GBD Study 2010 demonstrated higher rates of YLLs, YLDs, and DALY among drug user men than women.[27] These numbers suggest that the burden of drug use disorders in Iran follows a similar pattern to the global burden of illicit drug use disorders, and higher rates of measures among Iranian males are not particularly surprising. Nevertheless, more studies should be conducted in Iran to measure the burden of drug and alcohol use in different sub-populations. These types of studies could contribute to the design and implementation of specific treatment and prevention programs to reduce the disease burden due to drugs and alcohol use.

Based on the findings in 2010, the rates of obtained measures, including YLLs, YLDs, and DALYs, were considerably higher

Table 1. Death Rates (Per 100,000) Attributed to Drug and Alcohol Use Disorders.

Age (Years)	1990	1995	2000	2005	2010
Drug Use					
Males					
Under 5	0.44[0.12–1.3]	0.43[0.15–1.1]	0.5[0.2–1.4]	0.68[0.27–1.7]	0.79[0.31–2.1]
5 to 14	0.03[0–0.1]	0.04[0–0.1]	0.04[0.01–0.1]	0.05[0.02–0.1]	0.05[0.01–0.14]
15 to 49	5.3[1.5–13.3]	6.45[1.97–13.6]	7.5[2.5–12.9]	8.04[3.2–14.2]	9.4[4–20.8]
50 to 69	5.5[1.3–14]	7.2[1.9–14.6]	8.9[2.7–15.6]	9.11[3.6–18.3]	11.2[4.6–29.8]
>70	6.3[1.5–14.8]	8.1[2.1–17.4]	10.4[3.3–20.3]	11.8[4.4–26.2]	15.5[6.4–39.5]
All ages	2.9[0.86–7.1]	3.8[1.2–7.5]	5.1[1.8–8.6]	6.2[2.6–11.9]	7.7[3.6–17.5]
Age St.	4.6[1.4–10.9]	5.9[1.8–11.2]	6.9[2.5–11.6]	7.05[2.9–13.2]	7.9[3.8–18.9]
Females					
Under 5	0.22[0.03–1.3]	0.21[0.05–1.1]	0.26[0.08–1.2]	0.37[0.12–1.6]	0.44[0.12–1.9]
5 t0 14	0[0–0.01]	0[0–0.01]	0[0–0.01]	0.01[0–0.02]	0.01[0–0.03]
15 to 49	0.19[0.06–0.4]	0.25[0.09–0.57]	0.33[0.15–0.58]	0.39[0.22–0.75]	0.51[0.25–1]
50 to 69	0.36[0.12–0.9]	0.49[0.18–1.1]	0.67[0.29–1.1]	0.81[0.37–1.5]	1.1[0.52–2.3]
>70	0.97[0.3–2.4]	1.2[0.49–2.8]	1.83[0.76–3.2]	2.54[1.17–4.7]	3.8[1.8–7.7]
All ages	0.17[0.06–0.48]	0.22[0.09–0.44]	0.31[0.15–0.54]	0.43[0.25–0.82]	0.62[0.37–1.2]
Age St.	0.26[0.09–0.6]	0.33[0.14–0.68]	0.45[0.22–0.77]	0.55[0.32–1.1]	0.72[0.43–1.4]
Alcohol Use					
Males					
Under 5	0[0–0]	0[0–0]	0[0–0]	0[0–0]	0[0–0]
5 t0 14	0[0–0]	0[0–0]	0[0–0]	0[0–0]	0[0–0]
15 to 49	0.12[0.03–0.35]	0.13[0.05–0.34]	0.14[0.06–0.3]	0.13[0.05–0.31]	0.13[0.05–0.26]
50 to 69	0.37[0.07–1.39]	0.43[0.12–1.43]	0.45[0.15–1.27]	0.4[0.15–1.11]	0.37[0.14–1.01]
>70	0.66[0.19–1.67]	0.86[0.27–2.19]	1.05[0.32–2.65]	0.95[0.3–2.34]	0.99[0.29–2.68]
All ages	0.09[0.03–0.3]	0.11[0.05–0.31]	0.14[0.06–0.29]	0.15[0.07–0.32]	0.16[0.07–0.3]
Age St.	0.17[0.05–0.52]	0.2[0.08–0.52]	0.21[0.1–0.46]	0.2[0.1–0.42]	0.19[0.09–0.37]
Females					
Under 5	0[0–0]	0[0–0]	0[0–0]	0[0–0]	0[0–0]
5 t0 14	0[0–0]	0[0–0]	0[0–0]	0[0–0]	0[0–0]
15 to 49	0.02[0–0.05]	0.02[0–0.06]	0.03[0–0.08]	0.02[0–0.06]	0.02[0–0.06]
50 to 69	0.06[0.01–0.2]	0.07[0.02–0.2]	0.08[0.02–0.2]	0.07[0.02–0.17]	0.06[0.02–0.16]
>70	0.07[0.01–0.24]	0.07[0.02–0.22]	0.09[0.03–0.21]	0.09[0.03–0.21]	0.09[0.03–0.2]
All ages	0.01[0–0.04]	0.02[0–0.04]	0.02[0–0.05]	0.02[0–0.05]	0.02[0–0.05]
Age St.	0.03[0.01–0.07]	0.03[0.01–0.07]	0.03[0.01–0.08]	0.03[0.01–0.07]	0.03[0–0.06]

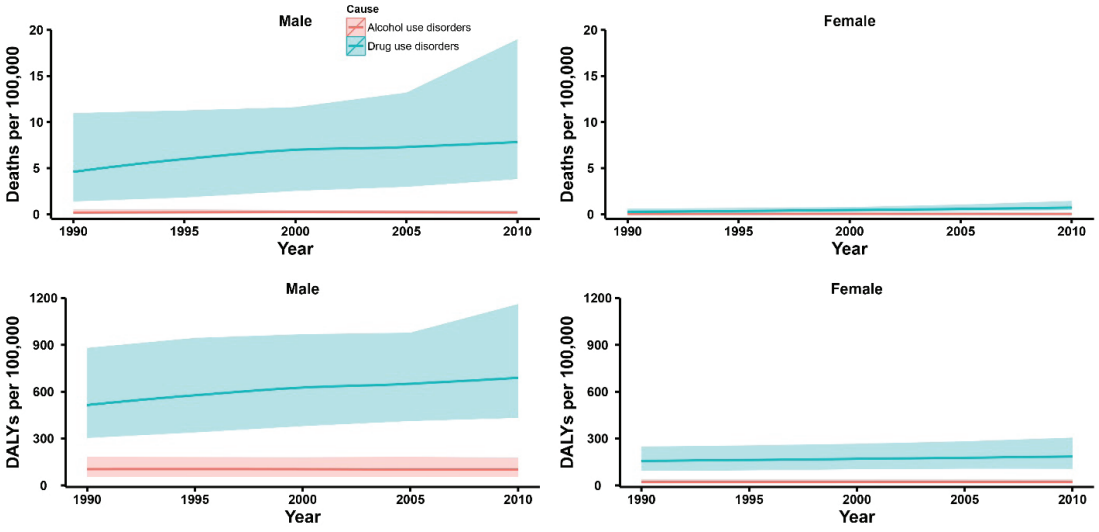

Figure 1. Trend of Deaths and DALYs Rates per 100,000 from 1990 to 2010 by Sex.

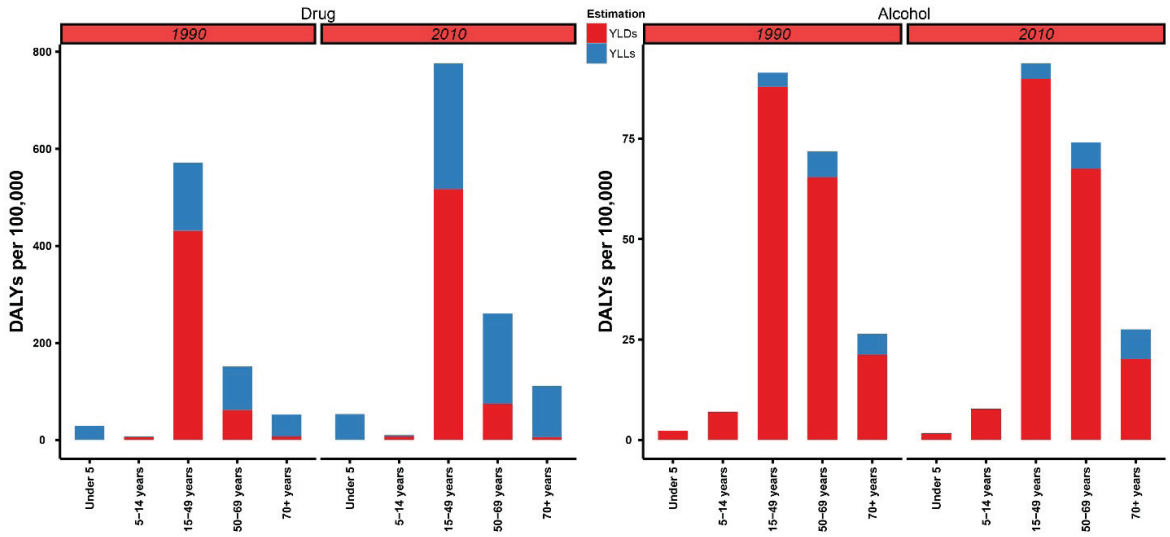

Figure 2. DALYs rates per 100,000 by Age Group, YLLs, and YLDs.

Table 2. DALY Rates (Per 100,000) Attributed to Drug and Alcohol Use disorders.

Age (Years)	1990	1995	2000	2005	2010
Drug Use					
Males					
Under 5	38.1[11.1–113.7]	37.1[12.8–94.9]	43.4[17.8–124.7]	58.4[23.7–146.8]	68.2[27.3–180.3]
5 t0 14	9.7[3.5–20.6]	10.9[4.1–23.1]	12.2[4.5–25.7]	14.1[5.8–29.2]	13.1[5.7–26.1]
15 to 49	858.7[505.1–1467.1]	932.9[566.6–1542]	1004.3[621.9–1602]	1055.5[678.6–1611]	1199.7[730–1995]
50 to 69	249.1[113.5–525.3]	301.4[133.3–549.9]	356.9[171–601.4]	373.2[196.6–662.9]	445.4[224.6–1040]
>70	87.9[27.9–194.4]	109.5[34.9–224.4]	129.6[48.4–235.8]	141.7[57.5–296.4]	172.7[78.5–403.9]
All ages	399.6[241.2–675.5]	476.6[291. –779.6]	578.1[360.1–912.1]	682.8[440.9–1037.5]	804.5[497.1–1351]
Age St.	516.3[304.1–880.6]	572.4[339.4–944.5]	626.7[380.1–968.3]	641.5[412.5-978.2]	691.7[432.4–1161]
Females					
Under 5	19.1[3.3–117.7]	18.4[4.5–90.9]	22.6[6.8–101.2]	31.5[10.7–134.9]	37.6[10.8–162]
5 t0 14	4.79[1.1–10.9]	5.3[1.3–12.3]	6.1[1.5–14]	7.2[2–16.6]	6.7[1.9–15.7]
15 to 49	291.6[171.5–466.4]	299.4[177.1–477.6]	308.3[184.8–491.8]	316.7[184.3–508.4]	342.5[190.5–573.7]
50 to 69	47.5[26.3–79.1]	53.1[30–86.6]	60.7[35.7–95.9]	67.2[41.7–104.1]	77.8[45.1–129.7]
>70	14.89[6.47–32.81]	18.44[8.22–38.59]	24.6[11.23–40.82]	31.47[16.1–55.9]	43[21.69–83.09]
All ages	138.5[81.5–221.7]	156.1[92.3–246.1]	177.9[107.6–278.6]	203.1[120.3–324.1]	227[128.5–376.9]
Age St.	157.2[92.9–248.7]	162.8[96.9–256.3]	170[103.3–266.7]	176.8[106.9–282.3]	185.3[106.5–305.9]
Alcohol Use					
Males					
Under 5	2.7[0.9–5.8]	2.4[0.8–5.2]	2.2[0.7–4.7]	2[0.5–4.3]	1.9[0.5–4.1]
5 t0 14	10.4[5.2–18.6]	11.3[5.7–20.1]	12.2[6.1–21.7]	13.2[5.9-24.5]	11.8[5.2–21.4]
15 to 49	151[78.4–266.4]	150.8[78.6–266.5]	150.1[77.9–263.4]	149[78.7–268.8]	152.6[78.1–267.9]
50 to 69	115.1[57.4–202.6]	117.8[60.6–206.8]	119.5[62.4–208.9]	119.6[62.1–210.3]	122.1[64.4–208.2]
>70	43.7[22–75.5]	46[23.6–77.8]	47.7[26.1–82.7]	45.8[24.8–78.1]	44.8[23.6–77.4]
All ages	79.3[41.3–138.5]	87.3[46.1–151.8]	96.1[50.7–166.4]	105.3[55.4–188.2]	111.7[57.7–193.3]
Age St.	104.4[53.8–182.9]	104.5[54.6–181.7]	104.2[54.2–180.8]	103[54.8–183.1]	103.5[54.2–178.8]
Females					
Under 5	1.8[0.5–4.2]	1.7[0.4–3.9]	1.6[0.4–3.6]	1.4[0.3–3.2]	1.5[0.3–3.4]
5 t0 14	3.5[1.3–6.4]	3.6[1.4–6.6]	3.7[1.4–6.9]	3.9[1.4–7.5]	3.5[1.2–6.3]
15 to 49	33.2[17–57.5]	33.4[17.3–57.7]	33.4[17.5–57.6]	33.2[17.4–56.7]	33.4[17.2–57.3]
50 to 69	25.6[12.9–45.9]	25.9[13.1–46.4]	26.2[13.1–46.8]	26.1[13.2–46]	26.2[13.5–46.2]
>70	8.4[3.7–15]	8.4[3.8–14.9]	8.4[4–15]	8.3[4.1–14.6]	8.1[3.9–14.4]
All ages	18.5[9.8–31.4]	20.2[10.8–34.1]	22[11.9–37.1]	23.8[12.9–40.3]	24.7[13.1–41.9]
Age St.	23.2[12.1–39.5]	23.2[12.4–39.2]	23.2[12.5–39.3]	23[12.3–38.5]	22.7[12.2–38.1]
All ages	18.5[9.8–31.4]	20.2[10.8–34.1]	22[11.9–37.1]	23.8[12.9–40.3]	24.7[13.1–41.9]
Age St.	23.2[12.1–39.5]	23.2[12.4–39.2]	23.2[12.5–39.3]	23[12.3–38.5]	22.7[12.2–38.1]

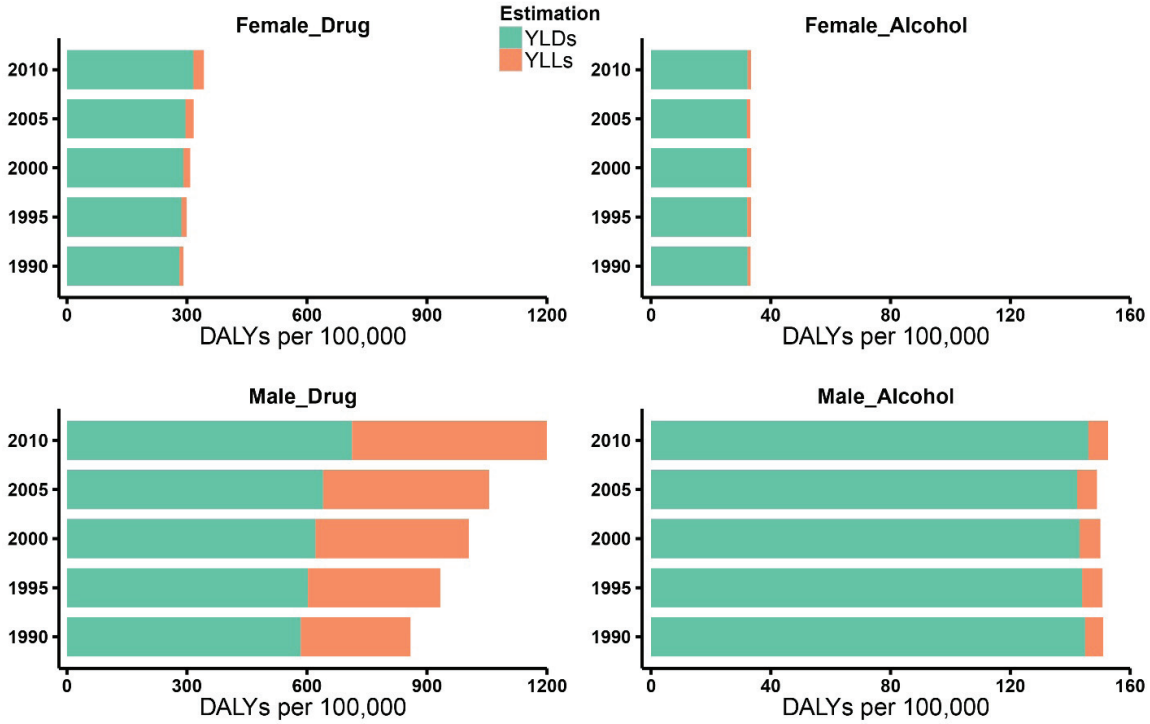

Figure 3. DALYs Rates per 100,000 by Year, Sex, YLLs and YLDs.

for alcohol dependent men than for women, similar to the illicit drug dependence burden in Iran and in the world. Although results from the GBD Study 2010 demonstrate higher DALYs for men, the difference between different countries is very slight.[28] This inconsistency might be due to the different patterns of alcohol use, which are caused by different socio-cultural norms among communities around the world. Alcohol use still has a hidden pattern in Iran. Further studies on alcohol use in this country would likely reveal more alcohol-related burdens for women. However, based on the GBD study 2010, all DALY, YLL, and YLD rates were much higher for drug use, globally as well as in Iran.

As we mentioned earlier, drug and alcohol use disorders account for about 2% of the total burden of diseases in Iran. According to the world drug report of the United Nations Office on Drugs and Crime (UNODC), Iran is one of the countries with the highest level of cannabis, heroin, and methamphetamine seizures.[30] This issue demonstrates the existence and easy accessibility of these drugs in Iran and reflects the excessive amount of drug use in this country. The considerable rate of drug use in Iran is one of the parameters that explains the heavy burden imposed by illicit drugs on the healthcare system of Iran. Therefore, drug use prevention education is immediately required and preventive measures should be implemented to decrease the burden of drug and alcohol use disorders in Iran.

The GBD Study 2010 is a valuable study but has some limitations in calculating the burden of drug and alcohol use in Iran. The scarcity of reliable data sources for drug and alcohol use estimation in Iran is a fundamental limitation for the formulation of precise estimates, and creates large-scale uncertainties. In addition, the GBD study results are mostly model-driven, but data-driven studies are more valuable for making health strategies. The GBD study findings have also been calculated at a national level, while appropriate interventions and resource allocation in every country require the determination of the burden of disease and risk factors at a sub-national level. Despite the existing limitations, to the best of our knowledge, the GBD study is the first to estimate the burden of drug and alcohol use disorders in Iran.

The above-mentioned limitations reveal the need to calculate the burden of disease, injuries, and risk factors at a sub-national level, alongside the national level. Therefore, the burdens of disease and risk factor analyses at the provincial or district levels should be taken into account. In this regard, the National and Sub-National Burden of Disease (NASBOD) study, has been conducted as a systematic comprehensive study using a standardized protocol of data collection, estimation processes, and advanced statistical models to evaluate the burden of disease, injuries, and risk factors at national and sub-national levels from 1990 to 2013. More information is available elsewhere about the details of the NASBOD project.[31,32] This study prepares precise data for estimating the health status over time in every province or across provinces, and could be a major source for evaluating the national and sub-national health priorities.

In conclusion, the available evidence leaves no doubt that Iranian men suffer more from the consequences of drug and alcohol use disorders compared to women. This issue highlights the need to pay more attention to men to mitigate the burden of drug and alcohol dependence in Iran. In addition, this would seem to be the time to break '*the drug and alcohol use taboo*' in Iran, inform the general population about the consequences of illicit drug and alcohol use at a national scale, and look at drug users as *patients* rather than *convicts* in the country. The results of the present study can aid policy makers in enhancing the existing policies towards

drug and alcohol use disorders and in improving the level of public health in Iranian communities.

Acknowledgments

We would like to thank the Institute for Health Metric and Evaluation (IHME) team for providing the results of the GBD study 2010. We also thank the Ministry of Health and Medical Education of Islamic Republic of Iran, and Setad-e-Ejraie Farmane Imam for their kind helps and supports.

Competing interests: None declared

Authors' contributions

General designing of paper: Babak Moazen, Mostafa Shokoohi, Atefeh Noori, Masoud Lotfizadeh

Designing of tables and graphs: Mostafa Shokoohi, Sahar Saeedi Moghaddam, Forough Pazhuheian

Writing primary draft: Babak Moazen, Shadi Rahimzadeh, Shohreh Naderimagham, Farimah Rezaei, Masoud Lotfizadeh, Mohammad Reza Kazemi

Manuscript revision: Babak Moazen, Shohreh Naderimagham, Farimah Rezaei,Hamid Reza Jamshidi, Setareh Rabbani

References

1. Supic ZT, Petrovic R, Milicevic MS, Trajkovic G, Bukumiric Z. The oral health of heroin drug users: case study in Bosnia and Herzegovina. *BMC Public Health*. 2013; 13(1): 1202.
2. Haritavorn N. Surviving in two worlds: Social and structural violence of Thai female injecting drug users. *Int J Drug Policy.* 2014; 25(1): 116-23.
3. Nogueira M, Bosch R, Valero S, Gómez-Barros N, Palomar G, Richarte V, et al. Early-age clinical and developmental features associated to Substance Use Disorders in Attention-Deficit/Hyperactivity Disorder in Adults. *Compr Psychiatry*. 2014; 55(3): 639-49.
4. Li K, Simons-Morton BG, Brooks-Russell A, Ehsani J, Hingson R. Drinking and parenting practices as predictors of impaired driving behaviors among U.S. Adolescents. *J Stud Alcohol Drugs*. 2014; 75(1): 5-15.
5. Ghimire B, Suguimoto SP, Zamani S, Ono-Kihara M, Kihara M. Vulnerability to HIV infection among female drug users in Kathmandu Valley, Nepal: a cross-sectional study. *BMC Public Health*. 2013; 13(1): 1238.
6. Mirabi P, Yarmohammadi-Vasel M, Moazen B, Sehat M, Rezazadeh M, Ahmadi K. Unprotected anal intercourse among Iranian intra-venous drug users. *Front Public Health.* 2013; 1: 34.
7. United Nations Office on Drugs and Crime. Drug Trafficking. Available from: URL: http://www.unodc.org/unodc/en/drug-trafficking/index.html.
8. Farhoudian A, Sadeghi M, Khoddami-Vishteh HR, Moazen B, Fekri M, Rahimi-Movaghar A. Component analysis of Iranian crack; a newly abused narcotic substance in Iran. *Iran J Pharm Res*. 2014; 13 (1): 337-44.
9. Ahmadi K, Rezazade M, Nafarie M, Moazen B, Yarmohmmadi-Vasel M, Assari S. Unprotected sex with injecting drug users among Iranian female sex workers: Unhide HIV Risk Study. *AIDS Res Treat*. 2012; 2012: 651070.
10. Dana D, Zary N, Peyman A, Behrooz A. Risk prison and hepatitis B virus infection among inmates with history of drug injection in Isfahan, Iran. *ScientificWorldJournal*. 2013; 2013: 735761.
11. Baheiraei A, Hamzehgardeshi Z, Mohammadi MR, Nedjat S, Mohammadi E. Alcohol and drug use prevalence and factors associated with the experience of alcohol use in Iranian adolescents. *Iran Red Crescent Med J*. 2013; 15(3): 212-7.
12. Afzali S, Saleh A, Seif Rabiei MA, Taheri K. Frequency of alcohol and substance abuse observed in drivers killed in traffic accidents in Hamadan, Iran. *Arch Iran Med*. 2013; 16(4): 240-2.
13. Jodati AR, Shakurie SK, Nazari M, Raufie MB. Students' attitudes and practices towards drug and alcohol use at Tabriz University of Medical Sciences. *East Mediterr Health J*. 2007; 13(4): 967-71.
14. Murray CJ, Lopez AD. Measuring the global burden of disease. *N Engl J Med*. 2013; 369(5): 448-57.
15. Wang H, Dwyer-Lindgren L, Lofgren KT, Rajaratnam JK, Marcus JR, Levin-Rector A, et al. Age-specific and sex-specific mortality in 187 countries, 1970–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012; 380(9859): 2071-94.
16. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, et al. 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. *Lancet*. 2012; 380(9859): 2224-60.
17. Lozano R, Naghavi M, Foreman K, Lim S, Shibuya K, Aboyans V, et al. Global and regional mortality from 235 causes of death for 20 age groups in 1990 and 2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012; 380(9859): 2095-128.
18. Murray CJL, Vos T, Lozano R, Naghavi M, Flaxman AD, Michaud C, Ezzati M, et al. Disability-adjusted life years (DALYs) for 291 diseases and injuries in 21 regions, 1990–2010: a systematic analysis for the Global Burden of Disease Study 2010. *Lancet*. 2012; 380(9859): 2197-223.
19. Murray CJ, Ezzati M, Flaxman AD, Lim S, Lozano R, Michaud D, et al. GBD 2010: design, definitions, and metrics. *Lancet*. 2012; 380(9859): 2063-66.
20. Salomon JA, Vos T, Hogan DR, Gagnon M, Naghavi M, Mokdad A, et al. Common values in assessing health outcomes from disease and injury: disability weights measurement study for the Global Burden of Disease Study 2010. *Lancet*. 2012; 380(9859): 2129-43.
21. Salomon JA, Wang H, Freeman MK, Vos T, Flaxman AD, Lopez AD, et al. Healthy life expectancy for 187 countries, 1990–2010: a systematic analysis for the Global Burden Disease Study 2010. *Lancet*. 2012; 380(9859): 2144-62.
22. Shield KD, Rehm M, Patra J, Sornpaisarn B, Rehm J. Global and Country Specific Adult per capita Consumption of Alcohol, 2008. Sucht. 2011; 57(2): 99-117
23. Lönnroth K, Williams BG, Stadlin S, Jaramillo E, Dye C. Alcohol use as a risk factor for tuberculosis—a systematic review. *BMC Public Health*. 2008; 8: 289.
24. Samokhvalov AV, Irving H, Mohapatra S, Rehm J. Alcohol consumption, unprovoked seizures, and epilepsy: a systematic review and meta-analysis. *Epilepsia*. 2010; 51(7): 1177-84.
25. Van Den Berg C, Smit C, Van Brussel G, Coutinho R, Prins M. Full participation in harm reduction programmes is associated with decreased risk for human immunodeficiency virus and hepatitis C virus: evidence from the Amsterdam Cohort Studies among drug users. *Addiction*. 2007; 102(9): 1454-62.
26. Foti DJ, Kotov R, Guey LT, Bromet EJ. Cannabis use and the course of schizophrenia: 10-year follow-up after first hospitalization. *Am J Psychiatry*. 2010; 167(8): 987-93.
27. Degenhardt L, Whiteford HA, Ferrari AJ, Baxter AJ, Charlson FJ, Hall WD, et al. Global burden of disease attributable to illicit drug use and dependence: findings from the Global Burden of Disease Study 2010. *Lancet*. 2013; 382(9904): 1564-74.
28. Rehm J, Mathers C, Popova S, Thavorncharoensap M, Teerawattananon Y, Patra J. Global burden of disease and injury and economic cost attributable to alcohol use and alcohol-use disorders. *Lancet*. 2009; 373(9682): 2223-33.
29. World Health Organization. *Global Burden of Disease, Regional Estimates for 2000–2011*. Geneva: WHO; 2014. Available from: URL: http://www.who.int/healthinfo/global_burden_disease/estimates/en/index2.html.
30. United Nations Office on Drugs and Crime. *World Drug Report 2013*. Vienna Austria; 2013. Available from: URL: http://www.unodc.org/unodc/secured/wdr/wdr2013/World_Drug_Report_2013.pdf.
31. Naserbakht M, Djalalinia Sh, Tayefi B, Gholami M, Eftekhar Ardabili M, Shariat SV, et al. National and sub-national prevalence, trend, and burden of mental disorders and substance abuse in Iran: 1990 – 2013, Study Protocol. *Arch Iran Med*. 2014; 17(3): 182-8.
32. Farzadfar F, Delavari A, Malekzadeh R, Mesdaghinia A, Jamshidi HR, Sayyari A, et al. NASBOD 2013: design, definitions, and metrics. *Arch Iran Med*. 2014; 17(1): 7-15.