Research Paper

National population size estimation of illicit drug users through the network scale-up method in 2013 in Iran

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ABSTRACT

Background: For a better understanding of the current situation of drug use in Iran, we utilized the network scale-up approach to estimate the prevalence of illicit drug use in the entire country.
Methods: We implemented a self-administered, street-based questionnaire to 7535 passersby from the general public over 18 years of age by street based random walk quota sampling (based on gender, age and socio-economic status) from 31 provinces in Iran. The sample size in each province was approximately 400, ranging from 200 to 1000. In each province 75% of sample was recruited from the capital and the remaining 25% was recruited from one of the large cities of that province through stratified sampling. The questionnaire comprised questions on demographic information as well as questions to measure the total network size of participants as well as the network size in each of seven drug use groups including Opium, Shire (combination of Opium residue and pure opium), Crystal Methamphetamine, heroin/crack (which in Iranian context is a cocaine-free drug that mostly contains heroin, codeine, morphine and caffeine with or without other drugs), Hashish, Methamphetamine/LSD/ ecstasy, and injecting drugs. The estimated size for each group was adjusted for transmission and barrier ratios.
Results: The most common type of illicit drug used was opium with the prevalence of 1500 per 100,000 population followed by shire (660), crystal methamphetamine (590), hashish (470), heroin/crack (350), methamphetamine, LSD and ecstasy (300) and injecting drugs (280). All types of substances were more common among men than women. The use of opium, shire and injecting drugs was more common in individuals over 30 whereas the use of stimulants and hashish was largest among individuals between 18 and 30 years of age.
Conclusion: It seems that younger individuals and women are more desired to use new synthetic drugs such as crystal methamphetamine. Extending the preventive programs especially in youth as like as scaling up harm reduction services would be the main priorities in prevention and control of substance use in Iran. Because of poor service coverage and high stigma in women, more targeted programs in this affected population are needed.

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Introduction

Iran's geographical location, especially its long border with Afghanistan (which is the main grower of opium in the world) and its proximity with Pakistan, has turned it into a major transit

country for illicit drugs (UNODC, 2011). After inflation and unemployment, substance smuggling and substance use is the third major dilemma in Iranian society resulting in serious social, economical and public health consequences (Moghanibashi-Mansourieh & Deilamizade, 2014).

Most of our knowledge regarding the epidemiology and extent of substance use in Iran is based on official reports of the Ministry of Health (MOH) and Iranian Drug Control (DCHQ). Discrepancies between these reports, though, make the picture of substance use more ambiguous. In 2002, MOH and DCHQ estimated the number of substance users in the population above 15 years Because of some biases and methodological errors (e.g. sampling from emergency clinics) the results were never announced or distributed (Tafreshi, 2012). A rapid situation assessment and analysis in 2007 estimated the number of substance users to be 1.2 million (corresponding to an adult prevalence of 2.4%). The most common type of drug used was opium (34%) followed by crack (which in Iran is a cocaine-free drug that mostly contains heroin, codeine, morphine and caffeine with or without other drugs) (26.6%), heroin (19.9%), shire (a combination of Opium residue and pure opium) (4.4%), neurjezik (4.1%), crystal methamphetamine (3.6%) and hashish (2%) (Narenjiha et al., 2007). In this survey the opiate users were recruited from the street, prisons and treatment clinics in 27 cities in Iran, which may limit the generalizability of the results. The results of the latest national household survey in 2011, conducted by DCHQ on 15,000 households, suggest that there are 1.325 million substance users (corresponding to a prevalence of 2.65%) among people between 15 and 65 years old. Based on their report, the most prevalent substances were opium (52.02%), crystal methamphetamine (26.22%), crack (15.95%), heroin (9.77%), hashish (6.43%), ecstasy (3.08%) and shire (2.83%) (Sarrami et al., 2013; Tafreshi, 2012). Although these official reports provide policy makers somewhat of a snapshot regarding the situation of substance use in Iran, some practical and methodological problems (such as obtaining data from prisoners, treatment seekers and street drug users, stigma toward substance use in household surveys, and extraction of information directly from the study population) lead to certain challenges and debates regarding the pragmatic extent of substance use in Iran. Furthermore, the diversity of the study population and the methodology that was used in these surveys may limit the monitoring of trends over time. The lack of valid and generalizable information on substance use, therefore, is the main challenge of drug use surveillance in Iran.

Network scale-up (NSU) is an indirect method of size estimation in hidden populations that has been used to estimate the size of hidden populations such as HIV-positive persons (Killworth et al., 1998) substance users (Kadushin et al., 2006; Salganik et al., 2011a), men who have sex with men (MSM) (Ezoe et al., 2012) and (other) groups at higher risk of HIV (Moldova UNAIDS Country Office, 2010; Paniotto et al., 2009; Shokoohi et al., 2012) around the world. Generally, every person knows how many people he/she identifies as his/her active social network. The average number of hidden subgroups reported by every respondent constitutes a fraction of their network. We are therefore able to scale up this fraction to a fraction of the total population and thus obtain an estimate the number of hard-to-reach groups of interest (Bernard et al., 2010; Johnsen et al., 1995, 1989). The indirect nature of data collection, the ability of this method to estimate the size of different subpopulations concurrently, its low cost and simplicity makes it a feasible method for size estimation in situations where the usefulness of other methods such as enumeration, capture-recapture and multiplier is doubtful due to limited access to reliable data sources (Guo et al., 2013; Rastegari et al., 2013, 2014; Salganik et al., 2011a)

Due to the significance of determining a reliable and updated estimate of the size of the drug user population by age, gender and types of substance for policy making, planning and surveillance purposes, we designed a national survey to estimate the size of illicit drug use in the entire country using NSU methodology. The policy makers and other health professionals may benefit from the results of this study in planning prevention and treatment interventions as well as in resource allocation and in monitoring the trend over time. It seems that not only in Iran, but also in the Eastern Mediterranean Region, this is the first time such a study was implemented on a national scale.

Methods

Sampling and data collection

In this cross-sectional study we recruited 7535 individuals from all provinces of Iran. Based on a pilot study in Kerman, the lowest prevalence of a specific drug use was 1.2%, which corresponded to injecting drugs (Shokoohi et al., 2012). We set the precision to be 0.2 of prevalence and type one error at 0.05. The sample size nationally was estimated at 7000. In the end we recruited 7535 participants from 31 provinces. The average sample size in each province was approximately 400, ranging from 200 to 1000. Because about three-quarters of the Iranian population live in capital cities, we tried to keep this ratio in our sample. So, 75% of the sample from each province was recruited from the capital and the remaining 25% was recruited from one of the large cities of that province.

Eligible persons were individuals over 18 years of age who had lived in Iran for at least five years prior to the survey. We implemented a self-administered, street-based questionnaire on passersby from the general public who met the eligibility criteria. The rational for choosing these respondents was that in a previous study, we compared the odds of information disclosure in response to sensitive questions in three interview methods (street-based, household, and telephone interviews). The results showed that street-based interviewing provides a higher rate of disclosing drug-related behaviors and sexual practices than telephone and household interviewing (Haghdoost et al., 2013). Based on social and economic classes, each city was stratified into three zones. In each stratum, two to four streets were selected randomly. Because we recruited participants non-randomly, we asked our trained interviewers to recruit all age, sex and socio-economic groups into the sample via quota sampling. Quotas were set for gender (50% male, 50% female), age (50% between 18 and 30, 50% above 30) and socio-economic status. Furthermore, we compared the sex-age distribution of sample with whole country census data, the difference was not significant. To maximize the confidentiality, we asked the interviewers not to select respondents from offices, shops, or similar places. If any invited subject refused to participate, replacement was done. The questionnaires were filled out anonymously. The questionnaire consisted of questions on demographic information as well as questions to measure the network size of participants and the number of participants in each of the seven drug use subgroups (Rastegari et al., 2013).

Applying network scale-up methodology

The NSU method is based on the assumption that by calculating the proportion of drug users in the social network of a representative sample of the general population (m/C), the prevalence of drug use in the whole population can be estimated. We calculated the average number of drug users in the personal network of participants (m) by asking them how many people they knew who belong to each of seven target groups including: