Spatial distribution and temporal trend of drug-related deaths in the Islamic Republic of Iran during 2014–2017

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Abstract

Background: Research suggests that there is an increasing trend in drug-related deaths worldwide: an estimated 69 000 individuals lose their lives due to substance abuse annually.

Aims: To determine the geographical pathology of drug-related deaths in the Islamic Republic of Iran and to evaluate incidence trends, with a focus on identifying high- and low-risk regions.

Methods: For this ecological study, we collected data from the 2 main sources (the Legal Medicine Organization and the Ministry of Health and Medical Education) responsible for registering substance-related deaths during 2014–2017. Data analysis was conducted using Joinpoint regression analysis, Global Moran's I and Anselin Local Moran's I.

Results: Of the 12 386 drug-related deaths in 2014–2017, most occurred during the summer months; 7162 of these were among middle-aged individuals. The mean age of children and adolescents who died of substance abuse was 5.2 [standard deviation (SD) 4.6] years. In the young adult group, mean age at death was 20.7 (SD 2.5) years; it was 34.2 (SD 5.4) years for adults and 55.6 (SD 9.8) years for older adults. Changes in mortality rate peaked in 2017 (annual percentage change = 0.52); in the last months of the study period there was a nonsignificant decrease (annual percentage change = −6.99) in the incidence (average annual percentage change = −0.5; 95% confidence interval: −3.2, 2.3).

Conclusion: Deaths due to substance abuse will remain a huge public health problem unless policy- and decision-makers determine why this problem continues to increase despite the extensive efforts on regulation and find ways to mitigate it.

Keywords: drug-related death, incidence, spatial distribution, temporal trend, substance abuse, Iran

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Introduction

Substance intoxication is dangerous and often fatal (*1*). Drug-related death is defined as any psychological or behavioural disorder due to psychoactive substance misuse (ICD-10: F11–F16, F19) leading to intentional or unintentional self-intoxication with substances for unknown intentions or exogenous causes (*2*). Research suggests that there is a generally increasing trend in the drug-related deaths rate worldwide (*1*). According to a World Health Organization estimate, 69 000 individuals lose their lives due to substance overdose every year (*3*). Although older age is one of the risk factors for substance overdose (*4*), studies conducted in the United States of America (USA) have shown increasing rates of substance-related suicide and intoxication in adolescents and adults (*5,6*). According to the national trends in the USA, during 1999–2016 the drug-related deaths rate in children and adolescents increased by 268.2% (*7*). The mortality rate due to substance intoxication among children in developing countries is 4 times greater than that in other countries (*8*). Although substance intoxication in the Islamic Republic of Iran is one of the main causes of poisoning among children and adolescents (*2,9*), a 5-year longitudinal study showed that substance intoxication was most common in adult men aged 30–39 years (*10*).

Our study was designed and conducted to investigate the trend for drug-related deaths rates in different population groups (children, adolescents, young adults, adults, older adults) during 2014–2017, with a special focus on identifying high- and low-risk regions (provinces) in the Islamic Republic of Iran.

Methods

Study design

An ecological design was used for this study, conducted in 2021. We describe the spatial distribution and trend of disease incidence rates (*11*). Using this design, the spatial patterns (multiple-group study) and the time trends were investigated simultaneously (*12*).

Data sources

We surveyed 3 main types of data sources covering 2014–2017. Data from the 2 main sources of drug-related deaths registers in the Islamic Republic of Iran: the Legal Medicine Organization and the Ministry of Health and Medical Education, were examined. The capture–recapture method was used to calculate number of deaths.

The third data source, the geographic coordinates of the patients, was obtained using the most recent information available on the *Google Map* software and the georeferenced layers of the Iranian provinces. We used aggregate data and compared the distributions of the disease in different provinces and areas (*13*,*14*).

Spatial and descriptive information related to the study area

The Islamic Republic of Iran is located in the Middle East, in the southwestern region of Asia between 25°3′ and 39°47′ north and 44°5′ and 63°18′ east. It has 31 provinces and an area of 1 648 195 km^2. Based on the last census, carried out in 2016, the population is estimated at 79 927 270 (*15*).

Target and study population

This study was designed to cover all cases of poisoning with drugs, and all met the eligibility criteria of the study. The inclusion criteria were: a known place of residence and diagnosis of drug-related deaths according to ICD-10 codes (*2*) in terms of the type of poisonous substance. The age classification was based on the large demographic classifications of the Statistical Center of Iran that regards age up to 14 years as child and adolescent, 15–24 years as young adult, 25–44 years as adult and 45–64+ years as older adult (*16*).

Statistical analysis

The statistical analysis covered 3 main parts: descriptive analysis of the epidemiological and demographic indicators of patients; analysis of the temporal trends of incidence of DRD; and spatial analysis of poisonous substance

Crude death rates (No. of cases per 100 000 population) were estimated during 2014–2017 (based on the 2016 census). Adjusted death rates were determined using a direct method based on the standard population of the USA in 2000 (*17*). The age-adjusted rate for each province was compared with the national age-adjusted rate using the *Z*-test. Statistical tests were carried out at a significance level of 0.05. We used *StataMP*, version 13, *Excel* and *SPSS*, version 23, for this section.

The second part was the time trend analysis: the analyses related to the crude death rate time trend were performed according to year, month and age group of the person. To analyse the trend for deaths caused by drug abuse, the mortality rates were considered the dependent variables and year and month were considered the independent variables. The rate for drug-related deaths was calculated separately for each age group. Along with detecting the exact time of joinpoints, the average annual percent change, annual percent change and slope changes of the regression line were estimated at 95% confidence interval (95% CI) for the annual trend for incidence of death from the disease during 2014–2017. These were determined using regression analysis of the endpoints on the *Joinpoint* regression statistical program, version 4.9.0.0.

The third part of the statistical analysis was the spatial pattern and cluster analysis. The spatial pattern of clustering was analysed using 2-sided α and 0.05 significance level. To evaluate the spatial distribution of incidence of disease, the cumulative drug-related deaths incidence rate was initially calculated for each province.

To assess spatial autocorrelation of the disease, we used the Global Moran's I index. The values related to this index range from –1 to +1, with the latter showing a more clustered and the former indicating a more dispersed distribution of the variable (*18*). The "zero" values are an indication of the randomly spatial distribution of the phenomenon under study (*18*).

Anselin Local Moran's I index was used for locating the high- and low-risk clusters or spots for drug-related deaths, it divides the polygons into 5 parts: high–high, low–low, low–high, high–low and not significant. High–high indicates a high incidence rate within a zone and its neighbouring areas, i.e. high-risk clusters of disease incidence, or, to use a more literal term, its hotspots; low–low indicates a low incidence of disease within a zone and its surrounding areas, i.e. the low-risk disease clusters or the cold spots (*15*,*19*,*20*).

Results

Descriptive

Of the 12 386 drug-related deaths during 2014–2017, the greatest number, 3513, occurred during the summer, and middle-aged people accounted for 7162 deaths. The age-adjusted drug-related deaths rate was 7.8 times greater in men than in women. Adults accounted for the highest number of drug-related deaths. The drug-related deaths rate increased in all age groups except for the child–adolescent group, which showed a significant increase in 2015 and a sharp decrease in 2016. The mean age of children and adolescents who died of substance use was reported as 5.2 (SD 4.6) years. Mean age was 20.7 (SD 2.5) years among the young adult group, 34.2 (SD 5.4) years for adults and 55.6 (SD 9.8) years for older adults. Over the 4-year period, the crude death rate per 100 000 persons was 15.14 and the age-adjusted death rate was 14.76 (Table 1).

Hamedan and Kermanshah provinces had the highest age-adjusted drug-related deaths rates, while Golestan, Bushehr and West Azarbaijan had the lowest rates (Table 2). The provinces where drug-related deaths was higher or lower than the national age-adjusted rate are shown in Table 2: the difference was statistically significant for the

Table 1 Distribution of number of drug-related deaths and the substance-related death rate, Islamic Republic of Iran, 2014–2017

Sex/age	Deaths		Specific death rate[a]	Age-adjusted death rate	Relative risk
	No.	%			
Sex					
Female	1 379	11.0	0.87	0.44	1[b]
Male	10 889	88.0	6.80	3.33	7.80
Unknown	118	1.0	–	–	–
Total	12 386	100.0	3.90	3.78	–
2014					
< 14 years	82	2.8	0.64	0.10	1[b]
15–24years	373	12.8	1.98	0.13	3.09
25–44 years	1 733	59.5	6.10	0.27	9.53
45–60 years	724	24.9	4.01	1.38	6.26
Total	2 912	100.0	4.23	3.64	–
2015					
< 14 years	81	2.8	0.62	0.13	1[b]
15–24years	462	16.2	2.52	0.35	4.06
25–44 years	1 655	58.0	5.71	1.72	9.20
45–60 years	658	23.0	3.52	1.21	5.67
Total	2 856	100.0	3.57	3.42	–
2016					
< 14 years	82	2.5	0.33	0.07	1[b]
15–24years	428	13.0	3.49	0.48	8.11
25–44 years	1 903	57.7	6.46	1.90	15.02
45–60 years	886	26.9	4.59	1.58	10.67
Total	3 299	100.0	4.13	4.09	–
2017					
< 14 years	86	2.6	0.43	0.09	1[b]
15–24years	532	16.0	4.61	0.64	10.72
25–44 years	1 879	56.6	6.32	1.91	14.69
45–60 years	822	24.8	4.08	1.40	9.48
Total	3 319	100.0	4.09	4.05	–

[a]*Per 100 000 persons*
[b]*Reference group.*

9 provinces with the highest rates and the 12 provinces with the lowest rates ($P < 0.001$).

Spatial autocorrelation and identifying the clusters

To analyse the spatial distribution of the disease, first the cumulative rate of incidence was calculated in 100 000 individuals. The 8 provinces with the highest 8 cumulative incidence rates were: Khorasan Razavi (18.7), Semnan (18.7), Tehran (21.2), Alborz (21.2), Hamedan, 25.8), Kermanshah (32.3), Lorestan (23.8) and Zanjan (22.9). The provinces with the lowest cumulative incidence rates were: Bushehr (5.6), Khouzestan (7.9), Azarbayjan Sharghi (5.7), Golestan (6.3) and Mazandaran (5.8)

The results obtained via Global Moran's I analysis gave a value for this index of 0.269, indicating the intensity of autocorrelation and the high tendency to clustering. The *z*-score value of 4.9 ($P < 0.001$) shows that the rate of spatial autocorrelation in these types of deaths was statistically significant, even at 0.99 level of confidence. In other words, the probability that the spatial distribution of the disease is not cluster-based and there is no high autocorrelation and that the cluster distribution and autocorrelation have been wrongly recognized as high was only 0.0004.

After finding that spatial autocorrelation was high, and given the spatial clustering of the disease, we decided to identify cold spots and hotspots using the Local Moran's I index. We found that Zanjan, Hamedan, Loretan and Kermanshah provinces form the high–high cluster, showing that the rate of drug-induced deaths was higher than the national average and that since these provinces are geographically close to each other, they formed a high risk (hotspot) cluster. In other words, the incidence of drug-induced deaths was high in these provinces and their neighbouring provinces. Conversely, the provinces of Kordestan and Mazandaran were detected as a low–

Table 2 Comparison of provincial rates (crude death rates and age-adjusted death rates using direct method) with the national rate, Islamic Republic of Iran, 2014–2017

Province	Crude death rate[a]	Age-adjusted death rate[a]	Difference rate (Province – whole country) (95% CI)	*P*-value
Kermanshah	32.22	31.02	16.20 (13.8, 18.7)	< 0.001
Hamedan	12.81	24.90	10.14 (8.49, 11.79)	< 0.001
East Azarbaijan	14.79	23.76	8.99(7.43, 10.55)	< 0.001
Lorestan	23.52	23.48	8.72 (6.48, 10.96)	< 0.001
Zanjan	22.57	21.53	6.77 (3.97, 9.57)	< 0.001
Razavi Khorasan	18.33	19.50	4.74 (3.63, 5.86)	< 0.001
Tehran	20.96	19.48	4.72 (3.91, 5.53)	< 0.001
Alborz	20.37	18.85	4.09 (2.41, −5.78)	< 0.001
Sistan & Balochistan	13.16	18.65	3.88 (2.27, 5.5)	< 0.001
Semnan	18.27	17.11	2.34 (−7.79, 5.47)	0.111
Qazvin	16.16	15.94	1.18 (−1.04, 3.41)	0.280
Isfahan	16.92	15.81	1.05 (−8.15, 2.17)	0.002
Fars	15.48	15.27	−5.06 (−6.31, 1.64)	0.371
Qom	16.06	15.14	0.38 (−1.8, 2.55)	0.733
Iran (total)	15.14	14.76	–	–
Ardabil	13.80	14.52	−2.42 (−2.34, 1.86)	0.820
Chahar–Mahal Bakhtiari	14.29	13.35	−1.41 (−3.77, 9.44)	0.261
Gilan	13.44	12.67	−2.10 (−3.5, −0.69)	0.007
Hormozgan	11.23	12.46	−2.30 (−3.99, −0.61)	0.014
Kohgilouyeh & Boyerahmad	10.72	10.54	−4.22 (−6.62, −1.81)	0.004
Markazi	11.16	10.20	−4.56 (−6.21, −2.91)	< 0.001
Kurdistan	9.54	10.15	−4.61 (−6.23, −3.00)	< 0.001
South Khorasan	9.43	10.11	−4.65 (−6.9, −2.39)	< 0.001
Ilam	10.27	9.92	−4.84 (−7.41, −2.28)	< 0.001
Kerman	10.16	9.67	−5.09 (−6.21, −3.97)	< 0.001
North Khorasan	8.86	8.94	−13.87 (−14.54, −13.2)	< 0.001
Khuzestan	7.77	8.51	−6.26 (−7.12, −5.39)	< 0.001
Yazd	10.00	8.45	−6.31 (−8.05, −4.57)	< 0.001
Mazandaran	5.72	7.24	−7.52 (−8.49, −6.55)	< 0.001
Golestan	6.20	6.43	−8.33 (−9.5, −7.17)	< 0.001
Bushehr	5.46	6.06	−8.71 (−10.1, −7.25)	< 0.001
West Azarbaijan	5.27	5.53	−9.23(−10.08, −8.38)	< 0.001

[a]*Per 100 000 persons.*

high, or cold spot, cluster, indicating that the drug-related deaths incidence was lower than the national average and that these regions are surrounded by high-risk areas. The geographical specifications related to provinces identified as high–high and low–high clusters of drug-induced death are presented in Table 3. No low–low or high–low clusters were observed.

Temporal trend

The results of the analysis time trend are presented in Figure 1 and Table 4. The raw death incidence trend for the whole country showed an initial increasing, but nonsignificant, rate during 2014–2017 (48 months) (APC = 0.52) (Figure 1, part A). At the end of the study period (second half of 2017), there was a decreasing, but nonsignificant, incidence rate (P = 0.310) for the disease (APC = −6.99) (average annual percent change = −0.5; 95% CI: −3.2, −2.3).

The number of deaths for each month was calculated for the 4 years covered by the study, and the trend of death registration was examined (Figure 1, part B). This chart indicates the number of new cases of deaths registered separately for each month during 2014–2017, which has 3 joinpoints. In the spring months (Jan, Feb, Mar) of 2014–2017, an intense and significant decrease was observed (MPC = −11.47, 95% CI: −21.0, −0.6), (P = 0.04) (Table 4). Then, according to the *Joinpoint* regression analysis, in the next 3 months, there was an increasing trend such that in the summers of 2014–2017 (Apr, May, Jun), the number of registered deaths reached a peak (APC = 18.31,

Table 3 Geographical specifications related to provinces identified as high–high and low–high clusters of drug-induced death (*n* = 100 000), 2014–2017

CIR	Altitude (m)	Longitude (°E)	Latitude (°N)	Area (km²)	District centre	District	Cluster type
32.3	1374	46.683	34.433	24 998	Kermanshah	Kermanshah	High–high
23.8	4050	48.353	33.487	29 308	Khoram Abad	Lorestan	
25.8	1850	48.510	34.790	19 546	Hamedan	Hamedan	
22.9	1638	48.384	36.496	21 773	Zanjan	Zanjan	
5.8	5600	51.301	36.453	23 842	Sari	Mazandaran	Low–high
9.6	1463	46.984	35.682	64 054	Sanandaj	Kordestan	

CIR = cumulative incidence rate.

95% CI: 5.3, 32.9). In the next 6 months of 2014–2017, i.e. autumn and winter (Jul, Aug, Sep, Oct, Nov, Dec), the trend for registration of drug-related deaths showed a decrease (APC = −5.09, 95% CI: −6.9, −3.2). Therefore, it can be concluded that deaths due to drug abuse exhibit seasonal changes (average annual percent change = −0.33, 95% CI: −1.8, 1.3) (Table 4).

The raw drug-related deaths rate for the age group ≤ 14 years during the 4 years under study showed a nonsignificant decreasing trend without noticeable changes (APC = −16.6) (Figure 1, part C). For the age group 14–25 years, there was an increasing trend over the 4 years (APC = 33.11) (Figure 1, part D). In the 25–44 age group, the incidence of death showed a moderate but nonsignificant increase (APC = 2.32) (Figure 1, part E; Table 4). The DRD rate for the age group 45+ years during the 4 years of the study also showed a moderate but nonsignificant increasing trend (APC = 3.21) (Figure 1 part F; Table 4).

Discussion

A total of 12 386 drug-related deaths were registered over the 4-year period in 2 archives. Mortality was higher in the adult age group and during the summers. The mean age of the substance-related deaths was 5.2 years among children and adolescents, 20.7 years among young adults, 34.2 years among adults and 55.6 years among older adults. The highest mortality rates were attributed to the east–west substance transit belt.

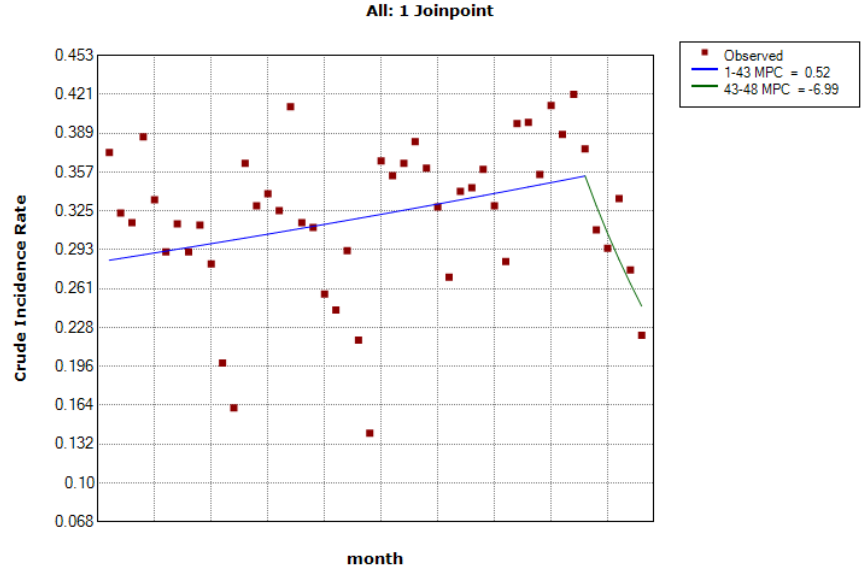
The Islamic Republic of Iran bears the greatest burden among all substance transit countries (*21*): the regions around the east–west route through the country has the highest mortality due to substance use. Substance transit from Afghanistan to the Islamic Republic of Iran has been one of the country's biggest problems since the 20th Century. Khorasan Razavi and Sistan and Baluchistan provinces are the starting points for the transit of substance shipments into the country. The east–west route directs substances to the Middle East, the northern route to Turkey and Russia and the southern route to the Persian Gulf countries. Around 37% of the heroin

Table 4 Temporal analysis with *Joinpoint* regression models fitted to crude incidence rate and count of drug-related deaths (DRDs) in the Islamic Republic of Iran, 2014–2017

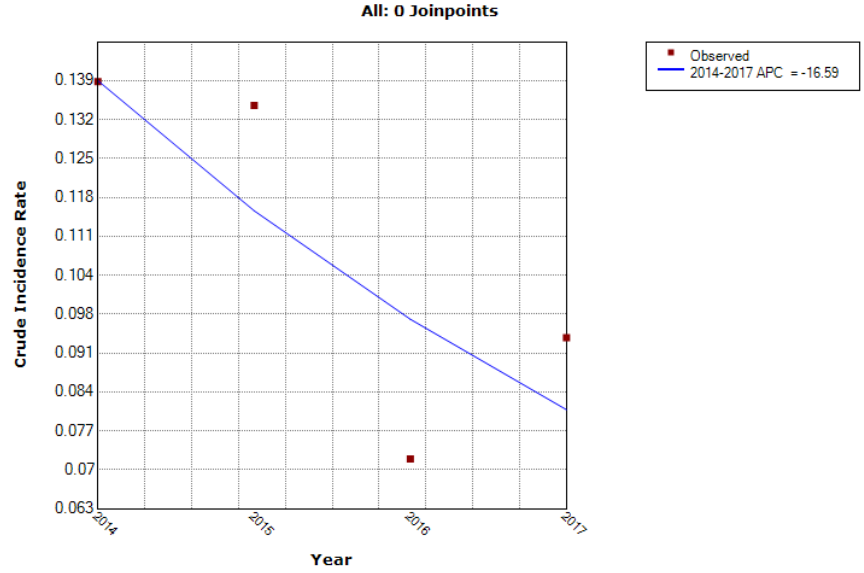
Factor	APC		*P*-value	AAPC	
	Point estimate	95% CI		Point estimate	95% CI
Temporal trend of the crude incidence rate of DRD for whole country					
1–43 months	0.50	−0.1, 1.1	0.073	−0.33	−1.8, 1.3
44–48 months	−6.99	−19.3, 7.2	0.310		
Temporal trend of new cases of count by month					
Jan, Feb, Mar	−11.47[a]	−21.0, −0.6	0.04	−0.51	−3.2, 2.3
Apr, May, Jun	18.31[a]	5.3, 32.9	0.011		
Jul, Aug, Sep, Oct, Nov, Dec	−5.09[a]	−6.9, −3.2	0.002		
Temporal trend of crude incidence rate of DRD according to age (years)					
≤ 14	−16.6	−49.1, 36.6	< 0.1	–	–
15–24	33.11[a]	27.0, 39.5	< 0.1	–	–
25–44	2.32	−8.3, 14.2	< 0.1	–	–
45–60+	3.21	−18.3, 30.4	1.0	–	–

APC = annual percent change.
AAPC = average annual percent change.
[a]*APC and slope are significantly different from zero at α = 0.05.*

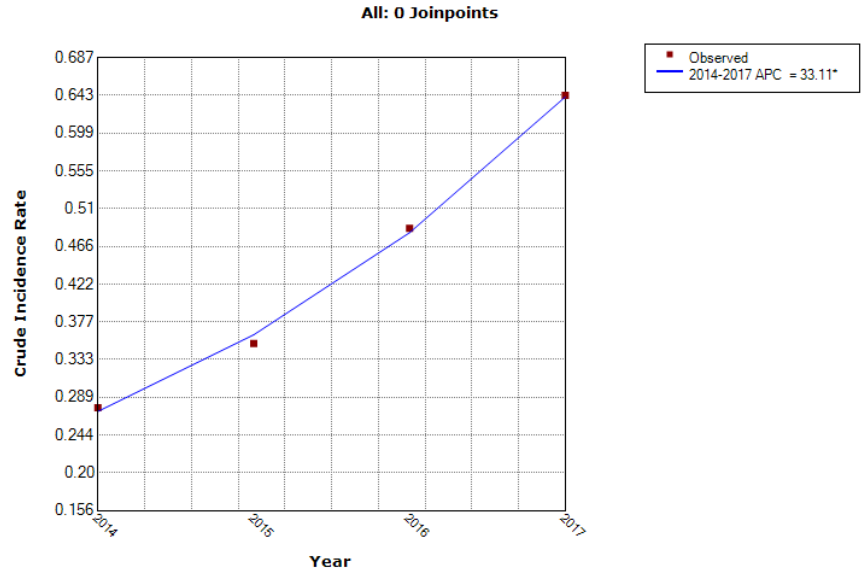
Figure 1 **The changing trend of substance-related deaths rate in the Islamic Republic of Iran during 2014–17**



* Indicates that the Monthly Percent Change (MPC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 1 Joinpoint.

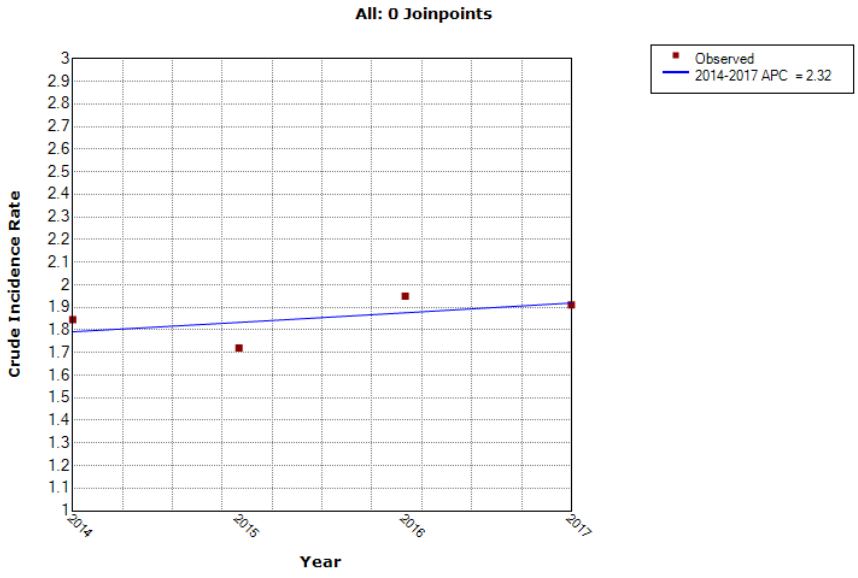


* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 0 Joinpoints.

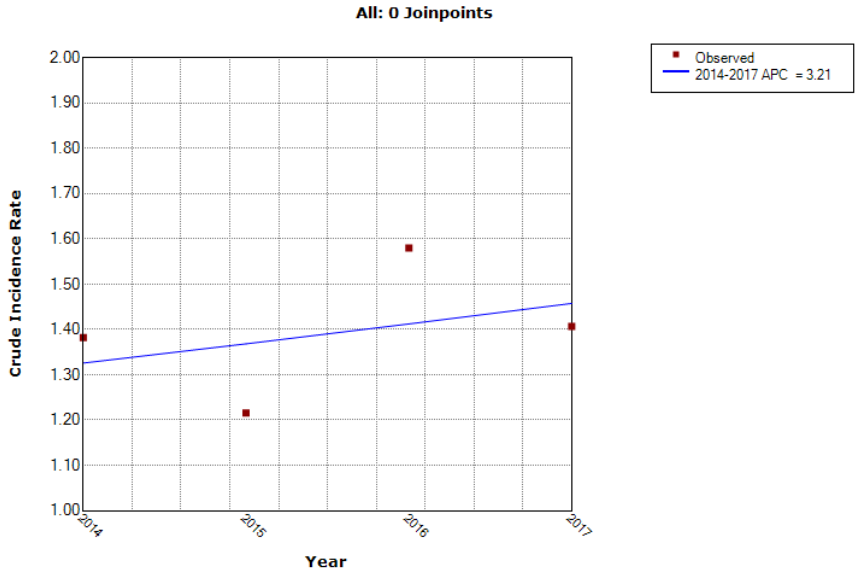


* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 0 Joinpoints.

Figure 1 The changing trend of substance-related deaths rate in the Islamic Republic of Iran during 2014–17 *(concluded)*



* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 0 Joinpoints.



* Indicates that the Annual Percent Change (APC) is significantly different from zero at the alpha = 0.05 level.
Final Selected Model: 0 Joinpoints.

produced in Afghanistan enters the Iranian market and 83% of Afghanistan's opium is transited through the Islamic Republic of Iran, of which approximately 40% is used domestically.

In our study, adults showed the highest mortality rate. According to demographic studies conducted in the Islamic Republic of Iran, the third and fourth decades of life are the most common ages for substance dependence (*22,23*). Similar studies conducted in the USA confirm this: although substance use disorders have been decreasing among adolescents, the mortality rate due to illicit substance use increased among adults (26–34 and ≥ 35 years) during 1999–2015 (*24*). The most important risk factors in this age group include: being single, having no proper job, unemployment, lack of financial security and homelessness (*25*).

Death among adults (45–54 years) adds to the years of potential life lost compared to later ages in life (55+ years) (*26*). A USA study calls these kinds of death as "deaths of despair" (*27*), common among those aged 45–54 years. A wide range of socioeconomic factors are implicated in increased substance abuse and overdose of lethal substances in this age group (*27*).

Substance abuse is common among older adults in the Islamic Republic of Iran (*28*), leading to a variety of disorders among this group (*29*). Some disorders come with aging: previous studies have shown that infection, liver disease and prescription of opium by doctors to relieve the pain of cancerous or noncancerous diseases are the most common causes of substance use disorders among adults and older adults, and these are associated with increased odds of death (*28–30*). The most important

reasons for substance abuse in this age include job loss, retirement, physical pain, loss of health and loss of relatives, as well as reduced social relationships (*29*).

Our findings showed that mortality was lower in women than in men. Although the results from similar studies indicate that the risk of death due to substance intoxication is greater in men (*22,30,31*), it is important to note that a low mortality rate due to substance abuse should not be interpreted as low burden of substance use in women (*31*).

The results of our study indicated that most deaths due to substance abuse occurred during summer. This is confirmed by the results of previous research conducted in the Islamic Republic of Iran (*32*). Although holidays make summer a fun season, adolescents are at risk due to substance and alcohol abuse.

Some of the study limitations were linked to under-reporting. First, this study was based on data collected from death certificates in the Ministry of Health and Medical Education and the Legal Medicine Organization, the quality of which depends on the accuracy and completeness of the registration process. Second, the Legal Medicine Organization refrained from providing the names of substances that caused death, thus an accurate description or report of such substances could not be provided.

Another limitation of the study was that age was not recorded for 50 deceased people in the 2015 statistics and 60 in the 2014 statistics; the data for these were therefore excluded from the study.

The advantages of this study over similar studies conducted in the Islamic Republic of Iran (*10*) include the use of 2 sources by the capture–recapture method to find the precise statistics for number of deaths due to substance abuse in each year, and that the crude and age-adjusted mortality rates in the provinces were reported using the direct method.

Conclusion

The Islamic Republic of Iran has the shortest substance transit route to Europe and other countries. There is a high demand for substance use in this country, and the provinces which lie on the east–west substance transit routes suffer the most damage from substance abuse complications. Death due to substance abuse will remain a huge public health problem unless policy- and decision-makers, physicians and parents identify the reasons for the increase of this problem despite the extensive regulatory efforts and find ways to protect children and families .

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Competing interests: None declared..

Distribution spatiale et tendance temporelle des décès liés à la consommation de drogues en République islamique d'Iran entre 2014 et 2017

Résumé

Contexte : Les recherches indiquent une tendance à la hausse des décès liés à la consommation de drogues dans le monde : selon les estimations, 69 000 personnes perdent la vie chaque année du fait de l'abus de substances psychoactives.

Objectifs : Déterminer la pathologie géographique des décès liés à la consommation de drogues en République islamique d'Iran et évaluer les tendances de l'incidence, en mettant l'accent sur l'identification des régions à haut et à faible risque.

Méthodes : Pour cette étude écologique, nous avons recueilli des données auprès des deux principales sources chargées de l'enregistrement des décès liés à la consommation de substances psychoactives (l'Organisation de médecine légale et le ministère de la Santé et de l'Enseignement médical) entre 2014 et 2017. L'analyse des données a été réalisée à l'aide de l'analyse de régression *Joinpoint*, Global Moran's I et Anselin Local Moran's I.

Résultats : Sur les 12 386 décès liés à la consommation de drogues enregistrés entre 2014 et 2017, la plupart se sont produits pendant les mois d'été ; 7162 d'entre eux sont survenus chez des personnes d'âge moyen. L'âge moyen des enfants et des adolescents décédés du fait de la consommation de substances psychoactives était de 5,2 ans [écart type (ET) 4,6]. Dans le groupe des jeunes adultes, l'âge moyen au décès était de 20,7 ans (ET 2,5) ; il était de 34,2 ans (ET 5,4) pour les adultes et de 55,6 ans (ET 9,8) pour les adultes plus âgés. Les variations du taux de mortalité ont culminé en 2017 (variation annuelle en pourcentage = 0,52) ; au cours des derniers mois de la période de l'étude, on a observé une diminution non significative (variation annuelle en pourcentage = −6,99) de l'incidence (variation annuelle moyenne en pourcentage = −0,5 ; intervalle de confiance à 95 % : −3,2, 2,3).

Conclusion : Les décès dus à la consommation de substances psychoactives resteront un énorme problème de santé publique à moins que les législateurs, les responsables de la santé publique, etc. ne puissent déterminer les raisons pour lesquelles ce problème s'aggrave encore malgré les efforts considérables déployés en matière de réglementation et que ces derniers puissent trouver des moyens d'en atténuer l'impact.

التوزيع الجغرافي والاتجاه الزمني للوفيات الناجمة عن المخدرات في جمهورية إيران الإسلامية خلال الفترة من 2014 إلى 2017: دراسة بيئية

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الخلاصة

الخلفية: تشير البحوث إلى تزايد اتجاه الوفيات الناجمة عن المخدرات في جميع أنحاء العالم، إذ يُقدَّر عدد الذين يفقدون حياتهم بسبب تعاطي مواد الإدمان بنحو 69 ألف شخص سنويًّا.

الأهداف: هدفت هذه الدراسة إلى تحديد التوزيع الجغرافي للوفيات الناجمة عن المخدرات في جمهورية إيران الإسلامية وتقييم اتجاهات الوفيات، مع التركيز على تحديد المناطق ذات المخاطر العالية والمنخفضة.

طرق البحث: لإجراء هذه الدراسة البيئية، جمعنا بيانات من المصدرين الرئيسيين المسؤولين عن تسجيل الوفيات الناجمة عن تعاطي مواد الإدمان (وهما مؤسسة الطب الشرعي، ووزارة الصحة والتعليم الطبي) خلال المدة من عام 2014 إلى 2017. وخضعت البيانات للتحليل باستخدام تحليل انحدار Joinpoint، وأداة Global Moran's I وأداة Anselin Local Moran's I.

النتائج: من بين 12386 حالة وفاة ناجمة عن المخدرات في الفترة من عام 2014 إلى 2017، وقعت معظم حالات الوفاة في أشهر الصيف؛ وكان 7162 شخصًا منهم في منتصف العمر. وكان متوسط عمر الأطفال والمراهقين الذين تُوفوا بسبب تعاطي مواد الإدمان 5.2 [الانحراف المعياري 4.6] سنة. وكان متوسط العمر عند الوفاة 20.7 (الانحراف المعياري 2.5) سنة في فئة الشباب، و34.2 (الانحراف المعياري 5.4) سنة في فئة الكبار، و55.6 (الانحراف المعياري 9.8) سنة في فئة كبار السن. وبلغت التغيرات في معدل الوفيات ذروتها في عام 2017 (النسبة المئوية للتغير السنوي = 0.52)، وشهدت الأشهر الأخيرة من فترة الدراسة انخفاضًا غير ملحوظ (النسبة المئوية للتغير السنوي = −6.99) في معدل الوفاة (متوسط النسبة المئوية للتغير السنوي = −0.5؛ حدود الثقة 95٪: −3.2، 2.3).

الاستنتاجات: ستظل الوفيات الناجمة عن تعاطي مواد الإدمان مشكلة ضخمة من مشكلات الصحة العامة، ما لم يتمكن المُشرِّعون أو المسؤولون عن الصحة العامة أو غيرهم من تحديد سبب استمرار تزايد هذه المشكلة على الرغم من الجهود المكثفة التي بُذلت حتى الآن.

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