

Diagnosis of macrosocial risks of drug use in Mexican municipalities

Solveig E. Rodríguez-Kuri,¹ Raúl García-Aurrecochea,² José Luis Benítez-Villa,² Carmen Fernández-Cáceres³

¹ Subdirección de Investigación, Centros de Integración Juvenil, A.C., Ciudad de México, México.

² Departamento de Investigación Clínica y Epidemiológica, Centros de Integración Juvenil, A.C., Ciudad de México, México.

³ Dirección General, Centros de Integración Juvenil, A.C., Ciudad de México, México.

Correspondence:

Solveig E. Rodríguez Kuri
Subdirección de Investigación, Centros de Integración Juvenil, A.C.
Av. San Jerónimo 372, Col. del Pedregal, Álvaro Obregón, 01900 Ciudad de México, México.
Phone: +52 (55) 5999 - 4949.
Email: solveig.rodriguez@cij.gob.mx

Received: 1 March 2018

Accepted: 28 November 2018

Citation:

Rodríguez-Kuri, S. E., García-Aurrecochea, R., Benítez-Villa, J. L., Fernández Cáceres, C. (2019). Diagnosis of macrosocial risks of drug use in Mexican municipalities. *Salud Mental*, 42(1), 5-12.

DOI: [10.17711/SM.0185-3325.2019.002](https://doi.org/10.17711/SM.0185-3325.2019.002)



ABSTRACT

Introduction. Factors associated with drug use are defined in terms of their proximity to the phenomenon and can be classified as individual, microsocial, and macrosocial. Macrosocial factors include variables of a geographic, economic, demographic, and social nature, which can be compiled from population censuses and surveys. **Objective.** To determine the levels of risk for drug use in municipalities in Mexico based on macro-social indicators. **Method.** Retrospective cross-sectional study, based on the analysis of population data, weighted by the Delphi method. **Results.** Sixty-four municipalities with a high or very high risk of drug use were identified. Factors such as the volume of drug seizures, prevalence of student use, alcohol supply, and inequality among the population were weighted as the factors with greatest risk for drug use. **Discussion and conclusion.** These data serve as a benchmark for guiding the efficient, rational administration of resources assigned for dealing with the problem of addictions, since they make it possible to identify localities with a greater need for care services.

Keywords: Risk factors, drug users, social determinants of health, mental health, Delphi technique, substance abuse.

RESUMEN

Introducción. Los factores asociados al consumo de drogas se definen en función de su proximidad con el fenómeno y pueden clasificarse en individuales, microsociales y macrosociales. Entre los factores macrosociales se incluyen variables de tipo geográfico, económico, demográfico y social, que es posible integrar a partir de censos y encuestas poblacionales. **Objetivo.** Determinar niveles de riesgo del consumo de drogas en municipios de la República Mexicana con base en indicadores macrosociales. **Método.** Estudio transversal retrospectivo, basado en el análisis de datos poblacionales, ponderados mediante el método Delphi. **Resultados.** Se identificaron 64 municipios con alto o muy alto riesgo de consumo de drogas. Factores como el volumen de decomisos de drogas, prevalencia de consumo en estudiantes, oferta de alcohol y desigualdad entre la población fueron ponderadas como los factores de mayor riesgo para el consumo de drogas. **Discusión y conclusión.** Estos datos representan un referente para orientar la administración eficiente y racional de los recursos destinados a atender el problema de las adicciones en tanto permiten identificar localidades que requieren servicios de atención con mayor prioridad.

Palabras clave: Factores de riesgo, usuarios de drogas, determinantes sociales de la salud, salud mental, técnica Delphi, abuso de sustancias.

INTRODUCTION

Scientific literature describes a wide array of risk and protective factors associated with substance use. Some authors define them according to their level of proximity to the phenomenon, because of which these factors can be classified as macrosocial, microsocial, and individual (Hawkins, Catalano, & Miller, 1992).

Macrosocial factors include economic, demographic and geographic variables, which affect the level of well-being of individuals. Another group of factors, the so-called microsocial factors, encompass aspects related to the subject's network of close relations, including those in the familial, school and work sphere, and with their partners and peers. Lastly, individual factors incorporate variables related to the person, which include aspects that ranging from self-esteem to the presence of affective or behavioral disorders.

According to Hawkins et al. (1992), the best way to develop effective strategies to prevent alcohol and drug use is precisely one that focuses on risk factors. In this respect, and from a macrosocial point of view, the population is exposed to very different risk conditions, depending on their geographical, economic, and social status. Thus, drug trafficking routes or areas with a high influx of tourists, for example, pose a significant risk of use, since they encourage greater supply and accessibility. Likewise, living in a locality with a significant migratory flow or high crime rates increases the risk of drug use (United Nations and International Drug Control Program, 1998; Santos & Paiva, 2007; Zhang et al., 2015).

Nowadays it is possible to compile information on this type of indicators, based on the data provided by various government agencies drawn from the censuses and surveys undertaken periodically, whereby it is feasible to perform a diagnosis in macrosocial terms of the level of risk of drug use in the various communities in the country.

This can contribute to achieving a more efficient, rational administration of the resources assigned for addiction care, insofar as it makes it possible to identify localities with a greater need for these services.

Accordingly, since 1997, the Centros de Integración Juvenil (CIJ) have conducted a risk diagnosis of drug use in municipalities and delegations in Mexico on the basis of macrosocial indicators. This project constitutes a second update of the study, "Macrosocial risks of drug dependence at the municipal level and strategic care network in Mexico," published in 1997 (Salinas et al., 1997), and first updated in 2011 (García, Rodríguez, Córdova, & Fernández, 2016). The results of these diagnoses have supported decision-making in the establishment of care units, at least at the CIJ, where three of the five units that have come into operation since the last study have been installed in municipalities classified as high-risk (García et al., 2016).

However, since drug use is a constantly changing phenomenon, it is necessary to periodically update its diag-

nosis. This study has compiled information from various sources, in order to obtain an approach to the problem of drug use in the country from a macrosocial perspective, in addition to offering an updated benchmark for care needs at the municipal level. The purpose of this study was to determine Macrosocial Levels of Risk for Drug Use in the 426 municipalities and urban delegations (communities with over 50 inhabitants) in Mexico to provide a useful parameter to plan the establishment of care units in the country.

METHOD

Type of study

Retrospective, cross-sectional study, based on the analysis of census data and population surveys, weighted by means of assessment based on the Delphi technique.

Procedure

Based on a set of population, geographic, economic, human development, violence and supply, and use data for substances detailed below, a risk index of drug use was obtained for each municipality or delegation included in the study.

Since each indicator has a different importance in the risk of substance use, a method of assessment, known as the Delphi technique was used, in order to assess the importance of the various risk indicators considered.

Delphi technique

The Delphi technique is a method based on a panel of experts, which allows for the exchange and contrast of opinions and individual arguments on a topic in order to make consensual decisions (García & Suárez, 2013). It is a method designed to obtain the opinion of a group of experts on a problem in a structured manner. The method incorporates a feedback exercise, which allows individual opinions to be brought closer to a consensus. This technique is especially useful when the available information is insufficient and requires the interpretation of specialists in the field (Boulkedid, Abdoul, Loustau, Sibony, & Alberti, 2011). Moreover, this technique guarantees three fundamental aspects for collecting information when using instruments of this nature, namely confidentiality, controlled iteration/feedback, and the response of the group in statistical form (Awad-Núñez, González-Cancelas, & Camarero-Orive, 2014).

Participants

The panel comprised 20 experts (11 women and nine men), whose professional career or work experience has provided them with extensive knowledge of the drug use problem and the associated risk and social conditioning factors asso-

ciated with the latter, because of which they had sufficient elements to assess the importance of the macrosocial risk indicators considered in the study. The professional profile of the panel experts included mainly professionals in the field of health, such as psychologists, doctors, social workers, sociologists, and nurses with educational attainment corresponding to higher education or above. Most of them are affiliated to public or private organizations or institutions in the field of health, as well as teaching and research.

Given that the Delphi technique requires at least 15 judges to guarantee the validity of the consensus (Taylor-Powell, 2002) and due to the possibility of high attrition, 39 people were invited to participate to ensure that by the end of the survey and feedback process, there would be at least 15 judges. The panel of experts was eventually made up of 20 people, who encompassed the gamut of professional profiles mentioned above and completed the entire process. They were sent an email in which they were invited to participate in a survey on risk factors for drug use by answering questionnaire located in a virtual site, developed for this study, for which they were provided with an access link, as well as a username and password. They were asked to assign a score of zero to ten to each of the indicators listed, according to the importance they could have as risk factors for drug use among the inhabitants of a community.

Participants were told that two weeks after their first participation in the survey, they should return to the site where they would be informed of the result of the average weighting of all the judges. They were then asked to enter a discussion forum in which they could discuss the indicators with the lowest level of consensus, in other words, those with the most disparate ratings and the greatest deviation from the average. In addition, once they had expressed their opinions in the forum, they were asked to answer the questionnaire again, providing the grade they considered most appropriate, whether they decided to maintain the one they given in the first survey or chose to modify it, after finding out about the average grades and having participated in the discussion forum. The information gathering period ran from May 18 to 24, 2017, in its initial stage (first application of the questionnaire) and from May 30 to July 8 of the same year in the second stage (feedback, participation in the discussion forum, and second application of the questionnaire).

Measurements

Since the diagnostic studies that preceded the one presented here, the measurement indicators have shown variations since the conditions of the social context in which substance use takes place have also changed. Firstly, it should be noted that the number of urban municipalities in Mexico has altered with respect to the previous version of the study (García et al., 2016) because of demographic changes in Mexico, from 371 to 426. Moreover, certain information sources are no longer

available or the level of specificity of their data has changed, from having municipal to state representativity or from state to regional representativity, such as the National Addictions Survey, the 2011 version of which (Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Instituto Nacional de Salud Pública, & Secretaría de Salud, 2012) contains data at the regional level, while the previous survey (Secretaría de Salud, 2009), which included state data, is already too outdated to be considered as a parameter in this diagnosis. Accordingly, it was decided to incorporate information from the Survey on Drug Use in Students (Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Comisión Nacional Contra las Adicciones, & Secretaría de Salud, 2015) which presents state data and, although it is not representative of the entire youth population of Mexico, it constitutes an important benchmark for substance use in the population enrolled in elementary (5th and 6th grades), middle and high school. Conversely, other sources have also emerged, more closely linked to the phenomenon that concerns us, which have been incorporated into this version.

Thus, whereas the last study included demographic, economic, geographical, educational, socio-familial, tourist influx and illegal drug production, and trafficking indicators, in this version of the study, indicators related to social violence have also been incorporated, as well as the number of nocturnal recreational spaces and those for alcohol sale and consumption.

In general, to undertake this diagnosis, efforts were made to incorporate indicators related to the drug use phenomenon in different ways. The following were therefore included: a) indicators directly related to use, such as survey data on the prevalence of use at the state level in the student population; b) factors that establish a more or less direct causal relationship, such as the presence of bars, canteens, and other establishments of this nature, which impact the supply of substances in localities; c) factors that imply an associative relationship, as in the case of indicators of violence and crimes which, although they do not maintain a causal relationship, may correlate with use; and d) structural factors, such as those related to demographic aspects, inequality, human development, etc., which, without having a linear relationship with substance use, may have a determinant effect on it.

Thus, eleven categories of indicators were considered: state prevalence of drug use, population, geographic, migration, education, employment, inequality and human development indicators, number of establishments for alcohol consumption, criminal activity and violence, seizures, and perception of sale and use of drugs. Table 1 provides a detailed list of Macrosocial Risk Indicators and their source.

Analysis

Once the risk rating for each indicator was obtained through the Delphi technique, and to prevent certain categories of

Table 1
Risk indicators and weighted importance

Category	Indicator	Importance weighted by indicator	Importance weighted by category	Justification of its inclusion	Sources
Demographic	Urban concentration (proportion of urban population of the state living in that municipality)	6.2	6.3	Prevalence of drug use is higher in urban areas and among young males. A high growth rate, as well as living in a large city, exposes people to a wide array of direct and indirect risks of using drugs.	Encuesta Nacional de la Dinámica Demográfica 2014 (INEGI, 2014) Encuesta Intercensal, 2015. (INEGI, 2015) Censo de población y vivienda, 2010. (INEGI, 2011) Anuarios estadísticos estatales 2009. (INEGI, 2010) Delimitación de las zonas metropolitanas, 2010. (CONAPO, SEDESOL, INEGI, 2010)
	Proportion of young people (average age)	6.4			
	Proportion of male population (%)	5.8			
	Average growth rate (percentage increase over 2010)	6.2			
	Forms part of a metropolitan area (yes - no)	6.9			
Geographical	Location on the northern border (border states yes - no)	7.2	7.2	Some of the municipalities with the highest prevalence of drug use in the country are located in states on the northern border of the country or constitute areas with a significant tourist influx.	Resultados de la actividad hotelera (Acumulados enero-diciembre 2016). (SECTUR, Subsecretaría de Planeación Turística, 2016). Diagnósticos Turísticos Delegacionales 2014-2015. (SECTUR-Ciudad de México, 2015).
	Tourist center (According to SECTUR criteria yes - no)	7.2			
Educational	Proportion of persons aged 15 and over with no schooling (%)	6.5	6.45	Low educational attainment is associated with a higher risk of experimentation with drug use.	Encuesta Intercensal, 2015. (INEGI, 2015)
	Educational Attainment (years)	6.4			
Night life	Presence of nightclubs and discos (No. of establishments)	7.7	7.75	Places with an impact on substance availability	Directorio Estadístico Nacional de Unidades Económicas, 2016 (INEGI, 2016).
	Presence of bars, canteens and alcohol outlets (No. of establishments)	7.8			
Migration	Migration rate (Difference between number of emigrants and immigrants)	6.1	6.1	The mobility of the population to another country exposes them to a greater acculturation stress, which has been associated with an increased risk of drug use.	Encuesta Nacional de la Dinámica Demográfica 2014 (INEGI, 2014)
Inequality	Human Development Index (0 to 1)	7.5	7.5	Structural factors indirectly related to drug use	Índice de Desarrollo Humano en México. United Nations Development Program, 2016 Consejo Nacional de Evaluación de la Política de Desarrollo Social, 2010
	Gini coefficient (0 to 1)	7.5			
Unemployment	Unemployment level (%)	6.8	6.8	Like the inequality indexes, it involves a structural factor related to drug use	INEGI. Indicadores de ocupación y empleo al segundo trimestre de 2017.
Prevalence of drug use in students	High prevalence of drug use at least once in their lifetime among middle school students (%)	8.1	8.05	These are direct indicators of the risk of drug use in the rest of the population	Encuesta Nacional del Consumo de Drogas en Estudiantes, 2014. (INPRFM, CONADIC, SSA, 2015)
	High prevalence of drug use at least once in their lifetime among high school students (%)	8.0			

Table 1
Risk indicators and weighted importance (continued)

Category	Indicator	Importance weighted by indicator	Importance weighted by category	Justification of its inclusion	Sources
Perception of sale and use of drugs and crimes in the community	Knowledge of alcohol consumption (% of population that reported having knowledge of this situation)	7.3	7.27	It suggests a perception of easy access to substances	Encuesta Nacional de Victimización y Percepción sobre Seguridad Pública, 2016. (INEGI, 2016)
	Knowledge of drug use (% of population that reported having knowledge of this situation)	7.6			
	Knowledge of sale of drugs (% of population that reported having knowledge of this situation)	6.7			
	Knowledge of frequent robberies and assaults (perception)	7.5			
Criminal activity and violence	Robbery with violence (Freq.)	7.5	6.94	They correlate with drug trafficking and use	Incidencia delictiva del fuero común (SEGOB, 2017)
	Theft without violence (Freq.)	6.7			
	Homicides (Freq.)	6.8			
	Kidnappings (Freq.)	6.9			
	Sex offenses/rapes (Freq.)	6.8			
Volume of drug seizures	Marijuana seizures (Tons.)	8.1	8.1	They are evidence of greater exposure in the area	Incidencia delictiva por entidad federativa (SEGOB, 2017)
	Cocaine seizures (Tons.)	8.1			
	Heroin seizures (Tons.)	8.1			
	Psychotropic seizures (units)	8.1			

indicators from being overrepresented by having a greater number of indicators than others, the risk rating of the indicators was averaged within each category. Based on these ratings, the values of the indicators were weighted and transformed, so that the parameters would be equivalent, even though the measurement units (persons, tons of drugs, etc.) varied. Each indicator was transformed on the basis of the weighted importance assigned, so that the maximum value obtained had the maximum value of the weighted importance assigned, based on a rule of 3, although in the case of categorical variables, such as belonging to a metropolitan area, a fixed weight was assigned for those cases and zero for those which did not belong to metropolitan areas. The sum of these scores was used to obtain a Macrosocial Risk Index for Drug Use (MRIDU) for each municipality or delegation.

Lastly, the risk level was estimated based on the number of standard deviations of the indices with respect to the average. Thus, municipalities with scores above two standard deviations were codified as Very High risk, those with between one and two deviations were coded as High risk, scores located between the average and one deviation corresponded to municipalities with Medium High risk and the same was done with scores below the average. In this case, the categories corresponded to the Medium Low, Low and, Very Low risk levels.

RESULTS

Of the 426 municipalities or delegations with over 50 000 inhabitants, 16 were identified as having a Macrosocial Risk Index of Drug Use corresponding to a Very High level (MRIDU greater than 51.68), 48 as having a High level (MRIDU of 46.38 to 51.68), 119 as having a medium high risk level (MRIDU of 41.12 to 46.36), 174 as having a medium low risk level (MRIDU of 35.79 to 41.05), and 68 as having a low risk level (MRIDU of 30.56 to 35.74), while just one municipality was classified with a very low risk level (MRIDU of 29.59) (Table 2).

Four municipalities in Baja California (Tijuana, Playas de Rosarito, Mexicali, and Ensenada), four Mexico City boroughs (Cuauhtémoc, Iztapalapa, Gustavo A. Madero, and Miguel Hidalgo), three municipalities in Sonora (San Luis Río Colorado, Puerto Peñasco, and Agua Prieta), two in Jalisco (Guadalajara and Puerto Vallarta), one in Nuevo León (Monterrey), one in Guerrero (Acapulco) and one in Chihuahua (Ciudad Juárez) were identified as being at very high risk (Table 2). Likewise, among the municipalities and boroughs with a high-risk level, 13 were identified in the State of Mexico, seven in Sonora, six in Mexico City, three in Tamaulipas, and two in each of the following states: Jalisco, Nuevo León, Chihuahua, Michoacán, Guanajuato, and Quintana Roo (Table 2).

Table 2
*Index of macrosocial risk of drug use (IRMCD) in municipalities and delegations in Mexico**

Municipality or borough	State	MRIDU	Risk level	Municipality or borough	State	MRIDU	Risk level
1 Tijuana	Baja California	63.95	Very high	46 Nuevo Laredo	Tamaulipas	47.78	High
2 Cuauhtémoc	Cd. de México	60.76	Very high	47 Salinas Victoria	Nuevo León	47.70	High
3 Guadalajara	Jalisco	58.77	Very high	48 Valle de Chalco Solidaridad	México	47.69	High
4 Monterrey	Nuevo León	58.54	Very high	49 Tlalpan	Cd. de México	47.69	High
5 Playas de Rosarito	Baja California	56.67	Very high	50 Lázaro Cárdenas	Michoacán	47.63	High
6 Mexicali	Baja California	56.39	Very high	51 Navojoa	Sonora	47.54	High
7 Iztapalapa	Cd. de México	56.36	Very high	52 San Luis Potosí	San Luis Potosí	47.52	High
8 Puerto Vallarta	Jalisco	55.03	Very high	53 Chihuahua	Chihuahua	47.48	High
9 San Luis Río Colorado	Sonora	54.47	Very high	54 Huehuetoca	México	47.38	High
10 Ensenada	Baja California	54.39	Very high	55 Torreón	Coahuila	47.37	High
11 Gustavo A. Madero	Cd. de México	54.12	Very high	56 García	Nuevo León	47.02	High
12 Acapulco de Juárez	Guerrero	53.02	Very high	57 Tejupilco	México	46.93	High
13 Cd. Juárez	Chihuahua	52.73	Very high	58 Tlajomulco de Zúñiga	Jalisco	46.78	High
14 Puerto Peñasco	Sonora	52.70	Very high	59 Los Cabos	Baja California Sur	46.73	High
15 Agua Prieta	Sonora	52.69	Very high	60 San Miguel de Allende	Guanajuato	46.69	High
16 Miguel Hidalgo	Cd. de México	52.52	Very high	61 Venustiano Carranza	Cd. de México	46.63	High
17 Tecámac	México	51.68	High	62 Huatabampo	Sonora	46.54	High
18 Hermosillo	Sonora	51.47	High	63 Iztacalco	Cd. de México	46.43	High
19 Chalco	México	51.44	High	64 Tláhuac	Cd. de México	46.38	High
20 Benito Juárez	Cd. de México	51.31	High	65 Pesquería	Nuevo León	46.36	Medium high
21 Benito Juárez (Cancún)	Quintana Roo	50.96	High	66 Salamanca	Guanajuato	46.30	Medium high
22 Tecate	Baja California	50.89	High	67 Cuautitlán Izcalli	México	46.29	Medium high
23 Ecatepec de Morelos	México	50.49	High	68 Tultitlán	México	46.27	Medium high
24 Guaymas	Sonora	50.33	High	69 San Pedro Tlaquepaque	Jalisco	46.22	Medium high
25 Cajeme	Sonora	50.29	High	70 Empalme	Sonora	46.21	Medium high
26 Querétaro	Querétaro	50.19	High	71 Azcapotzalco	Cd. de México	46.17	Medium high
27 Nogales	Sonora	50.03	High	72 Chicoloapan	México	46.07	Medium high
28 Coyoacán	Cd. de México	49.76	High	73 Álvaro Obregón	Cd. de México	46.04	Medium high
29 Puebla	Puebla	49.76	High	74 Veracruz	Veracruz	45.99	Medium high
30 Reynosa	Tamaulipas	49.67	High	75 San José del Rincón	México	45.89	Medium high
31 Tlalnepantla de Baz	México	49.41	High	76 Irapuato	Guanajuato	45.84	Medium high
32 Manzanillo	Colima	49.23	High	77 Almoloya de Juárez	México	45.81	Medium high
33 Chimalhuacán	México	48.84	High	78 Tampico	Tamaulipas	45.68	Medium high
34 Nezahualcóyotl	México	48.76	High	79 Acambay de Ruíz Castañeda	México	45.55	Medium high
35 Guadalupe y Calvo	Chihuahua	48.66	High	80 Xochimilco	Cd. de México	45.46	Medium high
36 Morelia	Michoacán	48.61	High	81 Río Bravo	Tamaulipas	45.29	Medium high
37 Zumpango	México	48.46	High	82 Celaya	Guanajuato	45.15	Medium high
38 Solidaridad	Quintana Roo	48.45	High	83 Villa Victoria	México	45.14	Medium high
39 Naucalpan de Juárez	México	48.22	High	84 Ixtapaluca	México	45.12	Medium high
40 León	Guanajuato	48.22	High	85 Atizapán de Zaragoza	México	45.11	Medium high
41 Toluca	México	48.12	High	86 Cuernavaca	Morelos	45.08	Medium high
42 La Paz	México	48.05	High	87 Poncitlán	Jalisco	44.94	Medium high
43 Matamoros	Tamaulipas	48.02	High	88 Uruapan	Michoacán	44.91	Medium high
44 Zapopan	Jalisco	47.92	High	89 Acámbaro	Guanajuato	44.86	Medium high
45 Caborca	Sonora	47.86	High	90 San Felipe del Progreso	México	44.83	Medium high

Table 2
Index of macrosocial risk of drug use (IRMCD) in municipalities and delegations in Mexico (continued)

Municipality or borough	State	MRIDU	Risk level	Municipality or borough	State	MRIDU	Risk level
91 Tecomán	Colima	44.64	Medium high	138 Tuxtla Gutiérrez	Chiapas	42.81	Medium high
92 Salvatierra	Guanajuato	44.62	Medium high	139 Ayala	Morelos	42.81	Medium high
93 Nicolás Romero	México	44.58	Medium high	140 Cadereyta Jiménez	Nuevo León	42.78	Medium high
94 El Marqués	Querétaro	44.58	Medium high	141 Apodaca	Nuevo León	42.77	Medium high
95 Zihuatanejo de Azueta	Guerrero	44.40	Medium high	142 Comonfort	Guanajuato	42.73	Medium high
96 Etchojoa	Sonora	44.37	Medium high	143 San Felipe	Guanajuato	42.70	Medium high
97 Chapala	Jalisco	44.26	Medium high	144 Gómez Palacio	Durango	42.69	Medium high
98 Moroleón	Guanajuato	44.25	Medium high	145 Villahermosa	Tabasco	42.69	Medium high
99 Cuajimalpa de Morelos	Cd. de México	44.22	Medium high	146 Lagos de Moreno	Jalisco	42.66	Medium high
100 Santa Cruz de Juventino Rosas	Guanajuato	44.05	Medium high	147 Villa de Allende	México	42.65	Medium high
101 Aguascalientes	Aguascalientes	44.03	Medium high	148 Coacalco de Berriozábal	México	42.62	Medium high
102 La Magdalena Contreras	Cd. de México	44.02	Medium high	149 Tonalá	Jalisco	42.61	Medium high
103 Uriangato	Guanajuato	43.99	Medium high	150 Huixquilucan	México	42.58	Medium high
104 Guadalupe	Nuevo León	43.98	Medium high	151 San José Iturbide	Guanajuato	42.58	Medium high
105 Pénjamo	Guanajuato	43.89	Medium high	152 Zinacantepec	México	42.57	Medium high
106 El Alto	Jalisco	43.86	Medium high	153 Jiutepec	Morelos	42.50	Medium high
107 Milpa Alta	Cd. de México	43.84	Medium high	154 Santiago Tuxtla	Veracruz	42.49	Medium high
108 Puruándiro	Michoacán	43.80	Medium high	155 Hidalgo del Parral	Chihuahua	42.40	Medium high
109 Cozumel	Quintana Roo	43.78	Medium high	156 Atotonilco el Alto	Jalisco	42.37	Medium high
110 Ixtlahuacán de los Membrillos	Jalisco	43.75	Medium high	157 San Juan del Río	Querétaro	42.35	Medium high
111 Temascalcingo	México	43.74	Medium high	158 Temixco	Morelos	42.30	Medium high
112 San Fernando	Tamaulipas	43.71	Medium high	159 Chilapa de Álvarez	Guerrero	42.23	Medium high
113 Acolman	México	43.70	Medium high	160 Texcoco	México	42.22	Medium high
114 La Barca	Jalisco	43.67	Medium high	161 Ameca	Jalisco	42.21	Medium high
115 Saltillo	Coahuila	43.64	Medium high	162 Valle de Bravo	México	42.19	Medium high
116 Cuautla	Morelos	43.54	Medium high	163 Ixtlahuaca	México	42.16	Medium high
117 Colima	Colima	43.54	Medium high	164 Tepatitlán de Morelos	Jalisco	42.04	Medium high
118 Poza Rica de Hidalgo	Veracruz	43.53	Medium high	165 Silao de la Victoria	Guanajuato	42.04	Medium high
119 Oaxaca de Juárez	Oaxaca	43.50	Medium high	166 JiQUIpilco	México	41.95	Medium high
120 Las Choapas	Veracruz	43.49	Medium high	167 Zamora	Michoacán	41.93	Medium high
121 Altamira	Tamaulipas	43.49	Medium high	168 Victoria	Tamaulipas	41.79	Medium high
122 Camargo	Chihuahua	43.40	Medium high	169 Apaseo el Alto	Guanajuato	41.75	Medium high
123 Mazatlán	Sinaloa	43.34	Medium high	170 Metepec	México	41.53	Medium high
124 Tultepec	México	43.33	Medium high	171 Amealco de Bonfil	Querétaro	41.50	Medium high
125 Ixhuatlán de Madero	Veracruz	43.25	Medium high	172 Rioverde	San Luis Potosí	41.49	Medium high
126 Ocotlán	Jalisco	43.20	Medium high	173 Santa Catarina	Nuevo León	41.48	Medium high
127 Ramos Arizpe	Coahuila	43.18	Medium high	174 Ciudad Madero	Tamaulipas	41.48	Medium high
128 General Escobedo	Nuevo León	43.16	Medium high	175 Córdoba	Veracruz	41.42	Medium high
129 Juárez	Nuevo León	43.15	Medium high	176 San Juan de los Lagos	Jalisco	41.42	Medium high
130 San Luis de la Paz	Guanajuato	43.11	Medium high	177 General Zuazua	Nuevo León	41.38	Medium high
131 Coatzacoalcos	Veracruz	43.04	Medium high	178 Apatzingán	Michoacán	41.37	Medium high
132 Xochitepec	Morelos	43.04	Medium high	179 Othón PBlanco	Quintana Roo	41.33	Medium high
133 Tapachula	Chiapas	42.93	Medium high	180 Abasolo	Guanajuato	41.22	Medium high
134 Cuahtémoc	Chihuahua	42.88	Medium high	181 Xilitla	San Luis Potosí	41.19	Medium high
135 Arandas	Jalisco	42.87	Medium high	182 Guanajuato	Guanajuato	41.19	Medium high
136 Encarnación de Díaz	Jalisco	42.84	Medium high	183 La Piedad	Michoacán	41.12	Medium high
137 Yuriria	Guanajuato	42.84	Medium high				

Note: *Only municipalities with a Very high, High and Medium high-risk level are included.

DISCUSSION AND CONCLUSION

As can be seen, a significant number of municipalities in the country (64) have macrosocial conditions that presumably place their populations at a high or very high risk of substance use. They can therefore be considered key planning objectives for setting up care units for drug use. It is worth noting that factors such as the location of a municipality on a drug trafficking or production route (volume of drug seizures), state prevalences of use in the student population, presence of places where alcohol is sold, and inequality among the population were weighted by the participating experts as the macrosocial factors with the greatest risk of drug use, while population variables had the lowest weighting.

In this respect, one can say that at least one factor in each of the different types of indicators considered had a decisive influence on the macrosocial risk index obtained. In other words, those that have a direct relationship with use, in this case; state prevalence of use in the student population; those with a more or less direct causal relationship such as sites that have an impact on the supply of alcohol or other substances; those that involve an associative or correlational relationship with use, in this case, the perception of easy access to substances (knowledge of sale and use in the street) and structural factors, specifically those that denote conditions of inequality among the population, such as a low human development index and high Gini coefficient.

This study has limitations that deserve comment to facilitate the correct interpretation of results. First of all, it should be recalled that the data used are drawn from information sources with varying time scales and were collected for different purposes from those of this project. However, due to the lack of a single source of information, it was decided to use the most up to date available records. At the same time, although information was collected using an electronic card with the aim of incorporating new technologies into the research processes, using conventional instruments in a physical format or a face-to-face strategy for data collection could yield different results. Lastly, it is important to note that this diagnosis has a municipal scope and cannot provide data at the local level, and must therefore be complemented by other studies. Other diagnoses are therefore required to identify the areas of greatest risk for drug use within the municipality. An example of studies of this kind in Mexico is the Basic Target Community Study (BTCS), developed at Centros de Integración Juvenil, which identifies care needs at the local level based on area trips, as well as interviews with key informants, in order to obtain information on areas with the greatest care needs ([Centros de Integración Juvenil, 2013](#)). However, one limitation of this study is that, given its internal nature, it is only conducted in municipalities where this institution has care units. It would also be useful to conduct studies to determine the accessibility

of services, both in the economic sense and about their geographical location, in order to facilitate treatment for those who so require.

Funding

None.

Conflict of interest

The authors declare they have no conflict of interest.

REFERENCES

- Awad-Núñez, S., González-Cancelas, N., & Camarero-Orive, A. (2014). Application of a model based on the use of DELPHI methodology and Multicriteria Analysis for the assessment of the quality of the Spanish Dry Ports location. *Procedia-Social and Behavior Science*, *162*, 42-50. doi: 10.1016/j.sbspro.2014.12.184
- Boulkedid, R., Abdoul, H., Loustau, M., Sibony, O., & Alberti, C. (2011). Using and reporting the Delphi method for selecting healthcare quality indicators: A systematic review. *PLoS ONE*, *6*(6), e20476. doi: 10.1371/journal.pone.0020476
- Centros de Integración Juvenil. (2013). *Estudio Básico de Comunidad Objetivo 2013*. México: Centros de Integración Juvenil, A.C.
- García, V. R., Rodríguez, S. E., Córdova, A. J., & Fernández, M. C. (2016). Diagnóstico macrosocial de riesgo del consumo de drogas en México. *Acta de Investigación Psicológica*, *6*(3), 2516-2526. doi: 10.1016/j.aipr.2016.11.005
- García, M. & Suárez, M. (2013). El método Delphi para la consulta a expertos en la investigación científica. *Revista Cubana de Salud Pública*, *39*(29), 253-267. Retrieved from: <http://scielo.sld.cu/pdf/rcsp/v39n2/spu07213.pdf>
- Hawkins, J., Catalano, R., & Miller, J. (1992). Risk and protective factors for alcohol and other drug problems in adolescence and early adulthood: Implications for substance abuse preventive. *Psychological Bulletin*, *112*(1), 64-105. doi: 10.1037/0033-2909.112.1.64
- Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Comisión Nacional Contra las Adicciones, & Secretaría de Salud. (2015). *Encuesta Nacional de Consumo de Drogas en Estudiantes 2014: Reporte de Drogas*. México: INPRFM. Retrieved from: http://www.conadic.salud.gob.mx/pdfs/investigacion/ENCODE_DROGAS_2014.pdf
- Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Instituto Nacional de Salud Pública, & Secretaría de Salud. (2012). *Encuesta Nacional de Adicciones 2011: Reporte de Drogas*. México: INPRFM. Retrieved from: http://www.conadic.salud.gob.mx/pdfs/ENA_2011_DROGAS_ILICITAS_.pdf
- Salinas, E., Domínguez, A., Zapata, R., Díaz-Negrete, D., Quintanilla, J., & Guisa, V. M. (1997). *Riesgos Macrosociales de Farmacodependencia a Nivel Municipal y Red Estratégica de Atención en México. Plan Rector Institucional 1988-2000*. México: Centros de Integración Juvenil A. C.
- Santos, A. & Paiva, V. (2007). Vulnerability to HIV: Tourism and the use of alcohol and other drugs. *Revista de Saúde Pública*, *41*(2), 80-86. Retrieved from: <https://www.ncbi.nlm.nih.gov/pubmed/18094790>
- Secretaría de Salud. (2009). *Encuesta Nacional de Adicciones 2008 (ENA, 2008)*. México: Consejo Nacional contra las Adicciones, Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz, Instituto Nacional de Salud Pública, Dirección General de Epidemiología, Dirección General de Información en Salud, Centros de Integración Juvenil. Retrieved from: http://www.conadic.salud.gob.mx/pdfs/ena08/ENA08_NACIONAL.pdf
- Taylor-Powell, E. (2002). *Quick tips collecting group data: Delphi technique*. Madison: University of Wisconsin. Retrieved from: <http://www.uwex.edu/ces/pdande/resources/pdf/Tipsheet4.pdf>
- United Nations & International Drug Control Programme. (1998). *Economic and social consequences of drug abuse and illicit trafficking*. Retrieved from: <https://www.ncjrs.gov/App/Publications/abstract.aspx?ID=195521>
- Zhang, X., Martínez-Donate A. P., Nobles, J., Hovell, M. F., Rangel, M. G., & Rhoads, N. M. (2015). Substance use across different phase of the migration process: A survey of Mexican migrants flows. *Journal of Immigrant and Minority health*, *17*(6), 1746-1757. doi: 10.1007/s10903-014-0109-5