# Prevention of suicidal behavior

Pan American Health Organization

World Health Organization
REGIONAL OFFICE FOR THE Americas

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Edited by Dr. Itzhak Levav

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# THE PAN AMERICAN HEALTH ORGANIZATION ADDRESSES SUICIDAL BEHAVIOR

In the closing days of 2014, the World Health Organization (WHO) launched the report *Preventing suicide: a global imperative* (1). In its Foreword, Dr. Margaret Chan, Director-General of WHO, stated that every suicide is a tragedy, noting that an estimated 800,000 people commit suicide each year and that for each death, there are many incomplete attempts. The impact of these deaths on families, friends, and communities is devastating and far-reaching, even long after the event occurs. Unfortunately, all too often suicide is not given priority as a major public health concern. Despite an increase in research and knowledge about suicide and its prevention, the stigma surrounding it persists, and those who need help frequently do not seek it, feeling alone in the face of the risk. Even when people do seek help, many health services admittedly fail to provide it. The challenge is real and must be met. As the Director-General of WHO declared: suicides are preventable (1).

Also in 2014, the Pan American Health Organization (PAHO/WHO), Regional Office of WHO for the Americas, published its second *Suicide Mortality in the Americas report* (2). Each year, some 65,000 premature deaths from suicide are registered in the Region. It is therefore not surprising that the Member States have acknowledged the extent and importance of the issue and that the *Strategy and Plan of Action on Mental Health* has given PAHO/WHO the mandate to strengthen its technical cooperation in this regard (3). In its most recent Strategic Plan (2014-2019), PAHO/WHO included suicide mortality as one of the impact indicators to evaluate in the Region (4).

Both the WHO global report and PAHO/WHO regional report were launched officially in Mexico in October 2014, with the support of the *Instituto Nacional de Psiquiatría Ramón de la Fuente Muñiz*, a PAHO/WHO Collaborating Center, and the Government of Mexico. A regional workshop was held during the launch to discuss related experiences to date and the best ways to promote action to prevent suicidal behavior.

## This publication

The Mental Health and Substance Use Unit of the Pan American Health Organization (PAHO/WHO), in conjunction with the aforementioned Collaborating Center, produced this publication, which is based on the presentations made in Mexico during the regional workshop on the prevention of suicide.

This report was conceived as a practical tool that provides essential information to better understand suicidal behavior and the main strategies to combat it, from registry to the evaluation of interventions, taking into account the approaches already under way in the Region.

The contents have been organized for easy reading, beginning with a worldwide overview of suicide from WHO's perspective. This is followed by a summary of the PAHO/WHO report *Suicide Mortality in the Americas* and subsequent reports from Central America, Chile, Cuba, the Dominican Republic, Guyana, Mexico, Nicaragua, and the Associated State of Puerto Rico.

Next come chapters on several topics concerning suicidal behavior, such as religion and spirituality, substance use, and the role of personality in the treatment and prevention of suicide among adolescents.

The closing chapter, authored by the Centers for Disease Control and Prevention of the United

States, discusses problems and strategies related to the methodological components of suicide prevention programs.

The chapters are relatively brief and summarize essential information. A list of references is provided at the end of each. The few repetitions found in the chapters are deliberate, to ensure that each one is complete and to guarantee easy reading. The tables and figures that illustrate the text may be reproduced; the only requirement is that their sources be cited.

The authors of the various chapters and the Mental Health and Substance Use Unit of the Pan American Health Organization, which produced the publication, will be gratified to see this effort stimulate, guide, and support the individuals and groups committed to suicide prevention.

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# PREVENTING SUICIDE: A GLOBAL IMPERATIVE

## INTRODUCTION

The purpose of this chapter is to provide an overview of the first global report on suicide, *Preventing suicide: a global imperative*, published by the World Health Organization (WHO) in 2014 (1). This is the first publication of its kind and it integrates available information so that immediate action may be taken to address the problem. The report is designed to enhance knowledge of suicide patterns around the world while underscoring the importance and severity of the issue and the need to undertake preventive measures. It also offers practical guidance on strategies governments may adopt, building on suicide prevention activities that are already under way.

The report was prepared with many contributions of governments, public and private agencies, WHO Collaborating Centers (e.g., the Centers for Disease Control and Prevention [CDC] and the National Institute of Mental Health [NIMH] of the United States), professional associations (i.e., the International Association for Suicide Prevention [IASP]), and world-renowned experts.

As stated above, the report is intended as a resource for regulatory and legislative bodies, as well as for entities made up of other actors and direct stakeholders, to make suicide prevention an imperative. This, in turn, enables countries to offer a timely, effective, rational response to lighten the burden of suffering that suicide and suicide attempts place on families, communities, and society as a whole. The report makes it possible for its users to advise governments, ministries of health, health professionals and other stakeholders.

### Addressing suicide: the WHO Action Plan

In May 2013, the 66th World Health Assembly adopted the first Mental Health Action Plan in the history of WHO. The section addressing suicide prevention sets a goal of reducing suicide rates by 10% globally by 2020. The Plan presents epidemiologic data on global suicide patterns and related protective and risk factors, setting the issue in a contemporary context. It also stresses the importance of national suicide prevention strategies and offers guidelines for prevention measures.

## GLOBAL EPIDEMIOLOGIC DATA

An estimated 804,000 suicide deaths were reported worldwide in 2012. This amounts to an annual global age-standardized suicide rate of 11.4 per 100,000 population (15 for males, and 8 for females). Given the stigma attached to suicide, which is even illegal in some countries, it is likely that suicide is underreported as a cause of death on death certificates. Globally, suicides are believed to account for 50% of all violent deaths among men and 71% among women. For each completed suicide, many more are attempted. Prior suicide attempts are the single most important risk factor for subsequent completed suicides in the uninstitutionalized population.

Suicide rates are highest among men and women aged 70 or older in almost every region of the world. In some countries, suicide rates are highest in younger people; globally, suicide is the second leading cause of death in persons aged 15–29. While national rates vary, low- and middle-income countries bear most of the global suicide burden, accounting for 75% of the world's victims.

The rates, characteristics, and methods of suicidal behavior vary widely among communities, population groups, and over time. Consequently, up-to-date surveillance of suicides and suicide attempts is an essential component of national and local suicide prevention activities. As noted above,

suicide is stigmatized (even illegal) in many countries. As a result, obtaining high-quality data on suicidal behavior is difficult, particularly in countries that do not have good vital registration systems (that register suicides as such) or good data collection systems on the provision of hospital services (that register medically treated suicide attempts).

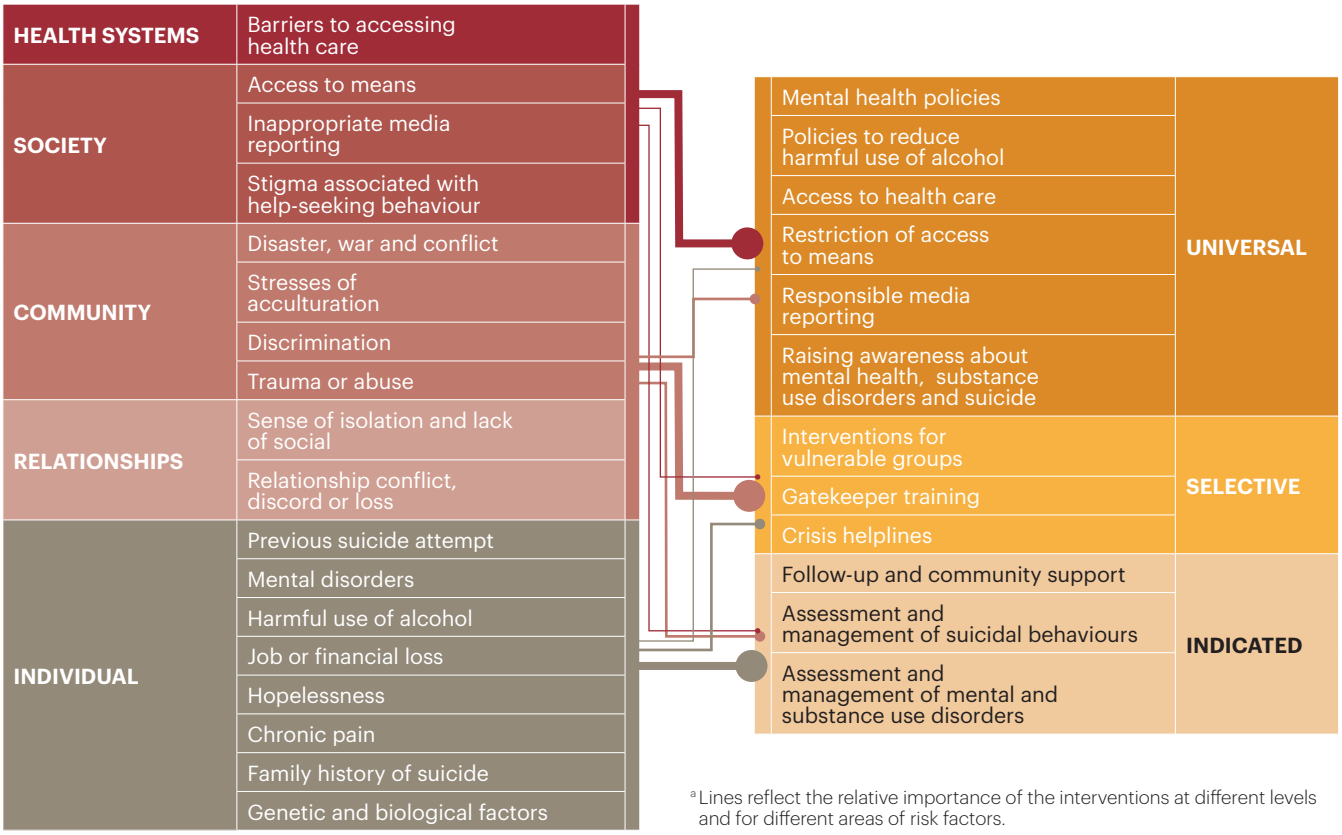
In short, developing and implementing appropriate suicide prevention programs for a community or country requires understanding the limitations of the available information and a commitment to improving data quality so that the effectiveness of specific interventions may be more accurately reflected.

## ASSOCIATED RISK FACTORS

Suicide risk factors related to the health system and society as a whole include barriers to accessing necessary health care and other help; the ease with which the means of suicide may be obtained; and media sensationalism of suicides, which may heighten the risk of copycat suicides. Other influences also are at work, such as the stigmatization of those who seek help for suicidal behavior (suicidal ideation or planning) or people with mental or substance use disorders.

Community-associated risks include wars and disasters, the stress of acculturation (e.g., among indigenous populations or displaced persons), discrimination, a sense of isolation, abuse, violence, and relationship conflict. Individual risk factors include, most notably, previous suicide attempts, mental disorders, harmful use of alcohol, financial loss, severe chronic pain, and a family history of suicide (Figure 1).

**Figure 1.**
**Key risk factors for suicide aligned with relevant interventions.[a]**




[a] Lines reflect the relative importance of the interventions at different levels and for different areas of risk factors.

### Risk prevention strategies

Prevention strategies to counteract these risk factors may be grouped along three levels.

Universal prevention strategies are designed to reach an entire population. These strategies promote access to health care, encourage approaches to prevent mental health issues (such as reducing the harmful use of alcohol), limit access to the means of suicide, and promote responsible reporting by the media.

*Selective prevention strategies* target vulnerable groups that are at higher risk of suicide than the general population, such as people who have suffered trauma or abuse, victims of war or disaster, refugees and migrants, and the relatives of people who have committed suicide. These activities are conducted, for example, by "gatekeepers" trained to provide support and services such as telephone help lines.

Finally, *indicated prevention strategies* target individuals with specific vulnerabilities specifically, people who have been discharged from psychiatric institutions or have attempted suicide. The intervention activities vary and include follow-up by general health workers or specialists or better identification and management of mental or substance use disorders.

Primary prevention that reinforces protective factors such as close personal relationships, a personal belief system, and strategies for coping with stressful situations may also be employed.

## CURRENT SITUATION IN SUICIDE PREVENTION

Knowledge about suicidal behavior has grown enormously in the past few decades. With respect to policies, 28 countries currently have national suicide prevention strategies. World Suicide Prevention Day, sponsored by the International Association for Suicide Prevention, is observed worldwide every year on 10 September. Furthermore, many suicide research units have been created, as have university courses on suicide and suicide prevention. In order to provide practical assistance to improve the assessment and treatment of suicidal behavior, countries are using non-specialist health professionals, creating mutual support groups of surviving relatives, and training volunteers. All are providing online and telephone assistance. In the past 50 years, many countries have decriminalized suicide, enabling people with suicidal behavior (ideation or plans) to seek help.

This report contains the public health model of suicide prevention (Figure 2). Suicide prevention begins with surveillance to define and understand the problem, followed by the identification of risk and protective factors. Once the elements or causes of the suicidal behavior are identified, an intervention is implemented and subsequently evaluated. Implementing the intervention is key to treating the problem.

Despite the progress mentioned above and the fact that suicide is a leading cause of death worldwide, it remains a low public health priority. In fact, suicide prevention and research on suicide have not received the financial or human capital investment they desperately need. It is hoped that this report will serve as a building block for the development and implementation of comprehensive suicide prevention strategies worldwide, the rational implementation of activities, and the assessment

**Figure 2.**
**Public health model of suicide prevention**

and scaling up of interventions. A comprehensive conceptual framework is obviously required, ideally one that is generated from national strategies that are tailored to specific cultural contexts and are backed by an evidentiary basis for implementation. Implementation and assessment should be conducted with vision, political will, and leadership, while enlisting direct stakeholders and adequate funding.

Prevention requires action. Suicide prevention approaches have evolved as community and country attitudes and beliefs about suicide have changed. The WHO report offers a blueprint to advance suicide prevention no matter where. Ministers of health have a critical role to play in providing leadership and bringing together stakeholders from other sectors in their country. They can collaborate in the coordination and implementation of relevant action in education, the media, justice, labor, social welfare, religion, and agriculture (pesticide control), using the current knowledge base about prevention.

In countries where suicide prevention activities are already under way, it may be advantageous to focus first on strengthening existing programs and conducting a situation analysis. Gaps may be identified to improve services, while efforts are made to develop an integrated national response by mapping and identifying all stakeholders and delegating roles and responsibilities accordingly.

## NATIONAL STRATEGIES

Numerous national suicide prevention strategies have been formulated in recent decades, particularly since 2000. A national strategy reflects the clear commitment of a government to address the issue. National strategies generally include prevention measures, such as surveillance, restriction of access to the means of suicide, guidelines for the media, stigma reduction, and public awareness, as well as training health workers, educators, the police, and other "gatekeepers." As a rule, these strategies also include crisis intervention and post-intervention services. A comprehensive suicide prevention strategy may involve multiple actors.

For a national suicide prevention strategy, it is essential that governments exercise leadership and call on multiple stakeholders who might not otherwise coordinate their actions. Governments are also in a unique position to develop and strengthen surveillance and to provide and disseminate the data necessary to inform action.

Suicide is a complex phenomenon with a multitude of intervening factors. Hence, there is no single response to its occurrence. Strategies to prevent it require tailoring measures to the cultural and social context of each country and the inclusion of evidence-based best practices and interventions with a comprehensive approach. Resources should be allocated to meet short-, medium-, and long-term objectives, and effective planning is a must. The strategy should be evaluated periodically and the findings used for future planning. However, lack of a fully developed comprehensive national strategy should not hinder the execution of less comprehensive suicide prevention programs, as these may contribute to the formulation of a national response. Some of these programs may be used to identify vulnerable groups at risk of suicide and increase their access to services and resources.

The development and putting in place of a national suicide prevention strategy requires:

- Recognition that suicidal behavior is a public health problem;
- An indication of government commitment to address the problem;
- Recommendation of a structural framework incorporating various aspects of suicide prevention;
- Guidance on suicide prevention based on key information—that is, identifying what has worked and what has not;
- Identification of the main parties and stakeholders accountable for specific tasks, outlining ways for them to coordinate;
- Identification of critical gaps in legislation, service delivery, and data collection;
- Allocation of the human and financial resources necessary for the interventions;
- Media efforts to raise public awareness;
- Adequate surveillance and an appropriate assessment framework requires inculcating a sense of responsibility among those responsible for the interventions to ensure that the necessary data are recorded reliably; and
- Creation of an environment for a research agenda on suicidal behavior.

### Development areas for strategic action

Strategic action implies:

- Engaging appropriate direct stakeholders and actors who can work within their own sectors or across sectors to reduce suicide rates;
- Making efforts to reduce access to the means of completing suicide;

- Improving the systematic collection of surveillance data to understand trends in suicide;
- Monitoring the effects of prevention efforts over time;
- Conducting efforts to debunk myths and raise awareness that suicide is a preventable public health problem; and
- Mobilizing the health system.

The purpose of strategic action is to promote continuous improvement and offer ideas about which actions to take. Table 1 provides examples of strategic action or ways of conceptualizing progress. The table is obviously not a formula or prescription for suicide prevention.

**Table 1.**
**Proposed strategic actions for suicide prevention, by current implementation level**

| Areas of strategic action | Lead stakeholders | No activity (currently there is no suicide prevention response at national or local level) | Some activity (some work has begun in suicide prevention in priority areas at either national or local level) | Established suicide prevention strategy exists at national level |
|---|---|---|---|---|
| Engage key stakeholders | Ministry of Health as lead, or other coordinating health body | Initiate identification of and engagement with key stakeholders on country priorities, or where activities already exist. | Identify all key stakeholders across sectors and engage them comprehensively in suicide prevention activities. Assign responsibilities. | Assess the roles, responsibilities, and activities of all key stakeholders on a regular basis. Use the results to expand sector participation and increase stakeholder involvement. |
| Reduce access to means | Legal and judicial system, policy-makers, agriculture, transportation | Begin efforts to reduce access to means of suicide through community interventions. | Coordinate and expand existing efforts to reduce access to the means of suicide (including laws, policies and practices at national level). | Evaluate efforts to reduce access to the means of suicide. Use the evaluation results to make improvements. |
| Conduct surveillance and improve data quality | Ministry of Health, Bureau of Statistics, all other stakeholders, and particularly the formal and informal health systems to collect data | Begin surveillance, prioritizing mortality data, with core information on age, sex and methods of suicide. Begin identification of representative locations for development of models. | Put a surveillance system in place to monitor suicide and suicide attempts at national level (including additional disaggregation) and ensure the data is reliable, valid and publicly available. Establish feasible data models that are effective and can be scaled up. | Monitor key attributes such as quality, representative- ness, timeliness, usefulness and costs of the surveillance system in a timely manner. Use the results to improve the system. Scale up effective models for comprehensive data coverage and quality. |
| Raise awareness | All sectors, with leadership from the Ministry of Health and the media | Organize activities to raise awareness that suicides are preventable. Ensure that messages reach some of the regions or populations targeted and are delivered through at least one widely accessed channel. | Develop strategic public awareness campaigns and implement them using evidence-based information at national level. Use methods and messages that are tailored to target populations. | Evaluate the effectiveness of public awareness campaign (s). Use the results to improve future campaigns. |

| | | | | |
|---|---|---|---|---|
| Engage the media | Media and Ministry of Health in partnership | Begin dialogue with the media on responsible reporting of suicide. | Approach major media organizations within the country to support the development of their own standards and practices to ensure responsible reporting on suicide. Work with media stakeholders to promote prevention resources and appropriate referrals. | Evaluate media reporting of suicide events. Engage and train all media about responsible reporting. Establish timely training for new workers in the media. |
| Mobilize the health system and train health workers | Formal and informal health systems, education sector | Begin planning and implementing care for people who attempt suicide, and train health workers. | Provide accessible evidence-based crisis care, clinical care and post intervention services at national level. Provide refresher training to health workers. Adapt curricula for health workers. | Implement regular monitoring and evaluation of existing services. Use the results to improve ongoing care. |
| Change attitudes and beliefs | Media, health services sector, education sector, community organizations | Begin implementation of activities to reduce stigma associated with seeking help for suicide. Increase help-seeking behaviour. | Change attitudes towards the use of mental health services, and reduce discrimina- tion against users of these services. | Conduct periodic evaluations to monitor changes in public attitudes and beliefs about suicide, mental and substance use disorders and help-seeking. |
| Conduct evaluation and research | Relevant community health services, education sector and Ministry of Health | Begin planning and prioritizing the required suicide prevention research, and collate the existing data (e.g. suicide deaths). | Expand existing research, assigning resources to inform and evaluate efforts to prevent suicide at regional and/or national level. | Conduct periodic assessment of the portfolio of research to monitor scientific progress and identify knowledge gaps. Redirect resources on the basis of the evaluation. |
| Develop and implement a comprehensive national suicide prevention strategy | Ministry of Health | Begin to develop a national suicide prevention strategy to serve as a rallying point, even if data and resources are not yet available. | Continue to develop the national strategy to ensure it is comprehensive, multisectoral and covers all gaps in service and implementation. | Evaluate and monitor strategy implementation and outcomes in order to identify the most effective components. Use the results to update the strategy continuously. |

The columns in Table 1 enumerate suggested measures for strategic action, regardless of a country's current progress in implementing an effective suicide prevention strategy. The intent is to enable stakeholders to use the information to consider the strategic action to take. It is suggested that stakeholders be included as potential leaders of each strategic action, using the Table 1 lists to identify additional measures to supplement current activities and fill in gaps in the national suicide prevention approach.

In the process, two key points should be taken into account. First, suicide prevention efforts should take place at the same time as data collection. Collecting and comparing reliable data on completed suicides and suicide attempts are important and have proven a real challenge in most countries. However, waiting for a perfect surveillance system to materialize is not the answer. Surveillance must be improved as the country moves forward with interventions to prevent suicides. In the meantime, changes will be introduced as necessary, based on the data.

Second, some countries may argue that for various reasons they are not prepared to provide a national suicide prevention response. Nonetheless, when actors and stakeholders are consulted about a possible national prevention response, an environment that enables change often results. Developing a national response to suicide engages stakeholders, stimulates public dialogue on matters related to stigma, identifies vulnerable target groups, sets research priorities, and raises public and media awareness. Consequently, instead of considering the development of a national response an end result, it would be more accurate to view it as an important step in the path toward effective suicide prevention.

## SUICIDE SURVEILLANCE AND MONITORING

The quality of the available global data on suicide and attempted suicide is poor in many countries. However, efforts are currently under way to improve surveillance systems, for which a series of key actions have been identified:

- Improve the quality of data (civil registration, hospitals, surveys, etc.), monitoring, and assessment systems in the countries;
- Periodically evaluate the availability, comprehensiveness, and quality of information regarding attempted and completed suicides;
- Include other monitoring activities (for example, on physical or mental health), instead of conducting independent activities; and
- Ensure that the surveillance system is used to support the development and assessment of suicide prevention activities.

## INSTRUMENTS

There are specific guidelines and protocols for each type of prevention strategy. For suicide, the World Health Organization developed the *mhGAP Intervention Guide* with recommendations for the assessment and management of activities for self inflicted injury/suicide. This guide was produced after an intensive systematic review of the scientific evidence by international experts who closely collaborate with the WHO Department of Mental Health and Substance Abuse. As a result of their efforts, the recommendations became phased interventions that were clearly presented.

Over the years, WHO has prepared a series of reports with data, guidelines, and recommendations on how to address suicide. Two reports are particularly relevant: *Preventing suicide: a resource series and Public health action for the prevention of suicide: a framework.*

WHO has also created *MiNDbank,* an online platform containing information from all the countries and international resources on mental health, substance use, disability, general health, human rights, and development. It is part of the *QualityRights* campaign, a WHO instrument for monitoring the quality of psychiatric care and respect for human rights. *MiNDbank* also aims to facilitate dialogue, advocacy, and research to promote reform in these areas in line with international human rights and best practice standards.

## REFERENCE

1. World Health Organization. *Preventing suicide: a global imperative.* Geneva: WHO, 2014.

# SUICIDE MORTALITY IN THE AMERICAS: REGIONAL REPORT OF THE PAN AMERICAN HEALTH ORGANIZATION/WORLD HEALTH ORGANIZATION

## INTRODUCTION

As has been stated in other chapters of this publication, in 2012 approximately 804,000 suicide deaths were reported worldwide, for an annual global age-adjusted rate of 11.4 per 100,000 population (15.0 among males and 8.0 among females) (1). In the Region of the Americas, some 65,000 suicide deaths are reported annually.

Historically, Latin America and the Caribbean have had lower suicide rates than the global average, while North America is at an intermediate level. Mortality data from Latin America and the Caribbean have been described as "irregular," with marked disparities in suicide rates from country to country, even between countries at similar levels of development.

Although suicide deaths remain the most visible and dramatic data, the various manifestations of suicidal behavior must also be considered, as they occur along a continuum that encompasses suicidal ideation, planning, and attempts. Various studies have shown that for each suicide, there are some 10 to 20, probably more, suicide attempts. Despite the frequency of these events, most countries lack a surveillance system for suicides and, hence, have no suicide attempt registry.

The Pan American Health Organization/World Health Organization (PAHO/WHO), considers suicide as a major public health concern, and has decided to strengthen its technical cooperation in this area. Its most recent Strategic Plan (2014-2019) included suicide among adolescents and young adults (15-24 years of age) as one of the impact goals to be evaluated in the Region. Also recognizing the concern over suicide and its potential control, the World Health Organization (WHO) in 2014 issued the global report *Preventing suicide: a global imperative* (1).

Pursuant to the mandates of the countries of the Americas, PAHO/WHO Mental Health and Substance Use Unit issued two five-year reports on suicide mortality in the Region, the first in 2009 and the most recent in 2014. This chapter is a summary of the second report, *Suicide Mortality in the Americas* (2), and includes additional comments by the author, who presented it at the regional workshop on suicide prevention, held in Mexico in October 2014.

The report provides an overview of suicide mortality in the Americas at the regional, subregional, and country levels, examining the distribution of suicide by age, sex, and method used, as well as suicide trends over the course of two decades (1990-2009).

## SUICIDE MORTALITY IN THE AMERICAS—REGIONAL REPORT

### Methodology

The suicide mortality data in this report are based on the number of deaths reported to the Pan American Health Organization (PAHO/WHO) by its Member States from 1990 to 2009. The denominators of the rates were taken from United Nations population figures. The mortality data analyzed correspond

to deaths due to intentional self-harm (ICD-10: X60-X84), according to the International Statistical Classification of Diseases and Related Health Problems, 10th Revision, (WHO, 2008).

To estimate stable suicide rates, the data were grouped into five-year periods (1990-1994, 1995-1999, 2000 2004, and 2005-2009). This report presents suicide rates in three ways: raw (unadjusted for age), age-adjusted, and corrected to include deaths of undetermined intent, which fall under external causes of death. The age-adjusted rates were calculated by the direct method, using the world standard population for 2005-2009. Deaths of undetermined intent (ICD-10: Y10-Y34) were redistributed.

Suicide mortality data were then analyzed by sex, age, and suicide method. Pearson's correlation ($p< 0.05$) was used to determine whether suicide trends had undergone a statistically significant change over a 20 year period (1990-2009). Finally, suicide's ranking among 65 subgroups as a cause of death was also evaluated.

This report used the following classification of countries by subregion: North America (Canada, the United States, Puerto Rico, and the U.S. Virgin Islands); Central America, the Hispanic Caribbean, and Mexico (Costa Rica, Cuba, Dominican Republic, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, and Panama); South America, comprising the Andean Region and the Southern Cone (Argentina, Bolivia, Brazil, Chile, Colombia, Ecuador, Paraguay, Peru, Uruguay, and Venezuela), and the non-Hispanic Caribbean (Anguilla, Antigua and Barbuda, Aruba, Bahamas, Barbados, Belize, Bermuda, British Virgin Islands, Cayman Islands, Dominica, French Guiana, Guadalupe, Guyana, Grenada, Haiti, Jamaica, Montserrat, Netherlands Antilles, Saint Kitts and Nevis, Saint Lucia, Saint Vincent and the Grenadines, Suriname, Trinidad and Tobago, and Turks and Caicos Islands). The term "Latin America and the Caribbean" includes all the countries except Canada and the United States.

## Results

Accounting for approximately 65,000 deaths from suicide annually and an age-adjusted mortality rate of 7.3 per 100,000 population for 2005-2009, suicide constitutes a major public health problem in the Americas. From a subregional perspective, the non-Hispanic Caribbean and North America experienced the highest suicide rates, and Central America, the Hispanic Caribbean, Mexico, and South America, the lowest.

The age-adjusted rate for Latin America and the Caribbean was 5.2 per 100,000 population for both males and females. Table 1 presents the unadjusted and age-adjusted annual suicide rates by subregion.

**Table 1.**
**Suicide rates per 100,000 population, in the Region of the Americas and by subregion, 2005 2009**

| Region | Unadjusted rates | | | Age-adjusted rates | | |
|---|---|---|---|---|---|---|
| | Total | Male | Female | Total | Male | Female |
| **America** | 7.62 | 12.1 | 3.14 | 7.26 | 11.54 | 3.04 |
| **Latin America and the Caribbean** | 5.20 | 8.22 | 2.10 | 5.23 | 8.39 | 2.12 |
| **North America** | 11.43 | 18.24 | 4.80 | 10.07 | 15.88 | 4.27 |
| **Central America, Hispanic Caribbean, and Mexico** | 5.06 | 8.11 | 1.97 | 5.30 | 8.50 | 2.02 |
| **South America** | 5.22 | 8.18 | 2.13 | 5.16 | 8.27 | 2.13 |
| **Non-Hispanic Caribbean** | 7.36 | 11.76 | 3.13 | 7.37 | 11.84 | 3.12 |

Standard used: world population 2005-2009.
Source: *Suicide mortality in the Americas. Regional Report.* Washington, DC: PAHO; 2014.

Suicide ranked 36th as a cause of death in the Region, 21st among males and 46th among females. In North America, it ranked higher, at 21st, and it was the third leading cause of death in the Americas in the 20–24 age group, and the fourth leading cause in the 10–19 and 25–44 age groups.

Suicide accounted for 12.4% of external causes of death in the Americas, ranging by subregion from 19.5% in North America to 7.9% in South America.

*Gender and suicide*

The age-adjusted suicide rates in the Region in 2005–2009 were 11.5 per 100,000 for males, and 3.0 for females. In Latin America and the Caribbean, the male and female rates were 8.4 and 2.1 per 100,000 population, respectively.

In the Americas, as elsewhere in the world, male suicide rates remain higher than female rates. According to the report, male suicides accounted for roughly 79% of all self-inflicted deaths. On average, the age-adjusted male/female ratio was 3.8 in the Region and 4.0 in Latin America and the Caribbean. At the subregional level, in Central America, the Hispanic Caribbean, and Mexico the age-adjusted male/female ratio was higher (4.2), while in North America it was lower (3.7).

At the regional level, male suicide rates were higher in all age groups. In all subregions, the male/female ratio was higher in persons over the age of 70. Regionwide, it was 7.9 for that age group, whereas the lowest male/female ratio (2.2) was observed in the population aged 10–19.

*Age and suicide*

The majority of suicides in the Region were reported among persons aged 25–44 (36.8%) and 45–59 (25.6%). Persons aged 60 and older accounted for 19.9% of suicides, while those aged 70 or older had a suicide rate of 12.4 per 100,000 population.

In most of the subregions, the highest suicide mortality was observed in the age group older than 70. In North America, the highest rate was seen in the 45–59 age group and in the non-Hispanic Caribbean, in persons aged 25–44. Males over 70 had the highest rates in all subregions except in the non-Hispanic Caribbean, where the highest rates were in the 25–44 age group. The ages of highest risk for females were 20–24 in most of the subregions. In North America and the non Hispanic Caribbean, in contrast, females aged 45–59 were at highest risk.

*Suicide methods*

Suffocation (39.7%), firearms (33.3%), and poisoning (18.2%) were the primary methods used in the Region, although they varied across subregions. The highest proportion of self-inflicted firearm deaths (47.2%) was observed in North America. Most suicides in Central America, the Hispanic Caribbean, and Mexico (64.3%) and South America (58.2%) were by suffocation. In the non-Hispanic Caribbean, poisoning was the most common method (47.3%).

The method chosen for suicide varied by sex. In males, suffocation was the most common method in the Region as a whole (41.7%) and in the subregions of Central America, the Hispanic Caribbean, and Mexico (68.1%) and of South America (61.5%). Firearms were the primary method used in North America (52.5%) and poisoning in the non-Hispanic Caribbean (44.4%).

In females, poisoning and suffocation were the most common suicide methods used in the Region (36.5% and 32.1%, respectively). Poisoning was the primary method in North America (39.7%) and the non Hispanic Caribbean (57.4%). However, suffocation was the most common method in the subregions of Central America, the Hispanic Caribbean, and Mexico (48.3%) and South America (46.0%).

In all countries, males were more likely to choose suffocation, firearms, and knives or cutting/piercing objects to commit suicide. Females, in contrast, were more likely to choose poisoning, jumping from a high place, drowning, or fire or flames. The greatest difference between males and females in terms of the primary method of suicide was related to firearms, which males used 1.9 times more often than females. Females, in contrast, were 2.7 times more likely than males to choose poisoning for suicide, and 4.2 times more likely to choose fire or flames.

Suicide methods also varied by age and subregion. In general, people under the age of 44 were more likely to choose suffocation, while those over 45 preferred firearms. In the subregions of Central America, the Hispanic Caribbean, and Mexico and of South America, the most common method in all age groups was suffocation. In North America, firearms were the preferred method, except among adolescents (ages 10–19), who most frequently chose suffocation. In the Hispanic Caribbean, the most common method was poisoning.

### Trends in suicide rates from 1990 to 2009

Suicide mortality rates in the Region of the Americas remained relatively stable over the 20-year period from 1990 to 2009.

When the subregional age-adjusted rates were examined, a slight decline in the overall rates was noted in North America. In contrast, the Central America, Hispanic Caribbean, and Mexico and the South America subregions showed increases, while the total suicide rates and the rates for both sexes in the non Hispanic Caribbean remained stable during the period. In South America, the increases were observed in both sexes. However, in North America and Central America, the Hispanic Caribbean, and Mexico, an increase was seen among males only.

The changes in suicide rates over the period were age-specific. In the Region as a whole, rates increased in the 25–44 age group, declining after age 45. North America experienced a reduction in all age groups, except in the 45–59 age group, where the rate increased. In Central America, the Hispanic Caribbean, and Mexico, there was an uptick in the 10–44 age group. In South America, suicide increased in persons aged 10–59, while there was a downward trend in persons over 70. The non-Hispanic Caribbean saw no significant changes during the period.

### Data limitations

The results of this report should be interpreted while bearing the following limitations in mind:

- Some of the countries lacked data for every year.
- Suicides represent an unknown percentage of unreported deaths. It is quite possible that a large number of suicides failed to be included in the rates of countries with a high percentage of unreported deaths. While underreporting in some countries is as low as 1%, in several countries underreporting of mortality by suicide is estimated to exceed 25%.
- Deaths of undetermined intent are those that the legal or medical authorities cannot attribute to homicide, suicide, or an accident. In the Region, such deaths account for 7% of all deaths from external causes. Only North America has percentages under 5%. A high percentage of deaths of undetermined intent suggests a higher number of potential suicides than is represented in the rates.
- A major problem with respect to underreporting rates is possible misclassification, which can be influenced by cultural and religious factors, as well as the stigma attached to persons who commit suicide.
- There are legal differences among countries regarding which deaths should be classified as suicides. Determining whether a death was a suicide involves not only legal issues but the aforementioned sociocultural factors.
- Suicides were reported in children under 5, probably due to errors in reporting and not to actual suicides in this age group. Such deaths accounted for only 0.05% of all reported suicides.

## FINAL CONSIDERATIONS

The first regional report on suicide mortality appeared in 2009 and analyzed the data for the period 1990 2004. The second report, "Suicide Mortality in the Americas," which is summarized in this chapter, was published almost five years later. On that occasion, the period 2005-2009 was added.

Clearly, suicide continues to be an important public health problem. This report provides a general descriptive overview of suicide in the Region and reflects a commitment by the Pan American Health Organization to tackle this health issue. PAHO/WHO has stepped up its efforts to appropriately address this problem and, in its most recent Strategic Plan (2014-2019), has made suicide one of the impact indicators to be evaluated in the Region of the Americas.

On average, some 65,000 people in the Region of the Americas die by suicide each year. This figure translates to an age-adjusted rate of 7.3 per 100,000 population for the period 2005-2009 (11.5. for males and 3.0 for females). The highest rates were observed in the non-Hispanic Caribbean and North America. Suicide was approximately four times more frequent in males than in females.

Persons over the age of 70, especially males, had the highest rate in the Region of the Americas. However, this finding was not valid for some subregions. Suicide ranked third among the leading causes of death in persons aged 10–24.

The primary suicide method in the Region was suffocation, followed by firearms and poisoning. These three methods accounted for more than 90% of all suicides. The methods used varied across subregions. In Central America, the Hispanic Caribbean, and Mexico and in South America, suffocation was the primary suicide method. In North America, it was firearms, and in the non-Hispanic Caribbean, poisoning. The method varied

by sex; males more often used firearms; females, poisoning.

Between 1990 and 2009, suicide rates in the Americas remained relatively stable, although rates changed in some subregions. There was a slight decrease in North America and increases in Latin America and the Caribbean.

Analysis of the data on suicide mortality is constrained by weaknesses in the information systems. Many countries have incomplete information, and underreporting is evident. This is explained in part by cultural, religious, and stigma-related factors that lead many families to hide the fact that a loved one has committed suicide.

Despite the large body of available literature on the subject, more in-depth research is needed in Latin America and the Caribbean to examine not only mortality but suicidal behavior as a whole, including suicidal ideation, planning, and attempts, as well as the associated social and cultural factors. Surveillance systems must also be strengthened.

As part of the evaluation of mental health systems in the countries it is necessary to collect and examine the available data on existing legal frameworks and the availability of programs, services, and resources for preventing and treating the problems associated with suicidal behavior.

Readers are invited to consult the English and Spanish versions of the report *Suicide Mortality in the Americas* (2), published by PAHO in 2014, which are available on the PAHO/WHO website. The WHO global report *Preventing suicide: a global imperative* (1) is also available (English and Spanish versions).

It is important to note that the reports of WHO (1) and PAHO/WHO (2) are not entirely comparable and yield different figures in some cases. This is because WHO used 2012 as the reference year for the analysis and estimated rates for countries whose mortality report for that year was not available. PAHO/WHO (2), in contrast, examined an earlier period to guarantee the availability of country mortality data. To ensure more stable (and thus, more reliable) rates, five-year periods were used.

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# SUBREGIONAL SUICIDE OBSERVATORY FOR CENTRAL AMERICA AND THE DOMINICAN REPUBLIC

## INTRODUCTION

The Subregional Suicide Observatory was created as an interdisciplinary, intersectoral resource to gather data and generate information about suicidal behavior in Central America and the Dominican Republic. Its purpose is to ensure timely official epidemiologic reporting to characterize suicidal behavior in the countries and thereby boost national capacity to make decisions for the creation and design of evidence based plans and programs. The Pan American Health Organization/World Health Organization (PAHO/WHO) encourages and endorses this initiative as part of subregional health policy integration in Central America and the Caribbean.

Suicide mortality data in Latin America have been described as "irregular," especially when compared with data from European countries (1). Delay in data reporting is one of the major problems (2). Also, marked disparities in rates exist between countries, even when they share similar levels of development (3). Methodological issues are likely the source of the discrepancies.

## RATIONALE

Recognizing suicide as a major public health concern, PAHO/WHO has intensified its technical cooperation in this area. Its recent Strategic Plan 2014-2019 (4) states that suicide is one of the impact goals that should be evaluated in the Region.

Setting this goal undoubtedly presents challenges for the countries, given their suicide reporting issues (see above). The lack of standardized variables—an instance of methodological obstacles—leads to data comparability issues, as does the absence of registration systems that have standardized processes for sustainable, methodical, and timely suicide event recording.

The proposal to create a subregional suicide observatory was conceived to strengthen mental health information systems and improve problem solving and decision-making with reliable epidemiologic evidence.

## BACKGROUND

According to WHO, suicide is a public health concern in high-income countries and is an emerging issue in low- and middle-income countries. It is one of the leading causes of death worldwide, especially among young people (5). Globally, more than 800,000 people die by suicide every year, which translates into one suicide death every 40 seconds. The number of lives lost to suicide each year exceeds the number of deaths from homicide and war combined. These surprising figures do not include suicide attempts, which occur more frequently than completed suicides (6).

Another precursor of the initiative is the subregional report on suicide in Central America and the Dominican Republic, 1988-2008 (*Informe subregional de suicidio en Centroamérica y República Dominicana*, 1988-2008—available in Spanish only) published by PAHO in 2011 (7), which traces the evolution of the problem in the eight countries of the subregion over a 20-year period In the regional report Suicide Mortality in the Americas,

it is estimated that approximately 65,000 suicides occur annually in the Region (8).

The PAHO/WHO subregional mental health office provides technical cooperation to member countries of the Central American Integration System (SICA), an organization that works to find joint solutions to the main problems of the populations of these countries. SICA is made up of Belize, Costa Rica, Dominican Republic, El Salvador, Guatemala, Honduras, Nicaragua, and Panama.

The integration system's Council of Ministers of Health of Central America (COMISCA) identifies regional health problems and sets priorities. Its Executive Secretariat, SE-COMISCA, serves as coordinator.

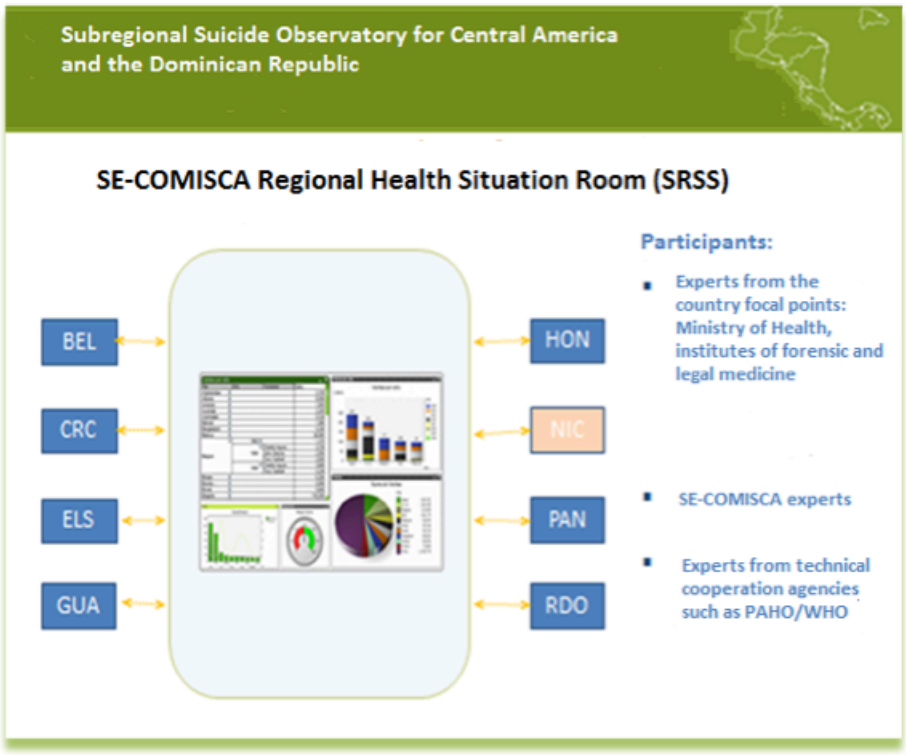
## Organizational structure of SE-COMISCA

SE-COMISCA is the politico-strategic and technico-administrative coordinating body. Its role is to improve and ensure the seamless functioning of COMISCA (9). COMISCA's periodic meetings are the main regional forum for analysis, deliberation, and proposals by the ministers of health. Other meeting participants are the Executive Secretary of COMISCA and the PAHO/WHO Representative in the host country, in the capacity of observer, along with advisors and specialists from the country delegations, guest contributors depending on the agenda, and SE-COMISCA staff. The venue of the Regular Meeting of COMISCA rotates among the member countries, following the sequential order established by the rotation of SICA's President pro-tempore.

SE-COMISCA has a subregional Virtual Office for Action, Information, and Communication for Health. The Virtual Office has a Regional Data Entry Platform and a Regional Health Situation Room (known by its Spanish acronym, SRSS) for the registration and analysis of data on diseases of high epidemiological interest in the subregion: dengue, influenza, and HIV infection (10).

Given these countries' membership in a common organization (COMISCA), progress in shaping the execution of regional health strategies, and the existence of the virtual platform, it was agreed to include suicidal behavior surveillance. The flexibility and horizontal structure of SE-COMISCA's online platform made it possible to include suicide reporting in the Regional Data Entry Platform (Figure 1). This is how the Subregional Observatory of Suicidal Behavior was created.

**Figure 1.**
**Structure for data entry, SE-COMISCA Regional Health Situation Room**



## SUBREGIONAL SUICIDE OBSERVATORY

### The Observatory's operational structure

Through the subregional technical coordinator for mental health in the PAHO/WHO Country Office in Panama, support was obtained for data management in SE-COMISCA'S Regional Data Entry Platform, the first step in putting the Observatory into operation. Next, national suicide focal points were appointed in collaboration with the PAHO/WHO Country Office in the eight participating countries. These technical staff served as liaisons with the Observatory, thereby establishing its first direct coordination with national programs.

### Implementation phases

Once the virtual platform had been created and focal points designated to operate the Observatory, the next step was to identify the primary source of the data to be contributed by each country. To that end, a survey was prepared to obtain official information on the primary data source and the individuals charged with providing the information. This was immediately followed by a consultation to determine which data to include.

This systematic approach was considered essential to create the Observatory, since countries register their epidemiologic information using different variables. Thus, a thorough technical search was conducted of the available information for each country. Once a consensus had been reached on which data to use, the next step consisted in verifying suicide variables reported in each country that were common to all countries. This exercise led to an agreement that the following variables should be reported: age, sex, time and place of the event, method, and date. The variables were later standardized.

### Standardization of variables

As mentioned earlier, this step is critical as it involves designing a strategic methodology to standardize the variables that will be monitored and reported. The most important part of this step is ensuring that countries use the same definitions and that each variable is reported on the same specified forms. This leads to the creation and standardization of a data collection instrument whose design incorporates international reporting criteria and standards such as the International Classification of Diseases, 10th Revision (ICD-10).

### Data collection instrument

Once the variables were selected and standardized, the data collection instrument was created, using the variables selected by the countries. The reporting instrument includes options for tracking each variable. Only information coinciding with that of the standardized forms can be uploaded. A Microsoft Excel spreadsheet is used. This spreadsheet is password-protected, preventing any changes in its structure and thus guaranteeing that the information can be entered in the platform with no problems and cannot be modified by individuals outside the technical area.

All forms are identified with the country's name and contain a heading with cells that are designated as the only space in which information can be entered.

**Figure 2.**
**Form for the entry of suicide cases reported by countries to the Observatory**

**Central American and Caribbean Suicide Observatory**
**Suicide data collection tool**

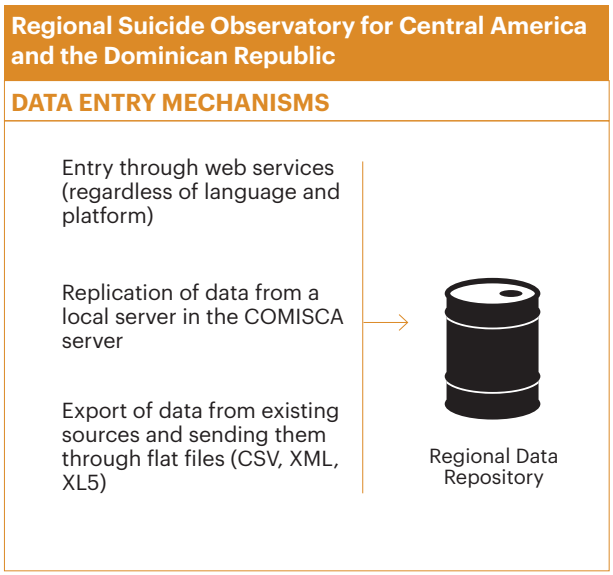
**Reporting institution:** Forensic Medicine

| | | | |
|---|---|---|---|
| **Year:** | 2012 | | |
| **Semester:** | 1 | | |
| **Country:** | SLV | El Salvador | |

| Age | Sex | Time | Place | Method | Date |
|---|---|---|---|---|---|

Figure 2 shows the form for El Salvador, whose acronym is SLV, as an example. The form for the rest of the countries in the subregion is similar. All staff designated as focal points were assigned username and password that enable them to upload the suicide data for their country to the platform (Figure 3).

**Figure 3.**
**Data entry mechanisms**




In short, the data entry process involved the following phases:

1. Definition of the data or variables to be collected;
2. Definition of the source and format of the data to be collected;
3. Standardization of the variables;
4. Definition of the periodicity of data updating; and
5. Definition of the data entry mechanisms.

As this process moves forward, every country in the subregion is expected to join. Seven of the eight countries currently belong to the Observatory.

## Launch of data entry

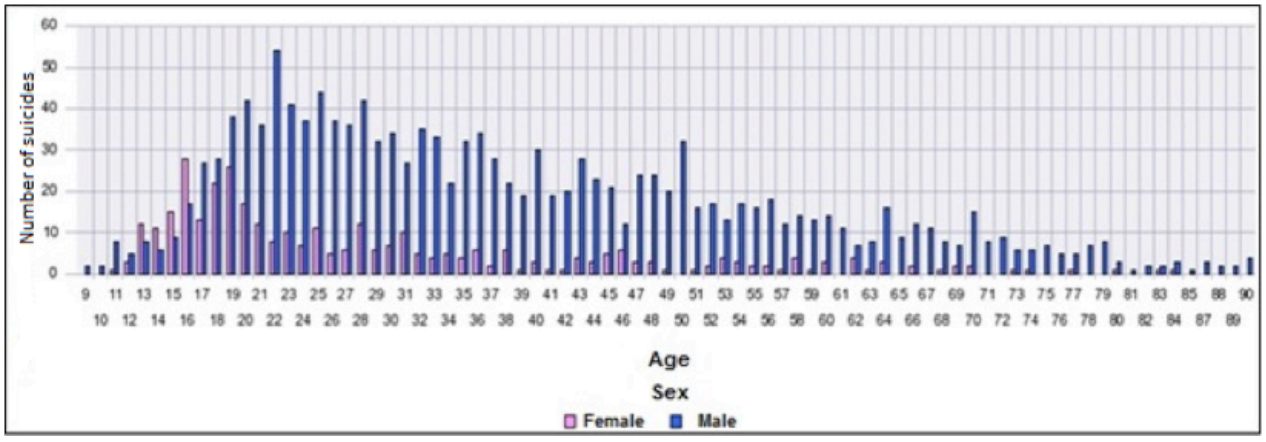
To facilitate the uploading of data, virtual meetings and two in-person workshops were held to train delegates from the countries involved in operating the platform. Afterwards, virtual meetings continued to be held to strengthen capacities and improve the data uploading to the platform. To make coordination of the virtual meetings run smoothly, terms for Presidents pro-tempore were established by country, in alignment with the six-month period in which each serves as President pro-tempore in COMISCA.

The Suicide Observatory is already functionally integrated with the Regional Data Entry Platform operated by SE-COMISCA and can be accessed through the website of the Virtual Office for Action, Information, and Communication for Health (Figure 4, only in Spanish).

**Figure 4.**
**Portal of the Virtual Office for Action, Information, and Communication for Health**


The Observatory has information available dating back to 2010, which is updated quarterly. At the time of this publication, it had data up to the third quarter of 2015. The Observatory has population data by country, sex, and age, making it possible to calculate suicide rates per 100,000 population. The data for Honduras and El Salvador are still reported according to national region, whereas the other countries send aggregate national data. The figures below provide examples of data from 2013.

**Figure 5.**
**Subregional suicide data, by age and sex, 2013**



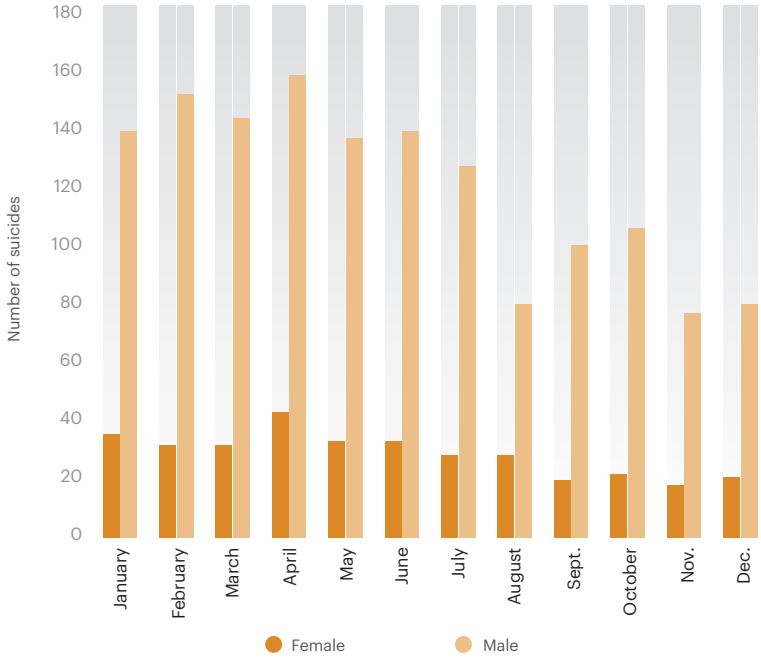

Source: Subregional Suicide Observatory

Among women, the ages with the highest number of suicide cases were between 15 and 19 years old; among men, they were at 22 years old (Figure 5). In both sexes, higher figures were reported among persons aged 15–28 years old.

Figure 6 shows that April and February were the months with the highest number of reported suicides among both sexes.

**Figure 6.**
**Suicide data, by month and sex, for the subregion, 2013**

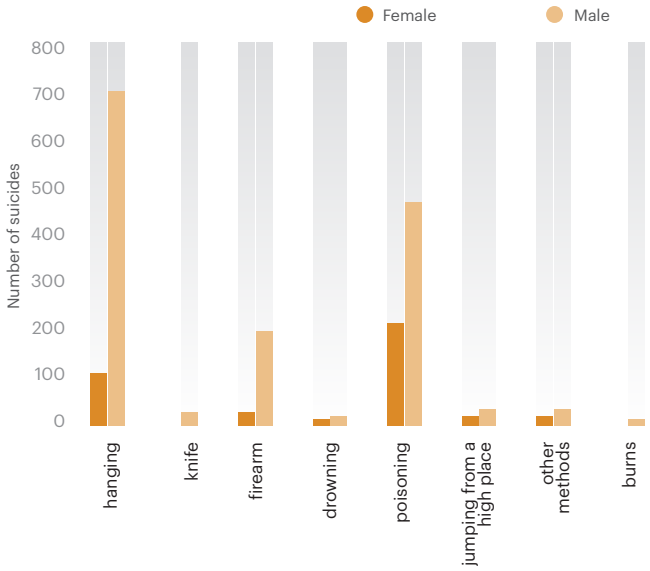
| | Female | Male | Total |
|---|---|---|---|
| January | 36 | 140 | 176 |
| February | 32 | 153 | 185 |
| March | 32 | 145 | 177 |
| April | 43 | 159 | 202 |
| May | 33 | 137 | 170 |
| June | 34 | 140 | 174 |
| July | 29 | 128 | 157 |
| August | 29 | 81 | 110 |
| September | 20 | 101 | 121 |
| October | 22 | 107 | 129 |
| November | 19 | 78 | 97 |
| December | 21 | 80 | 101 |
| | **350** | **1.449** | **1.799** |




Source: Subregional Suicide Observatory.

## Figure 7.
## Absolute suicide numbers, by method and sex, for the subregion, 2013

| | Female | Male | Total |
|---|---|---|---|
| Hanging | 104 | 713 | 817 |
| Poisoning | 213 | 472 | 685 |
| Firearm | 10 | 195 | 205 |
| Other methods | 13 | 28 | 41 |
| Jumping from a high place | 8 | 22 | 30 |
| Knife | | 12 | 12 |
| Drowning | 2 | 4 | 6 |
| Burns | | 3 | 3 |
| **Total** | **350** | **1,449** | **1,799** |



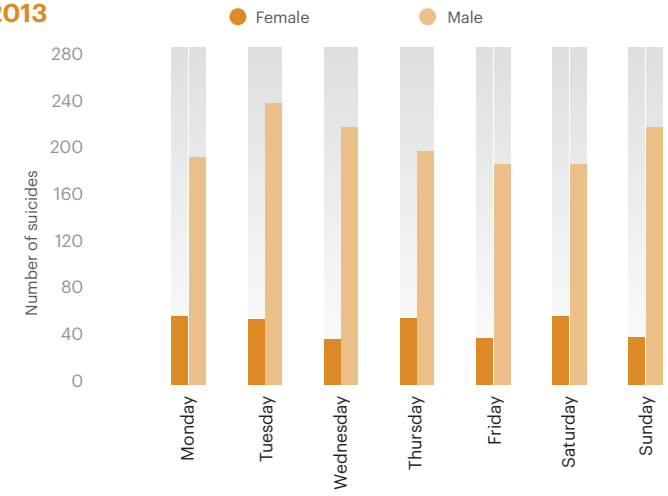

Source: Subregional Suicide Observatory.

Figure 7 shows that the primary method used to commit suicide is hanging, followed by poisoning and firearms. There is a clear male/female difference with respect to the preferred method: men prefer the use of more lethal methods, such as hanging, while women prefer poisoning.

Figure 8 shows that, according to the data reported, most suicides occur on Tuesdays, followed by Sundays and Wednesdays.

## Figure 8.
## Suicide data, by day and sex, for the subregion, 2013

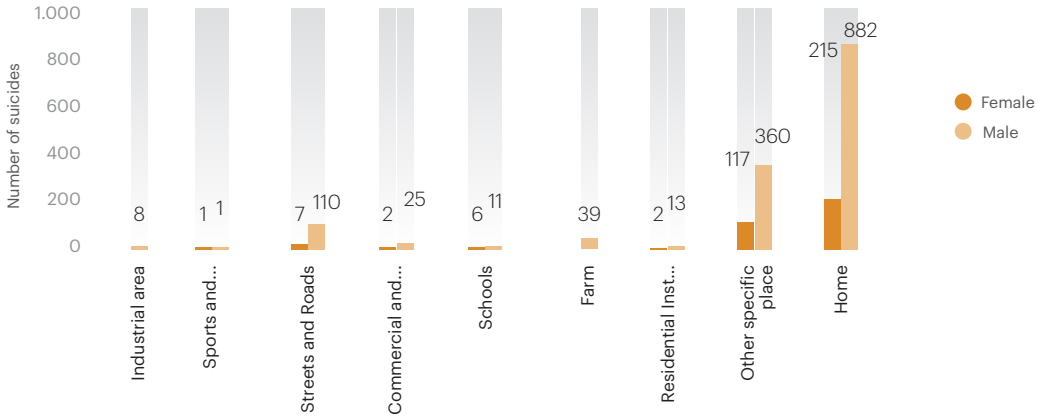
| | Female | Male | Total |
|---|---|---|---|
| Monday | 60 | 193 | 253 |
| Tuesday | 55 | 241 | 296 |
| Wednesday | 39 | 219 | 258 |
| Thursday | 57 | 198 | 255 |
| Friday | 40 | 189 | 229 |
| Saturday | 60 | 189 | 249 |
| Sunday | 39 | 220 | 259 |
| **Total** | **350** | **1,449** | **1,799** |




Source: Subregional Suicide Observatory.

**Figure 9.**
**Absolute suicide numbers, by place committed and by sex, for the subregion, 2013**

| | Female | Male | Total |
|---|---|---|---|
| Home | 215 | 882 | 1.097 |
| Other specific place | 117 | 360 | 477 |
| Streets and roads | 7 | 110 | 117 |
| Farm | | 39 | 39 |
| Commercial and service areas | 2 | 25 | 27 |
| Schools, other public institutions | 6 | 11 | 17 |
| Residential institution | 2 | 13 | 15 |
| Industrial and construction areas | | 8 | 8 |
| Sports and athletic venues | 1 | 1 | 2 |
| **Total per country** | **350** | **1,449** | **1,799** |




Source: Subregional Suicide Observatory.

The data in Figure 9 show that the preferred location to commit suicide is the home. Rarely, areas for sports and athletics are chosen as a venue.

## Agreements and monitoring for sustainability of the Observatory

The Subregional Suicide Observatory for Central America and the Dominican Republic is the first such effort in the Americas. The Observatory is considered very useful for informing the countries about the epidemiology of suicide in each of them and for making comparisons possible. It is therefore important to ensure that this process continues. The agreements and topics ratified by the focal points and technical coordinator to ensure proper monitoring and sustainability are summarized below.

- **Regularity of data collection:** Since one of the Observatory's objectives is to have up-to-date information for early intervention, it was agreed that the most feasible time interval for the countries to collect data is three months. In the end, it was decided that the data should be uploaded to the platform quarterly.
- **Commitment of the coordinating country:** The country that serves as President pro-tempore is responsible for verifying that all countries supply the data for that period, as well as for conducting a situation analysis and issuing an updated report for the six months of its term. It is also responsible for coordinating the virtual monitoring meetings and maintaining close communication with the technical support team that facilitated the Observatory's creation to ensure that the virtual platform is in good operating order.
- **Production of information:** By definition, the Observatory's production of information is

essential. Data analysis and discussion are the basis for making decisions and devising appropriate interventions to bring suicide rates down. The preparation of newsletters or reports on the findings was recommended. The first newsletter that was published contains information about the creation of the Observatory.

- **Frequency and participants in virtual meetings:** Virtual meetings are held in the situation room to foster discussions about the data in the platform. Two virtual meetings are held per semester, for a total of four per year. The participants are the staff designated as focal points. It has been suggested that each country also elect key actors who can contribute to the solution of the suicide problem.

### Observatory achievements

- The existence of a virtual platform with up-to-date suicide information. This permits timely knowledge of suicide patterns in the subregion;
- The existence of a functional subregional platform that includes suicide data. This has facilitated quarterly data reporting since 2010;
- Increased ease of suicide data capture and reporting;
- Recognition by each country of the importance of addressing suicide. Training has been provided to non-specialized personnel for this purpose;
- Publication of the first newsletter regarding the creation of the Observatory; and
- Updating of the document on the subregional frame of reference for suicidal behavior, which will serve as a guide for the preparation of the suicide prevention plan.

In Costa Rica, compulsory reporting of suicides and suicide attempts is now part of the health surveillance system. Given the advantages of this initiative, the other countries have been urged to follow the example.

### Next steps for the Observatory

- Standardize the variables for attempted suicide;
- Begin collecting data on attempted suicides;
- Develop a subregional suicide prevention plan, using the data obtained to formulate prevention strategies and address suicidal behavior, based on the strategies of the regional and subregional frames of reference;
- Develop guidelines to help each country train the personnel responsible for clinical diagnoses at the operational level;
- Work with national authorities to ensure the technical sustainability of the virtual platform and provide technical support to the suicide focal points in each country; and
- Look for opportunities to publicize and document country experiences with the support of national and international organizations.

### Challenges

- Ensure the sustainability and continuity of the Observatory platform;
- Make reporting of suicide attempts a compulsory part of the epidemiologic surveillance system in each country;
- Improve the information furnished by the countries, ensuring that the data are both national and official; and
- Coordinate internally with all individuals who enter data in order to build a consensus with the relevant authorities for timely decision-making.

## FINAL RECOMMENDATIONS

- Continue to raise awareness among decision makers about suicide, helping them visualize it with data and evidence to promote its inclusion in the national health policy agenda;
- Examine each country's suicide data, using it as input to formulate comprehensive national strategies to address the problem, within the framework of multisectoral participation that includes civil society; and
- Ensure the availability of financial resources to guarantee the technical sustainability of the virtual platform.

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# CREATION OF THE NATIONAL PROGRAM FOR SUICIDE PREVENTION IN CHILE

## INTRODUCTION

In 2007, following the guidelines for the prevention of suicidal behavior issued by the World Health Organization (WHO) (1), the Mental Health Department of Chile's Ministry of Health began to design the country's National Program for Suicide Prevention (2), which is grounded in the following principles:

- Base the program on general guidelines so each region may tailor it to local circumstances;
- Ensure its sustainability, incorporating program activities in routine health sector procedures as well as in those of all sectors involved in the prevention of suicidal behavior;
- Engage as many sectors as possible, since the proposed intervention model is based on an intersectoral approach as a prerequisite for suicide prevention;
- Engage both the public and private health sector, as suicidal behavior cuts across all social and economic groups;
- Include activities that have proven to be most effective elsewhere; in other words, the program should allow for the adaptation of international experience to local and regional conditions.

Given the vast geographic, cultural, and historical differences in suicide patterns in Chile, the program was designed with a regional approach so that it could be coordinated by the health secretariats in each region.

## NATIONAL PROGRAM FOR SUICIDE PREVENTION

### Components

The National Program has six components for the health secretariats as from all sectors involved in the prevention of suicidal behavior to implement in each region.

The first component is the creation of a surveillance system for suicidal behavior, making it possible to monitor suicides and suicide attempts alike, identify specific risk factors for each, and construct risk profiles to develop local intervention strategies.

The second component involves the development and implementation of regional intersectoral suicide prevention plans by panels in each region that represent as many local sectors as possible. The panels will formulate prevention plans using the data tracked by each region's surveillance system.

The third component consists of strengthening health professionals' competencies in detecting and managing suicide risk through in-service training, the distribution of technical tools, and work with educational institutions to ensure that these topics are included in the undergraduate and graduate curricula.

The fourth component involves preventive interventions in educational institutions to support an optimal educational environment for children and adolescents. This is accomplished by undertaking activities to boost self-esteem and develop life skills, fostering acquisition of the skills necessary for good crisis management and healthy decision making.

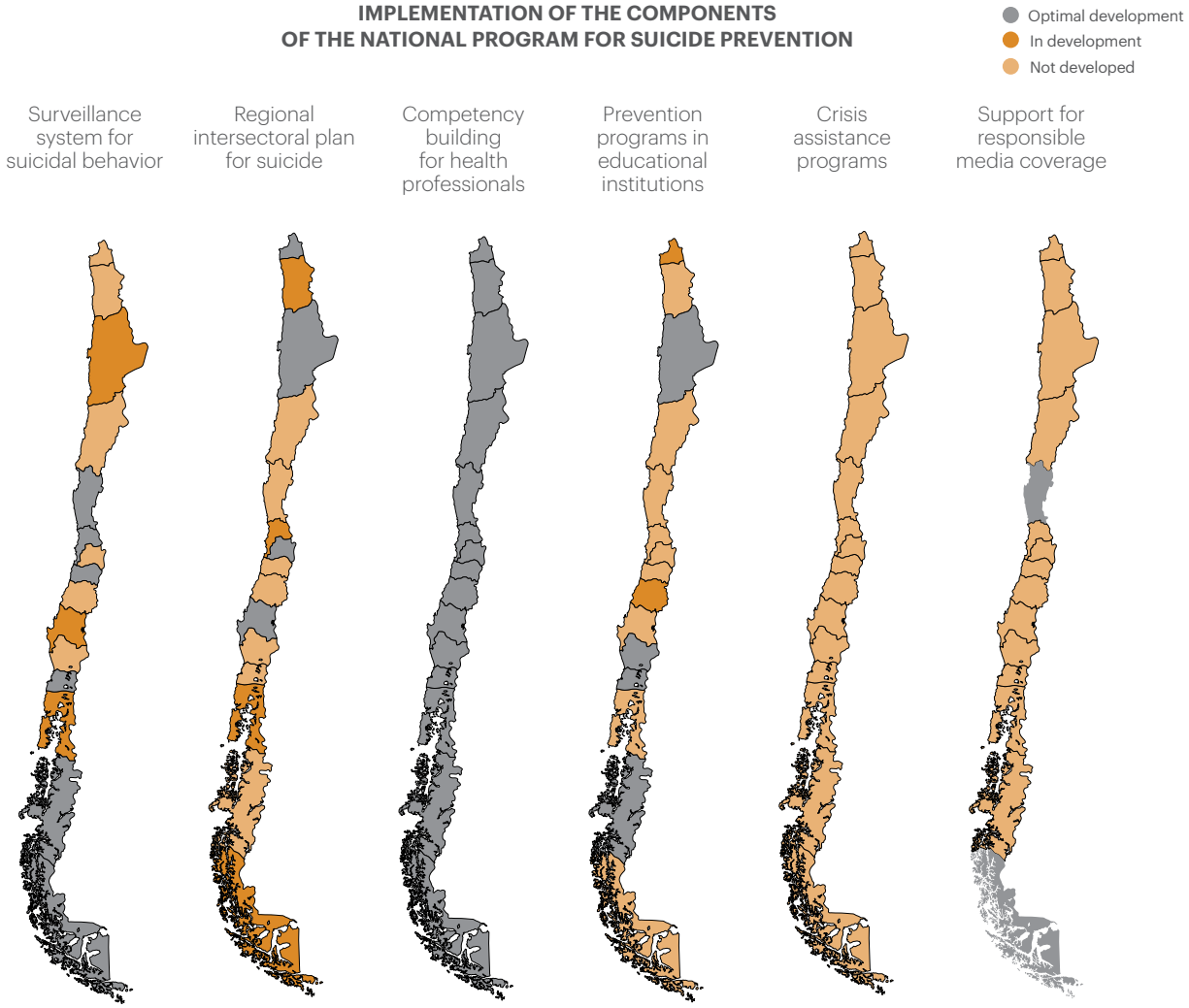
The fifth component consists of setting up crisis intervention programs such as telephone and web-based helplines and crisis intervention services that monitor individuals who have contacted the system and those who have made a suicide attempt.

Finally, the program includes a component on media coverage and a consideration of the role that the media can play in suicide prevention, given its potential influence on community attitudes, beliefs, and behavior. This component involves training communication professionals and periodically monitoring media reporting on suicidal behavior.

## Progress

The program needs both human and financial resources for its development and implementation in the country's 15 regions. However, Chile has not yet allocated specific resources for this purpose. Nonetheless, thanks to the commitment of health professionals, activities in connection with one or more of the six components have been carried out in all the regions, resulting in the progress described below (Figure 1).

**Figure 1.**
**Regional progress in implementing the components of the National Program for Suicide Prevention, Chile**



- **Competency building for health professionals.** All the regions have provided training in suicide prevention for public health system personnel, with an emphasis on primary health and mental health teams. The areas addressed include: theoretical aspects of suicidal behavior, risk and protective factors by age group, early detection of suicide risk, managing patients with suicide risk, managing patients who have recently attempted suicide, and the interview for conducting a psychological autopsy.

  A total of 3,780 staff received some type of in-person training. This was complemented in 2012 with a self-training module in the Ministry of Health's virtual training program on suicide prevention. As of June 2014, more than 3,300 staff had enrolled in this course.

- **Prevention programs in educational institutions.** There has been some development of this component, but only in four of Chile's 15 regions. The salient activities include training for instructors, teaching assistants, and student monitors. Two additional regions (Maule and Arica) have prioritized work with young people through regional advisory committees.

- **Crisis assistance programs**. This component of the National Program for Suicide Prevention has not been implemented in any of the 15 regions. Nationally, however, work with the "Health Responds" team has been under way to provide a coordinated response for people who call the helpline and, at the same time support public health personnel who need information about procedures or guidelines for action.

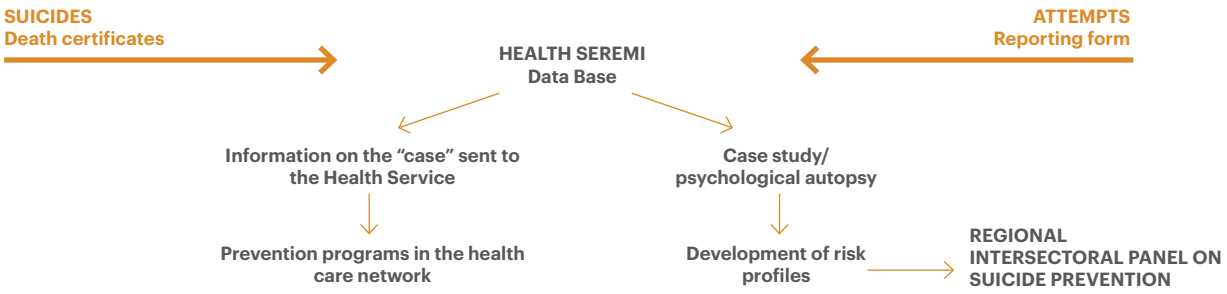
- **Media coverage.** Two of the country's 15 regions have systematically worked with the media, holding coordinating meetings with regional media organizations and training journalists.

Regional implementation of the program was accompanied by the development of a unified national surveillance system for use by all the regions. This system has been incorporated into the Ministry of Health's general epidemiological surveillance systems (Figure 2).

In order to make this a priority issue for the health system, other government sectors, and social stakeholders, periodic meetings, talks, and other events are held on suicide prevention, with participation in academic forum for analysis and discussion of suicidal behavior.

Mental health professionals in the regional health secretariats have also received training. The secretariats have received support in terms of materials and mentors for the training they provide to personnel in the health care network. The secretariats also receive ongoing advice and supervision when setting up the program, and social organizations receive technical assistance to support their suicide prevention efforts.

**Figure 2.**
**Flow chart of the surveillance system for suicidal behavior**

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*"Es un crimen no oponer a la muerte todos los obstáculos posibles."* José Martí

# A COMPREHENSIVE APPROACH TO SUICIDAL BEHAVIOR IN CUBA

## INTRODUCTION

Suicidal behavior is a complex problem stemming from the interaction of genetic, psychological, social, cultural, and environmental factors. In evidence since the very dawn of humanity, it has occurred in all eras, is seen in both sexes, and cuts across all social classes (1). Globally, it is among the three leading causes of death in individuals aged 15–34 (2).

In the foreword to *Preventing suicide: a global imperative,* published by the World Health Organization (WHO) (3), Dr. Margaret Chan, Director-General of WHO, notes: "Every suicide is a tragedy. It is estimated that over 800,000 people die by suicide and that there are many suicide attempts for each death. The impact on families, friends, and communities is devastating and far-reaching, even long after persons dear to them have taken their own lives."

Despite the fact that suicide is a preventable cause of death, a global age-adjusted suicide rate of 11.4 per 100,000 population was reported in 2012 (3).

The sharp upward trend in suicides has become a matter of concern for the countries' governments and health systems and for international organizations, all of which have responded with policies and programs for the prevention and control of suicidal behavior; yet, the outcomes have not always been encouraging. Seeking to improve these outcomes, in 1999 the World Health Organization launched its Suicide Prevention Program (SUPRE), a global suicide prevention initiative. The guide *Preventing suicide: a resource for teachers and other school staff* is part of a series of resources targeting diverse social and professional groups, including health workers, educators, social organizations, governments, lawmakers, media personnel, law enforcement agents, families, and communities (4).

Recent research indicates that suicide is preventable. Prevention involves a series of activities, such as providing suitable information for young people and children, offering effective treatment for mental illness, and controlling environmental risk factors. Appropriate dissemination of information and public awareness campaigns focusing on the problem are essential to ensure the success of prevention programs (4). WHO stresses the importance of remembering that suicides are not isolated events unrelated to the communities in which they occur.

## BASIC PRINCIPLES OF THE FAMILY MEDICINE PROGRAM IN CUBA

Under the family medicine model, 100% of the population has access to health services at the first level of care. In the Cuban health system, public health and individual health are integrated, observing the principles of universality, free service, accessibility, continuity, responsibility, and comprehensiveness in the health care provided to individuals, families, and communities (5).

One of the programs under this model includes treatment for suicidal behavior. The need for effective interventions to reduce suicide mortality became evident in Cuba some years ago, when the suicide rate spiked. From 1962 to 1970 it held steady, ranging from 10.6 to 12.6 suicides per 100,000 population. In 1972, however, the trend began to move upward. The figures began to stabilize in the 1980s but at rates in excess of 21.0 per 100,000 population.

In 1984, a national epidemiological study on suicidal behavior was launched. It began with active case-finding in the population. An instrument was developed and administered to the relatives of individuals who had attempted suicide and the health workers who had treated them. A cohort was formed with the individuals who had attempted suicide, which was periodically monitored (1). A series of steps were then taken to further improve the capture of primary data—mainly compulsory reporting of every self-inflicted injury and the optimization of emergency care for every attempt, including assessment by a psychiatrist.

In 1988, the National Program for the Prevention of Suicidal Behavior was developed, which began to be implemented in 1989. By 1990, rates had begun to decline, falling to 20.4 per 100,000 population (Table 1). This program has been modified several times.

**Table 1.**
**Crude and adjusted suicide rates by sex, Cuba, 1970-2013**

| | Male | | Female | | Total | |
|---|---|---|---|---|---|---|
| Year | Crude | Adjusted | Crude | Adjusted | Crude | Adjusted |
| 1970 | 13.6 | 15.6 | 9.9 | 11.2 | 11.8 | 13.5 |
| 1980 | 21.9 | 22.4 | 20.9 | 21.5 | 21.4 | 22.0 |
| 1982 | 24.1 | 23.9 | 22.3 | 22.1 | 23.2 | 23.0 |
| 1984 | 21.8 | 21.0 | 20.4 | 19.8 | 21.1 | 20.3 |
| 1985 | 22.9 | 21.9 | 20.6 | 20.0 | 21.8 | 20.9 |
| 1990 | 23.0 | 20.3 | 17.8 | 16.3 | 20.4 | 18.2 |
| 1995 | 25.5 | 21.5 | 14.9 | 13.3 | 20.2 | 17.3 |
| 2000 | 23.4 | 19.6 | 9.6 | 8.0 | 16.5 | 13.7 |
| 2002 | 20.4 | 16.5 | 8.2 | 6.5 | 14.3 | 11.4 |
| 2003 | 20.0 | 15.5 | 6.7 | 5.2 | 13.4 | 10.3 |
| 2004 | 20.3 | 15.8 | 6.6 | 5.2 | 13.5 | 10.4 |
| 2005 | 18.6 | 14.2 | 6.2 | 5.0 | 12.4 | 9.5 |
| 2006 | 19.6 | 14.5 | 4.9 | 3.5 | 12.2 | 8.9 |
| 2007 | 18.3 | 13.4 | 4.8 | 3.4 | 11.5 | 8.3 |
| 2009 | 20.3 | 15.1 | 5.9 | 4.1 | 13.1 | 9.4 |
| 2010 | 21.7 | 15.3 | 5.7 | 4.0 | 13.7 | 9.6 |
| 2011 | 21.6 | 15.3 | 5.6 | 3.8 | 13.6 | 9.5 |
| 2012 | 21.2 | 15.1 | 5.3 | 3.7 | 13.3 | 9.3 |
| 2013 | 21.4 | 14.8 | 5.3 | 3.7 | 13.3 | 9.1 |

## Other epidemiological data

A statistical analysis for 2011, 2012, and 2013 yielded the following results (6):

- Suicide was among the 10 leading causes of death, accounting for a total of 1,529, 1,495, and 1,490 deaths, respectively. The crude rates per 100,000 population were 13.6, 13.3, and 13.3 and the adjusted rates, 9.5, 9.3, and 9.1, respectively.
- In the 10–19 age group, suicide was the third leading cause of death, with total deaths of 40, 40, and 37 and a crude rate of 2.8, 2.8, and 2.6 per 100,000 population, respectively.
- It was the fourth leading cause of death in the 15–59 age group: 625, 604, and 553 deaths and rates of 10.4, 10.0, and 9.4 per 100,000 population, with a male/female ratio of 3.8, 4.0, and 4.0, respectively.
- Specific studies found that the most common method was hanging, especially among males.

## NATIONAL PROGRAM FOR THE PREVENTION OF SUICIDAL BEHAVIOR

### Program objectives

*General*

- Reduce morbidity from suicide attempts; and
- Reduce suicide mortality.

*Specific*

- Train health and mental health workers and the community in aspects of mental health;
- Set up a health surveillance system;
- Identify at-risk groups in the population;
- Optimize care for every person who has attempted suicide;
- Implement health promotion activities to promote protective factors and encourage healthy attitudes and lifestyles;
- Reduce suicide mortality in the under-20 and over-60 age groups; and
- Conduct qualitative and quantitative research to characterize suicidal behavior.

This program is a permanent fixture in all medical units across the nation. It is updated every five years and targets the entire population.

### Development of the program

The program employs a combination of strategies designed to tackle suicidal behavior, including: public policies to foster intersectoral and community participation; health promotion; health services with a network approach; risk mitigation; and the analysis of risk factors and health determinants, with a focus on primary care. Suicide risk assessment has traditionally considered risk factors; the success of preventive interventions depends on the early identification of these factors.

In designing the program for the prevention of suicidal behavior, priority was given to the identification of the at-risk individuals and population groups who would benefit from the specific prevention activities. Research, cohort studies, and statistical information were used to identify the groups at higher risk. When this information was lacking, consideration was given to the factors described in the literature, whose distribution is more or less universal.

The extensive array of risk factors, such as sociocultural and community aspects, which vary widely from context to context, underscored the need to conduct research to characterize this behavior and determine which behaviors are associated with suicide in the study population.

At-risk individuals were identified by active case-finding in the general population. It is redundant to point out the pivotal role of primary care services in this activity, since they are the gateway to the health system. The high credibility and capacity of these services to ensure continuous, dynamic, and organized procedures for comprehensive, planned assessment and intervention with a clinical, epidemiological, and social approach to individual and family health (7, 8) puts health workers at this level of care in a privileged position to identify and counsel people at risk of attempting suicide.

Identifying risk groups and risk situations enables the program to include specific preventive action in the primary care setting, with active participation by the basic health team: family physician, nurse, and psychologist.

This program also includes the use of other community and health resources to provide care for at-risk populations. For example, it promotes the inclusion of elderly people in "Grandparents' Circles," where efforts are made to meet their basic needs. Other examples are Women's Counseling Centers and Adolescents' Circles—the latter targeting young people with psychosocial risk factors for suicide or in situations involving isolation or loss of the group to which they belong.

In 1995, the program was included in the Reorientation of Psychiatry toward Primary Health Care strategy, whose basic feature is a stratified community approach. The purpose of the strategy is to improve the population's mental health by providing better services based on a community health model that stresses primary care, expands the curative and rehabilitation profile, emphasizes the risk- and protective-factor approach, and is integrated into the community through comprehensive public health efforts (9).

Activities to meet these objectives are carried out at all levels of care in the health system through service networks. As a part of an implementation strategy designed to strengthen mental health care using a community-based model, the activities consist of promotion, protection, prevention, treatment, and rehabilitation activities, with active community participation. They also include the optimization of care for patients with suicidal behavior to achieve rapid reintegration into their social milieu by systematically linking hospitals with community health workers.

In primary care, every person identified by the basic health team (family physician or nurse) as being at risk of suicide or has had a suicide attempt is assessed by a mental health team from the community mental health center or health area, taking into account the persistence of suicidal ideation, the plan and access to the means of suicide, and the presence or absence of social support networks, as well as the seriousness of the intent, the gravity of the situation, and the case-fatality of the intended method. When these parameters justify it, follow-up is provided for these people for at least one year, which is the period of greatest risk for a repeat attempt. The participation of the basic health and mental health teams makes it possible to use home care as a treatment option. The program thoroughly examines 100% of suicide attempts and suicides within 30 days of the event.

The second level of care conducts a thorough assessment of every person seen in the emergency services for a suicide attempt, emphasizing factors such as the persistence of suicidal ideation, the plan, access to the means of suicide, and the presence or absence of social support networks, in addition to the seriousness of the intent, the gravity of the situation, and the case-fatality of the method proposed, so that a decision can be made hospitalize the patient. Here, people are seen by a multidisciplinary team from the crisis intervention units of the psychiatry services of the country's general or psychiatric hospitals. The team is made up of psychiatrists, psychologists, nurses, and social workers. Hospital discharge is coordinated between the mental health team from the community or health area mental health center and the primary care services, which should guarantee follow-up.

The quality of care received by a person who attempts suicide depends on the organization, coverage, and accessibility of the health services, both primary and secondary. It has, therefore, been useful to create a flow chart for care and the protocols to follow for each level and institution in the network, with a referral and back referral system to guarantee the continuity of follow-up once the health system has successfully intervened in the crisis.

Under the program, a trained mental health professional or team at the first level of care provides follow-up and takes action to prevent a second suicide attempt. The community environment facilitates social integration and resources for rehabilitation. It also facilitates assistance to relatives and people close to the patient who suffer the consequences of the suicidal behavior or may themselves be at equal risk. Self-help and support groups made up of patients and relatives have proven to be a useful resource, including for surviving relatives of people who commit suicide (10, 11).

### Training

Training for program staff is differentiated and stratified by roles and responsibilities. It is one of the basic activities and requires continuous updating. The suicide module of the mhGAP Intervention Guide is currently being implemented (12).

It should be noted that the response is aligned with the program's objectives and purposes, the resources available for its implementation, and the organizational structure of both the health services and the community in general.

### Research

Conducting qualitative and quantitative research to characterize suicidal behavior has made it possible to learn about and solve specific problems or those related to epidemiological, diagnostic, and therapeutic aspects. Furthermore, the results obtained have made it possible to assess the need to devise interventions that target sociocultural and behavioral factors and population lifestyles.

### Epidemiological surveillance

One of the program's greatest achievements has been the development and launch of a statistical information system and a surveillance system on suicidal behavior. The cornerstone of the statistical system is the registration and quality of primary data, which is guaranteed by the compulsory reporting of every suicide and suicide attempt. The data are processed by the statistics departments of each institution at the different levels of care. The information is analyzed and the results are transmitted to the users of each entity of the system, along with relevant recommendations for decision-making and strategy development.

The objectives of the surveillance system are to learn about cases of attempted suicide and suicide, their main characteristics, the circumstances surrounding the events, and the methods used; to identify people at risk; and to alert policymakers (13).

Improving epidemiological surveillance of suicidal behavior is a priority in the current revamping of the program. In this regard, the development of epidemiology and epidemiological stratification by geographic area has led to an understanding of the uneven distribution of suicidal behavior in the country: some provinces have rates above the national average, while others have markedly lower figures. This inequality is also seen within provinces;

in some municipalities and towns, the number of cases is high, while in others, suicidal behavior is not a problem. Similarly, there are differences in the distribution of risk factors, especially those related to sociocultural and environmental aspects. Stratification has also facilitated the identification of regularities, specificity, and responses to the interventions. Although the scope of the program is national, activities, planning and decision-making are based on stratification, considering the particular characteristics of suicidal behavior in each province, municipality, and community. Surveillance systems must be capable of collecting, analyzing, and disseminating the information and periodically evaluating the effectiveness of the entire process (14).

### Communication

The program also has an educational component, supported by an information and communication strategy designed to foster and increase knowledge and the adoption of healthy attitudes, values, and practices that discourage self-destructive behavior. The strategy is based on an initial diagnosis of the needs and means of the target population.

International studies on media use show a direct correlation between media coverage and an increase in suicides, due to the copycat effect of suicidal behavior. Young people and the elderly are the groups most likely to be influenced. This has aroused concern that intense reporting of news about suicides can create a "culture of suicide." The copycat effect of publicity about these events depends on the tone and language used, how the information is reported, and graphic or other material used (15).

On the other hand, it is believed that responsible reporting of suicide can help save lives. Vulnerable people who seek help benefit the most, provided that the media furnish the right information. Efforts in mass communication strategies are geared to debunking myths through demonstrable scientific evidence; they inform the public about warning signs, health institutions where people can go to get help, and simple measures that can be taken with a person at risk.

## CONCLUSIONS

The main priorities of the program are:

- Improving the data collection system, the reliability of the primary data, and the flow of information;
- Continuous stratified training;
- Intervention in vulnerable and at-risk groups; and
- Systematic quality care for every person who attempts suicide.

Actions designed to meet the program objectives occur at all levels of care in the health system, and are supported by an implementation strategy designed to strengthen community-based mental health efforts. This is done with active community participation and the optimization of care for patients with suicidal behavior; the goal is to achieve their rapid reintegration into their social milieu through the systematic linkage of hospitals and health workers in the community.

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# STRATEGY FOR THE PREVENTION OF SUICIDAL BEHAVIOR – CENTERS FOR DISEASES CONTROL AND PREVENTION (CDC)

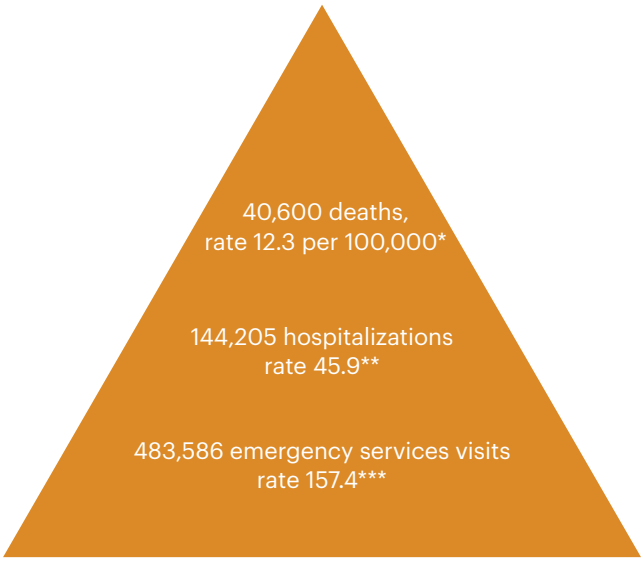
## INTRODUCTION

### Epidemiological characteristics of suicide in the United States

Suicidal behavior is a major public health challenge in the United States, as in the rest of the world, resulting in premature death, morbidity, lost productivity, and higher health care costs (1, 2). According to 2013 national mortality data, there were 41,149 deaths by suicide, or approximately one suicide every 13 minutes (3). That year, suicide was the 10th leading cause of death, and it has ranked among the 12 leading causes of death since 1975 (4). In 2009, the number of suicide deaths exceeded the number of deaths caused by traffic accidents (5). Overall, suicide rates rose steadily between 2005 and 2013 (15.3%). It should be noted that suicide is a problem at all stages of life. In fact, it is the third leading cause of death in children aged 10 to 14; the second in young people aged 15 to 24; the fourth in adults aged 25 to 44 years; and the eighth in adults aged 45 to 64 (6).

In the United States, completed suicides reflect only a portion of the people with suicidal behavior (for example, suicidal ideation, suicide planning, and suicide attempts) (7). Indeed, more people are hospitalized for non-fatal suicidal behavior than those with fatal injuries. However, even more people are seen for this cause in ambulatory care settings or do not get help (7) (Figure 1). In 2012, some 144,205 people were hospitalized in the United States for suicidal behavior, and there were 483,586 visits to hospital emergency rooms for self inflicted injuries (6).

**Figure 1.**
**Public health burden of suicidal behavior, USA, 2012**




Sources:

* CDC National Vital Statistics System

** Healthcare Cost and Utilization Project – Nationwide Inpatient Sample (HCUP-NIS)

*** CDC National Electronic Injury Surveillance System - All Injury Program

Several studies have shown that many people with suicidal behavior never turn to health services for help (8, 9). Consequently, incidence rates based on people who receive medical care substantially underestimate the burden of suicidal behavior on society. A wide range of measurement instruments therefore is needed to obtain a better understanding of the magnitude of the problem. Population surveys are useful, since they capture data that can paint a very different picture than information based on medical care received in the health system. In 2012, 8,300,000 people (3.7% of the adult population) reported having serious suicidal ideation, while 1,100,000 people (0.5%) reported having attempted suicide the previous year (10). Of the adults who reported a suicide attempt, 56.5% had received medical care (10). According to a representative national sample of high school students in 2013, 17% reported having seriously considered suicide during the 12 months prior to the survey, while 8% reported having made a suicide attempt (11).

Suicide, suicide attempts, and suicidal ideation have enormous emotional, physical, and economic costs for individuals, families, and communities. According to one estimate, each suicide death directly affects six people (that is, survivors), meaning that there are some 13 million survivors in the United States. This has serious implications, since survival is itself a suicide risk factor (12). This chapter will discuss the public health approach to preventing suicide-related problems and selected activities in the United States that correspond to the steps in that approach.

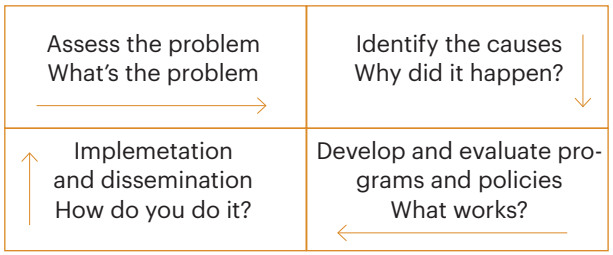
## PREVENTION MODEL

The public health prevention model has four basic steps (Figure 2):

1. Define and evaluate the problem;
2. Identify causes or risks and protective factors;
3. Develop and test programs and policies; and
4. Implement them and disseminate information (13).

These steps are often interconnected, with one step informing and leading to changes in another. The activities selected for each of the four steps are presented below. (It is also advisable to consult other publications containing a more exhaustive list, the specifics of these activities, and the suicide databases) (14, 15, 16).

**Figure 2.**
**The public health approach to suicide prevention**




### Activities for evaluating the problem

Recognizing the need for standardized terminology and measurements to improve the quality of surveillance data on suicidal behavior, the Centers for Disease Control and Prevention (CDC) and the National Center for Injury Prevention and Control (NCIPC) worked with the U.S. Department of Veterans Affairs to develop uniform definitions and data elements for the surveillance of self-inflicted violence (17). This process included consultations to address some of the scientific issues related to the potential definitions and data, whose collection may be considered part of the surveillance activities.

Systems that compile mortality data include the National Vital Statistics System and the National Violent Death Reporting System. Table 1 describes several of these systems.

The National Vital Statistics System (NVSS), administered by the Centers for Disease Control and Prevention and the National Center for Health Statistics, compiles, analyzes, and publishes data obtained from the archived death certificates of people who have died in the United States and its territories (18).

The National Violent Death Reporting System (NVDRS) is an active population surveillance system designed to obtain a complete census of all violent deaths of state residents and those that occur within the state among non-residents. The system compiles information on homicides, suicides, deaths of undetermined intent (that is, where there is not enough information for a medical or legal authority to distinguish between unintentional injury, self-inflicted injury, or assault), deaths due to legal intervention (for example, death of a person by an on-duty police officer), and accidental firearm deaths. The NVDRS employs a multi-source strategy

**Table 1.**
**Description of selected surveillance systems**

| Agency | Database and acronym | Event | Source of original data | Census or Sample | Jurisdictional level | Data on suicide | Frequency of database updating | Where to find the documents |
|---|---|---|---|---|---|---|---|---|
| **Injury deaths** | | | | | | | | |
| Department of Health and Human Services/ CDC/NCHS | National Vital Statistics System (NVSS) | Death | Death certificates | Census | County /borough | Compiles basic demographic data and information on external causes of death and the nature of the injury | Annual | http://www.cdc.gov/nchs/deaths.htm |
| Department of Health and Human Services/ CDC/NCIPC | National Violent Death Reporting System (NVDRS) | Death | Death certificates, medical examiner's/ physician's reports, police records, and data from the forensic laboratory. | Census | State | Compiles information on the characteristics and circumstances of deaths by self-inflicted violence. Includes information on variables such as mental illness, recent crises, method, and toxicology. | Annual | http://www.cdc.gov/ViolencePrevention/NVDRS/stateprofiles.html |
| **Injury Morbidity** | | | | | | | | |
| Department of Health and Human Services/ CDC/NCIPC | National Electronic Injury Surveillance System (NEISS/AIP) | Visit to emergency medical services | Emergency service medical records | Sample | US | Compiles data on self-inflicted injuries. Includes information on suicide attempts, external causes of the injury, and substances used. | Annual | Links to the NEISS coding manual, sample design, hospital level, etc. are found in: https://www.cpsc.gov//Global/Neiss_prod/2016NonTraumaNEISSCodingManual.pdf |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Department of Health and Human Services/ AHRQ | National Sample of Hospitalized Patients from the Healthcare Cost and Utilization Project | Hospitalized patient | Database developed with hospital administrative data | Sample | US | Compiles data on primary and secondary diagnoses and protocols; patient demographic characteristics (e.g., sex, age, race, average household income, zip code); characteristics of the hospital (e.g., ownership); expected source of payment; total staff; hospital discharges; length of hospitalization; severity and comorbidity of the measures. | Annual | http;//www.hcupus.ahrq.gov/nisoverview.jsp |
| **Behavioral risk factors and injury incidence** | | | | | | | | |
| Department of Health and Human Services/ CDC/CSELS | Youth Risk Behavior Surveillance System (YRBSS) | Behavior | Self-administered, computer-assisted | Sample | States, some large metropolitan areas | Self-reporting of serious suicidal ideation, plans, attempts, and attempts that required medical attention in the past 12 months | Biennial (in odd years) | http://www.cdc.gov/HealthyYouth/yrbs/ |
| Department of Health and Human Services/ SAMHSA, Center for Behavioral Health Statistics and Quality | National Survey on Drug Use and Health (NSDUH) | Behavior | In person, computer-assisted | Sample | States, some large metropolitan areas | Self-reporting of serious suicidal ideation, plans, attempts, attempts that required medical attention and attempts that required hospitalization in the past 12 months | Annual | http://www.samhsa.gov/data/NSDUH.aspx |

for the analysis of violent deaths (for example, using death certificates, medical examiners or physician's reports, police records, and toxicology data from the forensic laboratory). With information from all these sources, data compilers in each state assign a cause of death to each case (for example, suicide, homicide, accidental death by firearm, legal intervention, death of undetermined intent) (19). In 2014, the National Violent Death Reporting System compiled data from 18 of the 50 U.S. states.

Examples of morbidity databases derived from official records include the Healthcare Cost and Utilization Project and the All Injury Program (AIP) of the National Electronic Injury Surveillance System (NEISS).

NEISS-AIP was developed by the U.S. Consumer Product Safety Commission (CPSC). NEISS was expanded in July 2000 to compile data on all types of non-fatal injuries treated in a national representative sample of hospital emergency services, creating a complementary system called NEISS AIP. The system consists of a probabilistic, stratified national sample of hospitals, taken from all hospitals in the United States that have more than six beds and provide round the-clock emergency services (20).
The Healthcare Cost and Utilization Project (HCUP),

a group of databases with software tools and related products, was developed through a partnership between the federal government, the states, and industry, sponsored by the Agency for Healthcare Research and Quality. HCUP databases compile administrative data and contain publishable data and clinical and non-clinical information, including diagnoses and protocols, hospital discharges, patient demographic data, and costs to health service financing entities (for example, Medicare, Medicaid, and private insurance) for all patients, as well as costs for the uninsured. This information goes back to 1988. HCUP has databases for different types of information, such as hospitalizations, emergency services, and outpatient surgeries. One of these databases is the Nationwide Inpatient Sample (NIS), which covers the entire country and is the largest open access database in the United States on hospitalized patients, whatever the source of healthcare financing (21).

The surveys for compiling morbidity data include the Youth Risk Behavior Surveillance System (YRBSS) and the National Survey on Drug Use and Health (NSDUH).

The YRBSS survey, administered by the CDC's Division of Adolescent and School Health, monitors the risk patterns that contribute to the leading causes of death, morbidity, and social dysfunction in adolescents and young adults in the United States. The national YRBSS survey has been conducted every two years since 1991. Cross-sectional data from representative national samples of high school students are compiled on a wide range of priority risk behaviors, which include suicidal ideation, suicide planning, and suicide attempts. The questionnaire contains approximately 98 questions and is administered in the classroom by trained data collectors during a regular class period, with computer support. Students' participation in the survey is anonymous and voluntary, and local procedures for obtaining parental consent are followed (22).

The National Survey on Drug Use and Health, conducted by the Substance Abuse and Mental Health Services Administration (SAMHSA), is an annual nationwide survey that includes interviews with approximately 70,000 randomly selected people aged 12 and older. The survey data provide a representative sample of the uninstitutionalized general population in that age group. The survey compiles information on the risks associated with the use of drugs (including the use of prescription drugs for non-therapeutic purposes), alcohol, and tobacco; initiation of substance use; substance use disorders and their treatment; health care; and mental health. The data from the questions on suicidal ideation and suicidal behavior among people over 18 from all 50 states and the District of Columbia included in the sample are found in the mental health section (7). Despite the apparent abundance of surveillance systems, more state and local data on non-fatal suicidal behavior are needed, especially data on hospitalized patients and emergency services (23).

### Activities for identifying risk and protective factors

The CDC finances several (ICRC) to address education and research in an integrated manner, which will eventually have an impact in the field of violence and injury prevention. The centers' activities include a series of research, education, and prevention projects that deal with specific problems in violence and injury prevention at the national, state, and local level.

Several ICRCs have projects on suicide, and one of the centers focuses particularly on this area (24). The University of Rochester Center for the Study and Prevention of Suicide (in New York State) is devoted primarily to preventing the problems associated with suicide and promoting public health strategies geared to reducing mortality and morbidity from suicide and suicide attempts. The center's projects include: improving access to the most important data for planning prevention initiatives; defining and systematically tackling the challenge of preventing suicide and suicide attempts in middle-aged men and women; and focusing on the prevention of intimate partner violence as one of the many areas in which individual and family dysfunction, substance abuse, and economic and financial hardship interact, contributing to suicidal behavior and death.

The CDC also supports the Adverse Childhood Experiences Study (ACE), one of the largest investigations into the relationship between abuse in childhood and health and well-being later in life. Adverse childhood experiences include verbal, physical, and, sexual abuse and family dysfunction (for example, a family member who is incarcerated or suffers from mental illness or addiction; domestic violence; the absence of a parent due to divorce or separation). Adverse childhood experiences have been linked to a series of negative health outcomes in adulthood, including substance use, depression, cardiovascular disease, diabetes, cancer, premature death, and suicidal behavior (25).

The strategic direction for the prevention of suicidal behavior includes a 5-year horizon for CDC prevention efforts. The general strategy

is geared to building individual, family, and community connections (26). These connections show the degree to which a person or group is socially cohesive, interconnected, or shares resources with other people or groups. A number of concepts related to connectedness have been linked with suicide and self-inflicted violence, including the degree of social support, social engagement, social isolation, social integration, social cohesiveness, and social capital. The CDC conducted a literature review to find definitions of "connectedness" and invited a group of experts to draft a practical definition that could be used to adjust its measurement with respect to self-inflicted violence (27, 28). The goal is to improve the utility, measurement, and monitoring of connectedness and the factors related to resilience (the capacity to recover or deal with adverse situations).

Concerning research on risk and protective factors, more longitudinal studies are needed that focus on identification of the factors that protect against suicide in the general population. Also needed is research that examines the relationship between different factors that occur simultaneously in the many forms of violence, such as suicidal behavior, child abuse, interpersonal violence in adolescents, and intimate partner violence, along with studies that better define the relationship between suicidal behavior and the social determinants of health—for example, poverty and policies that heighten inequality (29).

**Activities for program development and evaluation**

The CDC collaborates with investigators from two U.S. universities to develop and evaluate programs for the prevention of suicidal behavior that are centered on fostering connectedness. One of the projects is run by staff from the University of Michigan and works with adolescents. This program includes a controlled random prevention trial designed for adolescents at high risk of suicidal behavior and connects the adolescent at risk with both another adolescent, called a "natural mentor," and a mentor from the community to facilitate and support the adolescent's participation in community organizations and activities (30). The other program, run by investigators from the University of Rochester, focuses on strengthening connections among older adults. The program includes primary care patients over the age of 60 who say they are lonely or a burden to others. They are randomly assigned to a control or intervention group. The intervention group is either assigned a peer companion or its members are trained to become peer companions themselves. These studies are helping people working in the prevention of suicidal behavior foster connectedness among vulnerable populations.

As part of the inter-institutional evaluation agreement between the ICRC and SAMHSA to strengthen the evaluation of the Garret Lee Smith Memorial Suicide Prevention Program (GLS), three detailed evaluations of local GLS programs were conducted. These programs are supported and administered through a unique partnership between SAMHSA and the CDC, whereby resources from both agencies are used as supplementary funding for expert evaluation and supervision. Conducted in Maine and Tennessee and at the Native American Rehabilitation Association - NW (NARA-NW), the three evaluations provided an opportunity to multiply resources and promote work in this field, obtaining more specific and detailed intervention data than had been collected through all the programs that receive funding (31).

From 2009 to 2011, the enhanced evaluation grantees supported by CDC and SAMHSA, engaged in a process to make their findings actionable for the field of suicide prevention. Thus, each site developed an "actionable knowledge" tool, which implies taking knowledge and applying it to daily practice to improve suicide prevention activities, stressing connectedness as a protective factor in suicide prevention (32).

Three reports were prepared targeting suicide prevention specialists. These reports highlighted three main themes of the detailed evaluations:

1. Suicide is a public health issue;
2. Connectedness is important for preventing suicide; and
3. Actionable knowledge processes and products are methods to promote the identification and use of research results or evaluations of suicide prevention practices.

The three reports highlight the work of the detailed evaluations' beneficiaries and provide relevant data to inform practice in suicide prevention. The reports include action-oriented content that enables readers to apply the lessons learned in their own practice (33). Still needed are the development and evaluation of programs that include the identification of approaches that have successfully prevented multiple health problems, such as substance abuse, suicidal behavior, and delinquency. It is also necessary to expand the evaluation of programs geared toward the general public and primary prevention strategies (2).

### Activities related to implementation and dissemination

The CDC is a key collaborator in the preparation and implementation of the National Strategy for Suicide Prevention (NSSP), which represents the U.S. effort to prevent suicide using a systematic approach. The NSSP establishes a framework for developing a series of suicide prevention services and programs and stresses resource coordination and the use of culturally appropriate services at all levels of government and in the private sector. As part of this strategy, there is a partner group from the public and private sector called the National Action Alliance for Suicide Prevention, in which the CDC participates (30). The purpose of the strategy, which reflects the contributions of individuals and organizations throughout the country, is to guide suicide prevention activities in the United States for the next decade. The national strategy has 13 goals, 60 objectives, and four interconnected strategic directions: healthy and empowered individuals, families, and communities; clinical and community preventive services; treatment and support services; and surveillance, research, and evaluation (34).

The CDC contributed to the preparation of the World Health Organization's first report on suicide prevention, entitled Preventing suicide: a global imperative (1). This report presents a comprehensive overview of suicide, suicide attempts, and suicide prevention efforts worldwide and describes evidence-based methods to design policies and prevention programs that are tailored to different contexts. The purpose of the report is to raise awareness regarding the public health implications of suicide and suicide attempts and the need to make prevention a priority on the global health agenda. The report also seeks to encourage and support countries to prepare or strengthen comprehensive suicide prevention strategies as part of a multisectoral public health approach; the national strategies in turn will provide the foundation for developing and implementing comprehensive global strategies.

The CDC participated in a national workshop attended by suicide researchers, public health officials, and mental health and media professionals. The purpose of the workshop was to discuss general issues and make specific recommendations to reduce the possibility of media-driven suicide contagion. Highlighting general topics that public officials, health professionals, and the media should consider when reporting on suicides, the recommendations identify aspects of news coverage that can foster contagion, and describe ways to strengthen community efforts to mitigate this possibility by specific types of news coverage (35).

The CDC also evaluated state suicide prevention planning in order to describe how state prevention plans were developed. The evaluation summarizes the key components of effective state suicide prevention planning. The main objectives of the study were to document the processes involved in developing state suicide prevention plans and compile these findings into a template for decision-making (36). The study highlighted four key factors as the basis for effective planning and implementation. The first was to establish a leadership group, even though the membership structure and the mandate of the groups varied. This group was essential for preparing a plan. Another factor was to frame the issue of suicide, since describing the prevention of suicidal behavior as a public health or mental health problem influenced the process. The next factor was to seek legislative support. This element was considered useful but needed to be preceded by the establishment of a vision and goals for the activity. The last key factor was called "moving from paper to practice," a reference to the capacity to adopt measures based on the plan formulated.

The final step—implementing and disseminating information—calls for the expansion of programs, focusing on middle-aged adults and the elderly, since many efforts are geared to younger people between the ages of 10 and 24. Assistance for communities is also necessary, so that they will be able to expand prevention activities and not have to depend on isolated strategies.

## CONCLUSIONS

Many sectors, including federal, state, and local government agencies, the private sector, non-governmental organizations, and community groups in the United States are using the public health approach to prevent suicidal behavior (1).

Multisectoral collaboration between government agencies (e.g., health, education, labor, justice, housing, social welfare) and the private sector has begun (37). This public health approach implies operating through an integrated network that enables the organizations involved to pool their resources and tools in a comprehensive effort to prevent suicidal behavior.

Since the U.S. Surgeon General issued a call to action to prevent suicide (38), considerable progress has been made in areas such as the expansion of surveillance systems (e.g., to obtain more exhaustive data on suicides, suicidal ideation,

and non-fatal suicidal behavior in adults). Research on suicidal behavior among military personnel has improved, and an extensive summary of the research on existing risk and protective factors has been prepared. In addition, there is greater knowledge about what works with adolescents and youth, greater awareness about suicidal behavior as a public health problem, and greater community participation. Nonetheless, there are still challenges in several areas, such as improving state and local monitoring of non-fatal suicidal behavior; conducting studies on protective factors; and assessing the outcomes of prevention programs (34).

*Note: The results and conclusions in this report are those of the author and do not necessarily reflect the official position of the U.S. Centers for Disease Control and Prevention.*

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# PROFILE OF SUICIDAL BEHAVIOR IN GUYANA: A RETROSPECTIVE STUDY, 2010–2012

## INTRODUCTION

The large number of suicide deaths each year (1) has prompted many countries, Guyana among them, to adopt national suicide prevention strategies.

According to a report published by the World Health Organization (WHO) in 2014 (1), Guyana has an age-adjusted suicide rate of 44.2 per 100,000 population. This rate is far above the global average of 11.4 per 100,000 population and 6.1 per 100,000 for the low- and middle income countries of the Americas. Neighboring Suriname, with a similar history and ethnic composition, has similar rates to Guyana's.

Suicide results from multiple influences, such as assorted combinations of demographic (e.g., sex, age), psychiatric (e.g., schizophrenia, depression) and stressful life events (e.g., unemployment, bereavement) (2, 3). It has therefore been determined that suicide prevention initiatives are more likely to succeed if they address a number of factors simultaneously (4). There have been several recent attempts to identify the different paths that lead to suicide by examining the risk factors common to people who have completed it. For example, O'Conner et al. (5) reviewed the forensic records regarding 142 suicides in Belfast and identified three groups: people who had had contact with health services; people with depression, other mental illnesses, and substance use; and people who had attempted suicide in the past, whose circumstances were also considered. A similar study (6) analyzed 148 suicide deaths in Hong Kong, and two groups were found: people with psychoses, who were undergoing psychiatric treatment, and who were experiencing acute stress; and people with financial problems and chronic stress, but whose mental health problems were no different than those of the general population. However, the extent to which these results can be generalized is still unclear.

The purpose of this study was to identify different suicide patterns, taking the specific characteristics of the various regions in the country into account. This study was the first step toward preparing a national multi-sectoral suicide prevention strategy. It involved the collection and analysis of data from a sample of cases of suicidal behavior in the country. Its purpose was to better characterize and understand suicide, in an effort to devise future interventions and initiatives for risk reduction.

## STUDY METHOD

### Design

The Office of the Medical Director of the Ministry of Health and the Psychiatry Department of the Georgetown Public Hospital Corporation (GPHC) made their records available for this research. Data were compiled from the statistical reports on all deaths in Guyana classified as the result of suicidal behavior between 2010 and 2012. Deaths that met the criterion of "highly probable" were considered as suicides. Since the study's purpose was to characterize suicidal behavior among the Guyanese, deaths of foreigners who committed suicide while in transit in the country were excluded.

The principal investigator and two social workers (research assistants) were responsible for data

collection. Initially, the documents used in the study were reviewed to ensure their reliability. During data collection, the investigators and assistants were in constant contact with each other to solve any problems encountered.

The statistical report contained basic information on suicide cases—for example, age, sex, ethnicity, geographic origin, and method used in the suicide. The questionnaires administered to people who had attempted suicide included more information. Data from direct interviews with patients or relatives were also included. Since no data were available on the presence and type of mental illness, or on stressful events and recent visits to a physician or hospital, that information could not be accurately assessed. Data were compiled through a review of information from sources that included each variable of interest. However, the data for some patients could not be completed.

In short, the information compiled included data on age, sex, marital status, and religion; a history of mental illness; visits or contacts with a hospital or a psychiatrist prior to the suicide; stressful events that had taken place in the past year, such as bereavement, the break-up of a relationship, interpersonal conflict, medical factors (e.g., concern about a diagnosis, gradual decline in health, or loss of independence due to an illness); and financial problems and unemployment. Also recorded were the day of the week and reasons for committing suicide, the method used, and other details, including the place of death. Other variables of potential interest were unavailable.

Suicide rates were calculated using census data from the preliminary report of Guyana's Population and Housing Census 2012 (7).

### Statistical analysis

Suicide rates (per 100,000 population) were calculated by dividing the number of suicides in males and females that took place in Guyana in a given year, per region and sex. Next, the average for all years of the study was calculated. All statistics were produced with IBM SPSS Statistics 20.0 (IBM SPSS Inc., Armonk, NY).

## RESULTS

### Suicide

A total of 673 suicide deaths were reported in Guyana between 2010 and 2012 (for an average of approximately 226 deaths per year). A representative sample of 555 cases was studied. Suicide rates and the number of suicide deaths, by region, are shown in Table 1.

**Table 1.**
**Suicide rates per 100,000 population and number of suicide deaths, by region, Guyana, 2010-2012**

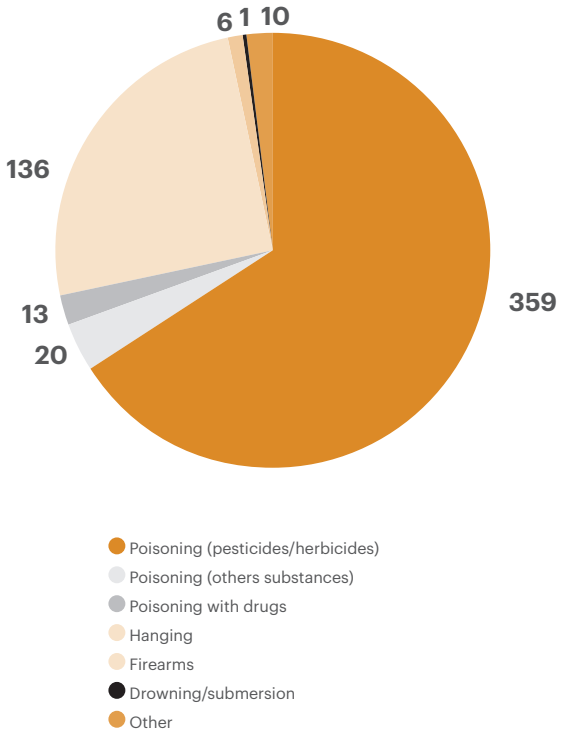
| Region | Population | Suicide rates per 100.000 population and number of suicide deaths | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | 2010 | | 2011 | | 2012 | | Average | |
| | | No. of deaths | Rate | No. of deaths | Rate | No. of deaths | Rate | No. of deaths | Rate |
| 1 | 26,941 | 3 | (11.1) | 3 | (11.1) | 1 | (3.7) | 7 | (8.6) |
| 2 | 46,810 | 30 | 64.5 | 26 | 55.5 | 18 | 38.4 | 74 | 52.7 |
| 3 | 107,416 | 44 | 40.9 | 35 | 32.5 | 43 | 40.0 | 122 | 37.8 |
| 4 | 313,422 | 49 | 15.6 | 49 | 15.6 | 20 | 6.4 | 118 | 37.6 |
| 5 | 42,723 | 14 | 28.1 | 14 | 28.1 | 17 | 34.1 | 45 | 30.1 |
| 6 | 102,431 | 57 | 52.1 | 57 | 52.1 | 53 | 48.4 | 167 | 50.8 |
| 7 | 20,280 | 2 | (9.9) | 2 | (9.9) | 2 | (9.9) | 6 | (9.9) |
| 8 | 10,190 | 2 | (19.6) | 2 | (19.6) | 0 | (0) | 4 | (13.06) |
| 9 | 24,212 | 2 | (8.3) | 2 | (8.3) | 1 | (4.15) | 5 | (6.9) |
| 10 | 32,452 | 2 | (5.06) | 2 | (5.06) | 3 | (7.6) | 7 | (5.9) |
| **Total** | **747,884** | **205** | **27.4** | **192** | **25.7** | **158** | **21.1** | **555** | **24.7** |

Similar results were obtained between 2003 and 2007, based on a total of 946 suicide deaths reported. The available statistics from the Ministry of Health indicate that 201 suicides were reported in 2003; 186 in 2004; 171 in 2005; 202 in 2006; and 186 in 2007 and the period 2010 2012 (Table 1). In conclusion, some 180 to 200 Guyanese committed suicide annually.

Guyana has the highest estimated suicide rate in the world (44.3 per 100,000 population in 2014). Suicide was the leading cause of death in young people aged 15–24 and the third leading cause in people aged 25–44. Of the total deaths from suicide, 50% occurred in the 20–49 age group, and 16.6%, in the 13–19 age group.

More men than women committed suicide, with a rate ratio of almost 4:1. The methods most often used were poisoning (with pesticides or herbicides), accounting for 359 cases, followed by hanging, for 136. Only a small percentage used firearms or burning (Figure 1).

**Figure 1.**
**Number of suicide deaths, by method, Guyana, 2010-2012**




Source: Centers for Disease Control and Prevention (CDC). Morbidity and Mortality Weekly Report (8).

More than 80% of suicides occurred among Guyanese of East Indian origin. The majority of cases were concentrated along the country's coast (regions 2, 6, 3, 4, and 5). The highest rate was in Region 2 (52.7 per 100,000 population), followed by Region 6 (50.8) and Region 3 (37.3). Only isolated cases of suicide were reported in Regions 7, 9, and 10 (probably due to the existence of protective factors in their communities).

### Suicide attempts

It is calculated that there are some 20 to 25 suicide attempts for every completed suicide. The precise number is unknown, since not all cases are recorded. According to the information compiled through the questionnaires, the most affected age groups were the 12–18-year-olds (30%) and 19–25-year-olds (over 20%). This is consistent with the majority of global epidemiological reports. Attempted suicides were more frequent among women, accounting for an estimated 75% of the total, giving a female to male rate ratio of almost 3:1. As with completed suicides, Guyanese of East Indian origin accounted for over 50% of attempted suicides and Afro-Guyanese, 25.9%. Attempted suicides were concentrated in the same regions as completed suicides: regions 6, 5, 4, 3, and 2, with isolated cases in the other regions. The groups most vulnerable to attempted suicides were unmarried people 60%; people with no children, 68%; people who lived with their family, over 50%; people from the community of Indian origin, and those of the Pentecostal religion, over 30%; low-income individuals, over 65%; and the unemployed, over 35%.

Over 37% of attempted suicides occurred on a Sunday or Monday, often in the home of the victim. In more than 60% of the cases, the individuals were generally trying to escape a stressful situation that was causing them pain, desperation, depression, or uncontrollable rage related to family conflict (31%); marital problems (25%); domestic violence (11%); and interpersonal conflicts (11%).

### Risk factors

The most frequent risk factors were intense psychological pain and depression (36.6%); access to lethal substances such as herbicides and pesticides (63.7%); alcohol and drug use (32%); and family dysfunction (34.5%). The least frequent factors were aggressiveness and impulsiveness, a family history of suicide, a previous attempted suicide, mental illness, and lack of social support.

Driven by numerous factors, suicide in Guyana is linked primarily to alcoholism, adolescent pregnancy, and abusive triangular relationships. The average Guyanese drinker consumes 13.7 liters

of pure alcohol per year, and 6.1% of the population is considered to drink in excess. The data from the survey on physical activity in Guyana indicated that 43.6% of the general population consumed alcohol and that more men than women were drinkers, 73% and 28%, respectively (9). It also is interesting to note that the percentage of adolescent pregnancies in Guyana is among the highest in the Caribbean. Finally, regarding domestic violence, according to a 2012 study, a high percentage of women in a relationship or union reported having been subjected to physical, as well verbal, abuse and sexual violence.

## DISCUSSION

This study employed broad population samples, which likely yielded results that were more representative than those of previous research. The statistical data were more accurate and revealed specific aspects necessary for characterizing the current suicide profile in Guyana.

The number of attempted and completed suicides held steady across the years. No reduction was observed, perhaps due to the lack of an adequate prevention and management strategy.

The annual suicide death rates (per 100,000 population) were systematically higher in Pomeroon-Supenaam (Region 2, 52.7) and East Berbice-Corentyne (Region 6, 50.8); followed by Demerara-West-Islands Essequibo (Region 3, 37.8); Demerara-Mahaica (Region 4, 37.6); and Mahaica-Berbice (Region 5, 30.1); the last three regions are located along the country's coast. A similar geographic distribution is observed for attempted suicides.

The concentration of suicide deaths in certain geographic areas (such as in rural areas) and specific demographic groups reveals that people of East-Indian ancestry, especially in agricultural areas, were more likely to attempt and complete suicide. It is probable that they had low levels of education, were employed in low income occupations, and had resided in the same community all their lives. Over 60% of the people who committed suicide did so by poisoning with agricultural pesticides or herbicides (organophosphorus compounds such as gramoxone and paraquat) that are extremely lethal, easily accessible through commercial networks, and found in most homes. Their frequent off-label use and the failure to enforce government regulations for their control make such poisoning the preferred method of suicide in Guyana.

According to several studies, the majority of people who commit suicide are young men under the age of 35. A higher incidence is found in the 20–44 age group. However, there is a high percentage of suicides in age groups at the extremes—namely, adolescents under 20 (16.6%) and the elderly, who number around 38,000 people countrywide, or 5.3% of the total population.

The reports from Guyana yield results similar to those of international studies, in which the male to female suicide rate ratio is 4:1, a figure that is the inverse for attempted suicides, where the female to male ratio is 3:1. Our hypothesis is that the higher proportion of attempts among women is due to suicide plans that are less well thought through and more impulsive. We have also found that in most cases, there was no history of any prior attempt.

The incidence of attempted suicides is higher on Sundays and Mondays, and they occur most often in the victim's home. People who resort to suicide do so as a psychological mechanism to deal with interpersonal problems and escape a life of suffering caused by hopelessness, depression, and uncontrollable rage in settings where family conflict, marital problems, or domestic violence reign. Attempted suicide may also be the victim's way of seeking help.

According to our report, social and economic problems were not the leading motivation for suicidal behavior. Women and young people were trapped in their homes by a culture of control. Some were subjected to physical and emotional abuse or incest. Men who committed suicide were described as the victims of unfulfilled aspirations and the loss of prestige and control over their lives.

It should be pointed out that over 80% of the people with suicidal behavior had not had any contact with mental health services, probably due to their limited access to health care.

### Strengths and limitations

As previously noted, our study was conducted with broad samples, which means that it has a greater probability of yielding more reliable results that previous studies.

The study was limited to attempted suicide cases that were surveyed after admission to a single institution where they could be administered the questionnaire.

## CONCLUSIONS

Suicide is a major public health problem in Guyana. Our study is a first step in attempting to characterize people who commit suicide in Guyana

and the causes behind it by reviewing the causes underlying attempted suicides. We are now in a better position to develop a comprehensive multisectoral suicide prevention strategy to reduce suicidal behavior in the country. Future research should include detailed psychological autopsies, toxicology research, and more in-depth psychiatric assessments.

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# EPIDEMIOLOGY OF SUICIDAL BEHAVIOR IN MEXICO

## INTRODUCTION

Suicide is self-inflicted harm with the explicit intention of ending one's life (1). An estimated 800,000 people around the world commit suicide each year (2). In 2012, the age- and sex-adjusted suicide rate in Mexico was relatively low, at 4.2 per 100,000 population, compared with 11.4 per 100,000 population globally and 6.0 per 100,000 population in countries in the Americas at a similar development level. The suicide rate in Mexico is rising steadily, however. In fact, while the new report of the World Health Organization (WHO) (2) indicates that, globally, the number of suicides fell by 8.8% and the adjusted suicide rate dropped by 26.1% during the 2000–2012 period, the suicide rate in Mexico rose by 17.1%. The increase was especially marked among women (58.3%) (Table 1).

**Table 1.**
**Suicide numbers and rates, worldwide, low- and middle-income countries in the Americas, and in Mexico, 2012**

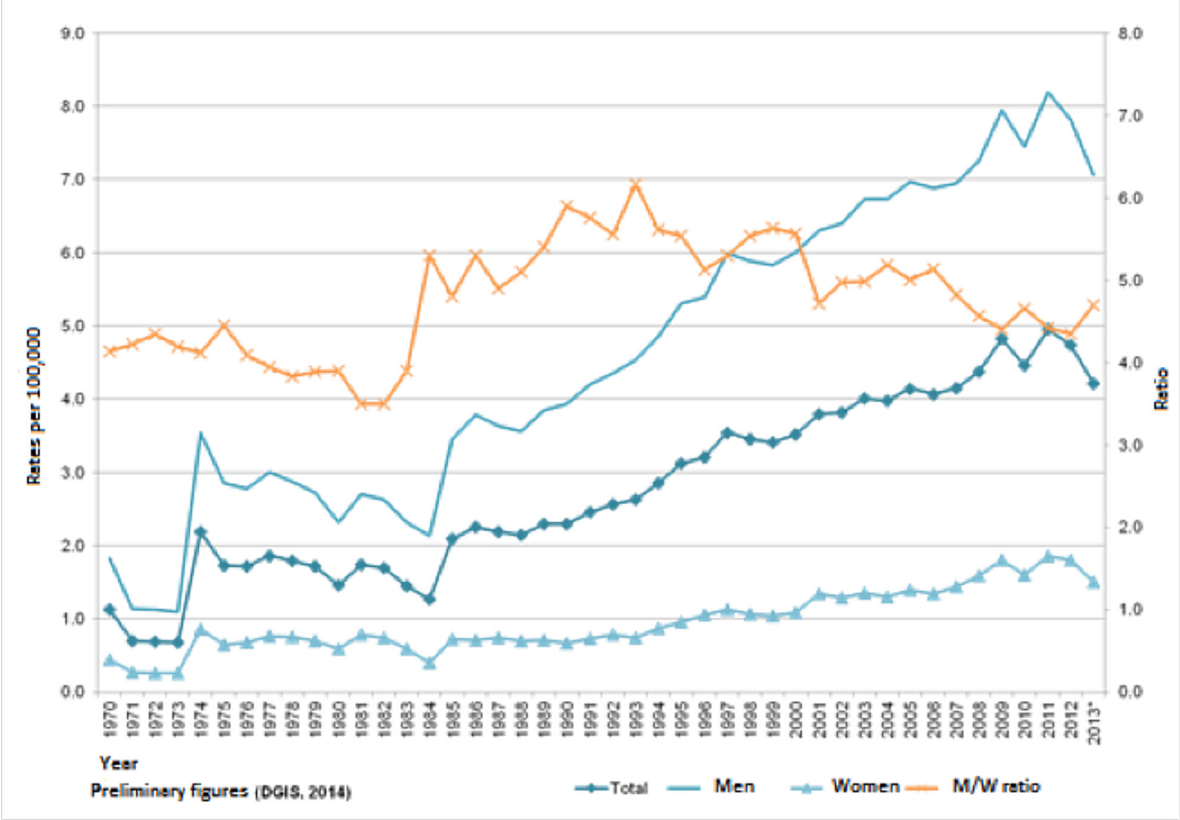
| Region | Population 2012 | Suicides (No.) | Age-adjusted suicide rates* (per 100,000 population) | | | M/F ratio | Change in adjusted suicide rates % 2000-2012 | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | Total | Men | Women | | Total | Men | Women |
| Global** | 7,075,000,000 | 806,000 | 11.4 | 14.5 | 8.2 | 1,86 | -26.1 | -22.7 | -32.0 |
| Low- and middle-income countries of the Americas | 581,000,000 | 34,000 | 6.0 | 9.6 | 2.7 | 3,58 | -8.4 | -8.8 | -7.5 |
| Mexico | 120,847,000 | 4,965 | 4.2 | 7.1 | 1.7 | 4,18 | 17.1 | 9.8 | 58.3 |

* Standardized global rates, WHO, 2012.
** Includes data from three territories that are not Member States of the World Health Organization.

Source: World Health Organization. Preventing suicide: a global imperative. Geneva: WHO; 2014.

Furthermore, Lozano et al. (3), who examined the main causes of premature death in 2010, observed that suicide had increased 1.25 times between 1990 and 2010, moving from 21st to 11th place among these causes. It should also be noted that the rate has been steadily climbing over the past 40 years (1970-2013) (Figure 1).

**Figure 1.**
**Suicide mortality trend, by sex, Mexico, 1970-2013**

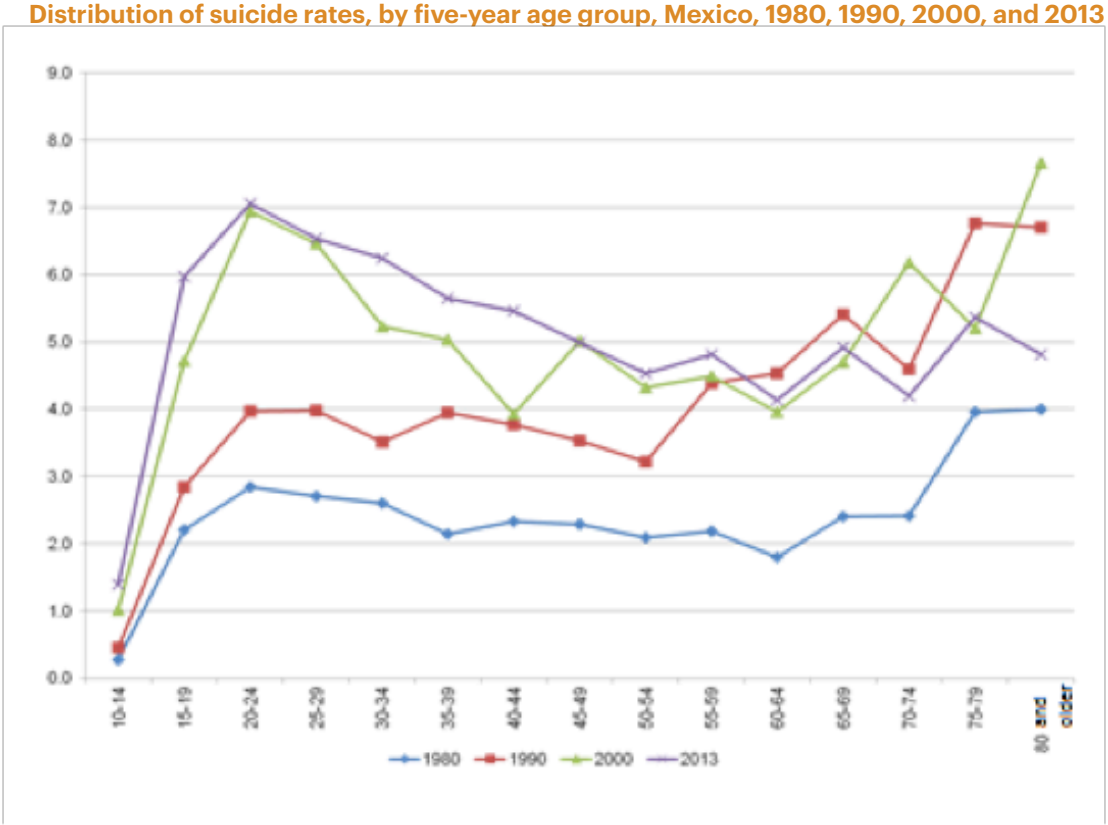



## Suicide by age and sex

The increase mentioned in the previous section is observed in both sexes. Men generally had suicide rates almost five times higher than women during the same period.

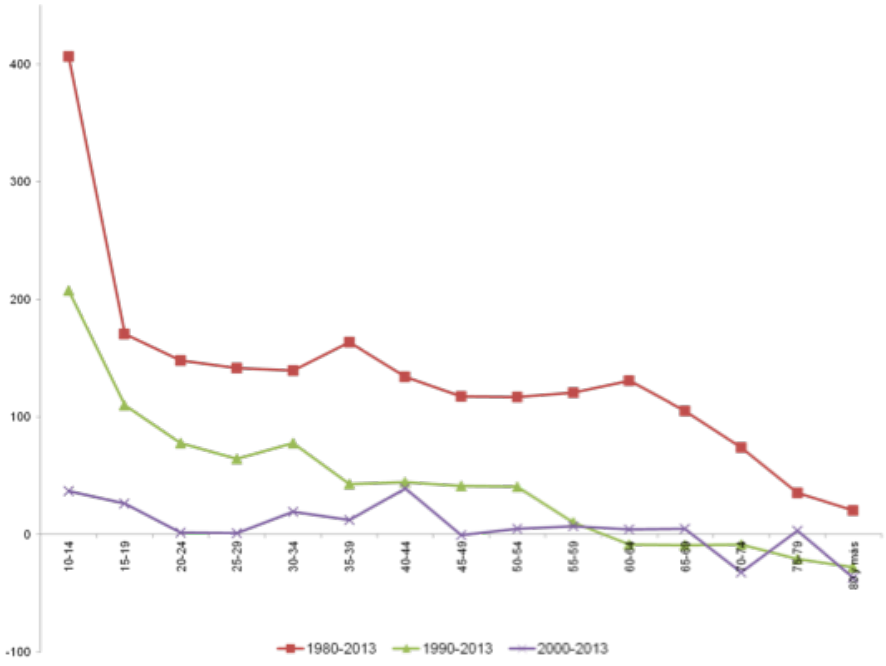
The increase in suicide mortality in recent decades was not the same across age groups. Figure 2 shows the trend in the rates by five-year age groups over four decades, using 1980, 1990, 2000, and 2013 for the observations. The figure illustrates that suicide rates in 2013 were significantly higher than in 1980, but that they were more pronounced in the younger age groups. For example, while in 1980 the highest overall rates were reported in the oldest age groups, in 2013 they were in the 20–24 age group (Figure 2). According to Figure 3, the highest percentage increases were observed in the 10-14 age group, decreasing in older individuals.

**Figure 2.**
**Distribution of suicide rates, by five-year age group, Mexico, 1980, 1990, 2000, and 2013**



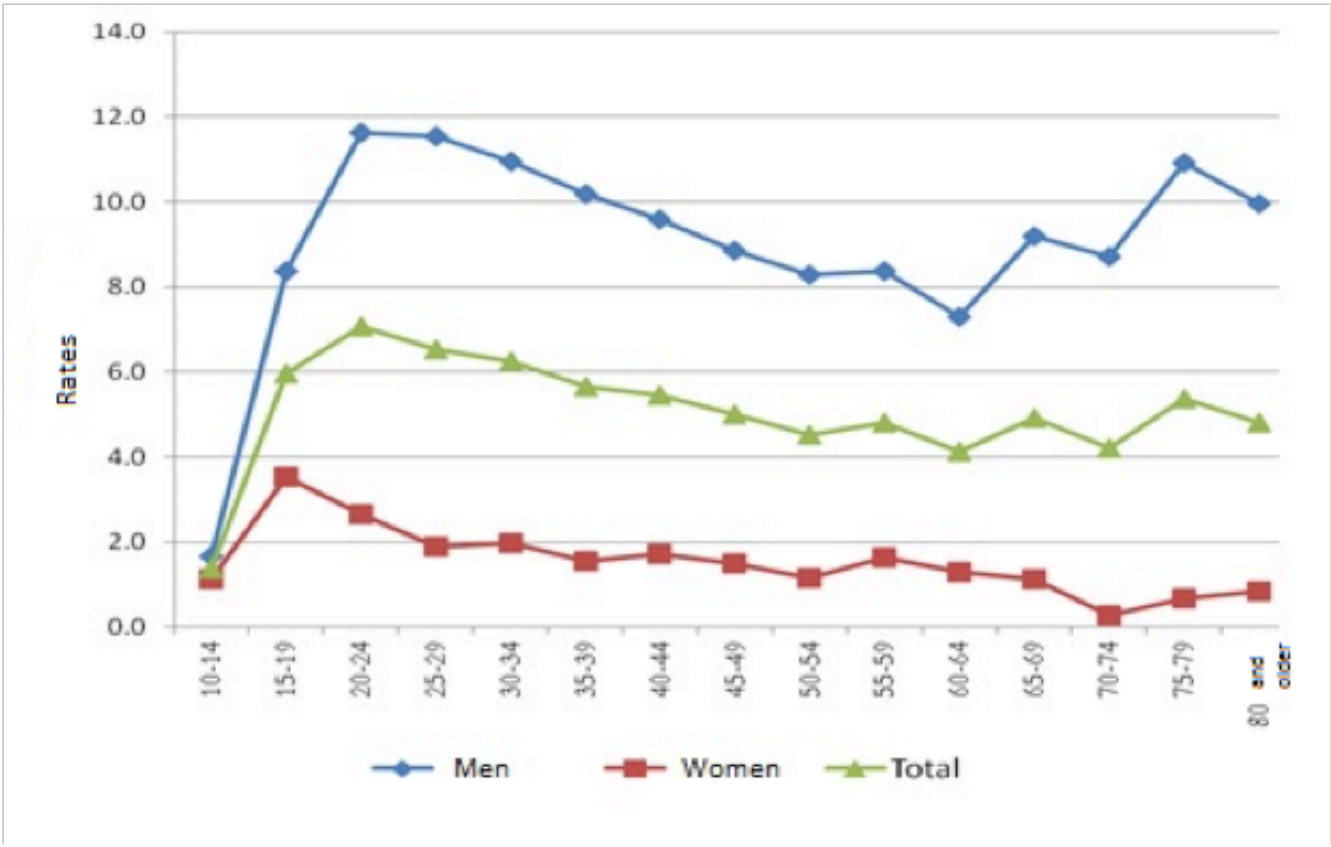

It is also worth noting that the most dramatic changes are observed when comparing current and past rates. During the most recent period (2000–2013), lower relative increases are observed; in some age groups (45–69), the rate has, in fact, stabilized or actually even fallen slightly (70–74 years and 80 years old and older) (Figure 3).

**Figure 3.**
**Relative percentage difference in suicide rates, by five-year age group, Mexico, 1980–2013, 1990–2013, and 2000–2013**



According to the most recent data from Mexico's National Institute of Geography and Statistics (INEGI), suicide was the third leading cause of death among young people aged 15–19 years and the fourth leading cause among 20–29-year-olds in both sexes in 2013. Among women, the highest suicide rate is observed in the 15–19 age group, while men experience the highest rates in the 20–24 and 25–29 age groups (Figure 4).

**Figure 4.**
**Suicide rates, by five-year age group and sex, Mexico, 2013**



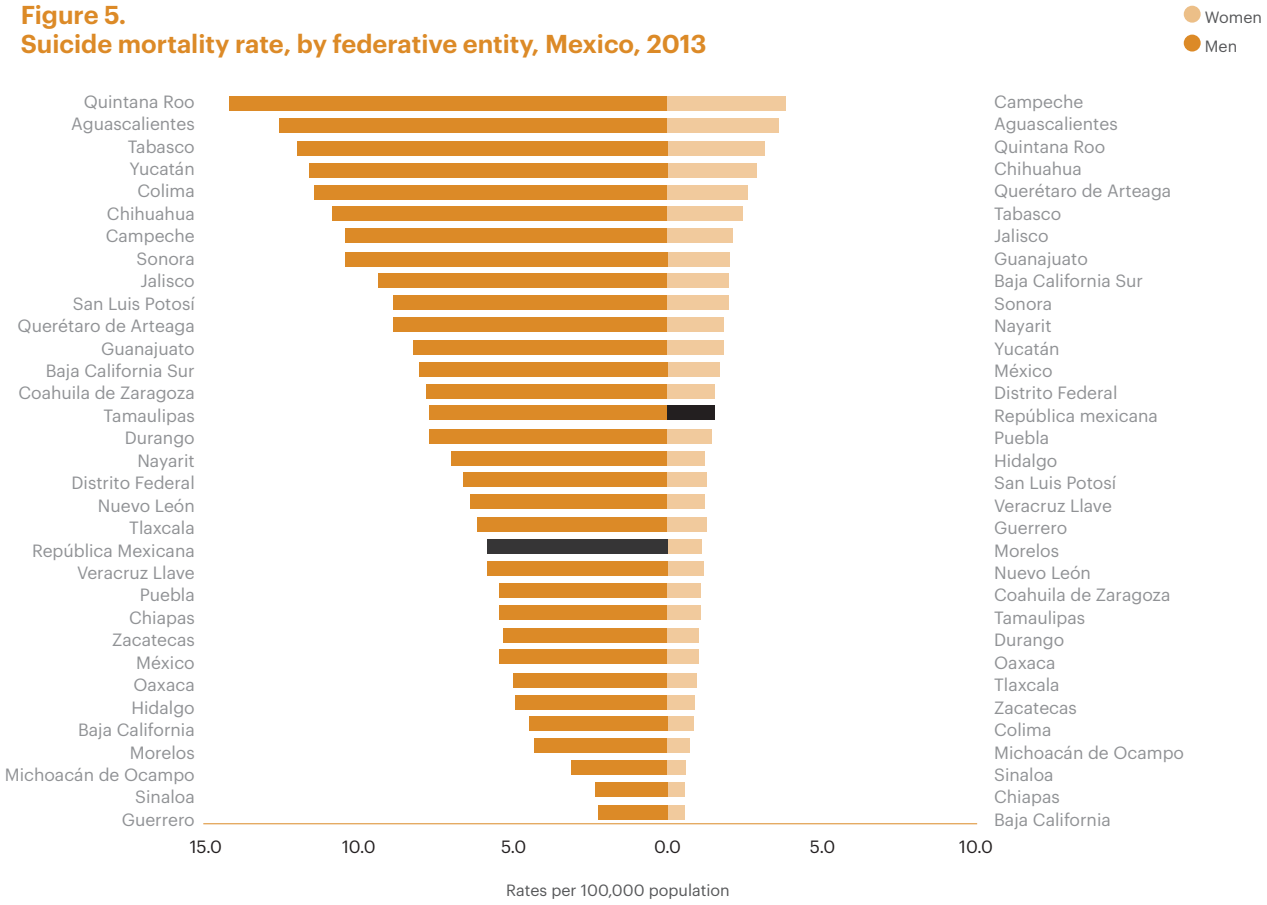

## Suicide methods

In 2013, 79.9% of all suicides among men were by hanging, followed by firearms, at 9.6%. Among women, hanging accounted for 71.8% of all suicide deaths, followed by poisoning, at 18.7%.

## Geographic distribution

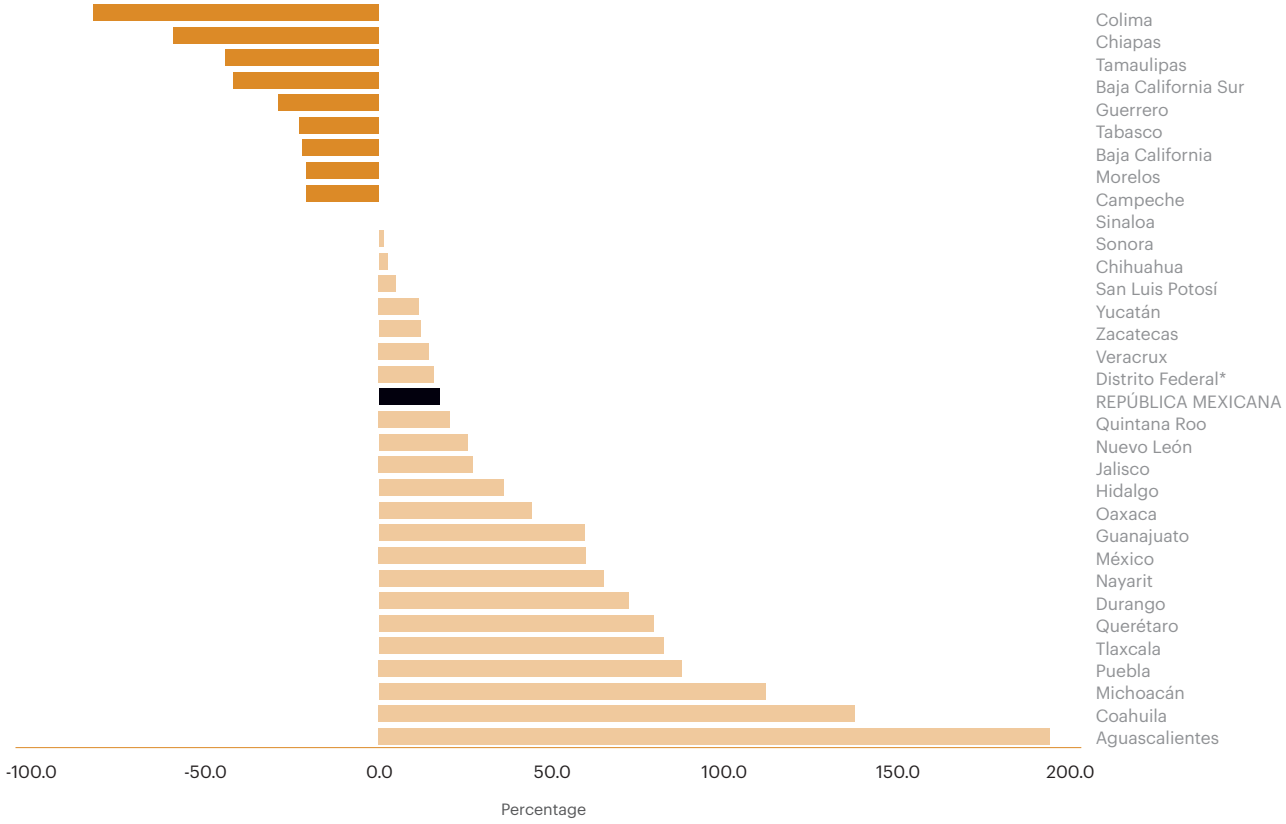
In 2013, two areas of higher risk were identified: one in the south-southeast (states of Quintana Roo, Campeche, Tabasco, and Yucatán) and another in the north (states of Aguascalientes, Baja California Sur, Sonora, and Chihuahua) (Figure 5).

**Figure 5.**
**Suicide mortality rate, by federative entity, Mexico, 2013**

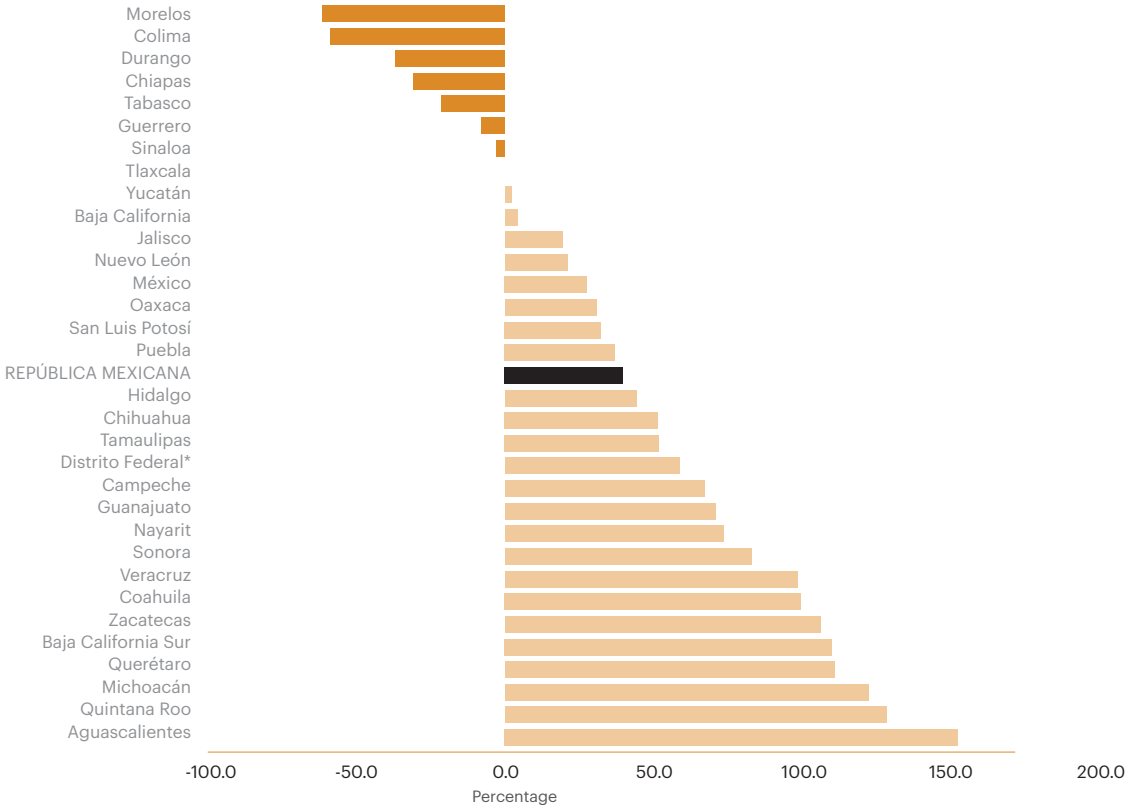



Figures 6a and 6b show the relative percentage change between the rates for 2000 and 2013 among men and women. Most states witnessed higher male and female suicide rates, the state of Aguascalientes recording the greatest increases for both sexes. In 2013, nine states reported reductions in the male suicide rate, and seven in the female suicide rate. Morelos was the state with the greatest drop in the female suicide rate, and Colima reported the largest decline in male suicides. Most of the states, however, reported increases in both the male and female suicide rates.

## Figure 6a.
## Percentage change in male suicide rates, by state, Mexico, 2000-2013




## Figure 6b.
## Percentage change in female suicide rates, by state, Mexico, 2000-2013



## ATTEMPTED SUICIDE

Mexico has conducted three major surveys that provide information on attempted suicides (4, 5) using representative national samples and a more limited sample of adolescents in the metropolitan area of the Federal District (Metropolitan Area of Mexico City – MAMC) (6). For more details, see Borges et al. (7).

According to these studies (Table 2), uncompleted suicides became less frequent with age: 4.3%, in the 12–17 age group, 3.8%, in the 18–29 age group, and 2.6%, in people aged 30–65. By sex and age group, attempted suicides accounted for 6.7% among women aged 12–17, 5.1% in the 18–29 age group, and 1.5% among 30–65-year-olds. The corresponding percentages for men were 2.1%, 2.3%, and 2.1%. These studies reported that attempted suicides over the previous 12 months accounted for only one-quarter of the attempts at "some time in life," namely 1.1% in the population aged 12–17; 0.9% in the population aged 18–29; and 0.6%, in the population aged 30–65.

**Table 2.**
**Percentage of attempted suicides in the general population at some time in life and in the past 12 months, Mexico, various years**

| Survey of adolescents in Mexican Adolescent Mental Health Survey (MAMC) (N = 3,005) * National adult psychiatric survey—ENEP (N = 5,782) ** | | | |
|---|---|---|---|
| | 12 to 17 years At some time Previous attempt % | 18 to 29 years At some time Previous attempt % | 30 to 65 years At some time Previous attempt % |
| Men | 2.1 | 2.3 | 2.9 |
| Women | 6.4 | 5.1 | 1.5 |
| Total | 4.3 | 3.8 | 2.6 |
| **National Addiction Survey ENA 2008 (N = 22,962)*** ** | | | |
| | 12 to 17 years 12 months Previous attempt % | 18 to 29 years 12 months Previous attempt % | 30 to 65 years 12 months Previous attempt % |
| Men | 0.6 | 0.7 | 0.4 |
| Women | 1.6 | 1.1 | 0.8 |
| Total | 1.01 | 0.9 | 0.6 |

* 2006; **2002; *** 2008.

Sources: National Psychiatric Epidemiology Survey and Mexican Adolescent Mental Health Survey, 2008; National Addiction Survey, 2008.

## Use of services

According to Table 3, about half the people in Mexico who had attempted suicide at some time in their life had at some point sought help for emotional problems or alcohol or drug abuse from the available services (8). Although adolescents visit medical services most often, they also make heavy use of the specialized services (mental health or social services) provided in schools (9).

**Table 3.**
**Percentage of service use by people who attempted suicide at some time in their life and in the past 12 months, Mexico, 2008**

| Use of services at some time in life | | |
|---|---|---|
| Type of service | 12 to 17 years (n = 121) Previous total % | 18 to 65 years (n = 166) Previous total % |
| Medical | 36.7 | 49.3 |
| Non-medical | 9.2 | 14.1 |
| School | 23.1 | - |
| Some service | 49.4 | 53.0 |
| **Use of services in the past 12 months** | | |
| Type of service | 12 to 17 years (n = 62) Previous total % | 18 to 65 years (n = 31) Previous total % |
| Medical | 12.8 | 36.6 |
| Non-medical | 4.2 | 4.5 |
| School | 4.6 | - |
| Some service | 17.4 | 41.1 |

Sources: National Psychiatric Epidemiology Survey and Mexican Adolescent Mental Health Survey.

Service use in the 12 months prior to the survey was substantially lower than the lifetime use for attempted suicides: 17.4% of the adolescent population and 41.1% of the adult population (especially men) sought treatment.

Studies using a similar methodology in the international context generally confirm that Mexico is at an intermediate level when it comes to the use of health services to obtain help for suicidal behavior (10).

## CONCLUSIONS

- The suicide rate for both sexes is relatively low compared to that of many countries both inside and outside the Region of the Americas. As in most other countries, the male suicide rate in Mexico is higher the female rate, with a ratio of 4:1.
- Although relatively low, Mexico's suicide rate has been rising steadily, as opposed to the international trend, where a decline has been observed. Recent increases in suicide among the young are pronounced in the female population and are especially troubling.
- Young people (of both sexes) and older men are the principal groups at risk for suicide.
- Suicide is a major component of the burden of disease in Mexico, especially in younger groups.
- The geographical distribution of suicide rates in Mexico is very unequal, with high rates in two groups of states—one in the southeast and the other in the north. With some exceptions, the suicide rate in most states has risen over the past 13 years.
- Suicide attempts are common in Mexico. As in other countries, they occur more frequently in adolescents than adults, and in women than in men.
- Most of the people who had recently attempted suicide had not sought help from the health services.

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# RESEARCH ON SUICIDAL BEHAVIOR IN NICARAGUA

## INTRODUCTION

Nicaragua's first rigorous epidemiological studies in psychiatry began in the 1980s, sponsored by the Pan American Health Organization/World Health Organization (PAHO/WHO) and European institutions such as Italy's Mario Negri Institute and the Swedish Agency for Research Cooperation with Developing Countries (SAREC) (1).

The Ministry of Health's acknowledgment that suicide was a serious public health problem marked the beginning of unofficial surveillance of suicide, from 1995 to 2007, period during which an uptick in suicides was uncovered. During that period, the suicide rate exceeded 13 suicides per 100,000 population; men, among whom it surpassed 15 per 100,000 population, were at greater risk than women (2, 3).

With assistance from Sweden's Umeå University, the Teaching Hospital in León established a surveillance system based on a methodology employed by a European parasuicide study. It found that, between 1999 and 2001, suicide attempts and suicides were most frequent among 15–25-year-olds, with attempted suicides being more common among women and completed suicides among men (4).

Pesticide ingestion was the leading means of suicide, followed by hanging; jumping from a height was the least used method (5).

The study of suicidal behavior noted it was not unlike an iceberg: the public features form a visible tip, but other dimensions remain invisible to the naked eye. With this analogy as a guide, the investigators planned research to describe suicide attempts and completed suicides. They explored suicidal ideation and family, teacher, and student attitudes by sharing stories about friends or relatives who had attempted or completed suicide (6).

Women most often used drugs and pesticides in their suicide attempts. The study unearthed an important piece of information: those who attempted suicide had contacted a primary care center within the six months leading up to the attempt. This new knowledge prompted making changes in all of the medical school's departmental curricula (nursing, psychology, and medicine), to enhance skills in identifying suicide warning signs and preventing suicide completion (7, 8).

During the three years of surveillance (1999–2001), two yearly spikes emerged in the incidence of suicide and suicide attempts—from May to June and from October to November— which lead to the hypothesis that they were driven by events related to the end of the semester and the end of the school year (4, 7).

Administering the "Attitudes towards Suicide" questionnaire from the European parasuicide study yielded a statistically significant association between exposure to relatives with suicidal behavior and manifestations of suicidal behavior among those studied (OR=2.97; 95% CI=1.47-5.30) (8). A subgroup analysis by sex found that this association was significant only in women who had a relative or friend with suicidal behavior (OR=4.62; 95% CI=1.74-12.31) (8).

The search for suicides was conducted using police records, death certificates from the 18 city halls, and reports from the Ministry of Health in the Department of León. Some 74.6% of the suicides

were identified in Ministry of Health records, and 55.1% and 53.5%, respectively, in police and city hall records. It should be noted that none of the sources had a complete registry.

### A sample intervention

Interventions were conducted at two schools in areas surrounding the Teaching Hospital in León. Both sites involved a "suicide outbreak," described as such because of a spike at a single location over a short period of time.

A qualitative monographic study conducted through interviews of friends, relatives, and girlfriends or boyfriends characterized suicidal adolescents as: substance users with family conflicts who abused their girlfriends, enjoyed humiliating others, were disrespectful to teachers, had no goals in life, and tended to profane the Church and its symbols. The study characterized their parents as complacent, unconcerned, and permissive, tending to minimize their children's attention-seeking behavior in school.

Through the joint efforts of community organizations, government institutions (Ministry of Health, Ministry of Education, the water and power company), and faith-based groups affiliated with different Christian religious denominations, under the leadership of the mayor's office, the suicides were contained.

## CONCLUSIONS

The studies since 1990 on suicidal behavior yielded more extensive information and the following lessons (4, 7, 9):

- Suicidal behavior predominates in urban areas;
- While more women attempt suicide, more men actually complete the act;
- The 15–24 age group is the most vulnerable;
- Pesticide ingestion is the most common means of committing suicide;
- People at risk have communicated their suicide intentions (for example, to teachers, physicians, relatives);
- The risk among women increases when a friend or relative has attempted or committed suicide; and
- Suicidal behavior is underreported.

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# SUICIDE IN PUERTO RICO: CHALLENGE AND COMMITMENT

## INTRODUCTION

Puerto Rico is an archipelago situated between the Caribbean Sea and the Atlantic Ocean. Its capital, San Juan, is located in the north of Isla Grande (1). According to the intercensal estimate for 2014, Puerto Rico had a population of 3,548,397 (2).

Since the end of the 19th century, when Spain ceded the territory to the United States, the Commonwealth of Puerto Rico has enjoyed a special legal and political status that has evolved over time. Briefly, native-born Puerto Ricans are U.S. citizens with all immigration rights. Puerto Rico has its own legislation. Its citizens have the right to vote in U.S. presidential elections and to elect a governor but are not represented in the two houses of the U.S. Congress.

Puerto Rico's official languages are Spanish, which predominates, and English. The majority religion is Catholic.

### Current situation

The prevailing view of Puerto Ricans is that they are a happy, sociable, and generous people, to mention but a few of their most salient characteristics—so much so that in 2007, the University of Michigan's Institute for Social Research ranked Puerto Rico as the second happiest land in the world after Denmark (3). The reality is more complex, however. The majority of Puerto Ricans suffer the effects of constant economic, social, and political changes that often have a devastating impact on broad sectors of the population. This can lead to suicide as the preferred response to the impotence felt in the face of the ensuing stress. The relatively high proportion of homicides, domestic violence, and child abuse is a clear indicator of the emotional state and hostility that prevail in various segments of the population.

Although there is a close link between suicide and psychological problems, the latter are not the sole influence; other factors (i.e., economic, social) also play a part in self inflicted death. In order to understand the population's suicide and mental health problems, it is important to be aware of the socioeconomic factors in play. Workforce participation in Puerto Rico is among the lowest in the world: less than half of those eligible people are employed in the formal economy. Moreover, unemployment has been persistently higher than in the U.S. mainland and is especially high among youth and people with little formal education (4). Numerous studies have linked economic crises to higher suicide rates, estimating a 0.8% increase for each 1% increase in unemployment.

This same association is seen between unemployment and such mental health disorders as depression and anxiety (5). In Puerto Rico, the frequency of mental health disorders is troubling; roughly 50% of the population is reported to have emotional problems. The Puerto Rico Psychiatry Society has indicated that 25% of the population suffers from major anxiety disorders, 6% from bipolar disorder, and 48% from some other psychiatric condition at some time in their lives (6). Clearly, suicide is a complex multifactorial problem.

## PUBLIC POLICY IN SUICIDE PREVENTION

### Act No. 227

In 1999, the World Health Organization (WHO) launched the SUPRE program, a global suicide prevention initiative. Puerto Rico joined the initiative through its Act on the Implementation of Public

Policy in Suicide Prevention (Act No. 227) of 12 August 1999, the purpose of which was to create and implement public policy to address the issue of suicidal behavior. To that end, in 2001 the Suicide Prevention Commission was created under the Department of Health, the government agency charged with public policy implementation in the health sector.

### Suicide Prevention Commission

The Suicide Prevention Commission has been mandated to promote, develop, implement, and coordinate suicide prevention strategies and activities. It also has the authority to monitor and evaluate suicide prevention and intervention programs and is responsible for promoting research and bringing public and private institutions together to assist community support networks, volunteers, and self-help groups. The 17-member Commission is chaired by the Secretary of Health, who heads the Department of Health. Other Commission members are the 10 secretaries of the principal government agencies: the Mental Health and Anti-addiction Services Administration, the Health Insurance Administration; and the Departments of Sports and Recreation, Housing, Family Affairs, Education, Justice, Corrections and Rehabilitation, Labor and Human Resources, and Public Safety. The Commission also has a representative from each of the two organizations that speak for the Commonwealth's 78 municipalities; two representatives from nonprofit organizations that provide services to people at risk of suicide; one representative from academia specializing in this field; and one representative of the surviving relatives of people who have committed suicide.

The Commission was created in 2001, and efforts since then have been devoted to setting up a suicide statistics system, conducting media campaigns to promote prevention and awareness, designing and distributing educational materials, and organizing conferences for different populations and professionals.

Since 2013, the Commission has focused on developing and implementing a National Suicide Prevention Strategic Plan. As part of this plan, guidelines were issued for the development of a uniform protocol for suicide prevention for all Puerto Rico. A workshop on rapid response to suicidal behavior was also designed; workshop attendance is mandatory for all civil servants in all government agencies. In addition, agreements have been reached with several universities to promote research on suicide and ensure that suicide prevention is addressed in workshops offered in their academic programs.

## EPIDEMIOLOGY OF SUICIDE IN PUERTO RICO

Suicide is one of the 15 leading causes of death in Puerto Rico and is the third leading cause of violent death (7). From 2000 to 2014, an average of 313 suicides per year was registered, that is around 8.4 deaths per 100,000 population. However, as in the rest of the world, many suicide deaths may be classified erroneously as deaths from accidents or other external causes. As a result, suicide numbers may be under-reported.

Mounting a surveillance system is a complex task, since it involves a range of authorities. Up to now Puerto Rico has had no surveillance system to monitor mental health problems and suicide. Active, continuous, and systematic information on suicidal behavior at all stages hence is lacking.

Suicidal behavior includes suicidal ideation, making the plan, the attempt, and finally, completing the suicidal act. Consequently, the suicide burden in a society should not be measured by deaths alone. It is estimated that for each suicide committed, there are as many as 20 uncompleted suicides. If we examine these figures using the 229 suicide deaths in Puerto Rico in 2014 as an example, we can extrapolate that 4,580 people attempted suicide that year.

The suicide estimates for Puerto Rico presented in this section were calculated using the File Maker Instant Web Publishing program of the Institute of Forensic Science of Puerto Rico. These figures are preliminary, since deaths under investigation by the Institute are not usually reported until the investigation is complete; thus, cases are sometimes entered after the month in which the death occurs.

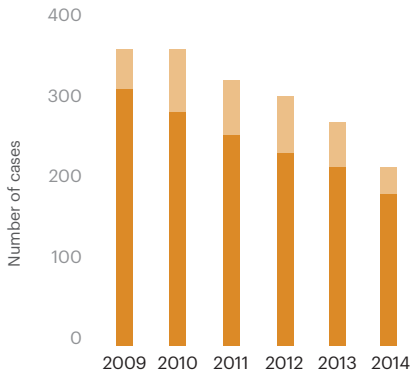
Table 1 shows the number of suicide deaths between 2000 and 2014. Preliminary data indicate that a total of 4,700 deaths by suicide occurred over the 15-year period. While the highest suicide mortality rates occurred in 2009 and 2010, in the four years between 2011 and 2014 the trend declined slightly. From 2013 to 2014, a clear reduction in suicide mortality was observed, falling from 8.4 to 6.5 per 100,000 population, a 24% reduction.

## Table 1.
## Number of suicides and suicide rates, Puerto Rico, 2000-2014

| Year | Population* | No. of suicides | Rates (per 100,000 population ) |
|---|---|---|---|
| 2000 | 3,810,605 | 317 | 8.3 |
| 2001 | 3,818,774 | 318 | 8.3 |
| 2002 | 3,823,701 | 259 | 6.8 |
| 2003 | 3,826,095 | 307 | 8.0 |
| 2004 | 3,826,878 | 331 | 8.6 |
| 2005 | 3,821,362 | 342 | 8.9 |
| 2006 | 3,805,214 | 299 | 7.9 |
| 2007 | 3,782,995 | 308 | 8.1 |
| 2008 | 3,760,866 | 340 | 9.0 |
| 2009 | 3,740,410 | 356 | 9.5 |
| 2010 | 3,721,527 | 353 | 9.5 |
| 2011 | 3,686,771 | 326 | 8.8 |
| 2012 | 3,642,281 | 314 | 8.6 |
| 2013 | 3,595,839 | 301 | 8.4 |
| 2014 | 3,548,397 | 229 | 6.5 |

* According to annual estimates of the population: 01-04-2000 to 01-07-2014 (Intercensal and Vintage estimate, 2014). Taken from the United States Census.
Source: Institute of Forensic Science of Puerto Rico. Preliminary data up to 8 April 2015.

## Figure 1.
## Suicide deaths, by sex, Puerto Rico, 2009-2014



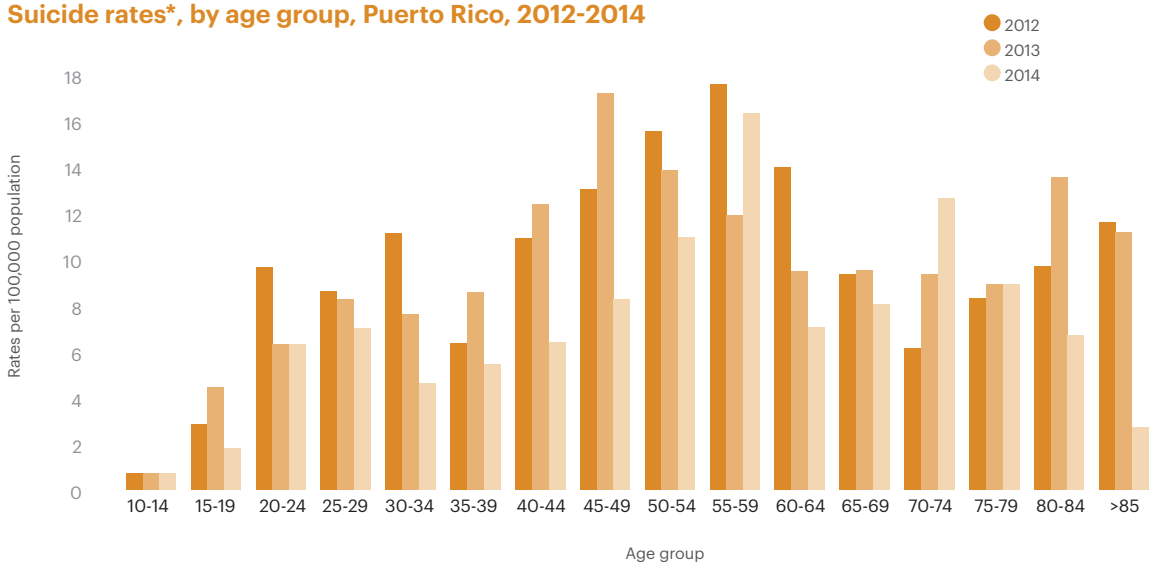

Source: Institute of Forensic Science of Puerto Rico. Preliminary data up to 8 April 2015.

Figure 1, illustrates the distribution of suicide cases by sex over the six years prior to 2015. It reveals that during the period 2009-2014, men continued to have higher suicide mortality rates, accounting for 80% of all suicides.

Figure 2 shows the distribution of suicide rates by age group during the period 2012-2014. In 2012, the highest rate was in the 55–59 age group, followed by the 50–54 age group. In 2013, the highest rates were in the 45–59 and 50–54 age groups. In 2014, the highest rate was in the 55–59 age group, followed by the 70–74 age group. These data show that during the last three years of the period, adults had the highest suicide mortality.

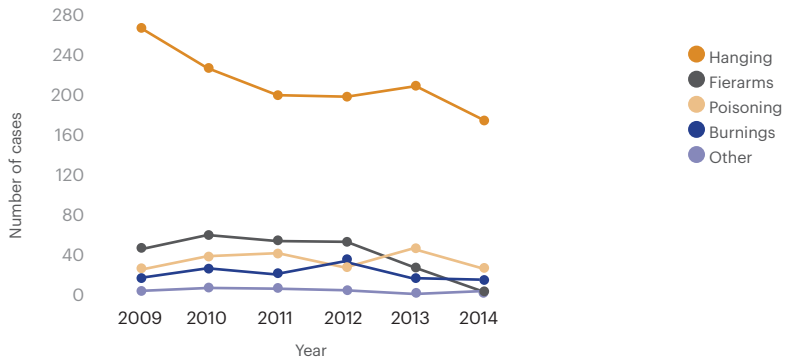
Figure 3 shows that between 2009 and 2014, hanging was the main method used to commit suicide in both sexes. During the last two years of the period, deaths from poisoning fell and firearms were the second leading means of committing suicide. It should be noted that the use of firearms is a more violent and irreversible method than poisoning, and that firearms are less accessible in Puerto Rico than in the United States; unlike the U.S. mainland, there are many restrictions on firearm purchases. Use of this method in Puerto Rico therefore suggests greater determination on the part of a suicidal person.

**Figure 2.**
**Suicide rates*, by age group, Puerto Rico, 2012-2014**




*Rates according to annual population estimates 2009-2013, up to 1 July 2013. Taken from the United States. Census.
Source: Institute of Forensic Science of Puerto Rico. Preliminary data up to 8 April 2015.

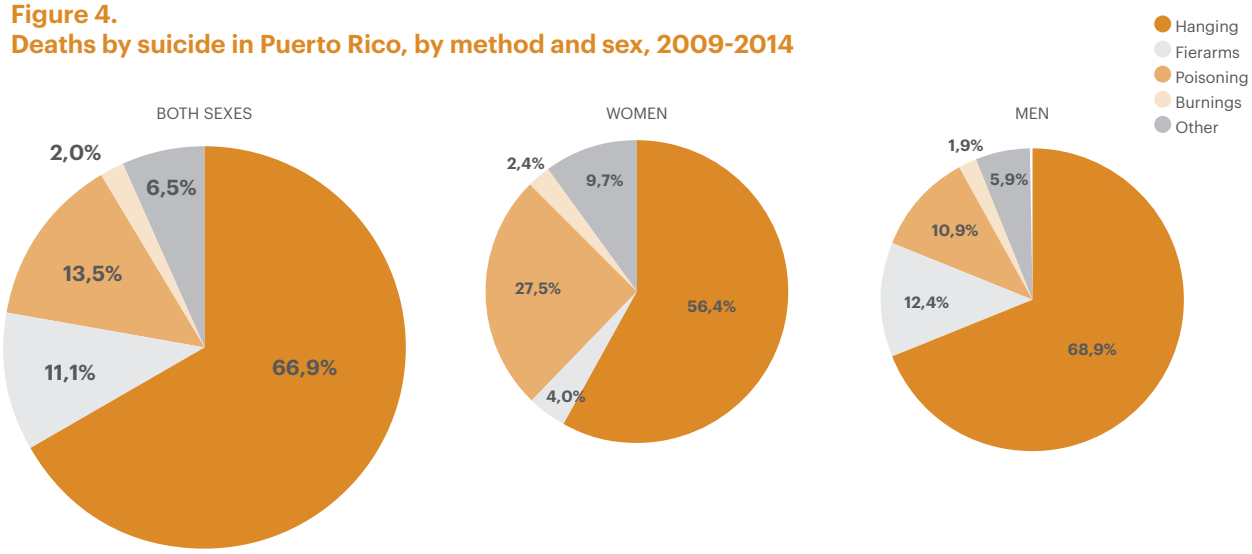
**Figure 3.**
**Suicide trends, by method, Puerto Rico, 2009-2014**




Source: Institute of Forensic Science of Puerto Rico. Preliminary data up to 8 April 2015.

Figure 4 shows the variations in the methods used, by sex. In both sexes, the most common method is hanging. In men, the second most common method is by firearm and the third, poisoning. In women, the second most common method is poisoning, followed by other methods such as suffocation, drowning, and falls.

**Figure 4.**
**Deaths by suicide in Puerto Rico, by method and sex, 2009-2014**




Source: Institute of Forensic Sciences of Puerto Rico. Preliminary data up to 8 April 2015.

## CONCLUSIONS

Suicide today is a serious global public health problem. For all its economic and social problems, Puerto Rico nonetheless has a lower suicide rate than the United States mainland (8).

Even though Puerto Rico has enacted one of the few laws in the world governing public policy on suicide prevention and in recent years has launched media campaigns on suicide prevention, mandated compulsory training for different populations, distributed thousands of educational pamphlets, and developed a National Strategic Plan and uniform protocol for suicide prevention, much remains to be accomplished. For example, Puerto Rico still lacks a surveillance system for suicidal behavior at all stages.

The complexity of a suicide prevention project and resistance to it will soon be overcome. Suicide has characteristics that call for an immediate multidisciplinary approach. It is therefore essential to engage all sectors of society in this project. Suicide is everyone's problem and, thus, all social sectors must be involved (9).

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# THE ASSOCIATION BETWEEN SUICIDAL BEHAVIOR AND DRUG ABUSE: A CHALLENGE FOR PREVENTION

## INTRODUCTION

This chapter explores the link between drug abuse and suicidal behavior, as well as potential prevention and treatment alternatives. The data presented have been extracted from studies conducted in Mexico as well as international research projects that situate the dimensions and scope of the issue in Mexico within an international context.

Over the past 45 years, the reported suicide rates have risen by 60% globally (1, 2). Suicide is the third leading cause of death among young people aged 15 to 24 worldwide, after car accidents and cancer. Suicide attempts, in turn, are one of the main reasons children and adolescents are referred to emergency psychiatric services (3).

Mexico follows a similar pattern. From 1970 to 2007, suicides rates soared, increasing by 275%, from 1.13 deaths per 100,000 population in 1970 to 4.12 per 100,000 in 2007. Despite this increase, Mexico is among the countries with relatively low suicide rates. The greatest number of suicides occurs among youths and young adults between the ages of 15 and 34, who account for 54% of all suicides. The highest rate is observed in the 20–24-year-old subset (7.13 suicide deaths per 100,000 population), a proportion that declines steadily by age group until the 55–59 bracket (3.76 per 100,000 population). Suicides rates rise again as of age 60, with the highest rate observed in the 80–84 age group (7.04 per 100,000 population) (4).

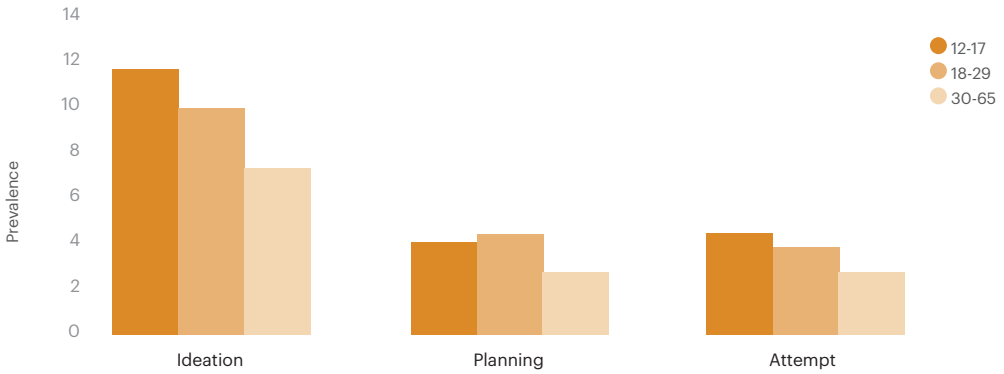
Suicide is the third leading cause of death in people aged 15–25, the fourth in the 25–29 age group, and the fifth in the 30–34-year-old bracket. Its rank as a cause of death declines with age, coming in at 44th in people aged 80–84 (4).

Suicide is more common among men, and in the years compared—1970 and 2007—the male/female gap widened. In fact, in 1970 there were 4.1 male suicides for every one female suicide. In 2007, the ratio was 4.8: 1 (4).

Suicide attempts occurred in 2.7% of the adult population aged 18–65 and in 4.3% of the adolescent population. The highest proportion of suicide attempts were observed between the ages of 12 and 35. This behavior is more common among women (3.6%) than men (1.8%) (5, 6) (Figure 1).

As a result of these trends, suicidal behavior has become a major public health concern in Mexico, primarily in the younger population.

**Figure 1.**
**Suicidal behavior at some time in life, by age group, urban population, Mexico, 2002-2006**




Sources: Survey of adolescents aged 12–17 in Metropolitan Mexico City (N = 3,005, Benjet et al., 2009). National Survey of Adults aged 18– 65 (N = 5,782, ME Medina-Mora et al., 2003)

Thinking about committing suicide is no minor issue, either. A study by Nock et al. (7) that compared suicidal behaviors and their respective risk factors in 17 countries, including Mexico, shows that the transition from suicidal ideation to a suicide attempt is extremely fast. In most countries, this transition took less than a year.

Concern about the increase in suicidal behavior has prompted researchers to evaluate associated factors. In this regard, Gunnel and Lewis (8) underscore that suicidal behavior is a complex phenomenon with no single cause. They maintain that a series of genetic and environmental influences are involved and suggest that three determinants are behind the etiologic complex. First, mental illness—such as depression and anxiety disorders—and substance abuse, both of which lead to suicidal ideation and planning. Second, impulsive behavior in response to life events, which significantly influences the step from the plan to the attempt. Third, a serious physical illness, which not only can increase the probability of mental illness, but also can directly influence suicidal ideation and planning.

Underlying mental illness and impulsive behavior are genetic vulnerability and environmental influences on development, such as the loss of parents, abuse at an early age, broken relationships, job loss, social and economic hardship, other negative life events, and substance abuse later in life.

Not all those who suffer from mental illness commit a suicidal act. In fact, there are intervening factors that facilitate the step from ideation to planning and the attempt. These might include, cultural/personal acceptance of suicide, substance use, imitation, and/or lack of problem-solving skills, for example. Being young and female are influential factors for suicide attempts; being male is an influential factor for suicide.

These underlying elements notwithstanding, other factors exist that protect individuals from progressing to action, including social support and help-seeking. While impulsiveness influences the transition from ideation to attempt, the shift from attempt to suicide is affected by the choice of means and their availability (for example, weapons in the home, unprotected hazardous places, or pesticides). Rescue strategies in suicide prevention programs may protect individuals at risk of dying. Such strategies include the availability of treatment, antidotes, etc.

## SUICIDE AND SUBSTANCE ABUSE

The link between suicide and substance abuse in youth, the main focus of this chapter, merits particular attention due to the upsurge in both problems. The National Psychiatric Epidemiology Survey revealed that substance use disorders are common in young people (9): the average age of onset for drug use disorders is 17 (10).

Furthermore, both household (11) and school surveys (12) show growing substance use in young people. Finally, to cite other data sources, a longitudinal survey conducted by Benjet et al. (13) highlighted that when a sample of the population between the ages of 12 and 17 in 2005 was re-interviewed eight years later, substance abuse had increased among them. A common risk factor for the two phenomena—substance abuse and suicide attempts—is exposure to violence, and impulsiveness plays a key role in both.

## Link between substance abuse and suicidal behavior

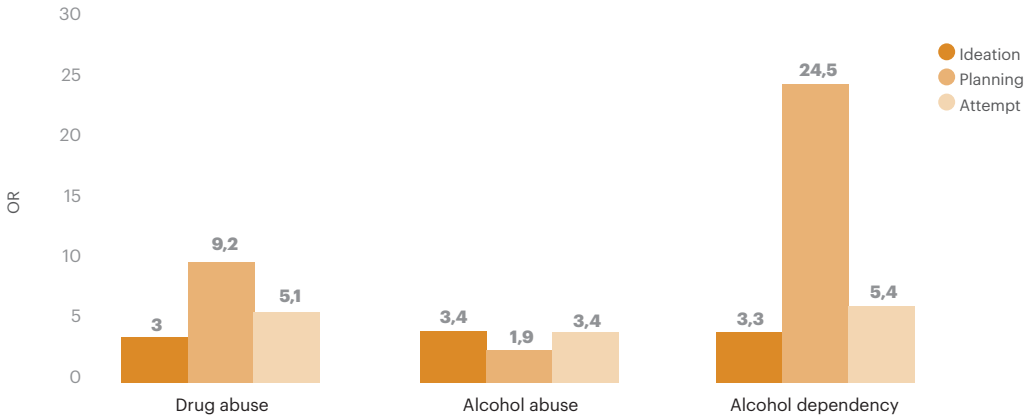
A number of variables affect an individual's predisposition to suicidal behavior when using drugs, especially when there are associated disorders. Particularly important are comorbidities, a history of adverse life events, a genetic predisposition, feelings of hopelessness, and the neurobiological effects of chronic intake of abused substances (14, 15, 16).

This chapter explores the epidemiology of substance abuse disorders among those who attempt suicide; the risks substance use entails in the context of suicidal behavior; the comorbidity of substance abuse, mental illness, and suicidal behavior; and prevention and treatment alternatives.

## Substance abuse disorders and other mental illness in people who attempt suicide

Figure 2, shows data for the adolescent population, which illustrate that drug and alcohol abuse are associated with the probability of suicidal ideation, suicide planning, and suicide attempts. In fact, an adolescent with a drug abuse disorder or alcohol dependency is five times more likely to attempt suicide (6).

**Figure 2.**
**Probability (OR)[a] of suicidal ideation, planning, or attempt among adolescents aged 12–17 when substance abuse disorders are present, Mexico.**




[a] OR = Odds ratio
Source: Borges, Benjet, Medina-Mora, Orozco; 2008.

Both the National Psychiatric Epidemiology Survey (10) and the Mexican Adolescent Mental Health Survey (17) show that psychiatric disorders are reported more commonly among people who plan suicide than among those who do not (18). This suggests that suicidal behavior is influenced not only by substance abuse disorders but also by the presence of other mental illness. As seen in Table 1, substance abuse is one of the most prevalent disorders in the over-18 population attempting suicide (28.3%), after anxiety (47.3%) and mood disorders (38.7%). In adolescents aged 12–17, the prevalence of drug abuse disorders falls to 20.4%, situating it below anxiety (65.1%), impulse control (55.6%), and mood disorders (47.7%) (5, 6).

**Table 1.**
**Comorbidity between substance abuse, other mental disorders, and suicide attempts, Mexico, various years**

| Disorder | 12 to 17 years (N= 121) * % | 18 to 65 years (N= 166) ** % |
|---|---|---|
| Mood | 47.7 | 38.7 |
| Anxiety | 65.5 | 47.4 |
| Impulse | 55.6 | 25.5 |
| Substance use/ abuse | 20.5 | 28.4 |
| Other | 85.4 | 75.4 |

Sources: * National Psychiatric Epidemiology Survey and Mexican Adolescent Mental Health Survey (N = 3,005), 2006 (Benjet et al., 2009); ** National Adult Psychiatric Survey (N = 5,782), 2002 (Medina-Mora et al., 2003).

Drug use and dependency, in particular, are usually linked to other psychiatric pathologies, such as mood, anxiety, or personality disorders. This association is observed in some 30%-50% of cases (19) and reaches 75% in the most serious cases, as observed among those admitted to Mutual Assistance Residential Centers[1] (20). People suffering from more than one disorder or comorbidity have a significantly higher probability of exhibiting suicidal behavior (7, 21). The results of the Mexican Mental Health Survey confirm the additive effects of psychiatric comorbidity: while the presence of a single disorder increases the risk of a suicide attempt 4.2 times, the presence of four or more coexisting disorders increases the risk 39.3 times (18). In adolescents, the greater the number of comorbidities, the greater the risk of suicide. The presence of three or more mental disorders increases the risk of suicidal ideation 7.2 times; the probability of devising a suicide plan, 5.2 times; and the risk an attempt, 5.7 times. Once comorbidities are controlled, their effect size decreases but remains significant (6).

Comparing the results of these surveys in different countries, Nock et al. (7) observed major differences between developed and developing countries (as defined by the World Bank[2]) (22) with respect to mental disorders that increase the risk of suicidal behavior. In developed countries, mood disorders increase risk the most while, in developing countries, impulse control and substance abuse disorders stand out.

## Does the association between substance abuse disorders and suicidal behavior remain when other risk factors are controlled?

The results of Mexico's National Psychiatric Comorbidity Survey (10) of the population over 18 confirm that the strongest predictors of suicide attempts are substance-use disorders (16.6% of those with a disorder of this type had made at least one suicide attempt) and impulse control disorders (6.7% of the people with an impulse-control disorder had attempted suicide). A substance abuse or dependency disorder increases an individual's risk of a suicide attempt by 17.7-fold, and the effect of alcohol abuse or dependency disorder is almost as strong (12.8 increase in risk) (23). This trend persists when comorbidity with other psychiatric disorders is controlled for in the analysis (5)—that is, the association between suicide attempts and substance-abuse disorders is independent of other risk factors. Moreover, as seen in Table 2, risk levels differ with the type of drug and the suicidal behavior involved (24).

[1] These centers offer residential care based on the 12-step model developed by Alcoholics Anonymous, as well as a variety of residential services whose length varies from four weeks to up to 12 months. Some of these centers have large facilities, while others, due to limited space and high user demand, are overcrowded. Many centers do not have specialists or health professionals on staff (20).

[2] Country development levels are primarily defined by income per capita. Even though it recognizes that development is not simply a question of income, the World Bank uses the Gross National Product (GNP) per capita to classify countries into four groups: low income (US$1,035 or less), lower middle-income (US$1,036 to $4,085), upper middle-income (US$4,086 to $12,615) and high income (US$12,615 or more). Likewise, based on the same indicator, the Organization for Economic Co-operation and Development (OECD) classifies countries into two major groups, developed countries (basically, the high-income countries of the World Bank classification) and developing countries (the low, lower-middle, and high-income countries (22).

**Table 2.**
**Probability of suicidal ideation, planning, and attempts among adolescents aged 12–17 when substance abuse is present (OR)[a], Mexico.**

| Disorder/Frequency of use | Ideation OR | Plannig OR | Attempt OR |
|---|---|---|---|
| Alcohol | | | |
| At some time | 2.13 | 3.87 | 3.43 |
| 12 glasses/year | 2.06 | 2.25 | 2.26 |
| Abuse/dependency | 3.10 | 4.21 | 2.5 |
| Drugs | | | |
| At some time | 3.77 | 6.29 | 5.11 |
| Abuse/dependence | 6.24 | 13.29 | 6.79 |
| Tobacco | | | |
| At some time | 3.76 | 5.27 | 5.91 |
| Weekly | 3.36 | 4.15 | 4.92 |
| Daily | 2.96 | 3.19 | 9.62 |
| Dependency | 3.79 | 5.34 | 7.65 |

[a] OR= Odds ratio
Source: Miller, Borges, Orozco, Mukamal, Rimm, Benjet, Medina-Mora, 2011.

### Service use

Studies in Mexico on health service use (25) showed that roughly half of those who attempted suicide at some time in their life sought some type of help, mainly for problems related to depression or drug abuse/dependence. Men reported greater use of services than women.

Adolescents who had attempted suicide sought help from medical facilities (32.5%) and specialized school health services (25.6%). However, only one-sixth of the young people with suicidal ideation had been detected at school. Coupled with the previous information, this means that less than 25% received some type of treatment after the attempt.

Service use declined sharply in recent suicide attempts. Less than one-fifth of adolescents and 40% of the adult population received treatment at some service. Men over the age of 18 were more likely to seek treatment (64.2%) than were women in the same age group (17.2%), while the male to female ratio was the reverse in adolescents (11.3% in men vs. 19.2% in women) (25).

## PREVENTION AND TREATMENT

The data presented confirm that substance abuse and dependence heighten the risk of suicidal behavior in young people and adults. This association persists after controlling for comorbid psychiatric disorders. However, the specific outcomes—suicidal ideation, planning, or attempts—vary according to the substance being abused. Furthermore, the impact of substance abuse on suicidal behavior is different among adolescents than among those over 18. The additional difficulties that arise in identifying and treating suicidal people, even after a suicide has been attempted, are troubling.

The global report on suicide prevention (1) states that suicides are preventable and that the most successful programs are the ones that combine prevention and/or detection of associated psychiatric disorders—in this case, substance abuse and dependence—with attention to other risk factors, such as the influence of the media, the availability of lethal means, and access to services.

Implementing policies to reduce the harmful use of alcohol, training health workers in

early detection, and ensuring monitoring and community support are only some examples of action that can be taken to prevent the suicidal behaviors associated with drug use.

The frequent existence of comorbidities underscores the importance of shifting from a disorder-focused model of care, to a needs-based model, and ultimately, to a people-centered model, in which healthcare services for substance abuse and mental health problems, which today are provided in separate settings, are integrated.

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# RELIGION, SPIRITUALITY, AND SUICIDE PREVENTION

## INTRODUCTION

An estimated 84% of the world's population practices some form of religion (1). Most religions are concerned about matters related to life and death and, consequently, can have an impact on suicidal behavior. The World Health Organization's report on suicide prevention (2) discusses the role of religious ideas and practices as protective factors, while also noting the potential risk they may pose for suicide. This chapter briefly examines the scientific evidence on the association between religion and mental health in general and, more specifically, suicide. It also examines how communities of faith contribute to suicide prevention.

For decades, the fields of religion and mental health have considered themselves adversaries. More recently, a rapprochement has occurred, spurred by the abundance of evidence demonstrating the general benefit that religious beliefs and practices confer on mental health (3). As will be seen in the brief analysis below, there is valid evidence of the beneficial effects of religion on mental health. However, research findings are sometimes difficult to apply because of the definitions used. This chapter will briefly examine these definitions to facilitate understanding.

### Definitions

It is necessary to define the terms "religion" and "spirituality" used in this chapter. Religion encompasses the beliefs, practices, and rituals related to the "transcendent." In western religious tradition, the transcendent is related to the mystical, to the supernatural, to God; in the eastern tradition, it includes the search for the ultimate truth, reality, or enlightenment (4). Religion also involves a belief in spirits, angels, or demons. Religious traditions tend to have specific beliefs about life after death and rules to guide behavior within a social group. Religion is often organized and practiced within a community, but can also be practiced individually and privately, outside the confines of an institution. Key in its definition is the fact that religion is deeply rooted in an established tradition, that it involves a group of people with common beliefs and practices related to the transcendent. Religion is a single construct, whose definition is generally not in dispute.

The term "spirituality" is currently more in vogue than and preferred over "religion." Throughout most of human history, it has been used in connection with a relatively small group of deeply religious people whose lives were given over to the Divine, as they understood it, and reflected the pious religious teachings of their faith. They were often religious leaders (for example, Moses, Jesus, Mohammed, Buddha, Gandhi) or members of the clergy.

Over the past 20 years, however, the meaning of "spirituality" has changed. Today, it is regarded as something personal that people define for themselves, and it often lacks the standards, rules, and obligations associated with structured religion. A person can be spiritual but not religious. In fact, today, a type of "secular spirituality" is often seen in circles that disapprove of religion. As a result, spirituality is perceived as something that is not divisive and is common to all, both religious and secular people alike.

As indicated above, spirituality is largely self-defined and can be anything a person wishes it to be. It is, therefore, especially useful in clinical settings, where the goal is to establish a dialogue with patients on these matters using a common language that transcends religion. However, due

to its loosely defined nature, spirituality is hard to measure and quantify for research purposes. Consequently, since religion is what has generally been measured and correlated with mental health (suicide in particular), in the discussion of the research that follows, reference is made primarily to religion.

## MENTAL HEALTH BENEFITS OF RELIGION

Many studies have shown the link between participation in religious activities and certain aspects of mental health, including depression, self esteem, the direction and purpose (of life), hope and optimism, and alcohol and drug use—factors that often underlie suicidal ideation, suicide attempts, and suicides. The results of these studies, which were selected by a systematic literature review conducted in 2010, are summarized below (5).

### Depression

Due to religion's role in coping with adversity and the connection between adversity and depression, it is not surprising that religion is somehow linked with depression. As of 2010, at least 444 studies had quantitatively examined the association between religion or spirituality and depression. The first of these were published in the early 1960s. A total of 272 (61%) showed an inverse relationship with depression, while only 28 (6%) found that participation in religious activities was associated with a higher frequency of depression. In studies with a more rigorous research design, 67% (119 of 178 studies) found fewer cases of depression among those who were more religious, while 7% (13 of 178 studies) identified more cases of depression among that group.

The results of this review agree with those of a previous independent meta-analysis of 147 studies that were published before 2003, in which 98,975 subjects had participated (6); the meta-analysis yielded an average inverse correlation of 0.10 between religion or spirituality and depression. Even though the correlation is low, it is similar in direction to the effect of being male compared to being female (depression is reported twice as often among women). A particularly pronounced inverse relationship is seen when examining stressed populations, where the correlation increased by 50%.

### Self-esteem

Religious beliefs can exacerbate feelings of guilt in certain people if they fail to meet the exacting behavioral standards prescribed by their religious traditions. This perceived failure, in turn, lowers their self-esteem. Analogously, mental health experts have argued that religion damages self esteem because it emphasizes humility instead of pride in oneself (7). However, a systematic and objective examination of these possibilities indicates precisely the opposite.

Our systematic review identified 69 studies that explored the relationship between religiosity and self-esteem. Of these studies, 42 (61%) found higher self-esteem in people who were more religious or spiritual, while only 2 (3%) found lower self-esteem. Furthermore, the more rigorous studies showed that in 17 out of 25 (68%), people who were more religious had higher self-esteem. These results coincide with the inverse relationship found between religion or spirituality and depression.

### Direction and purpose

When life loses its direction and purpose, people often wonder whether the effort to carry on and struggle with difficult situations is worth it. At least 45 studies examined the relationship with religion and spirituality, and 42 (93%) of them found a significant positive relationship. These studies were often conducted in populations whose problems, such as chronic disabling disease, made it harder to find direction and purpose in life. All of the 10 studies whose quality was considered acceptable reported a statistically significant positive relationship (4). Religious beliefs give direction and purpose to life experiences that people might otherwise view as random and unpredictable, and over which they have no control. In these situations, suffering can soon become intolerable and drive people to suicide.

### Hope and optimism

Hope keeps people striving to meet their goals in life and, in complicated situations, offers them a light at the end of what could otherwise be a dark and endless tunnel. At least 40 studies examined the relationship between religion or spirituality and hope; 29 (73%) of them found a significant positive relationship. No study found an inverse relationship. Studies on optimism yielded similar findings. The review identified 32 studies conducted before 2010 that examined the relationship between religion or spirituality and optimism. Of these, 26 (81%) found a significant positive relationship (4). Again, as with hope, no study showed an inverse relationship with these two dimensions. When people have hope and are optimistic about the future, they do not commit suicide.

### Alcohol and drug use

Alcoholism and drug addiction are among the strongest risk factors for suicide. Here, too,

quantitative studies published in peer-reviewed academic journals systematically report that people who are more religious are less likely to use and abuse addictive substances. At least 278 studies published before 2010 examined the relationship between religion or spirituality and alcohol consumption, alcoholism, or dependency. In 240 (86%) of these studies, an inverse relationship was observed (only 4 of the 278 studies showed a positive relationship). The probability of finding less alcohol consumption and alcoholism among people that were more religious or spiritual increased to 90% (131 studies) when only the more rigorous studies (i.e., greater sample size, longer monitoring, better statistical analyses) were included.

The findings were similar for drug use and drug addiction. Of the 185 studies that examined the relationship between religion or spirituality and drug use, 84% showed an inverse relationship, and only two (1%) showed a positive relationship. Again, the more rigorous studies—that is, 86% of 112 — had at least the same probability of showing this relationship. Hence, the vast majority of the studies showed that religion, or spirituality, was linked to less frequent alcohol and drug use (4). The fact that most of these studies were conducted among high school or university students is particularly important, since this is a stage when young people often begin to experiment with toxic substances that will affect their education, future employment, family life, and health for the rest of their lives—all of which will have an impact on their suicide risk.

## RELIGION AS A SUICIDE RISK FACTOR

Although participation in religious activities is generally associated with a lower risk of suicide and fewer suicide risk factors, there are cases in which it can drive people to suicide. Some religions, for example, accept suicide under certain conditions (2). Individuals suffering from depression, who are at increased risk of suicide, can be at even greater risk due to the negative aspects of a given religion and greater exposure to highly emotional religious experiences that heighten their instability (9). Only seven studies showed an association between religion and suicide. Spiritual struggles (a person's belief that God has abandoned him or her, doubts about divine benevolence, or intense interpersonal conflicts within a community of faith) are predictive of ill health, poor mental health outcomes (10), and greater suicide risk (4).

Although these studies largely include hypothetical situations and case reports instead of systematic research, it is important to mention them. First, religious belief systems promote standards of behavior and moral values that can be hard to live up to—for example, forgiveness (turning the other cheek), loving one's neighbor, loving one's enemies, confining sexual activity to a single person in a life-long marriage, and sacrificing one's own well-being for others. In vulnerable people, the failure to meet such high expectations can lead to discouragement and a sense of impotence leading some of them to give up and opt for suicide. In other cases, prolonged suffering, either their own or that of a loved one, can fuel anger against God and cause individuals to feel punished by God and abandoned by their community of faith. Overwhelmed by their burdens, such people may commit suicide as an act of revenge against God. Research in patient populations has revealed that crises of belief of this nature predict significantly higher mortality (11).

It should be pointed out that suicide terrorists who risk their lives to cause harm and kill people under the guise of religion are not mentally ill but follow distorted religious teachings or have been indoctrinated by leaders who distort religious teachings to satisfy a need for revenge, power, domination, and control over others. These leaders are not following what the founders of those religions preached or their fundamental teachings, but exploit human weakness and vulnerability to further objectives that are often political (12).

## RELIGION AS A PROTECTIVE FACTOR

With few and limited exceptions, the major world religions have negative attitudes toward suicide and explicit teachings against it (8). For example, monotheistic religions have a commandment against suicide, and eastern religions (Buddhism, Confucianism, and Hinduism) also oppose it, affirming respect for life.

Time and again, research on participation in religious activities and suicidal ideation, suicide attempts, and suicides has shown the existence of an inverse relationship. Our systematic review of quantitative research published prior to 2010 found the following: at least 141 studies have actually examined the relationship between religion or spirituality and the suicidal behavior cited above. Of these, 106 (75%) showed an inverse relationship, while only 4 (3%) showed a positive relationship. With respect to the 49 more rigorous studies, 39 (80%) found fewer suicides, fewer suicide attempts, or more negative attitudes toward suicide in people who were more religious or spiritual (4).

Conventional wisdom and simple logic suggest that people with strong religious beliefs that discourage suicide, as well as individuals who are less depressive, have high self esteem, find greater direction and purpose in life, and are more optimistic and hopeful thanks to their religious beliefs, have a lower risk of suicide.

## Explanatory models

Stack (13) summarized the main theories that explain why religion tends to be a protective factor against suicide. These theories clearly overlap and complement one another.

The "religious commitment theory" states that individuals with religious beliefs are influenced by the teachings of their religious tradition, which discourages or has a direct commandment against suicide, thus reducing the risk of depression and suicide.

The "religious network theory" emphasizes the protective effect of belonging to a social group. Indeed, numerous studies based on samples from the community and people with psychiatric disorders found lower suicide rates among people who frequently attend a church, temple, or synagogue (14). In fact, there may be a suicide risk related to "the dose" associated with the frequency of attendance at houses of worship: in a sample of people at high risk, those who attended less than once a month were twice as likely to commit suicide (15).

The "religious integration theory" posits that constant adherence to religious ideas and practices and the integration into a community of faith provide a greater sense of hope and purpose in life, as demonstrated in several studies with samples from the community and psychiatric populations (4).

The "moral communities theory" states that, in addition to the social support found in communities of faith, the size of the community is important, since it reinforces acceptable behavior. For example, certain countries with homogeneous religious affiliation reinforce values associated with preserving life or oppose those supporting the acceptability of suicide. Indeed, recent world events have shown that communities play an important role in suicidal behavior but, in those cases, in the opposite direction of the one theorized by the "moral communities" approach. Suicide terrorists seem to be politically motivated while claiming religious justification and calling for support from their communities. "Moral communities" can serve as a buffer against suicidal behavior but can also have the opposite effect, insofar as they tolerate suicide by justifying it on religious grounds.

According to Stack, religion's role in reducing suicidal behavior may very likely be related to the unacceptability of suicide. National samples of Christian believers in the United States show that the least acceptance of suicide is found among the most religious people who attend church often and believe in the benevolence of God, life after death, and the resurrection of the dead. An extensive international survey with the participation of 80 countries from all continents found that religion, no matter which one, was a predictive factor for lower suicide rates (16).

## Role of communities of faith in suicide prevention

Communities of faith are uniquely positioned to contribute to suicide prevention. Religious leaders are considered key gatekeepers in the promotion of a community based prevention strategy (17). Systematic collaboration among spiritual leaders, primary care providers, and mental health professionals can have a real impact on suicide prevention. In the United States, spiritual leaders spend more time treating people with mental health problems—even those with serious mental disorders—than do family physicians, psychiatrists, or psychologists (18).

## A project in Honduras

A mental health project involving a religious denomination is being implemented in Honduras with the collaboration of the Ministry of Health, the University of Honduras Medical School, PAHO/WHO, the Seventh Day Adventist Church, and the Loma Linda University Medical School (USA). The purpose is to train spiritual leaders to spearhead community activities aimed at preventing the risks associated with suicidal ideation, such as depression, addiction, violence, and trauma.

In addition to offering spiritual leaders training, the project provides them with workbooks on relevant topics so that they may inform their communities, identify and refer individuals in need of mental health services, and network with primary care providers trained by the WHO Mental Health Global Action Programme and mental health professionals in the community. The workbooks employ an evidence-based approach (for example, cognitive behavioral therapy) and use terminology that is culturally appropriate for the selected profession (clergy) and the communities with whom they chiefly

interact. These spiritual advisors are also trained to identify and properly filter suicidal individuals.

As a complement to this community strategy, Davy et al (19) published an article in the Seventh Day Adventist newsletter, which is read throughout the world by the majority of its members (approximately 18 million) and is published in 13 languages. The article summarizes the results of the WHO report on suicide prevention (2) and extrapolates the results to the Adventist community context to educate the membership and raise awareness about suicide.

## CONCLUSIONS

Overlooking religious factors (that is, beliefs and practices) can ignore one of the most powerful influences to prevent suicide, just as overlooking religious communities can exclude important allies from the common effort to reduce suicides.

The following suggestions therefore are offered:

- Adopt a biopsychosocial and spiritual framework to understand suicide;
- Systematically include measures of religious adherence when collecting population data to more accurately target interventions;
- Forge partnerships with spiritual leaders and communities of faith, together with other civic organizations, to promote prevention activities in the community;
- Provide spiritual leaders with training on suicide and educate mental health professionals about the role of religion in suicide prevention; and
- Recognize and learn about the unique approach of the different faith traditions to suicide, the teachings that contribute to the development of cognitive groups, and community ties that help to prevent suicide or increase its risk.

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# THE STUDY OF PERSONALITY IN THE TREATMENT AND PREVENTION OF SUICIDE IN ADOLESCENTS

## INTRODUCTION

Adolescent self-harm is a global public health concern. In fact, for three decades the World Health Organization (WHO) has observed a steady rise in deaths by suicide among youth under the age of 25. In Mexico, for example, the highest proportion (14.9%) of deaths by suicide among total violent deaths occurs among 15–19 year-olds (1). Multifactorial in nature, adolescent suicide is a complex bio-psychosocial phenomenon and one of the models to understand it takes into account risk and protective factors, along with other health and disease determinants. The model is founded on the premise that suicide risk in adolescents results from the interaction of individual processes (including cognitive processes and biochemical, psychological, and psychopathological factors) and macro processes (for example, exposure to adverse life events), mediated by family, social, cultural, economic, and other environments. Recent attention has been drawn, for example, to the Internet's influence on vulnerable groups of adolescents who have attempted suicide and other self-inflicted harm (2).

Since 1992, the U.S. Centers for Disease Control and Prevention (CDC) has devised various suicide prevention strategies that have been integrated into a national strategy for the United States. The CDC has also created a database of interventions that have proven effective. Regarding adolescents, the strategies converge on early identification of risk indicators as well as the assessment of individual and contextual factors. In the area of psychology, the CDC identifies programs for middle-school and high school settings that use screening instruments to identify struggling adolescents. The screens include personality traits associated in the scientific literature with heightened suicide risk.

The purpose of this chapter is to examine the study of personality in adolescents at risk of suicide, given its importance in preventing suicide mortality. In evaluating psychological intervention strategies, it has become clear that it helps to know the personality profile of adolescents at risk who are seen at mental health services. This chapter is based on more than 10 years of research in Mexico.

## FUNCTIONAL AND DYSFUNCTIONAL PERSONALITY

### How is personality addressed in adolescents at risk?

Personality is the organized—and usually stable—set of psychological traits and mechanisms in an individual that exert influence on his or her interactions with and adaptations to the environment. Although the complexity of personality is evident, valid measurement of its constituting constructs, as well as differentiation of the dysfunctional personality, are both possible.

Regarding personality in adolescents at risk, it is helpful to distinguish between:

- Personality characteristics or traits associated with suicide risk and emotional distress—for

example, in adolescents who are students and remain functional, at least to a degree; and

- Personality disorders whose comorbidity with substance abuse or mood or anxiety disorders is present in young people who have been hospitalized for a suicide attempt, and who, moreover, may have dropped out of school or run away from home.

This distinction improves the ability to decide which preventive actions and clinical practices are the most appropriate to take and employ. Two clinical case studies are useful in this regard: first, an adolescent whose parent has died unexpectedly develops suicidal ideation while attempting to cope with the death; and second, an adolescent who has been diagnosed with a major depressive disorder characterized by psychoses and suicidal intent.

Generally, the first scenario calls for a psychotherapeutic intervention in which personality assessment would shed light on the adolescent's internal and external resources to focus on the subject of death itself (for example, as part of the grieving process). In the case of the second adolescent, the priority would be to devise a pharmacological-psychotherapeutic treatment regimen for clinical depression, a condition that is a major contributing factor to suicide risk.

Yet, having in mind the complexity of the suicide phenomenon—which does not follow linear causality—, it is well known that suicidal intent is not necessarily preceded by mental illness or that all people with psychiatric disorders are at risk of suicide.

### Personality and psychopathology

In the dysfunctional personality category, two nosologic systems have been followed: the American Psychiatric Association's Diagnostic and Statistical Manual on Mental Disorders (DSM IV), and Chapter V of the World Health Organization's International Classification of Diseases (ICD-10). Nevertheless, since the recent appearance of the DSM-V, Mexico's psychology and psychiatry services have opted to follow the WHO classification system because the DSM-IV-TR and the ICD-10 are mutually compatible. Using this latter instrument, the presence of higher suicide risk or the risk of self-inflicted injury has been documented in adolescents with the following disorders (organized by the prevalence of the self-destructive behavior or death by suicide): schizophrenia (F20), borderline personality disorder (F60.3), bipolar disorder (F31), recurrent depressive disorder (F33), and substance use disorders such as the harmful use of alcohol (F10). Comorbidity should be remembered here, since it is useful to take the co-existence of two or more disorders in an individual into account, as they heighten the potential for suicidal and/or self-destructive behavior (in both adolescents and adults).

Another aspect of dysfunctional personality analysis relates to the stage of adolescent development. While one of the diagnoses most associated with suicide risk is borderline personality disorder (low tolerance for frustration, impulsiveness, irritability, high emotional demand, etc.), in fact, that determination can be problematic since according to developmental psychology, personality is not fully formed at this phase, especially among younger adolescents. However, one of the main challenges in both psychiatry and psychology continues to be the heterogeneity of the profiles of adolescents who have attempted to kill themselves and have not been diagnosed with a mental (or personality) disorder. This suggests that adolescents who attempt suicide may belong to different subtypes of personality profiles.

In both scenarios, knowing the personality traits or characteristics associated with suicide risk in adolescents or young adults is important, so that these indicators are included in prevention and intervention efforts (in addition to risk factors and other conditions, as specified earlier). The purpose of this chapter is to examine the personality of adolescents with no psychiatric diagnosis that requires medication and/or hospitalization. The chapter also explores the personality of adolescents under emotional distress accompanied by suicidal ideation, suicide planning and suicide attempts, who are also receiving some form of psychological intervention in outpatient services or at the primary care level. To this end, it discusses elements that encourage the development of a suicide risk profile based on the personality structure of Mexican adolescents who attend school, while using a clinical case description to illustrate the implications of such a profile for psychological treatment.

## PERSONALITY ASSESSMENT AND SUICIDE RISK

### Psychological measurement in adolescents

Psychological assessment currently involves a variety of processes, tools, and techniques.

A proposal for an evidence-based model for adolescent suicide risk assessment would include:

- Psychological interview models such as those proposed by Shea (3) to determine the degree of suicide risk vis-à-vis other situations, such as substance use, interpersonal conflict, or school or family problems;
- Psychometric instruments (which evaluate constructs and quantify psychological variables), such as the Adolescent Suicide Risk Inventory (IRIS-A) (4) or the Minnesota Multiphasic Personality Inventory (MMPI) (5);
- Clinimetric instruments (strictly empirical instruments for measuring behaviors or clinical indicators), such as the Beck scales for suicide ideation, hopelessness, depression, and anxiety (6); and
- Projective tests, such as the Family Drawing or Children's Apperception Test with animal figures (CAT), used to assess at-risk children or preadolescents, where the goal is to broaden or delve more deeply into the information obtained with the aforementioned techniques or tools.

Since the use of self-reporting instruments (within the psychometric repertoire) has been one of the strategies that has helped demonstrate the link between personality and suicide, it is relevant to briefly discuss what it is they measure. The MMPI, for both adults (MMPI-2) and adolescents (MMPI-A), identifies differences in personality traits that are useful to detect or predict suicide risk. It is also possible to assess the components of suicide risk, such as intent, depression, hopelessness, or the absence of protective circumstances, which is what the Adolescent Suicide Risk Inventory (IRIS-A) does. Another self-reporting instrument used in the study of suicide risk is the Life Events Questionnaire (7), since determining the link between personality traits and suicide risk also implies identifying the types or styles of coping with adverse life events. In fact, risk is determined not only by personal characteristics but by an individual's internal resources and how he or she deals with life's difficult situations.

One aspect common to these instruments is the reference population—that is, during their construction and validation, the population of origin has been taken into account to establish a (statistically validated) parameter of "normal." This makes it possible to evaluate the distribution of that population's responses in this set of psychological variables, so that the distance of an individual's responses from the norm can be measured. The farther the distance from the norm identified in the population of origin, the greater the probability of distress, difficulty, risk, or diagnosis of a mental health disorder or problem.

The Minnesota Personality, IRISA, and Life Events inventories have been validated in the Mexican population following the procedure summarized here. The three instruments consist of different scales or subscales corresponding to the different components of the constructs they evaluate; thus, each makes use of graphs that visually display the score obtained to facilitate the identification of scores in or outside the normal (average) range.

## The MMPI Personality Inventory and Suicide Risk

The first psychometric studies on personality and suicidal behavior in youth first appeared in the scientific literature in the 1970s. These initial studies reported, for example, that university women with one or more suicide attempts had a profile characterized by a high demand for affection, low tolerance for frustration, a tendency toward aggressiveness, and difficulty forming close relationships (8).

The first studies using the MMPI also appeared during this period, along with one of the most systematically reported findings in the scientific literature: the heterogeneity of the personality profiles obtained with this inventory. In this regard, patients with psychiatric disorders and suicidal behavior were initially compared with non-suicidal patients, while at the same time, the difficulty in establishing a personality profile that would make it possible to distinguish between the two groups was discussed. Higher scores on the MMPI depression and hypochondria scales were found among patients with suicide risk (9). These initial studies from the 1970s are related to what is known today: that up to 60% of the people who committed suicide had some mood disorder, the most common being major depression.

## Life events, personality, and suicide risk

Few studies have explored the link between adverse life events, suicide attempts, and personality traits. Examining exposure to stressful life events is important for shedding light on the coping strategies adopted by dysfunctional, maladaptive people at risk of suicide. Life events associated with suicidal behavior and personality

in adults include the break-up of a relationship or marriage, problems with the law, unemployment, family conflict, and financial difficulties (10). Among adolescents, assessments of stressful life events as predictors of suicide attempts indicate that they are accompanied by the presence of specific personality traits, such as a high degree of impulsiveness and the search for new sensations, and low scores for persistence, self-direction and self-control, and cooperativeness (11).

Other life events, such as physical and sexual abuse in childhood, have been assessed by identifying personality correlates with histories of attempted suicide and suicidal ideation. What stands out here are gender-mediated behavioral problems, identity problems, and impulsiveness, specifically in the case of serious suicidal ideation (12). Factors associated with the family, including family conflict, as well as personality and affect disorders, together with personality traits such as low self-esteem and impulsiveness, are considered to influence suicidal behavior (13).

Studies of Mexican adolescents have revealed an association between suicidal ideation, planning, and attempts and life events of a social or health nature, with no significant differences found between the sexes. Thus, in the case of suicidal ideation, the risk almost triples in individuals exposed to negative social events vis-à-vis individuals who are not; in the case of suicide planning and attempts, the risk is three times higher among people exposed to negative health related life events than among people who are not. Looking at social situations, problems with friends or intimate partners should be cited, while in health, the risks are related to substance use.

With regard to interpersonal conflicts, some are related to the personality traits found in adolescents with suicide risk: alienation, isolation, and anger. In general, the risk of suicidal ideation or planning, or suicide attempts, quadruples when an adolescent is exposed to negative events, while exposure to positive events seems to protect against such risk, especially suicide planning.

### Personality traits and suicidal behavior

Opinions about the role of personality in suicide risk and treatment for suicidal behavior in adolescents have varied over the years. Attempts to assess personality traits in adolescents have shown that few instruments are capable of doing so. Although general personality inventories are useful for identifying personality traits that can predispose an individual to eventual self-destructive or suicidal behavior, they are underutilized as a source of clinical information to assess and predict suicide risk (14)

Personality traits that have helped identify adolescents at risk of suicide are aggressiveness, impulsiveness, and hostility. Perfectionism has also been linked to suicidal behavior (15).

Thus, contradictory findings have been reported concerning the influence of personality on suicidal behavior in adolescents. While some studies fail to find distinctive personality traits in adolescents who have attempted suicide (16), others indicate a number of traits that could potentially be used to construct a risk profile: neuroticism, introversion, low self esteem, impulsiveness, and external locus of control (17). It has also been suggested that using the MMPI-A profile in isolation to assess adolescent suicide attempters is inadequate to detect latent suicide risk. Nonetheless, researchers have identified a series of statements made by interviewees that are very common in suicidal adolescents, including: "I don't care what happens," "No one cares very much what happens to me," "My future is hopeless" (18). The MMPI-A has proven a useful instrument in some Mexican studies on suicidal behavior, since it evaluates not only stable traits in adolescents but also problematic ones (19).

## PERSONALITY PROFILES IN MEXICAN ADOLESCENTS WITH SUICIDE RISK

The MMPI-A contains two types of profiles. The first includes the basic scales for personality traits related to psychopathology, as well as validity scales that measure the sincerity of the interviewee, and thus, the acceptability of his or her responses. The second profile consists of supplementary content scales, specifically designed to identify adolescent problems such as alienation, difficulties with anger management, immaturity, addictive tendencies, etc.

In a study of adolescents in Mexico City public schools, the MMPI-A was used as part of a strategy for timely detection of suicide risk and subsequent psychological intervention or referral to specialized mental health services (20). The profiles reported here are based on the evidence from that research.

Although there are similarities between male and female adolescents at risk of suicide (for example, somatization), the evidence points to suicidal personality profiles that vary with gender.

### Personality in adolescent girls at suicide risk

The adolescents at high risk had difficulty with anger management, were generally resentful,

and demanded excessive attention, affection, and empathy. They also tended to blame others for what happened to them. These girls were self-centered and defiant, had a tendency to somatize their problems, and had little capacity for introspection.

They were usually referred to psychotherapy by their parents because of defiance, disobedience, and negativity; they were suspicious and distrustful of other people's motives and characteristically avoided deep emotional attachment. They showed little introspection with regard to their psychological problems, and their behavior often sparked anger and rejection in others.

The findings with this type of personality profile suggest that these adolescents are viewed as immature, easily frustrated, impatient, defiant, and concrete in their thinking. There can be enormous discrepancies in how they see themselves and how they are viewed by others. They are usually referred to psychotherapy because of recurrent conflicts with their parents, which may turn into chronic serious fights. Moreover, they typically have no impulse control and act without adequately weighing the consequences of their actions. These adolescents often have problems with authority figures, who describe them as instigators. Even though they resort to acting out as a defense mechanism, substance use is uncommon.

In conclusion, what adolescent girls with these types of profiles have in common is their problem with anger management, and, contrary to the findings of studies with adults, depression is not a salient trait (Table 1).

**Table 1.**
**Principal descriptors of personality in adolescents who have reported one or more suicide attempt**

| Male | Female |
|---|---|
| Problems with anger management | Problems with anger management |
| Tendency toward somatization | Tendency toward somatization |
| Impulsiveness | Impulsiveness |
| Health concerns | Resentment |
| Problems with social adaptation | Excessive demand for attention, affection, and sympathy |
| Cognitive problems | Defiance |
| School performance substantially below average | Little introspection |
| Alienation and isolation | Mistrust |
| Problems stemming from substance use | Disobedience |
| | Negativity |
| | Discrepancy between external perception and self-perception |
| | Recurrent conflicts with parents |

### Personality in adolescent males at suicide risk

Adolescent males identified as being at risk of suicide usually exhibit psychological traits related to somatic concerns, such as headaches or insomnia, and perceive themselves to be suffering from some physical illness. The findings indicate that these youths feel sick and are concerned about their health. Strictly speaking, they may report a greater frequency of serious illness in childhood. Often, there is a history of social maladaptation and social awkwardness—that is, difficulty forming and maintaining interpersonal relationships. These youths also have difficulty concentrating or problems with cognitive processes, to the point where they exhibit symptoms of delirium. They usually have academic problems and substantially below-average school performance.

These adolescents also display impulsiveness and self-destructive behavior, meaning that they are more likely to attempt suicide and engage in substance use. They often have a history of father/mother-adolescent conflict, and their parents are more likely to be divorced. These youths generally feel alienated and isolated from others; their poor anger management can exacerbate these feelings.

They are commonly referred to psychotherapy for exhibiting excessive emotional control, and they are seen as evasive, defensive, and fearful of emotional involvement with others. A large proportion of these youths comes from homes without a father or with an absent father figure, or have experienced rejection or distancing by the father figure. They may also express rage, including violent outbursts toward parental figures. Two areas of personality assessed with the MMPI-A stand out: their attitude toward health professionals and problems with alcohol or other substances (Table 1).

## INTERVENTION BASED ON PERSONALITY ASSESSMENT

As part of the aforementioned study, this approach to characterizing personality in groups of at risk adolescents was used to design a prevention strategy. The screening strategy identified suicide risk, and some of the personality traits were applied to plan the content of group psychological intervention sessions at their school (at the end of the school day). Based on the psychometric evidence, the topics addressed were problems with anger management, impulsiveness, and immaturity. For example, two to four sessions were devoted to working on these issues, the frequency determined by the time allotted by the schools for the project. Other sessions were devoted to stress (assessed with stressful life events) or addictions, and yet others to working directly on suicide risk. According to some of the traits and the responses and reactions to a battery of psychological tests, descriptive charts were designed to guide the sessions.

It should be noted that many of the emotions linked with suicidal ideation that were expressed in therapy are associated with the discomfort generated by the personality traits mentioned. Furthermore, by addressing the common element of interpersonal problems, the group sessions provided an opportunity to identify and discuss matters that very likely would not have materialized in individual therapy, as observed in the pilot testing of the intervention's case study. Finally, the combination of areas where up to 80% of suicide risk is associated with personality traits (anxiety, low self-esteem, family and school problems, anger) were revisited in the thematic content of the psychological intervention, integrating the stressful situations to which the adolescents had been exposed.

The following case study provides a clinical vignette in which personality traits provided a key aspect of treatment in outpatient consultations with an adolescent girl at risk of suicide and depression.

## CASE STUDY

María (M.) is a 13-year old girl seen for suicidal ideation and recurrent self-inflicted injuries, as well as depression. She lives with her parents and extended family. The mother assumes that recent changes in the family's financial situation have affected her daughter (the father lost a good job and the mother stopped working to care for her sick father).

The problem of self-inflicted injuries had begun two years earlier, according to the patient, although the mother said it had begun a year ago. The mother also noted radical changes in her daughter's mood, believing them to be due to adolescence: she had become withdrawn and was always in a bad mood.

The girl had begun to take an interest in the occult and started dressing "darketo" style (Mexico City urban tribe with Gothic clothing) or "emo" (an urban youth subculture whose adherents have a negative outlook and tend to portray themselves as pessimists and victims of society). During the first session, the mother reported that they had contacted a group of adolescents with self-inflicted injuries and their mothers via the Internet. After several sessions, she had seen that rather than helping her daughter, this group had reinforced her behavior, so she had asked her to avoid contact with it. The mother apparently wanted to be in control and manage her daughter's treatment, so it was decided to work mainly with the girl and, only when strictly necessary, with the mother.

In the initial sessions, some instruments were administered, such as the family test, the questionnaire on adolescent suicide risk, IRIS-A (which classified her as being at high risk), and the MMPI-A. In the family drawing it was observed that M. did not distinguish clearly between her nuclear family and her extended family; she seemed to feel invaded, viewed simply as part of the group and therefore with no identity of her own.

The MMPI-A profile of M. turned out to be reliable, according to the parameters of the instrument, since she answered the questions sincerely and there were no indicators of inconsistency in her responses. Furthermore, the profile indicates that she felt bad emotionally and wanted help, because she felt defenseless and incapable of solving her problems.

The most salient personality traits on the basic scales were: rebellion and difficulty conforming to social norms (scale 4), anger (scale ANG-A) and mistrust (scale 6), marked egocentrism, and difficulty developing her self-concept and identity (scale 8).

The content scales, which clarified and complemented the score on the basic scales, showed major behavioral problems, indicating that since M. did not accept the prevailing social norms, she was rebelling—behavior that might be related to her self-inflicted injuries. Furthermore, this was related to a high score on the family problems scale, which reflected her very negative feelings toward her family. The high score for school problems and limited aspirations can be attributed to her low self-esteem and need for attention. The score on the immaturity scale was also rather high, which explains her egocentrism and inability to grow. This was addressed in one of the first sessions, in which she talked about problems in her interactions with her family and her difficult relations with her uncle, whom she considered the worst person in the family. M. also commented that for a long time, she had been the favorite girl in the family, but once her brothers were born and she experienced her growth spurt (actually, she had been tall and strapping since the age of 11), the family had stopped paying attention to her and she felt lonely.

Later sessions focused on family problems, which had one of the highest scores in this second profile (scale FAM-A), and it became clear that many of M.'s problems were with her mother, who, moreover, did not understand her. M. related that she often hurt herself because she got angry with her mother and did not express it. Her mother appeared to be very intrusive. In subsequent sessions, M. talked more about her anger and was acting it out less, which led to fewer self-inflicted injuries. She realized that she sometimes did poorly in school to upset her parents, but she was only hurting herself, since she wanted to pursue her studies.

The exploration of some of M.'s personality traits and working on them in therapy over a relatively short period (18 sessions), enabled M. to stop hurting herself and stop thinking about death, although it is clear that not all of her problems were solved. The therapy ended because the patient and her family moved to another city. The type of therapy provided in this case has been used successfully in other cases.

It is evident from the studies mentioned in this chapter that personality traits are not the cause of self-inflicted injuries or suicide risk; however, if they are used not only for diagnostic purposes but are worked on during interventions, the prognosis can improve.

## CONCLUSION

Adolescents who have attempted suicide or exhibit serious suicidal intent are a heterogeneous group in terms of personality traits and exposure to adverse life events prior to their suicidal behavior. Interventions to mitigate suicide risk in adolescents will have to address individual differences, such as impulsiveness, affect regulation, and sensitivity, as well as gender differences.

Although the personality profiles obtained with the MMPI-A confirm this heterogeneity, adolescent males at risk of suicide can be described as impulsive, with poor anger management, alienated, and socially isolated, with serious academic difficulties and hypochondria. In contrast, adolescent girls at risk of suicide are characterized as apprehensive, nervous, angry, and defiant; they report more conflicts with their parents than males do, have little tolerance for frustration and boredom, have low self-esteem, and are impulsive.

Finally, active incorporation of these descriptors into the design of psychological interventions can make them more effective in reducing suicide risk.

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