

# Epidemiological Profile of Suicide Attempts and Deaths in a Southern Brazilian City

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## ABSTRACT

Suicide is the act of taking one's own life voluntarily and intentionally, and Brazilian suicide rates, from 1980 to 2000 recorded an average of 4.9 per 100,000. This research aims to describe the profile of suicide attempts and suicide mortality from August 2010 to August 2012. The data of suicide attempts and completed suicides were obtained from SINAN (Notification Information System for Diseases). The data collected indicates that the largest number of people who have attempted to commit suicide is female, between 30-39 years old, married, white, schooling from the 5th to 8th grade, factory workers living in urban areas, who committed the attempt at home by poisoning. Regarding completed suicides, cases were predominantly male, between 30-39 years old, married, white, schooling from 1st to 4th grade and/or high school, working in trade/services, in urban areas, committed in their homes by hanging.

**Keywords:** Suicide; psychopathology; epidemiology.

## RESUMO

*Perfil Epidemiológico de Tentativas e Mortes por Suicídio em Município da Região Sul do Brasil*

O suicídio é a ação de tirar a própria vida de maneira voluntária e intencional, e o Brasil, de 1980 a 2000, registrou uma taxa média anual de 4,9/100.000 habitantes. Buscou-se estabelecer um perfil das tentativas e óbitos por suicídio num município da região sul do Brasil, entre agosto de 2010 e agosto de 2012. Os dados foram obtidos através das fichas de Notificações do SINAN. O município apresentou uma taxa de suicídios de 21,42/100.000, muito acima da taxa nacional. O maior número de pessoas que fizeram tentativas é do sexo feminino, entre 30-39 anos, casadas, raça/cor branca, escolaridade de 5ª a 8ª séries, industriárias, residem em área urbana, realizaram a tentativa em casa por envenenamento. Os suicídios tiveram predominância do sexo masculino, entre 30-39 anos, casados, raça/cor branca, escolaridade de 1ª a 4ª série e/ou ensino médio completo, atuam no comércio/serviços, residem área urbana, cometeram em suas residências por enforcamento.

**Palavras-chave:** Suicídio; psicopatologia; epidemiologia.

## RESUMEN

*Perfil Epidemiológico de Intentos de Suicidio y Muertes en el Municipio del Sur de Brasil*

El suicidio es el acto de matar intencionalmente a sí mismo, y entre 1980 y 2000, Brasil registró una tasa media de 4,9/100.000. El objetivo de esta investigación fue establecer un perfil de los intentos de suicidio y las muertes en un municipio en el sur de Brasil, entre 2010 y 2012. Los datos se obtuvieron de los registros del Sistema de Información de Enfermedades de Declaración Obligatoria (SINAN). La ciudad tenía una tasa de 21,42/100.000 en los años 2010 y 2012, siendo muy superior a la tasa nacional. El predominio de los intentos es de sexo femenino, con edades entre 30-39 años, casado, raza blanca escolarización, del 5 al 8º grado, industriarias, que viven en zonas urbanas, llevó a cabo el intento de envenenamiento en el hogar. Los suicidios tienen predominantemente masculino, edad 30-39 años, casado, raza blanca de la escuela de 1º a 4º grado y/o secundaria, trabajando en el comercio/servicios, la vida urbana, y se comprometieron en residencia en la horca.

**Palabras clave:** Suicidio; psicopatologia; epidemiologia.

Suicide is a subject linked to taboo and prejudice. Death, even being a natural consequence of life, is an uncomfortable theme of discussion and that people avoid talking about. Thus, when a person attempt against its own life, this fact usually generates a great emotional impact over the family and friends and for this reason\_it is a theme of great relevance and complexity. Suicide means *sui* = itself and *caedes* = action of kill, therefore it is the act to take off his or her own life in an intentional way, aiming the fatal objective. Besides the expectation for the death, some people with any disorder or mental disabilities would not be aware of the fatal outcome (Viana et al., 2008; Werlang & Botega, 2004).

There is a fine relation between suicide and the social context where it occurs. In Western societies, it is very common to perceive suicide as a coward act, being a thing that people can't do and can't talk about because it is conceived as a sin, aimed as a tentative to eliminate pain and suffering. Suicide is usually accompanied by shame or guilty by the family, and police reports are distorted to hide the actual motivations for the act. But, it is common that in Eastern Culture, suicide is seen as a positive behavior, either as an act of fidelity, honor, discipline and good character or an act that redeems a family or a name (Dias, 1991).

What causes suicide is a combination of many factors. There is not a single reason that leads someone to commit the act, but it is better understood as a final act in a chain of factors in his or her biography. It can be enumerated factors as constitutional, environmental, cultural, biological and psychological one, and what is called "the reason for it" is indeed the last identified factor (Cassorla, 1991). World Health Organization (WHO) defines suicide as a self-inflicted violence, where the person is, at the same time, the agent and the victim of the greatest act of violence, the self-killing (Pordeus & cols., 2009). The suicide behavior leads to a conflict between to die and to stay alive at the same time, and many times the result (to die or to survive) is determined by the strength of these thoughts and feelings, in one side, and for the chance, considering the way, the possibilities to be saved and the physical health, for the other. The person could be avoiding of an unbearable and indescribable situation, fear of madness, annihilation or disintegration. Other times it could be added to a lack of hope, a giant melancholy and the assurance that no one is worth. Death thus is perceived as solution, not because one is searching for the death, but because life is intolerable (Cassorla, 1991; Viana, 2008).

There are many factors related to a suicide risk, like humor, anxiety and personality disorders (Søndergård & cols., 2007; OPAS, 2009; Autry & Monteggia,

2009), addiction to legal and non-legal substances (Johnson, Gruenewald, & Remer, 2009; Schneider, 2009; Sublete & cols., 2009) and psychotic disorders, like schizophrenia (Sansone, Kelley, & Forbis, 2013). Social factors, as family dynamics, event-related stress and resilience capacity must be considered as protective or non-protective elements (Jeglic & cols., 2005; Roy, 2006; Gradus, 2010; Burton & cols., 2011). There is more suicide risk in biographical events like recent or old meaningful losses, important dates as birthdays or holidays, widowhood, and being far from family, disabling diseases, chronic pain, epilepsy, spinal trauma, cancer and AIDS. Sociodemographic factors linked to a greater risk of suicide is for males, age between 15 to 35 and over 75 years old, being very rich or very poor, leaving in urban areas, being unemployed (especially if recent), legal problems, retirement, atheism, single or divorced and being immigrant (Podgorski, 2010; Souza & cols., 2011).

In 2008, WHO estimated about 728,000 suicides around the world, counting 1.4% of total mortality and 15% of mortal damage. This data showed that suicide rate was 11.6/100,000 inhabitants (Värnik, 2012) and until 2020, more than 1.5 million people will commit suicide. Brazil is in 67th position in a worldwide classification in number of suicides, but in absolute numbers, Brazil is in the 10th position. 0.8% of all deaths, with a 4.5/100,000 inhabitants suicide rate, relatively low considering world rates (Lovisi & cols., 2009).

Suicide behavior is amongst three more frequent causes of death, and it is the 6th cause of disability between 15 to 35 years old. In 2005, were registered 8,550 suicides, representing almost one death per hour (Werlang & Botega, 2004; OPAS, 2009). Rio Grande do Sul has one of the greatest rates of suicide, counting 14/100,000 suicide per inhabitants for males and between 3.2 and 4.7/100,000 suicide per inhabitants for females. Farmers and fishermen showed potential risk of suicide, about 16.3/100,000 against 5.7/100,000 from technical and scientific workers (Barros, Oliveira, & Marin-León, 2004). Considering marital status, married or widowed people has the greatest rates of suicide, opposing to divorced or single, with lowest rates. In elderly people, there was a raise of suicide rates in people with more than 70 years old, but in the 90's there was a raise of suicide rates in younger population considering 20 to 59 years old. The most common method to commit suicide is hanging, with 62.5% of suicides in 90's, followed by firearms (21.5%) (Dumesnil & Verger, 2009). It is necessary to understand patterns and main characteristics, like personal, social and cultural related to suicide, and to prepare better healthy strategies to deal with the

problem and to avoid a raise of the rates (Lester, 2007; Conwell & cols., 2010; Schwartz & cols., 2010). To find out why southern of Brazil has suicide rates higher than national average was the motivation for this study. The main objective was set up a profile of suicide attempters between 2010 and 2012, to better understand the problem and to aid promoting prevention strategies.

## METHOD

The general objective of the research was to find out characteristics of the people who tried or committed suicide in a region in southern Brazil, between August 2010 and August 2012. Data was obtained by Domestic, Sexual and other forms of violence, filled by county hospital and sent to County Health Bureau. This Bureau sends these data to national ISND/SINAN (Information System for Notifiable Diseases). For data collecting, the Bureau accepted the realization of the research. After the research project been approval by Research Ethics Committee (CAAE 05263012.4.0000.5319), the data was collected. Inclusion criteria were all the forms filed between August 2010 and August 2012. The names were preserved, and data referring to age, sex, race, scholarship, residence zone, occupation, marital status, if there were mental disorders or retardation, where the act occurred, time of the attempt, local, if the attempt was the first or recurrent, and what mean to try or commit suicide were analyzed. Form contains other fields not used in this research, because they didn't refer to the suicide attempt profile. Analysis consisted in a descriptive statistics (mean, frequency and percentage), aiming to identify mainly sex, age, scholarship and another aspects related to attempts and deaths occurred by suicide.

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## RESULTS

The county researched has about 35,000 inhabitants. Data obtained from ISND form considering the two years showed that were notified 179 cases of attempt or suicide commitment, 164 were suicide attempts (91.6%) and 15 were consummate suicide (8.4%). There was a greater rate of suicide attempting in females (133 cases, 81.09% of notified cases against 31 cases, 18.91%), and males had greater rate of consummated suicide (8 cases, 53.33%, against 7 cases in females, 46.67%). Thus, the county annual suicide rate is 11.42/100.000 for males and 10.0/100.000 for females, amounting to a 21.42/100.000 consummated suicide annual rate.

Considering the age, there was a greater attempt suicide number ranging 30-40 years old (41 cases, 25.00%), followed by 20-25 years old (32 cases, 19.51%) and 40-50 years old (26 cases, 15.85%), with people economically active. The consummated suicide range with more cases had been 30-40 years old too (5 cases, 33.33%) and 40-50 years old (4 cases, 26.66%). There was an agreement between the attempted and consummated suicides when referring to the marital status; in the first place was stable union or married (75 cases of attempted, 45.73%, and 9 cases for consumption, 60.00%) followed by singles (54 cases of attempted, 32.92%, and 3 cases of consumption, 20.00%). About race, the main category was white for both cases (for attempt 142 cases, 86.59%, and 13 for consumption, 86.66%); the region was colonized by immigrants coming from Italy and Germany.

The suicide attempters and consummated had primary incomplete scholarship (34 cases for attempts, 20.73% and 3 cases for consummated, 20.00%), followed by complete school (23 cases for attempt 14.02, and 3 cases of consummated, 20.00%) even though these statistics of 51 forms did not have this field proper answered (28.49% from total, 179 cases). Regarding jobs, industrialists (23 cases, 14.02%), homemakers (20 cases, 12.19%), trade and services, general services and retired (17 cases each one, 10.36%) had the main suicide attempt rates. In consummated suicides, the main occupations were trade and services (5 cases, 33.33%), followed by farmers and retired (2 cases each, 13.33%).

TABLE 1  
Profile of Attempting and Suicide Consumption – Years 2010 to 2012

<i>Dimension</i>	<i>Range</i>	<i>Attempting</i>	<i>Consumption</i>
Sex	Male	31	8
	Female	133	7
	Total	164	15
Annual mean rate (by 100,000)	Male	44.28	11.42
	Female	190.00	10.00
	Total	234.28	21.42
Age	0 - 15 years old	3	0
	15 - 19 years old	24	1
	20 - 25 years old	32	0
	25 - 30 years old	24	0
	30 - 40 years old	41	5
	40 - 50 years old	26	4
	50 - 60 years old	11	3
	60 > years old	3	2
	Total	164	15
Marital Status	Married/Stable Union	75	9
	Single	54	3
	Divorced	10	2
	Widow	2	0
	Not answered	21	0
	Unknown	2	1
	Total	164	15
Scholarship	Illiterate	1	0
	1st to 4th degree	9	3
	Incomplete 4th degree	7	1
	Incomplete 5th to 8th degree	34	2
	Complete basic education	14	0
	Incomplete school	18	0
	Complete school	23	3
	Incomplete higher education	1	1
	Complete higher education	4	1
	Not answered	47	4
	Unknown	6	0
	Total	164	15
	Residence	Not answered	2
Urban		147	12
Rural		15	3
Total		164	15
Place of fact	Home	155	13
	Thoroughfare	3	1
	Bar or similar	1	0
	Other	5	1
	Total	164	15
Type / Method Used	Poisoning	137	3
	Cutting or piercing object	16	0
	Hanging	8	9
	Blunt object	1	0
	Fire gun	0	1
	Other	2	2
	Total	164	15

The occurrence of mental disorders for attempts and consummations was notified as not present or not identified (96 cases for attempt, 58.53%, and 7 consummated cases, 46.66%) and present (52 cases for attempt, 31.70%, and 7 consummated cases, 46.66%). 17 cases from total (9.49%) were not answered in this item. The generic responses (only “presence of mental disorder”) did not allow knowing what psychopathology was associated.

A number of 147 cases of attempting (89.63%) and 12 cases of consummated suicide (80.00%) occurred in urban areas, and 15 cases of attempting (9.14%) and 3 cases of suicide (20.00%) occurred in rural areas. The local of attempting or consummation was mainly at home (155 cases for attempting, 94.51%, and 13 cases for consummation, 86.67%).

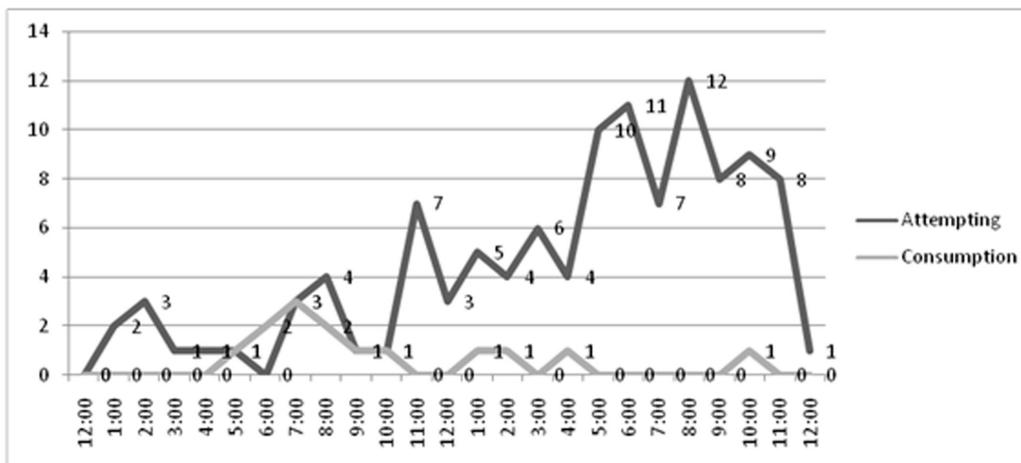
The time of occurrence for many of the attempting suicides were at 8PM (12 cases, 7.31%), at 6PM (11 cases, 6.71%) and at 5PM (10 cases, 6.10%), and the

consummate suicides were at 7AM (3 cases, 20.00%), at 6AM (2 cases, 13.33%) and at 8AM (2 cases, 13.33%) (Graphic 1).

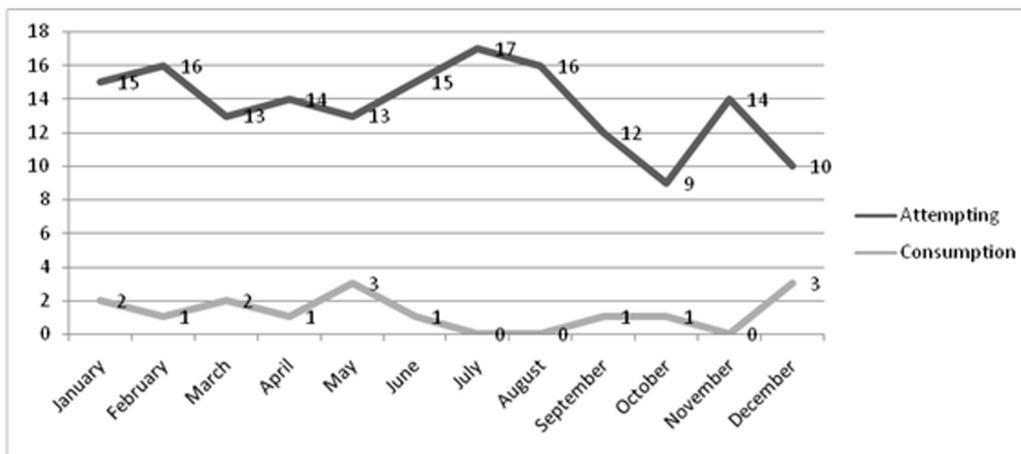
Months with main cases were: attempting suicide in July (17 cases, 10.36%), August and February (each one with 16 cases, 9.76%), January and June (each one with 15 cases, 9.15%) and consummate suicide in May and December (each one with 3 cases, 20.00%), and January and March (each one with 2 cases, 13.33%) (Graphic 2).

Considering suicide attempt recurrence, 79 cases (48.17%) had already tried at least once and only 5 cases (33.33%) of suicide consummate tried before (10 cases, performing 66.66% of consummated suicide did not try to kill himself or herself before). The method used by suicide attempters was mainly poisoning, in 137 cases (83.53%), against 9 cases of consummated suicide by hanging (60.00%) and 3 by poisoning (20.00%).

GRAPHIC 1  
Time of Attempting or Consumption of Suicide



GRAPHIC 2  
Month of Attempting or Consumption of Suicide



## DISCUSSION

The attempting suicides were 82 cases per year and the suicides were 7.5 cases per year. In Brazil, between 1980 and 2006, mortality rates ranged 4.3-5.7 deaths/100,000 inhabitants. Southern Brazil had the greatest suicide rates in this period, ranging 8.1-10.4 deaths/100,000 inhabitants (Lovisi & cols., 2006). In the county of this study, it was obtained an annual suicide rate of 21.42/100,000 inhabitants, four times greater than national average. Considering only annual suicide attempting rates, it was obtained 243.25 / 100,000 per inhabitant, about seventy times greater than Brazilian average.

Women made more suicide attempts than men, but men were more effective in the suicide. One cause of these differences is that men usually had more lethal ways, while women didn't. In the case of women, were notified "poisoning" by medicines, which can eventually allow a more effective help than hanging or firearms (Lovisi & cols., 2006). Poisoning is one of the most common ways to attempt or consummate suicide (Santos, Legay, & Lovisi, 2013).

Considering the age, people ranging from 30 to 50 years old had more consummated suicides. In Rio Grande do Sul, young adults had an increasing suicide rate in recent years, but older people, with 70 years old or more, have still showed greater suicide rates (Meneghel & cols., 2004), although other states like Bahia have a greater rate of suicide in a younger population (20-39 years old) (Souza & cols., 2011). The county of this study has a young population with attempted or completed suicide, which showed a difference between state rates. Considering attempting suicides numbers, 30-40 years old followed by 20-25 years old and 40-50 years old range had the greatest numbers, referring to an active economic percentage of population.

There were a greater attempt and suicide rates in married and stable union rates, followed by single. These numbers also differ with Brazilian rates: widows have more attempts and consummate suicides (13.7/100,000 inhabitants) (Meneghel & cols., 2004), but another finds show that single ones have more attempts and suicides. Rates of suicide between Brazilian states are different, and the southern state showed greater rates than others, as showed in studies about Amazonas (Orellana, Basta, & Souza, 2013), Espírito Santo (Macente & Zandonade, 2011), Rio de Janeiro (Bezerra Filho, Werneck, Almeida, Oliveira, & Magalhães, 2012) Rio Grande do Norte (Dutra & Roehle, 2013), Minas Gerais (Vidal, Gontijo, & Lima, 2013) and São Paulo (Freitas, Seiwald, Parada,

& Hubner, 2013) states. Possibly, cultural and social factors are related to these differences (Souza & cols., 2011).

The major percentage of attempt and suicide people was white; the county was colonized by Italian and German descents, what explains this fact. People with incomplete primary school made more attempts and suicide: about 39% (attempts) and 40% (suicides) with complete school. Lovisi & cols. (2006) pointed out that low scholarship is related to higher attempts and suicide rates. It is necessary to point out that 51 forms (28.49% of all) had not answered this field.

Among people that made suicide attempts, industrial workers, homemakers, trade/services workers, general cleaning services and retired stood out to other categories of professions. Industrial workers are auxiliary production and trade/services category includes salesman, administrative assistant, workers in microenterprises and general services. Concerning consummated suicides, there were greater incidence among trade/services and technical-scientific workers. General services workers, farmers, retired, homemakers and merchants were the professions that have emerged with more prevalence of suicide in the Brazilian's Southern region (Viana & cols., 2008). The researched county has a notable industry and commerce, which may explain the higher rate of suicide attempts and suicide deaths in individuals working in professional areas related with this economy sector.

Most of the forms (n=120, 67,03%) were met without a record of what disability or disorder in individuals who had attempted or committed suicide. Those that were answered generically specified mental disorder and behavior disorders as the most significant. According to OPAS (2009), over 90% of suicides can be made a diagnosis of mental disorder. The most frequent situations correspond to depression, bipolar disorder, chemical dependency, especially alcohol.

Most attempts and suicide deaths occurred in individuals living in urban areas, but the county has several communities within which occurred fifteen attempts and three suicides, which could be related to pesticide use. In rural communities, the use of pesticides is associated with neurological disorders and poorer mental health, influencing suicidal thinking and behavior, and easy access due to the storage of these products is a risk factor (Zhang & cols., 2009) although, living in urban areas may not be sufficiently protective element, considering the physical and cultural proximity of the urban area studied with its countryside.

Most of the suicide attempts occurred in the residence, also evident among the cases of completed

suicide. Regarding the method, poisoning was the most widely used mechanism for attempting suicide, and hanging was the most used in cases of suicides. Most suicides occur in the residence of the subject and are more related to hanging (Souza & cols., 2011). Attempts occurred through poisoning include drug intoxication mostly, and there is a strong relationship with the abuse of psychoactive drugs (Lovisi & cols., 2006). The municipality studied has a good government program for distributing psychoactive drugs, but it is perceived an indiscriminate use and easy access to prescriptions and remedies to carry out the suicide attempt.

Suicide attempts occurred most often at 8PM, 6PM and 5PM and regarding suicides, 7AM, 6AM and 8AM were the most significant times of occurrence. It can be observed that attempts occur mostly by the afternoon and early evening, and suicides happen by the morning. We could not find research to discuss these findings, and it deserves attention for further research.

January, February, June, July and August were the months with most frequent notifications of suicide attempts. Suicides occurred more frequently in the months of May and December. It was observed that the early summer and early winter are the ones that have higher rates of suicide attempts, while suicides occurred in most of the months of May and December. People with a seasonal pattern of mood disorders tend to experience depressive episodes during a particular season, especially winter. This is a standard known as seasonal affective disorder (SAD), which may be a possible reason for the early peak during early summer and winter (Kaplan & Sadock, 1997). In Brazil, there is not a significant change in solar rates, but in the Southern region this change is greater than other states, and the winter is colder; so, it is possible that may have some relation between winter and the increase attempts and suicide rates in July and August. There is a warning to the month of December, in which increased suicide rates, in the municipality studied, because according to the popular belief there is a highest rate of suicide during the end of year festive, deserving further study on the relationship between suicide and holidays (Sehnm & Palosqui, 2011). However, there is no consensus relating seasonality and suicides. Nader et al (2011) did not identify seasonality in suicide numbers in a research conducted on 67,741 cases of suicide in Australia between the years 1970 and 2008, and other authors seem to reinforce this lack of seasonality depending on the calculation method used.

Considering suicide attempts, 79 cases (48.17%) referred to individuals who had attempted suicide before, but the majority of consummated suicides had

not done earlier attempt (10 cases, 66.67%), according to the forms. The presence of suicidal behavior, and especially a positive history of suicide attempts, it has been seen as an important predictive value in assessing risk for suicide (Turecki, 1999). The county studied, however, had the most cases of suicide among accomplished individuals who had no history of previous attempts, requiring a larger study to better understand the relationship between different types of manifestations of suicidal behavior. It is possible to associate mental disorders with early suicide attempts, such as depressive episode (Chachamovich & cols., 2009; Santos & cols., 2009). The association between early suicide attempt and mental disorders increases by 5-6 times the risk for new and suicide attempts (Hovanesian, Isakov, & Cervellione, 2009). However, it is important to emphasize problems of record notifications, deserving further studies to identify possible inconsistencies of this information.

The results showed that the profile of suicide attempts in the period studied are: females, between 30-40 years old, married, white, with incomplete primary, industrialists, living in urban areas, making the attempt in their residence, most likely to have tried at home around 8PM in the month of July using poisoning (possibly medicines). Consummated suicides profile are: males, between 30-40 years old, married, white, with incomplete primary or incomplete high school education, worked in trading industry/services, residing in urban area, consummating suicide at home, around 7AM in May or December, without history of suicide attempts and by hanging.

## CONCLUSION

A better understanding of the profile of suicide attempts and consummations is critical to establishing strategies and policies compatible to deal with the problem, especially in the case of high rates presented in this research. Although the survey data can be considered satisfactory, it was possible to identify two situations that may impair an adequate profile of attempts and suicide deaths. One of these conditions refers to the instrument, because the wording of the bookmark to dubious interpretations, inaccurate or inappropriate references to a clearly information are necessary for a general overhaul of the form. It is possible to get better questions, or even have a specific form to evaluate suicide attempts and consumptions. The form is used to evaluate also sexual violence and others, differing only in item completed as self-harm. Another question is concerning to a possible lack of preparation to a proper form answering. It was frequently identified

forms with incompleteness, with some issues more than others. Filling form does not follow a pattern or have a standardized answer, suggesting the need for training the employees responsible for filling. The city had major annual rates of suicide attempts and deaths by comparing them to the national level, which leaves room for discussion and detailed study on effective ways to prevent this phenomenon, and the elaboration of public policies to address the problem.

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