


## Characterization of suicides in the Seridó region of the state of Rio Grande do Sul: A time series study

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### ABSTRACT

**Objective:** To analyze suicide cases from 2000 to 2015 in the seridó region of Rio Grande do Norte, Rio Grande do Norte, Brazil. **Methods:** This is an epidemiological, ecological and time-series study, developed in the 4th health region of the state of Rio Grande do Norte. The study population consisted of suicide cases that occurred in the region in the time series. In the researched databases, information was collected regarding: socio-demographic characteristics, number of deaths due to suicide, number of inhabitants per municipality, and the human development index. The data were analyzed using descriptive statistics by reading the absolute (n) and relative (%) frequencies, as well as the suicide mortality rate. **Results:** A total of 397 cases of suicide were identified in the period, with a mean age of 43.7± 18.9 years; most were male (82.1%); young adults (38.48%); white skin color (48%); single people (48%) and farmers (30.27%), in addition to hanging as the most used method (79%). **Conclusion:** The profile of suicides in the Seridó region of Rio Grande do Sul is very similar to what is already known in the national and international literature. However, the figure of the single male farmer as the main actor identified points to the importance of further studies on the phenomenon, in order to support regional public policies in suicide prevention, directed to these workers and inserting them in psychosocial care networks.

**Keywords:** Suicide, Mental health, Preventive psychiatry, Epidemiology.

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## INTRODUCTION

Suicide refers to the deliberate act, performed by the individual himself/herself, whose intention is to die, in a conscious, intentional, even ambivalent way, using a means that he/she believes to be lethal<sup>(1)</sup>. It is among the major public health problems, and its attempt is associated with a considerable reduction in the life expectancy of the general population<sup>(1)</sup>.

According to estimates by the World Health Organization (WHO), suicide is responsible for at least 800,000 deaths annually, corresponding to one death every 45 seconds, or more than two thousand people who end their own lives every day somewhere on the planet<sup>(2)</sup>. Young people and young adults are among the most affected – being the second most frequent cause of death among those aged 19 to 25 years<sup>(2)</sup>.

The mental disorders most commonly associated with suicide are: depression, bipolar mood disorder, and dependence on alcohol and other psychoactive drugs. Schizophrenia and certain personality traits are also important risk factors. According to Bertolote & Fleischmann (2002)<sup>(3)</sup>, the risk situation is aggravated when more than one of these conditions are combined, such as depression and alcoholism, or even the coexistence of depression, anxiety and agitation.

In Brazil, the average mortality rate by suicide is 5.5 per 100,000 inhabitants over the course of a year, which can be considered relatively low when compared to other countries, although this rate has been increasing over the last ten years<sup>(2)</sup>. In spite of this, because it is a populous country, Brazil occupies the eighth place among those with the highest absolute numbers of deaths by suicide<sup>(2)</sup>.

In the last epidemiological bulletin, released by the Ministry of Health in 2017, the suicide mortality rate in the country in the period studied, although twice as low as the world rate in 2012, showed a similar pattern of behavior regarding sex and marital status. On the other hand, the highest mortality rates in adults and the elderly were highlighted, contrary to what was observed in world data<sup>(2)</sup>. Considering the 1993 WHO classification, Brazil has an average level of suicide mortality rate (between 5 and 15/100,000 inhabitants) in males. In this group, the highest rates were observed in the elderly population over 70 years of age; in people with low schooling; single, widowed or divorced; and that they used hanging as the primary means to commit suicide.

It is known, however, that in Brazil there is an unequal distribution of suicide cases in the different regions of the country<sup>(4)</sup>. In certain localities, as well as in some population groups, such as: indigenous people from the Midwest and North, and farmers from the interior of Rio Grande do Sul, the mortality rates are close to those of Eastern European countries and Scandinavia, in the range of 15-30 per 100,000/year. Several sociocultural and economic factors seem to be associated with these high rates, as well as a high frequency of mental distress and alcohol abuse<sup>(5)</sup>.



In Brazil, the highest rates of death by suicide were recorded in the states of Rio Grande do Sul, Santa Catarina and Mato Grosso do Sul, respectively<sup>(6)</sup>. The region of Seridó Potiguar, in the interior of the Northeast, in turn, appears as a *suicide cluster* in Rio Grande do Norte, with several municipalities presenting suicide mortality rates well above the national average, in the Northeast and in the state itself<sup>(7,8)</sup>. The municipality of Caicó, specifically, located in the aforementioned region, has already occupied the 3rd place among the 20 Brazilian cities, with at least 50,000 inhabitants, with the highest suicide rates between the years 2005 and 2007<sup>(9)</sup>.

Several sociocultural and economic factors seem to be associated with these high rates, as well as a high frequency of mental distress and alcohol abuse<sup>(5)</sup>. According to Meleiro (2018)<sup>(1)</sup>, the main vulnerability factors for suicidal ideation can be divided into four broad categories: demographic, diagnostic, psychiatric history, and psychological. Of the demographic characteristics, male gender, being single or divorced, and being unemployed are known risk factors.

In this context, the present study sought to obtain a broader understanding of the phenomenon of suicide and its particularities in the *locoregional context, with the objective of analyzing suicide cases in the region of Seridó Potiguar, in the period from 2000 to 2015, with the characterization of the sociodemographic profile and the means used to do so.*

Developed within the scope of a professional master's degree, the perspective of action research employed in this study also assumed the commitment that its product could assist in a proposal for intervention in the local reality, contributing to teaching-service-community integration and directing actions to prevent and reduce mortality by suicide in the region.

## METHODS

This is an epidemiological study, of the ecological type and time series, referring to the period from 2000 to 2015. The research setting was the 4th health region of the state of Rio Grande do Norte, located in the Seridó Potiguar region. The study population consisted of suicide cases that occurred in the IV URSAP (Regional Public Health Unit) in the period referring to the time series.

According to IBGE data, the Seridó Potiguar is a geographical and cultural region belonging to the state of Rio Grande do Norte, covering an area of 9,374.063 km<sup>2</sup>, and an estimated population of 311,531 inhabitants, corresponding to 9.1% of the total population of the state<sup>(10)</sup>. It consists of 25 municipalities: Acari, Bodó, Caicó, Carnaúba dos Dantas, Cerro Corá, Cruzeta, Currais Novos, Equador, Florânia, Ipueira, Jardim de Piranhas, Jardim do Seridó, Jucurutu, Lagoa Nova, Ouro Branco, Parelhas, Santana do Matos, Santana do Seridó, São Fernando, São João do Sabugi, São José do Seridó, São Vicente, Serra Negra do Norte, Tenente Laurentino Cruz and Timbaúba dos Batistas, presenting the highest concentration of municipalities with high or medium-high human development index (HDI) in the North and Northeast regions of the country<sup>(10)</sup>.



Data collection was carried out between August and October 2017, using a standardized questionnaire for the study. The ITEP/Caicó – RN databases were consulted to obtain information regarding: sociodemographic characteristics and number of deaths by suicide between January 1, 2000 and December 31, 2015, in the Seridó region of Rio Grande do Sul. In the IBGE, information was collected on the population of the municipalities and the human development indices (HDI).

Among the variables investigated are the independent variables: gender, age, occupation, place of residence; and the dependent variable: death certificate by suicide, considered as deaths resulting from intentional self-harm (X60-X84), of the International Statistical Classification of Diseases, in its tenth edition (ICD-10)<sup>(11)(11)</sup>.

The data were analyzed using descriptive statistics by reading the absolute (N) and relative (%) frequencies, as well as the suicide mortality coefficient, in the quadrennials from 2000 to 2015, according to quantitative variables. To calculate the Suicide Mortality Coefficient, the following formula was used: *number of suicides x 100 thousand/number of inhabitants*. In addition, the data and information were analyzed based on the theoretical conceptual framework of collective health, with references and authors who reflect on the interface between collective health and mental health and, in particular, on the phenomenon of suicide in its various determinations.

The research was evaluated and approved by the Research Ethics Committee of the Faculty of Health Sciences of Trairi – Federal University of Rio Grande do Norte (FACISA-UFRN), under CAAE No. 56201616.2.0000.5568, Opinion Number: 1.707.504.

## RESULTS

According to the information obtained from the ITEP/Caicó database, during the period from 2000 to 2015, there were 397 cases of suicide in the Seridó region, with the municipalities of Caicó (29.47%), Currais Novos (9.57%) and Jucurutu (7.30%), with the highest number of cases in the period studied, and the municipality of Timbaúba dos Batistas with no cases recorded for the period (Table 01).

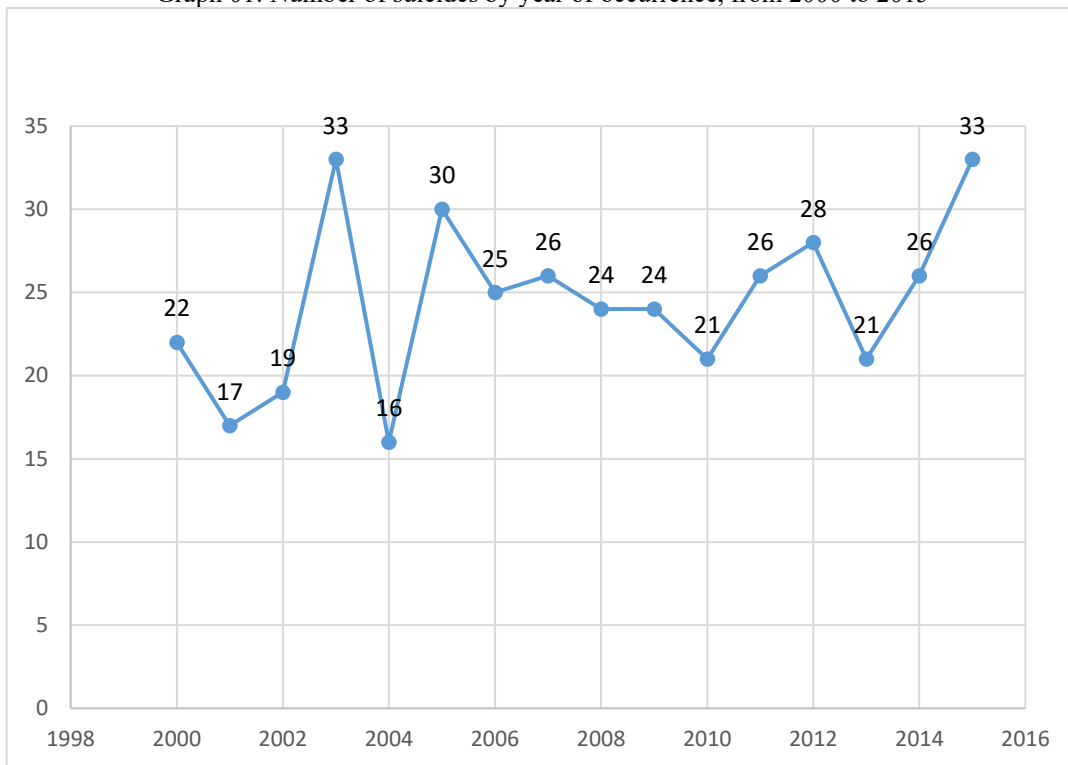
Table 01: Occurrence of suicide in the Seridó region of Rio Grande do Norte, by city and micro-region, from 2000 to 2015

Microregion/Municipality	Human development index (HDI)	Absolute Frequency (n)	Relative Frequency (%)	Mortality Coefficient
<b>Seridó Ocidental</b>				
<b>Caicó</b>		<b>117</b>	<b>29,47%</b>	
Jardim de Piranhas		24	6,05%	
Serra Negra do Norte		3	0,76%	
São João do Sabugi		12	3,02%	
São Fernando		6	1,51%	
Timbaúba dos Batistas		0	0,00%	
Ipueira		4	1,01%	
<b>Seridó Oriental</b>				
Acari		11	2,77%	
Carnaúba dos Dantas		Human Development Index (HDI)	Absolute Frequency (n)	
Mortality Coefficient		10	2,52%	
<b>Currais Novos</b>		<b>38</b>	<b>117</b>	
Equador		3	24	
Parelhas		9	3	
Jardim do Seridó		22	12	
São José do Seridó		11	6	
Santana do Seridó		2	0	
Ouro Branco		15	4	
<b>Serra de Santana</b>				
Bodó		5	11	
Cerro Corá		15	8	
Florânia		14	10	
Lagoa Nova		15	38	
Santana dos Matos		12	3	
São Vicente		10	9	
Tenente Laurentino Cruz		2	22	
<b>Vale do Açu</b>				
Jucurutu		29	2	
<b>Total</b>		<b>397</b>	<b>15</b>	

Source: Survey data

Graph 01 shows the absolute distribution of the number of suicide cases in the period studied, highlighting the years 2003 and 2015 with the highest frequency (n=33).

Graph 01: Number of suicides by year of occurrence, from 2000 to 2015



Source: Survey data

Among the 397 cases of suicide in the Seridó region of Rio Grande do Sul, in the period from 2000 to 2015, the average age was  $43.7 \pm 18.9$  years. According to the socio-demographic characteristics presented in Table 02, suicide was characterized as having a predominance of males (82.1%), young adults (38.48%), whites (48%), singles (48%) and farmers (30.27%).

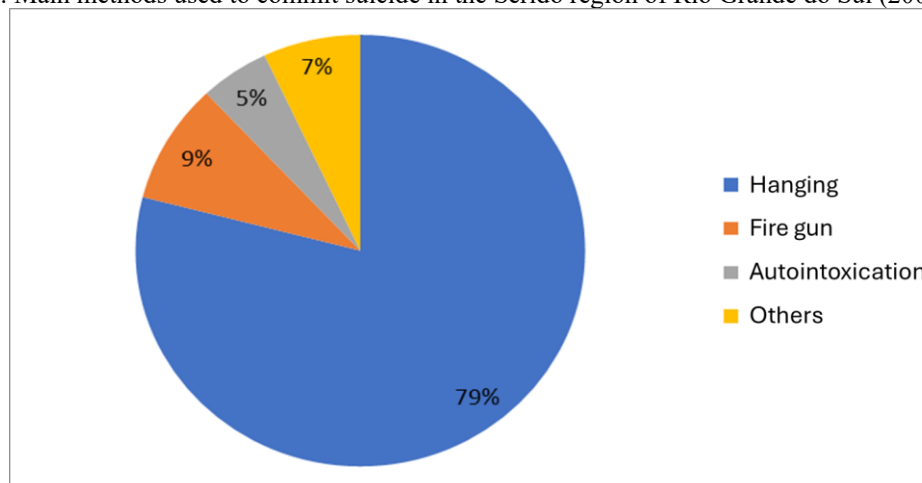
Table 2: Sociodemographic characterization of suicides in the Seridó region / RN, according to gender, age group, ethnicity and marital status, from 2000 to 2015.

VARIABLES	2000-2003 N = 94	2004-2007 N = 95	2008-2011 N = 101	2012-2015 N = 107	TOTAL N = 397
	%	%	%	%	%
<b>GENDER</b>					
Masculine	78,72	82,10	87,13	80,37	<b>82,08</b>
Feminine	21,28	17,90	12,87	19,63	<b>17,92</b>
<b>AGE GROUP</b>					
< 18	6,38	5,26	8,91	1,88	<b>5,6</b>
18 a 40	50,00	34,74	33,66	35,51	<b>38,48</b>
41 a 64	31,91	36,84	43,56	35,51	<b>36,96</b>
65 or +	11,71	23,16	13,87	27,10	<b>18,96</b>
<b>ETHNICITY</b>					
Black	5,32	4,21	8,92	7,48	<b>6,49</b>
Brown	39,36	32,63	37,62	49,53	<b>39,78</b>
White	55,32	63,16	53,46	42,99	<b>53,73</b>
<b>MARITAL STATUS</b>					
Single	44,68	47,37	57,42	43,92	<b>48,35</b>
Married/Stable union	37,23	43,16	38,61	45,78	<b>41,95</b>
Divorced	4,25	1,05	1,00	2,80	<b>2,27</b>
Widower	5,32	7,37	2,97	6,54	<b>5,55</b>
Not assessable	8,52	1,05	0	0,96	<b>1,88</b>

Source: Survey data

Among the methods used for the event (suicide), the following stood out: hanging, firearms and self-intoxication, with hanging being the most used method (79%) (Graph 02).

Graph 2: Main methods used to commit suicide in the Seridó region of Rio Grande do Sul (2000 to 2015)



Source: Survey data

## DISCUSSION

According to the information obtained from the ITEP/Caicó database, during the period from 2000 to 2015, there were 397 cases of suicide in the Seridó region, highlighting the cities of Caicó, Currais Novos and Jucurutu, showing, proportionally, a higher number of suicide cases in the larger municipalities of the Seridó region. This result is corroborated by other studies, when Caicó assumed

a prominent position in the regional context, occupying the 3rd position in the ranking in the country's suicide rate in municipalities with up to 50 thousand inhabitants, in the period from 2005 to 2007<sup>(9)</sup>, and the Seridó region of Potiguar presented high suicide mortality rates in the period from 2010 to 2014<sup>(7)</sup>.

In the present study, only the municipality of Timbaúba dos Batistas did not present cases of suicide during the period studied. However, this reveals the difficulty regarding the statistical treatment of indicators that use the base of 100,000 inhabitants in the calculation of the coefficient, with emphasis on small municipalities such as São José do Seridó and Ouro Branco, which, proportionally, presented higher mortality coefficients than those of Caicó and Currais Novos, which had more cases in absolute number.

In addition, it is noteworthy that the municipalities of Caicó and Currais Novos have the largest regionalized hospitals, as well as the most complex mental health services in the region. In view of this, the importance of deepening knowledge about the degree and circuit of notification of cases in the regional context is considered, as well as the attribution of the event to their place of residence or where they actually died.

As of MS Ordinance No. 1,271/2014, suicide attempts became a mandatory and immediate notifiable disease, and the notification must be made to the Municipal Health Department within 24 hours. The start of care for the person should also be immediate, and they should receive the necessary emergency follow-up, as well as psychosocial follow-up in the Health Network<sup>(12)</sup>.

It is estimated that for every case of suicide there are at least ten attempts of sufficient severity to require medical attention and that these behaviors are up to 40 times more frequent than completed suicides. It is also considered that, for each documented attempt, there are four others that were not recorded<sup>(13)</sup>. It is likely that many of these attempts do not reach hospital care because they are of minor severity. Even when patients arrive at the care units, the records prepared in the emergency services usually indicate only the injury or trauma resulting from the attempts that required medical care<sup>(14)</sup>.

In relation to the period studied, it was observed that mortality by suicide in the seridó potiguar was not distributed homogeneously and/or equitably over the years. There were peak periods, seen in 2003, 2005, 2012 and 2015, as well as sharp declines in the number of cases, seen in 2004 and 2013. According to the study by Santos (2017)<sup>(7)</sup> on suicide cases in RN, there was a cluster of suicide in the Seridó region, mainly in rural areas. In this scenario, we point to the importance of further studies and reflections on these indicators, seeking new correlations with historical, economic, social, environmental and cultural factors, which could be having a seasonal impact on the occurrence of cases.





Regarding the socio-demographic profile of the cases, the results presented corroborate the existing scientific literature on the subject, which frame the profile of the suicidal person, historically marked by the predominance of male, white, single, middle-aged men<sup>(15,16)</sup>.

In addition, regarding the occupation of individuals who committed suicide, it was observed that 30.2% of the cases were farmers. If, on the one hand, the region has a large contingent of farmers, due to economic activity, evidencing a probable selection bias, recent studies in several countries, such as India, China, Japan and Australia, have also shown concern about the increase in the number of suicides in this category of workers<sup>(17-20)</sup>. This is because prolonged or acute exposure to organophosphate pesticides is characterized as one of the causes of aggressiveness, impulsivity and increased risk of suicide among farmers<sup>(20)</sup>. On the other hand, a qualitative study with family members of suicidal farmers in the interior of Rio Grande do Norte found that the lack of opportunities for work and leisure, as well as drought, appear as possible causes for suicide in this class of workers, demonstrating a multifaceted phenomenon that also reverberates in other psychosocial dimensions<sup>(21)</sup>.

In this context, it is observed that men from Serido, single and of working age had the highest proportion of suicide cases. It is noteworthy that, historically, women commit three times more suicide attempts than men, but using less lethal methods<sup>(4)</sup>. Therefore, it is recognized that, when it comes to suicidal behavior, men idealize, plan and execute attempts with more lethal and forceful means, with little chance of survival, such as suicide by firearms and hangings<sup>(4)</sup>.

Regarding the method used, the findings of our study are also similar to those found in the national reality, in which hanging appears as the main method adopted for suicide in men<sup>(6)</sup>. Also according to the epidemiological bulletin of the Ministry of Health, hanging, exogenous intoxication and firearms were, in that order, the most used means to commit suicide<sup>(6)</sup>. Although it is known that this is an inexpensive and easily accessible method, especially in rural communities, this finding gains even greater contours when observing the main occupation of the individuals who committed suicide investigated here, namely, farmers.

According to the WHO, strategies to restrict the means of committing suicide, such as controlling the use of pesticides and firearms, reduce the incidence of suicide and are recommended as universal prevention tools, i.e., for the general population<sup>(22)</sup>. However, it is known that suicide is a multifactorial phenomenon and that prevention goes beyond restricting the means of committing it. It is necessary to have a network of care and teams constantly prepared to welcome the individual who suffers, whether in PHC settings, health services in general and emergency care units.

Considering that the gateway for patients with suicidal ideation or attempt may be primary care or clinical emergency, it is of fundamental importance to train general practitioners and an integrated health network for attention and care in cases of suicide. The identification and



assessment of suicide risk is the responsibility of the entire health network, and permanent training is of paramount importance, as it is a serious global public health problem<sup>(23)</sup>.

## FINAL THOUGHTS

The present study characterized the cases of suicide in the region of Seridó Potiguar, in the interior of northeastern Brazil, giving visibility to the main individual involved who frames the characteristics and profile of suicidal behavior in the region. It was observed that the highest proportion of suicides were men, single, farmers and in the economically active age group; Hanging was identified as the most frequent form.

It is concluded that suicide in the Seridó Potiguar is a major public health problem, with repercussions and consequences that go far beyond the individual who committed the act itself, bringing consequences to the family, social, economic and cultural context of its people.

It is worth noting some limitations of the present study, such as the fact that this study was based on secondary data, making it impossible to draw greater statistical inferences. However, it points to the importance of this work in arousing new discussions in the various social segments, as well as in pointing out the need to produce new studies to investigate possible associations with socioeconomic factors and exposure to pesticides.

In addition to the above, the present study also supported a proposal for intervention in the psychosocial care network in the Seridó region of Rio Grande do Sul as a contribution to teaching-service-community integration in the context of the approach to suicide.



## REFERENCES

1. Meleiro, A. M. A. S. (2018). *Psiquiatria: estudos fundamentais*. 1.ed.- Rio de Janeiro: Guanabara Koogan.
2. World Health Organization. (2014). *Prevenção do Suicídio: Um manual para profissionais da saúde em atenção primária*. Genebra: Who Press.
3. Bertolote, J. M., & Fleischman, A. (2002). A global perspective in the epidemiology of suicide. *Suicidology*, 7(2), 6-8.
4. Botega, N. J. (2015). *Crise suicida: avaliação e manejo*. 1. ed. Porto Alegre: Artmed.
5. Marín-León, L., Oliveira, H. B., & Botega, N. J. (2012). Suicide in Brazil, 2004–2010: The importance of small counties. *Revista Panamericana de Salud Publica*, 32(5), 351–359.
6. Brasil. Ministério da Saúde. (2006). *Estratégia nacional de prevenção do suicídio: manual dirigido a profissionais das equipes de saúde mental*. Brasília: MS. [http://bvsmms.saude.gov.br/bvs/publicacoes/manual\\_editoracao.pdf](http://bvsmms.saude.gov.br/bvs/publicacoes/manual_editoracao.pdf)
7. Santos, E. G. O. (2017). *Análise espaço-temporal da mortalidade por suicídio no Rio Grande do Norte no período de 2000 a 2015*. Dissertação de mestrado, Faculdade de Ciências da Saúde do Trairi, Universidade Federal do Rio Grande do Norte, Natal.
8. Santos, E. G. O., & Barbosa, I. R. (2017). Conglomerados espaciais da mortalidade por suicídio no nordeste do Brasil e sua relação com indicadores socioeconômicos. *Cad. Saúde Colet.*, 25(3), 371-378.
9. Botega, N. J. (2010). Comportamento suicida em números. *Revista Debates Em Psiquiatria*, 11–15.
10. Instituto Brasileiro de Geografia e Estatística. (2017). *Divulga as estimativas de população para estados e municípios*. Resolução nº 4, de 28 de agosto de 2017.
11. Organização Mundial de Saúde. (2009). *CID-10: tradução Centro Colaborador da OMS para a classificação de doenças em português (10ª ed. rev.)*. São Paulo: Editora da Universidade de São Paulo.
12. Brasil. Ministério da Saúde. (2014). Portaria nº 1.271 de 6 de junho de 2014. Define a Lista Nacional de Notificação Compulsória de doenças, agravos e eventos de saúde pública nos serviços de saúde públicos e privados em todo o território nacional, nos termos do anexo, e dá outras providências. *Diário Oficial da República Federativa do Brasil*, Seção 1:67.
13. Meleiro, A. M. A. S., & Bahls, S. C. (2004). O comportamento suicida. In: A. M. A. S. Meleiro, C. T. Teng, & Y. P. Wang (Orgs.), *Suicídio Estudos Fundamentais* (pp. 13-36). São Paulo: Segmento Farma.
14. Minayo, M. C. S. (2005). Suicídio: violência auto infligida. In: Secretaria de Vigilância em Saúde. *Impacto da violência na saúde dos brasileiros* (pp. 205-239). Brasília: Ministério da Saúde.
15. World Health Organization. (2014). *Preventing suicide: a global imperative*. Geneve: World Health Organization. [http://apps.who.int/iris/bitstream/10665/131056/1/9789241564779\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/131056/1/9789241564779_eng.pdf?ua=1).



16. World Health Organization. (1993). Guidelines for the primary prevention for mental, neurological and psychological disorders: suicide. Geneve: World Health Organization. [http://apps.who.int/iris/bitstream/10665/58959/1/WHO\\_MNH\\_MND\\_93.24.pdf](http://apps.who.int/iris/bitstream/10665/58959/1/WHO_MNH_MND_93.24.pdf).
17. Klingelschmidt, J., et al. (2018). Suicide among agricultural, forestry, and fishery workers: a systematic literature review and meta-analysis. *Scand J Work Environ Health*, 44(1), 3–15.
18. Ram, B., & Singh, S. P. (2017). Agrarian Crisis In India-Its Causes And Effects Department. *IJARIE*, 3(1), 2395-4396.
19. Kunde, L., et al. (2017). Pathways to Suicide in Australian Farmers: A Life Chart Analysis. *International Journal of Environmental Research and Public Health*, 14, 352- 374.
20. Lyu, C. P., et al. (2018). Case Control Study of Impulsivity, Aggression, Pesticide Exposure and Suicide Attempts Using Pesticides among Farmers. *Biomed Environ Sci*, 31(3), 242-46.
21. Dutra, E., & Roehle, M. V. (2013). Suicídio de agricultores no Rio Grande do Norte: compreensão fenomenológica preliminar dos aspectos existenciais. *Psicologia em Revista*, 19(1), 108-118.
22. World Health Organization. (2012). Public health action for the prevention of suicide: a framework. Geneve: World Health Organization. [http://apps.who.int/iris/bitstream/10665/75166/1/9789241503570\\_eng.pdf?ua=1](http://apps.who.int/iris/bitstream/10665/75166/1/9789241503570_eng.pdf?ua=1).
23. Leenaars, A. A. (2005). Effective Public health strategies in suicides prevention are possible: a selective review recent studies. *Clin Neuropsychiatry*, 2(1), 21-31.