

## BRIEF COMMUNICATION

# Suicide among physicians in the state of São Paulo, Brazil, across one decade

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**Objective:** To describe mortality by suicide among physicians in the state of São Paulo, Brazil, between 2000 and 2009.

**Methods:** Secondary analysis of government mortality data. The variable of interest was “underlying cause of death”, specifically deaths classified by the ICD-10 as intentional self-harm (X60 to X84).

**Results:** The analyses examined 2,297 declarations of death, among which suicide accounted for 50 cases, i.e., 1.7% of all causes of death. Women comprised 13.2% of the total sample and represented 24% of the death-by-suicide group, indicating an overrepresentation of women in the latter ( $p = 0.02$ ). Deaths by suicide occurred on average 20 years earlier than deaths by other causes ( $46.8 \pm 14.2$  years and  $68.1 \pm 15.8$  years, respectively;  $p = 0.001$ ). There was a significant association between single and/or divorced status and suicide ( $p < 0.001$ ). The average mortality rate during the study period was 4.2 deaths per 100,000 physicians registered with the Regional Board of Medicine of the State of São Paulo.

**Conclusion:** Deaths by suicide occurred 20 years earlier than deaths by other causes. Medical institutions should develop strategies for the prevention and early detection of mental disorders and occupational stressors that elevate the risk of suicide among physicians.

**Keywords:** Suicide; physicians; mortality; epidemiology; occupational psychiatry

## Introduction

Studies of causes of death are critical for monitoring health care delivery and planning strategies to reduce preventable deaths, such as those related to external causes, including suicide. In Brazil, municipal health departments actively search declaration of death (DD) records and notify the appropriate units. The Mortality Information System (MIS) of the Ministry of Health contains information about deaths from 1979 to the present.

Mortality by suicide varies widely across countries; the lowest rates are reported in Muslim and Latin American nations (fewer than 6.5 per 100,000). Rates higher than 30 suicides per 100,000 inhabitants have been reported in Belarus, Lithuania, and Russia. The majority of suicides (73%) occur in developing countries.<sup>1</sup>

Although Brazil's suicide mortality rate increased by 29.5% in 26 years (1980-2006), the national rate (4.9 per 100,000 inhabitants on average) is still considered low compared with worldwide suicide rates.<sup>2</sup> Mortality by suicide is underreported in Brazil, and some deaths registered as having an “unknown cause” are later determined to be suicides.<sup>3</sup> Between 1996 and 2009, 6,002 suicides were completed in the state of São Paulo,

Brazil, for a rate of 4.6 deaths by suicide per 100,000 inhabitants (7.5 for men and 2.0 for women).<sup>4</sup>

International data indicate that suicides are more frequent among physicians than among members of the general population.<sup>5-7</sup> Many studies have compared physician mortality with that of the general population and have found that, despite having a higher life expectancy and a lower mortality rate from avoidable diseases and various other causes, physicians are more susceptible to suicide.<sup>8</sup> Compared with the rest of the working-age population, doctors have a 2.45-fold higher rate of death by suicide.<sup>6</sup> Depression, addictive behaviors, burnout, and occupational stress have been cited as risk factors for suicide among physicians,<sup>7,9-11</sup> especially among younger doctors.

Little is known about the prevalence of suicide among physicians in Brazil. Thus, the present study aimed to describe mortality according to suicide patterns among physicians using deaths registered in the state of São Paulo between 2000 and 2009.

## Methods

### Sample

A historical dataset encompassing the period from 2000 to 2009 was constructed by retrieving information from DD records held by the MIS, an official data source of the Brazilian federal government. The dataset included the

DDs of São Paulo residents with code 061 (physician) in the "occupation" field. Declarations in which the occupation field was left blank (16%) were excluded.

To determine the population of medical professionals in the state, the Regional Board of Medicine of the State of São Paulo (Conselho Regional de Medicina do Estado de São Paulo, CREMESP) provided data indicating the number of registered physicians, new registrants, and deaths during the study period.

The registered medical population (active and inactive) as of June 30, 2004 (the midpoint of the study period), was used as the denominator to calculate the suicide mortality rate. On that date, according to registration data consulted in December 2012, there were 118,065 living physicians registered with the CREMESP.

#### Variables and instruments

The variable of interest was "underlying cause of death", and this analysis focused on deaths caused by suicide. The "underlying cause of death" field was completed on all of the DDs analyzed; only 44 of the DDs (1.5%) classified the death as the result of "poorly defined causes" (R99). The causes of death were described using the ICD-10. Only deaths caused by "intentional self-harm" (codes X60 to X84) were considered.

#### Data analysis

The dataset was coded in Microsoft Access and analyzed using Stata 11 software. The chi-square test and Fisher's exact test were performed to determine differences in the proportion of deaths by type (suicide or non-suicide) according to the distribution of cases in the contingency table.

#### Results

Data from 2,297 DDs of physicians living in São Paulo who died between 2000 and 2009 were analyzed. The subjects were predominantly male (86.2%), white (94%), and married (65%) Table 1.

Diseases of the circulatory system were the most frequent cause of death (29.7%), followed by neoplastic diseases (27.9%), respiratory diseases (10.7%), and external causes (8.9%). Fifty cases of suicide were identified (1.7% of total deaths, representing 3.1% of male deaths and 1.6% of female deaths). Gender and marital status were associated with suicide incidence. Differences between the suicide and non-suicide groups are shown in Table 1.

The rate of mortality by suicide among the sample was 4.2 for every 100,000 doctors at the midpoint of the

**Table 1** Sociodemographic characteristics of the 2,927 physicians deceased between 2000 and 2009, state of São Paulo, Brazil, according to cause of death (suicide vs. non-suicide)

	Non-suicide	Suicide	Total	p-value
Marital status				< 0.001
Married	1,838 (65.5)	23 (46.0)	1,861 (65.1)	
Divorced	254 (9.0)	8 (16.0)	262 (9.2)	
Single	350 (12.5)	17 (34.0)	367 (12.9)	
Widowed	344 (12.3)	1 (2.0)	345 (12.1)	
Ignored	21 (0.7)	1 (2.0)	22 (0.8)	
Race				0.030
White	2,621 (94.0)	48 (96.0)	2,669 (94.1)	
Asian	99 (3.6)	0 (0.0)	99 (3.5)	
Brown	47 (1.7)	0 (0.0)	47 (1.7)	
Black	18 (0.6)	2 (4.0)	20 (0.7)	
Brazilian Indian	2 (0.1)	0 (0.0)	2 (0.1)	
Gender				0.023
Male	2,502 (87.0)	38 (76.0)	2,540 (86.8)	
Female	375 (13.0)	12 (24.0)	387 (13.2)	
Age, mean $\pm$ SD	68.1 (15.8)	46.8 (14.2)	67.8 (16.9)	0.001
Year of death				0.910
2000	265 (9.2)	6 (12.0)	271 (9.3)	
2001	259 (9.0)	3 (6.0)	262 (9.0)	
2002	302 (10.5)	5 (10.0)	307 (10.5)	
2003	308 (10.7)	4 (8.0)	312 (10.7)	
2004	308 (10.7)	8 (16.0)	316 (10.8)	
2005	295 (10.3)	4 (8.0)	299 (10.2)	
2006	302 (10.5)	6 (12.0)	308 (10.5)	
2007	260 (9.0)	3 (6.0)	263 (9.0)	
2008	306 (10.6)	7 (14.0)	313 (10.7)	
2009	272 (9.5)	4 (8.0)	276 (9.4)	
Total	2,927 (100.0)	50 (100.0)	2,927 (100.0)	

Data expressed as n (%), unless otherwise noted. SD = standard deviation.

studied period when gender was not considered. Taking gender into account, the rate of mortality by suicide was 2.9 per 100,000 for females and 4.9 per 100,000 for males between 2000 and 2009.

There was no statistically significant difference between genders in the manner in which suicide was completed ( $p = 0.080$ ). However, a numeric difference was observed: 25% of the women completed suicide by intoxication, and 25% completed suicide by suffocation. Among the men, the primary method used to complete suicide was not defined in the death certificate in 34.2% of the cases. Among suicides for which the method was listed, the most common method involved the use of a firearm (26.3%).

## Discussion

The death-by-suicide rate for this population of physicians (4.2 per 100,000 on average) is comparable to the suicide rates for the general population in the state of São Paulo over a similar period (4.6 per 100,000).<sup>4</sup> Such similar figures, however, are not supported by the international literature.<sup>5-7</sup> Underreporting of deaths due to suicide among doctors may be one factor involved in this phenomenon, and may explain why our study showed a smaller suicide rate compared to that found among physicians in other countries.<sup>3,12</sup> Other studies are needed to better explain this situation.

The proportion of suicide among female physicians is another notable finding. Women comprised 13.2% of the total sample and 24% of the death-by-suicide group; thus, women are overrepresented in the suicide group ( $p = 0.02$ ). Importantly, this result does not mirror the suicide rate of the Brazilian population, in which men are 2.3 to 4.0 times more at risk.<sup>2</sup> However, the rate of mortality by suicide among female doctors was lower than the rate for male doctors. To clarify, the calculation of proportional mortality uses total deaths as the denominator (in this case, women represent only 13.2% of total deaths between 2000 and 2009). To calculate the mortality rate, however, the total number of living subjects in the sample is used as the denominator (women represent 35% of living physicians). This discrepancy could be the result of an age gap between men and women in medicine: women have only recently achieved numerical representation in the profession commensurate to that of men. Therefore, if the total reported deaths are the basis of the calculation, women are overrepresented. However, when the population of living physicians is used as the baseline, men are more likely than women to complete suicide, reflecting the behavior of the general population.<sup>2,4</sup>

Deaths by suicide occurred on average 20 years earlier than deaths by other causes ( $46.8 \pm 14.2$  years and  $68.1 \pm 15.8$  years, respectively). This finding does not reflect the pattern observed in the general Brazilian population, in which the highest suicide incidence is observed among people older than 65 years.<sup>2</sup>

Importantly, premature death by suicide creates a significant economic burden. It is estimated that the loss of production caused by suicide cost Brazil R\$1.3 billion in 2001.<sup>13</sup>

The results showed a significant association between single and/or divorced status and suicide ( $p < 0.001$ ), indicating the important supportive role of family in detecting and treating predispositions to suicide. One study showed that, when compared with the general population with the same cause of death, physicians who committed suicide had a higher incidence of mental disorders or job-related problems.

Despite this reality, toxicology analyses revealed that the proportion of doctors undergoing psychopharmacological antidepressant treatment<sup>11</sup> was lower than that of the general population. Such results suggest that inadequate treatment and an increased rate of job-related problems and stress may constitute potentially modifiable risk factors that could be keys to reducing suicide deaths among physicians.

Some authors indicate that physicians are underserved by the current prevention and care network.<sup>7</sup> In fact, a consensus of American experts suggested that the medical culture tacitly discourages early assistance because those who seek help may be stigmatized and exposed to prejudice, may risk unemployment and may even lose their professional license. The consensus asserted that removing these cultural and institutional barriers is imperative and constitutes a life-saving measure.<sup>7</sup>

A potential limitation of this study is the possible loss of cases because of under-registration, under-notification, and inadequate completion of the "occupation" or "underlying cause of death" fields.<sup>12</sup> When it is difficult to establish the intentionality behind violent actions, their classification contains a degree of imprecision. Death certificates typically describe the nature of the death event (mechanical or pathophysiological) rather than its intentionality (accidental, suicide, or homicide).<sup>12</sup> In Brazil, it is likely that the rate of mortality by suicide is at least twice as high as the registered data reflects, according to a study that thoroughly evaluated deaths by "external causes of ignored type" by gathering data from police stations and medicolegal institutes and through home visits.<sup>3</sup>

The literature regarding suicide in Brazil also reveals differences across regions (4.7 per 100,000 in the North and 9.4 per 100,000 in the Southeast), with higher rates in smaller municipalities (4 per 100,000 in those larger than 200,000 inhabitants and 13 per 100,000 in those smaller than 20,000). There has been a significant increase in suicide rates in recent decades, especially among men aged 15 to 24 years (from 0.3 to 6.0 per 100,000).<sup>12,14</sup>

Medical institutions (medical schools, professional regulatory agencies, and professional and specialty associations) have an important role to play in providing knowledge about physician health and developing strategies to improve the prevention and early detection of mental disorders and occupational stress, which increase the risk of suicide in the medical population.<sup>12,15</sup> Despite the obvious need, there is a notable lack of both an effective strategy and a national policy for suicide prevention in Brazil.<sup>12</sup>

## Disclosure

The authors report no conflicts of interest.

## Acknowledgements

This study received financial and organizational support from Conselho Regional de Medicina do Estado de São Paulo (CREMESP).

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