

Suicide Undetermined Deaths Among Youths and Young Adults in Latin America

Comparison with the 10 Major Developed Countries: A Source of Hidden Suicides?

Colin Pritchard¹ and Sarah Hean²

¹Research Professor in Psychiatric Social Work, ²Senior Lecturer in Research Methods,
both Institute of Health & Community Studies, Bournemouth University, UK

Abstract. In Latin American (LA) and the major developed countries' (MDC) suicide and undetermined deaths are analyzed as methods of suicide and the number of undetermined deaths are similar, possibly containing *hidden* suicides. The goal was to test the likelihood that LA cultural attitudes lead to higher undetermined rates and more hidden suicides. We used 3-year WHO average mortality data to compare LA and MDC mortality by age and gender, and χ^2 tests to examine any differences. In 13 LA countries younger-aged (15–34) men and women's suicides were higher than all-age rates, and undetermined deaths exceeded the suicide rates. Nine LA countries had significantly more undetermined younger-aged male deaths than females. Sixteen of 18 LA countries had significantly higher undetermined death rates than the MDC. LA younger-aged males²⁴ 146s differential suicide: Undetermined rates indicated they may contain substantial numbers of hidden suicides. Inadvertently, cultural attitudes to suicide may hinder prevention.

Keywords: suicide, undetermined deaths, Latin America

Introduction

It has long been assumed that suicide rates increase as people age, from youth (15–24) through to the older age bands 65+ (Hawton & Van Heering, 2002; Joiner, 2006; Maris, Maris, Berman, & Yufit, 2000[*not in refs*]; Yunes 1993). Recently however, it had been found that *younger-aged* (15–34) male suicide rates rose significantly in many of the major developed countries (MDC) and many were higher than their all-age rate (Gunnell et al., 2003[**please include up to 5 authors here**]; Pritchard & Hansen, 2005a; WHO 2005[1979–2005 in refs]). Conversely, throughout the major developed countries female suicides rates declined across all age bands (Pritchard & Hansen, 2005a,b).

This suggests that younger-aged (15–34) MDC males in the developed countries are under particular psychosocial pressures (Gunnell et al., 2003; Qin, Agerbo, & Mortensen, 2003; Pritchard & Hansen, 2005a).

Latin American (LA) younger-aged male suicide rates have also increased recently in Argentina (Serfaty et al.[**please include up to 5 authors here**], 2003), Brazil

(Meneghel 2004[*not in refs*]; Rodrigues & Werneck, 2005; Souza, 2002[*not in refs*]), and Colombia (Sanchez, Orejarena, & Guzman, 2004). Moreover, as in the MDC, these LA suicides were linked with mental disorder and socio-economic and psychosocial stresses (Botega et al. [**please include up to 5 authors here**], 2005; Hawton & Van Heering, 2002; Joiner, 2006; Levi et al. [**please include up to 5 authors here**], 2003; Marin-Leon & Barros, 2003; Qin et al., 2003; Sanchez et al., 2004).

A key feature in the LA countries is the traditionally strong Roman Catholic culture, which according to Durkheim suggests suicide rates would be expected to be lower than in predominantly *Protestant* or *secular* countries (Durkheim, 1958[*not in refs*]; Pritchard & Baldwin, 2000). In Catholic theology, suicide is still considered a cardinal sin, which appears to be the rationale for the greater stigma surrounding suicide in countries with a strong Roman Catholic and Orthodox culture (Marin-Leon & Barros, 2003; Otereo, 2004; Pritchard & Baldwin, 2000), as well as in Islamic countries (Pritchard & Amunallaha[Amunalla in refs], 2007).

In the last decade however, European Catholic countries such as Ireland, Italy, and Spain have been willing to report more suicide (Cantor, Leenaars, & Lester, 1997; De Leo, Conforti, & Carollo, 1997; Grazino [Granizo in refs], Guallar, & Rodriguez-Artalejo, 1996), which might have accounted for their increased rates over the past 25 years (Cantor et al., 1997; De Leo et al., 1997; Grazino et al. [Granizo in refs], 1996; Pritchard & Baldwin, 2000; Pritchard & Hansen, 2005a,b). However, recent comparisons of suicide and undetermined deaths in the 10 MDC found few significant differences amongst Catholic and Non-Catholic countries (Pritchard & Hansen, 2005a,b).

Nonetheless, even in many non-Catholic MDC, stigma surrounding suicide persists (Cvinar, 2005), and it has been suggested that to save the family further distress, coroners may report a fatality as an *open verdict*, rather than suicide, which then appears in the World Health Organization's (WHO) undetermined category of "Other External Causes of Death" (WHO, 2005 [1979–2005 in refs]). Hence, it has been argued that undetermined rates should be included in prevalence studies of suicide (Linsley, Schaparia, & Kelly, 2001; Salib et al. [please include up to 5 authors here], 2005; Stanistreet et al. [please include up to 5 authors here] 2003).

Theoretically, therefore, because of the stigma surrounding suicide in traditionally strong Catholic countries (Marin-Leon & Barros, 2003; Otereo, 2004), might it be expected that LA countries will have lower reported suicide rates than most MDC, but possibly have more undetermined deaths, which may be the source of hidden suicides?

Indeed, research from Argentina found increases in undetermined deaths, especially amongst younger-aged people (15–34) (Serfaty et al., 2005). This suggests that LA countries under-report their suicide rates, which are then more likely to be reported within the WHO *undetermined death* category (Marin-Leon & Barros, 2003; Otereo, 2004).

To explore this possibility, this study, which is essentially to stimulate a hypothesis, seeks to determine whether:

1. LA younger-aged [15–34] males are at greater risk than younger-aged females,
2. patterns of suicide and undetermined deaths are similar to those found in the 10 major developed countries, and,
3. whether there is any evidence indicating that LA undetermined rates might be more likely to be a repository for hidden suicides?

Methodology

All data were extrapolated from the latest WHO annual mortality statistics, which reported upon the 18 LA countries for which data was available. Bolivia and Honduras, which reported no suicide, and Belize – whose small population made any comparative unfeasible – were excluded from the review.

All had used the current International Classification of Diseases (ICD) 10th edition, except Guatemala and Guyana, who had used the ICD 9th edition. This poses no problem as there is virtually no difference on suicide between the editions; indeed, according to the National Center for Health Statistics (USDHHS, 2005), in the 10th edition suicides are slightly under-reported by 0.0038%. Conversely, in the 9th edition of the ICD, the *undetermined* category was designated "Other Violent Death" (OVD), which was less inclusive than the revised category of undetermined deaths, "Other External Causes of Death." This needs to be remembered when considering the results from Guatemala and Guyana.

Death rates are given per million (ppm) of population, thus, allowing comparisons between countries of differing sizes. Annual suicide rates vary so the latest 3 year average rates were calculated. In the majority of countries, the latest date was for 1998–2000, but some had earlier years, for example, Guyana 1994–96, and some had a few years later, such as Mexico (1999–2001) and Costa Rica (2000–02), but all are noted in the text. To match the majority of countries, therefore, the 10 MDC mortality data is for the average 3 years of 1998–2000.

Suicide rates are given by gender in three age bands, all-age rate, to be compared with the "youths" (15–24) and "young adult" (25–34) rates by gender.

"Hidden" Suicides

Undetermined Deaths

Other External Causes of Deaths (WHO 2005) are designated because "either legal or medical authorities had insufficient information to determine whether it was an accident, self-harm or an assault" (WHO, 1992, pp. 1095). Undetermined methods of death include "poisoning . . . (ranging from drugs to vapors and gases) . . . hanging . . . suffocation . . . drowning and submersion . . . firearms . . . undetermined intent in road crashes . . . blunt . . . falling . . . sharp objects . . . (coded Y10–35) . . . and the sequel of earlier undetermined accidents" (coded Y 87–89), but in each case "intent could not be determined" (WHO 1992, pp. 1095). This is why some authorities claim that methods of undetermined deaths are similar to those in suicide and, therefore, might well be hidden suicides (Linsley et al., 2001; Salib et al., 2005; Stanistreet et al., 2001). Nonetheless, while these causes are similar to those of suicide, no clear *intent* had been established.

To place the LA results in a wider context, their patterns of mortality will be compared with the average patterns found in the 10 major developed countries for 1998–2000. *Major* is defined as those countries with populations of 15+ million, for whom there was consistent WHO data available. The countries eligible are Australia, Canada, France, Germany, Italy, Japan, the Netherlands, the UK, and the USA [only nine given here].

To explore the likelihood of undetermined deaths containing hidden suicides, suicide to undetermined death ratios are calculated for the LA and the major developed countries, as theoretically LA countries should have disproportionately more undetermined to suicide deaths than the MDC.

A series of Chi Square tests are undertaken to compare mortality patterns between LA and the MDC, and rates between men and women in LA are also compared. Statistical significance is taken at the 5% level ($< .05$) but Chi Square results falling just short $< .07$ are reported as *trends*.

It has been argued that substantial differences in ratios of 0.10 (i.e., 10%) or more might be considered clinically substantial; however, to err on the side of caution we take as *substantial* a ratio of + or $- 0.20$ that is, 20%, as reported in other international studies (Pritchard & Amunalla [Amunalla is refs], 2007; Pritchard & Baldwin, 2000; Pritchard & Hansen, 2005a,b; Pritchard & Wallace, 2006).

Numbers rather than rates were reported for the Dominican Republic, Nicaragua, and Peru deaths, so population data from the US Bureau of Statistics (USDHHS, 2006) were used to calculate these countries' mortality rates.

The tables will present the countries in the rank order of the highest suicide to undetermined death ratios.

Results

Suicide

Table 1 shows the rates per million [ppm] for each LA country for suicide and beneath this the undetermined deaths for the all-age rate, youths (15–24) and young adults (25–34) rates. Countries are ranked in the table by the highest suicide to undetermined ratios.

Males

The countries with the highest male suicide all-age rate in LA were Uruguay at 290 ppm, followed by Cuba 214 ppm, and Chile 182 ppm; the only other countries with all-age rates above 100 ppm were Guyana 146 ppm, Argentina 134 ppm, Costa Rica [figure missing], and El Salvador at 116 ppm. Countries with all-age rates lower than 50 ppm were Peru at 11 ppm, Guatemala 34 ppm, and Paraguay 39 ppm.

Young adult male suicides were higher than youth rates in every country except Argentina, Chile, Columbia, Dominican Republic, Ecuador, Nicaragua, and Peru.

Younger-aged (15–34) male rates were higher than their all-age rates in every country except Cuba and Uruguay, whilst Brazil's youth rates were only slightly lower than their all-age rates.

Females

There was a similar female to all-age ranking as with the male suicides. The highest rates were in Cuba at 80 ppm, Uruguay 55 ppm, and El Salvador 54 ppm, and the lowest in Peru at 6 ppm, and Mexico and Panama at 13 ppm.

Interestingly the younger youth (15–24) female suicides were higher than young adult (25–34) rates in every Latin country except Cuba and Uruguay, whilst these two countries' younger-aged (15–34) female rates were the only nations with lower rates than their all-age suicides.

Males versus Females

In every country, males had higher rates than females for both suicide and undetermined deaths. Table 2 lists the statistically significant differences between LA gender for suicide and undetermined deaths.

Only two all-age rates in LA countries differed by gender, Nicaragua whose male undetermined rates were disproportionately higher than females ($p < .03$) and in Guyana, where female all-age undetermined rates were proportionately higher than their men's rates.

Half the LA countries' younger-aged (15–34) males had statistically significantly more undetermined deaths than females namely Argentina, Brazil, Colombia, Costa Rica, Ecuador, Nicaragua, Paraguay, and Venezuela. Conversely, Uruguay female undetermined rates were significantly higher than the male undetermined rates.

Undetermined Deaths

Males

The highest all-age rates were Guyana 506 ppm, Guatemala 475 ppm, and Venezuela 318 ppm, with the lowest being El Salvador 1 ppm, Uruguay 5 ppm, and Costa Rica 28 ppm.

In the majority of the LA countries, the younger-aged male undetermined rates were higher than their all-age rates, notable levels of younger-aged undetermined rates were found in Guatemala at 794 ppm, Guyana at 787 ppm, and Venezuela at 655 ppm, with a further 4 countries having rates higher than 100 ppm.

However, Costa Rica, Cuba, El Salvador, and Uruguay had lower younger-aged undetermined deaths than their all-age rates.

Females

The highest female undetermined all-age rates were in Guyana at 167 ppm, Guatemala 110 ppm, and Venezuela at 43 ppm, no other country reaching 40 ppm, the lowest

Table 1. Latest 3-year suicide and undetermined death rates per million and ratios ranked by suicide: Undetermined ratios

Country, year, suicide & undetermined rates	All ages M-F	Youths 15-24 M-F	Young adults 25-34 M-F
1. Guatemala 1997-99	34-8	50-16	73-9
Undetermined	475-110	486-120	794-102
Ratio	13.97-13.75	9.72-7.50	10.8-11.3
2. Peru 1998-2000	11-6	42-26	17-6
Undetermined	60-27	59-69	58-21
Ratio #	5.45-4.50	1.40-2.65	3.41-3.50
3. Dominican Rep 1996-8	27-10	23-14	41-7
Undetermined	128-37	134-27	133-30
Ratio #	4.74-3.70	5.83-1.93	3.24-4.29
4. Venezuela 1998-2000	88-15	110-26	150-19
Undetermined	318-43	655-37	586-38
Ratio	3.61-2.87	5.95-1.42	3.91-2.00
5. Guyana 1994-96	146-23	170-48	295-15
Undetermined	506-167	486-168	787-134
Ratio	3.47-7.26	2.89-3.5	2.67-8.93
6. Ecuador 1998-2000	60-26	104-59	85-46
Undetermined	129-27	151-38	202-26
Ratio	2.15-1.04	1.45-0.64	2.38-0.57
7. Brazil 1998-2000	64-16	60-20	87-19
Undetermined	117-26	131-18	152-17
Ratio	1.83-1.63	2.18-0.90	1.75-0.89
8. Colombia 1997-99	81-24	127-61	123-28
Undetermined	109-28	132-23	148-18
Ratio	1.35-1.17	1.04-0.38	1.20-0.64
9. Argentina 1999-2001	134-35	153-50	137-30
Undetermined	156-33	229-29	198-23
Ratio	1.16-0.94	1.50-0.58	1.45-0.77
10. Paraguay 1998-2000	39-17	51-43	82-5
Undetermined	41-15	55-26	50-20
Ratio	1.05-0.88	1.08-0.60	0.61-4.00
11. Mexico 1999-2001	63-13	90-26	105-15
Undetermined	40-8	35-9	51-8
Ratio	0.63-0.62	0.39-0.35	0.49-0.53
12. Nicaragua 1998-2000	104-47	180-109	152-40
Undetermined	59-12	61-10	47-3
Ratio #	0.57-0.25	0.56-0.09	0.31-0.08
13. Panama 1998-2000	84-13	90-30	118-28
Undetermined	40-6	43-15	32-8
Ratio	0.48-0.46	0.48-0.50	0.27-0.29
14. Costa Rica 2000-02	116-20	142-46	167-26
Undetermined	28-8	12-10	28-3
Ratio	0.24-0.40	0.08-0.22	0.17-0.12
15. Chile 1999-2001	182-30	199-49	244-44
Undetermined	32-5	42-6	35-3
Ratio	0.18-0.17	0.21-0.12	0.14-0.07
16. Cuba 1999-2001	214-80	100-60	197-71
Undetermined	29-11	13-3	20-8
Ratio	0.14-0.14	0.13-0.05	0.10-0.11
17. Uruguay 1998-2000	290-55	110-26	252-55
Undetermined	5-5	0-8	8-0
Ratio	0.02-0.09	xx-0.31	0.03-xx
18. El Salvador 197-99	116-54	174-144	184-57
Undetermined	1-0	0-0	0-0
Ratio	0.01-xx	xx	xx

*ICD 9 undetermined = Other violent deaths. #Rates estimated.

Table 2. Gender differences in patterns of suicide and undetermined in LA and *p* values

Country	All ages	Youths 15–24	Young adults 25–34
	<i>p</i>	<i>p</i>	<i>p</i>
Argentina	<i>ns</i>	< .01	< .04
Brazil	<i>ns</i>	< .02	< .06t
Chile	<i>ns</i>	<i>ns</i>	<i>ns</i>
Colombia	<i>ns</i>	< .001	< .06t
Costa Rica	<i>ns</i>	< .04	< .0001
Cuba	<i>ns</i>	<i>ns</i>	<i>ns</i>
Dominican R	<i>ns</i>	<i>ns</i>	<i>ns</i>
El Salvador	<i>ns</i>	<i>ns</i>	<i>ns</i>
Ecuador	<i>ns</i>	< .001	< .0001
Guatemala	<i>ns</i>	<i>ns</i>	<i>ns</i>
Guyana	< .002#	<i>ns</i>	<i>ns</i>
Mexico	<i>ns</i>	<i>ns</i>	<i>ns</i>
Nicaragua*	< .03	< .01	< .07t
Panama	<i>ns</i>	<i>ns</i>	<i>ns</i>
Paraguay	<i>ns</i>	< .07t	< .001
Peru*	<i>ns</i>	<i>ns</i>	<i>ns</i>
Uruguay	<i>ns</i>	< .001F	<i>ns</i>
Venezuela	<i>ns</i>	< .0001	< .0001

ns = not significant. T = trend. # indicates females more undetermined deaths.

Table 3. Suicide and undetermined deaths in the MDC 2000 (rates per million) and ratios of undetermined deaths to suicides 1998–2000.

Country, suicide Undetermined	All ages M–F	Youths 15–24 M–F	Young adults 25–34 M–F
Australia	198–52	237–58	358–77
Undetermined	5–3	15–2	13–6
Canada	184–52	214–51	245–57
Undetermined	20–7	14–2	21–5
France	174–95	125–35	260–76
Undetermined	13–4	9–3	17–3
Germany	203–70	126–31	178–46
Undetermined	37–25	25–8	34–8
Italy	109–35	71–17	107–27
Undetermined	20–10	14–3	12–4
Japan	352–134	150–67	256–110
Undetermined	22–10	12–5	15–10
Netherlands	127–62	90–32	152–59
Undetermined	4–3	4–0	6–2
Spain	131–40	74–17	123–29
Undetermined	4–1	2–1	4–2
UK	113–32	87–24	166–34
Undetermined	50–21	63–18	78–24
USA	171–40	179–32	223–46
Undetermined	23–9	19–5	31–10
Average suicide	186–61	135–36	207–56
Undetermined	20–9	18–5	23–7
Suicide: Undetermined Ratio 1:	0.11–0.15	0.13–0.14	0.11–0.13

being El Salvador at 0 ppm, with 6 countries having rates less than 10 ppm.

The highest younger-aged (15–34) female rates were in Guyana at 168 ppm and Guatemala at 120 ppm, but no others reached Ecuador's rates of 38 ppm, with 11 Latin younger-aged females suicide rates being higher than their all-age rates.

Suicide to Undetermined Rate Ratios

A perusal of suicide to undetermined ratios in Table 1 shows that Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Guatemala, Guyana, Peru, and Venezuela, had substantially higher (> 0.20) *undetermined* than suicide all-age rates. Notable *suicide: Undetermined* ratios were Guatemala 13.97:1 and 13.75:1 for males and females respectively, Peru 5.45 male to 4.50 female; Dominican Republic 4.74 and 3.70; Guyana 3.47 and 7.26; and Venezuela 3.61 and 2.87 males and female ratios respectively.

Eight countries' younger-aged males *suicide: Undetermined* ratios were greater than their all-age ratios and for Guyana and Panama younger-aged female ratios were greater than their all-age ratios.

Gender Differences in LA

Table 2 shows the gender differences between the patterns of suicide to undetermined rates. Younger-aged males had significantly more or a significant trend of undetermined rates to suicides than females in Argentina, Brazil, Colombia, Costa Rica, Ecuador, Nicaragua, Paraguay, and Venezuela.

In regard to all-age rates, only Nicaragua had significantly more male undetermined deaths [*<* .03] and Guyana having significantly more female undetermined than males.

LA versus MDC Suicide and Undetermined Deaths

Table 3 lists the 10 MDC 3-year average suicide and undetermined rates (1998–2000). The highest male younger-aged suicide rate was 298 ppm in Australia and the lowest 99 ppm in Spain. In 6 MDC, younger-aged suicide rates were lower than the all-age rates.

Average suicide rates for the MDC were 186 ppm male and 61 female all-age rates of suicide, and 171 ppm and 46 ppm younger-aged male and female rates, respectively.

Undetermined deaths in the MDC ranged from all-age rates of 50 ppm in the UK to 4 ppm in the Netherlands and Spain, overall averaging 21 ppm, and younger-aged males and averaged 21 ppm males and 6 ppm females. **[please clarify this paragraph]**

In every MDC, the suicide rates, in all age bands, were

Table 4. Comparison of suicide: Undetermined ratios between LA and the major developed countries [*df*, *p* values]

Country suicide: Undetermined ratio	M-F <i>p</i>	M-F <i>p</i>	M-F <i>p e</i>
Argentina 2001	< .00001-< .00001	< .0001-< .005	< .00001-< .0001
Brazil 2000	< .00001-< .00001	< .00001-< .001	< .00001-< .0001
Chile 2001	<i>ns-ns</i>	<i>ns-ns</i>	<i>ns-ns</i>
Colombia 1999	< .00001-< .00001	< .00001-< .06t	< .00001-< .0001
Costa Rica 2002	< .01-< .06t	<i>ns-ns</i>	<i>ns-ns</i>
Cuba 2001	<i>ns-ns</i>	<i>ns-ns</i>	<i>ns-ns</i>
Dominican Rep 1998	< .00001-< .00001	< .00001-.00001	< .00001-< .00001
El Salvador 1999	< .00001#-< .01#	< .0001-< .0001#	< .0001-< .0001#
Ecuador 2000	< .0001-< .0001	< .00001-< .002	< .00001-< .001
Guatemala 1999	< .00001-< .00001	< .00001-0.00001	< .00001-< .00001
Guyana 1996	< .00001-< .00001	< .00001-0.00001	< .0001-< .00001
Mexico 2001	< .00001-< .02	< .00001- <i>ns</i>	< .00001-< .02
Nicaragua 2000	< .00001- <i>ns</i>	< .003- <i>ns</i>	< .002- <i>ns</i>
Panama 2000	< .00001-< .09t	< .00001-< .03	< .003- <i>ns</i>
Paraguay 2000	< .00001-< .001	< .00001-< .005	< .0001-< .0001
Peru 2000	< .00001-< .00001	< .0001-< .0001	< .0001-< .0001
Uruguay 2000	< .0001#- <i>ns</i>	< .0001#- <i>ns</i>	< .002#-< .02#
Venezuela 2000	< .0001-< .00001	< .0001-< .0001	< .0001-< .0001

indicates proportionately lower undetermined rate than MDC.

more than twice the undetermined death rates, indeed 5 MDC suicide rates were more than 10 times their undetermined death rate. With the exception of the UK, males at 50 ppm, Germany 37 ppm and the USA 23 ppm, undetermined deaths were relatively uncommon in the MDC, and only UK female all-age rates exceeded 20 ppm.

Patterns of Mortality between LA and MCD

The majority of LA countries' suicide rates were lower than those in the MDC. Focusing upon the younger-aged, only Chile, El Salvador, and Guyana had suicide rates for both genders higher than the MDC. Only Argentina, Guyana, and Nicaragua had higher male younger-aged rates, and only Chile matched the female MDC younger-aged rates.

All LA countries' male undetermined all-age rates were substantially higher than the MDC averages. In fact, apart from Peru, every LA country's undetermined rate was at least 3.5 times more than the all-age male average MDC rate.

The results of a series of χ^2 tests on the average MDC rates of suicide and undetermined deaths by age and gender compared to the LA countries are shown in Table 4.

There were highly significant differences between MDC patterns of suicide and undetermined deaths in 14 LA countries, with both LA men and women having significantly higher undetermined rates than the average MDC. The four exceptions included El Salvador and Uruguay, whose undetermined rates were significantly lower than the MDC

average and in all age bands. The other exceptions were Chile and Cuba, whose patterns of *suicide: Undetermined* were *not* significantly different from the MDC.

Contextual Numbers

To place the suicide and undetermined rates in context, the numbers of deaths of the largest four LA and two MDC countries spanning the range and their current approximate populations are given. Argentina (39 million) had an annual average of 3,142 suicides to 3,487 undetermined deaths. Brazil (172 million) had 6,779 suicides to 12,117 undetermined deaths. Colombia (41 million) had 2,163 suicides and 2,810 undetermined, whilst in Mexico (100 million) there were 3,784 suicides and 3,219 undetermined. Of the two *representative* MDC countries, the UK (59 million) had 4,066 suicides to 2,045 undetermined deaths, and the USA (283 million) had 29,319 suicides and 4,400 undetermined deaths annually.

Discussion

Limitations of the Study

Studies of aggregated data can tell us little about individuals. Another limitation is that there was no consistent WHO pre-1990's data available for many LA countries; therefore, it was not possible to compare them over time,

either with each other or the MDC. Nonetheless, the overall approach has been said to resolve the problems inherent in crossnational studies (Shah & De, 1998), seen in a number of international comparisons of problematic mortalities (Amunnalla & Pritchard, 2007[**not in refs**]; Pritchard & Baldwin, 2000; Pritchard & Wallace, 2006). The main problem, however, is that the causes of undetermined deaths (Other External Causes of Death) are essentially unknown; because no intent or cause could be decided upon, whether they contain hidden suicides can only be inferential.

Main Findings

1. There were significant differences in the patterns of male and female younger-aged *suicide: Undetermined* in Argentina, Brazil, Colombia, Costa Rica, Ecuador, Nicaragua, Paraguay, and Venezuela, where men had proportionately more undetermined deaths than women. The converse was the case for Uruguay, whose females had significantly higher undetermined rates than males.
2. Except for El Salvador and Uruguay, 13 other LA countries had highly significant patterns of suicide to undetermined deaths compared to the average major developed country rates; only Chile, Costa Rica, and Cuba had similar *suicide: Undetermined* ratios to the MDC.
3. In view of the significantly higher rates of Latin undetermined to suicide deaths, these may well be a repository for hidden suicides, especially for younger-aged males in Argentina, Brazil, Colombia, Dominican Republic, Ecuador, Guatemala, Guyana, Mexico, Nicaragua, Panama, Paraguay, Peru, and Venezuela?

What can be stated unequivocally is that patterns of undetermined deaths and suicides in the majority of LA countries are markedly different from the 10 MDC, and although by definition undetermined rates are *unknown*, it is a reasonable assumption that hidden suicides are more likely to occur in LA than in the 10 MDC.

What might these results indicate and what might account for the differences? Whilst country-specific research will be necessary, a number of general points can be made.

With proportionately higher undetermined deaths amongst LA younger-aged (15–34) males, it would appear that they are more vulnerable than females. In view of the traditional Catholic attitudes concerning suicide, this may reflect something of a cultural response to the stigma surrounding suicide. This suggests that undetermined deaths may well contain a significant proportion of hidden suicides.

Younger-aged Latin males, like their MDC age peers, may also be subjected to particular psychosocial and economic pressures (Blakely, Collings, & Atkinson, 2003; Granzio et al., 1996; Gunnell et al., 2003; Pritchard & Hansen, 2005a; Qin et al., 2003); relative improvements in opportunities for younger-aged women may mean that young

LA men, as in the MDC, are facing new competitive pressures, which was not the case for their fathers. Certainly, younger-aged men bear a disproportionately higher percentage of unemployment in the majority of countries under review (ILO, 2005). However, one recent Brazilian study found no statistical association between suicide and socioeconomic factors (Marin-Leon & Barros, 2003), again indicating the need for country-specific research.

It would seem likely that in many LA countries the traditional religio-cultural attitudes about suicide have contributed to the markedly different patterns of suicide to undetermined deaths found in the major developed countries, even in the predominantly Catholic European countries of France, Italy and Spain, with the high probability of having more hidden suicides.

This seems a reasonable interpretation, as it has been shown that other countries with a strong cultural antipathy to suicide, the Islamic countries also have difficulties in dealing with the problem (Al-Jahdali et al., 2004; Khan & Hyder, 2006; Moghadaminia & Abdollahi, 2000). Indeed, it has recently been found that many Islamic countries also have a disproportionately high rate of undetermined to suicide deaths, similar to many LA countries, suggesting that here, too, is a strong possibility of there being hidden suicides amongst these high levels of undetermined deaths (Pritchard & Amunnalla[**Amunnalla in refs**], 2007).

Conclusions

It seems a reasonable assumption that there will be a substantial number of undetermined deaths in the LA countries, which were probably suicide, and that suicides in many LA countries, are substantially underreported.

The practice issue however is stark. These younger-aged male undetermined rates are exceptionally high and governments should review their services for younger-aged citizens to stem the toll, whose sequel often reverberates throughout their families for decades.

The death of a young person fulfills every parent's nightmare – that their child might predecease them, and what could be more terrible than their child dying by their own hand?

Moreover, whilst we have been dealing in rates and statistics, it should be remembered that suicide is a continuing family tragedy. If we assumed but half the undetermined deaths might be re-designated “suicides,” then the annual tolls are even more daunting – in excess of 4,800 people dying annually in Argentina, 3,500 in Colombia, 5,300 in Mexico; 5,088 in the UK and 31,000 in the USA. Such numbers far outweigh many national catastrophes (Pritchard & Butler[**not in refs**], 2003; Pritchard & Wallace, 2006).

Many Governments of the major developed countries have recognized that suicides are often preventable and have made commitments to try and reduce these depreda-

tions (Department of Health, 1997; Goldney, 1998; USDH, 1999). These results provide evidence that in LA, as elsewhere, the task has never been more important or more urgent, especially for younger-aged males. It is feared that the traditional cultural attitudes in the majority of LA countries toward suicide leads to a denial of the problem and inadvertently may hinder preventive measures.

References

- Al-Jahdali, H., Al-Johani, A., Binsalih, S., **include up to 6 authors** et al. (2004). Patterns and risk factors for intentional drug overdoses in Saudi Arabia. *Canadian Journal of Psychiatry*, *49*, 331–334.
- Blakely, T., Collings, S., & Atkinson, J. (2003). Unemployment and suicide: Evidence for their causal association. *Journal of Epidemiology and Community Health*, *57*, 595–600.
- Botega, N., Barros, M., Oliveira, H.B., **include up to 6 authors** et al. (2005). Suicidal behavior in the community: Prevalence and factors associated with suicidal ideation. *Review de Brasila Psiquiatria*, *27*, 45–53.
- Cantor, C., Leenaars, A., & Lester, D. (1997). Under reporting of suicide in Ireland. *Archives of Suicide Research*, *3*, 5–12.
- Cvinar, J. (2005). Do suicide survivors suffer social stigma? A review of the literature. *Perspectives on Psychiatric Care*, *41*, 14–21.
- De Leo, D., Conforti, D., & Carollo, G. (1997). A century of suicide in Italy: A comparison between old and young. *Suicide and Life Threatening Behavior*, *6*, 122–6.
- Department of Health. (1997). *The healthier nation*. London: HMSO.
- Evans, B., & Pritchard, C. (2001) An international comparison of “youth” [15–24] and “young adult” [25–34] homicide: Highlighting the USA anomaly. *Critical Social Policy*, *11*, 83–93.
- Goldney, R. (1998). The international association for the prevention of suicide: The Adelaide Declaration. *Crisis*, *19*, 50–52.
- Granizo, J., Guallar, E., & Rodriguez-Artalejo, F. (1996). Age-period-cohort analysis of suicide mortality rates in Spain 1959–91. *International Journal of Epidemiology*, *25*, 814–20.
- Gunnell, D., Middleton, N., Frankel, S., **include up to 6 authors** et al. (2003). Why are suicide rates rising in young men but falling in the elderly? A time series analysis of trends in England & Wales 1950–1998. *Social Science and Medicine*, *48*, 324–9.
- Hawton, K., & Van Heering, K. (2002) *The international handbook of suicide and attempted suicide*. London: Wiley.
- ILO. (2005). *Yearbook 2005*. Geneva: International Labour Office.
- Joiner, T. (2006). *Why people die by suicide*. Harvard, MA: Harvard University Press.
- Khan, M., & Hyder, A. (2006). Suicides in the developing world: A case study from Pakistan. *Suicide and Life-Threatening Behavior*, *36*, 76–81.
- Levi, F., La Vecchia, C., Lucchini, F., **include up to 6 authors** et al. (2003). Trends in mortality from suicide 1965–99. *Acta Psychiatrica Scandinavica*, *108*, 341–9.
- Linsley, K., Schaparia, K., & Kelly, T. (2001). Open verdicts versus suicide: Importance to research. *British Journal of Psychiatry*, *178*, 465–8.
- Marin-Leon, L., & Barros, M. (2003). Suicide mortality: Gender and socio-economic differences. *Review Saude Publica*, *37*, 357–63.
- Maris, R., Berman, A., & Yufit, R. (Eds.). (1992). *Assessment and prediction of suicide*. New York: Guildford Press.
- [not in text]Meneghel, S., Victoria, C., Faria, N., **include up to 6 authors** et al. (2004). Epidemiological aspects of suicide in Rio Grande do sul Brazil. *Review de Saude Publica*, *38*, 804–10.
- Moghadamania, A., & Abdollahi, M. (2002). An epidemiological study of poisoning in the northern Islamic Republic of Iran. *East Mediterranean*, *8*, 88–94.
- Otero, M. (2004). Suicide in Buenos Aires. *Canadian Bulletin of Medical History*, *21*, 41–71.
- Pritchard, C., & Amunalla, S. (2007). An analysis of suicide and “undetermined” deaths in 17 predominantly Islamic countries, contrasted with the UK. *Psychological Medicine*, *37*, 421–430.
- Pritchard C., & Baldwin, D. (2000). Effects of age and gender on elderly suicide rates in Catholic and Orthodox countries: An inadvertent neglect? *International Journal of Geriatric Psychiatry*, *15*, 904–910.
- Pritchard, C., & Hansen, L. (2005a). Adolescent and youth suicide in England & Wales: An international comparison. *International Journal of Adolescent Medicine Health*, *17*, 239–53.
- Pritchard, C., & Hansen, L. (2005b). Comparison of suicide in people aged 65–74 and 75+ by gender in England & Wales and the major Developed countries. *International Journal of Geriatric Psychiatry*, *20*, 17–25.
- Pritchard, C., & Wallace, S. (2006). Suicide in the major Western countries 200–02. The violent deaths of September 11th 2001. *Archives of Suicide Research*, *10*, 383–390.
- Qin, P., Agerbo, E., & Mortensen, P. (2003). Suicide risk in relation to socio-economic demographic, psychological and familial factors: A national register-based study of all suicides in Denmark 1981–1997. *American Journal of Psychiatry*, *160*, 765–772.
- Rodrigues, N., & Werneck, G. (2005). Age-period cohort of suicide rates in Rio de Janeiro, Brazil 1979–1998. *Social Psychiatry and Psychiatric Epidemiology*, *40*, 192–6.
- Sanchez R., Orejanena, S., & Guzman, Y. (2004). Characteristics of suicides in Bogota 1985–2000. *Review de Salud Publica*, *6*, 217–34.
- Salib, E., Rahim, S., El-Nimar, G., **include up to 6 authors** et al. (2005). Elderly suicide: An analysis of coroner’s inquests into two-hundred cases in Cheshire 1989–2001. *Medical Science and Law*, *45*, 71–80.
- Serfaty, E., Foglia, L., Masautis, A., **include up to 6 authors** et al. (2003). Violent cause of death in young people 10–24 years old. Argentina 1991–2000. *Vertex*, *14*, 40–8.
- Shah, A., & De, T. (1998). Suicide and the elderly. A review. *International Journal of Clinical Practice*, *2*, 3–7.
- [not in text]Souza, E., Minayo, M., & Malaguias, J. (2002). Suicide among young people in selected Brazilian State capitals. *Cadria Saude e Publica*, *18*, 673–683.
- Stanistreet, D., Taylor, S., Jeffrey, V., **include up to 6 authors** et al. (2001). Accident or suicide? Predictors of coroner’s decisions in suicide and accident verdicts. *Medicine Science and Law*, *41*, 111–115.

- USDH. (1999). *The Surgeon General's call to action to prevent suicide*. Washington, DC: US Department of Health.
- USDHHS. (2005). *Comparability of causes of death between ICD 9 & 10. National Vital Statistics Report*. Hyattsville, MD: US National Center for Health Statistics.
- USDHHS. (2006) *Health, United States, 2006*. Washington, DC: U.S. Department of Health & Human Services.
- WHO. (1992) *International classification of disease* (10th ed.). Geneva, Switzerland: WHO.
- WHO. (1979–2005). *Annual world health statistics*. Retrieved on [date?] from www.who.who.org
- Yunes, J. (1993). Mortality from violent causes in the Americas. *Boliva Oficina Saniat e Panama, 114*, 302–16.

About the authors

Please supply short bios of BOTH authors.

Colin Pritchard

Institute of Health & Community Studies
Bournemouth University
Royal London House
Christchurch Rd
Bournemouth BH 1 3LT
UK
Tel. +44 1202 962783
E-mail cpritchard@bournemouth.ac.uk