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Item Type	Article
Authors	Flisher, A.J.;Liang, H.;Laubscher, R.;Lombard, C.F.
Citation	FLISHER AJ, HOLAN LIANG, LAUBSCHER R, LOMBARD CF. Suicide trends in South Africa, 1968-90. Scandinavian journal of public health [Internet].
Publisher	Londres
Journal	Scandinavian journal of public health.
Rights	Attribution 3.0 United States
Download date	2024-07-19 12:28:20
Item License	http://creativecommons.org/licenses/by/3.0/us/
Link to Item	https://infospace.mrc.ac.za/handle/11288/595221

Suicide trends in South Africa, 1968–90

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Scand J Public Health 2004; 32: 411–418

Aims: A study was undertaken to investigate suicide rates and proportional mortality trends in South Africa from 1968 to 1990. *Methods:* Suicide rates per 100,000 population per year and suicide proportional mortality rates per year were calculated. The analyses were stratified by race, sex, and age group. Trends were interpreted using graphs depicting smoothed sex/race-specific suicide rates and proportional mortality rates over time. Regression models for suicide rates were fitted within specific age groups to test the effects of race, sex, and time. Further analysis was done within the specific age and race groups, if any interaction was found with time. *Results:* There were increases in suicide rate in the young (particularly for white males) and for whites aged 65 years and above (particularly for males). *Conclusions:* The finding that suicide among the young and elderly in South Africa is increasing suggests that preventive efforts are indicated, especially for white males. Trends for young South Africans mirror those in Europe and the USA, and attention to trends in these countries may predict future trends in youth suicide in South Africa.

Key words: longitudinal studies, South Africa, suicide.

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BACKGROUND AND AIM

Suicide ranks consistently among the top 10 causes of death according to official statistics in the USA and many European countries (1). Although the time trends of suicide rates vary between countries, the averaged suicide rate for 16 European countries has risen considerably over the last century (1). The two main periods of rise in suicide rate were in the early twentieth century and in the 1970s extending into the early 1980s. A similar trend is seen in the USA, with a peak in suicide rate in 1932, followed by a decrease, then a steady rise in rate peaking for a second time in 1977 (1). Since then in the USA, and since the early 1980s in Europe, the suicide rate has plateaued (1, 2).

However, despite an apparent stabilization of the overall suicide rate, suicide rates in younger age groups have been increasing, both in Europe (3, 4) and the USA (5, 6). The rise of suicide in the young is particularly evident in males. Maris (7) showed that between 1960 and 1980 there was a large increase in the suicide rates of males and females aged 15–24 in the USA, this rise being greater for males. Similar trends have been reported in Europe (8). Diekstra et al. (1) noted that this pattern of increasing suicide rate among the young (particularly males) was also evident

outside Europe and the USA, in countries with a population predominantly of European descent, such as Canada, Australia (9), and New Zealand (10). It did not appear to be applicable to Asian or Latin American countries. However, they do not provide any data in support of this assertion. It would be of interest to know whether such a pattern was applicable to African countries.

Over the same time frame as the rise in suicide in the young, there has been a reciprocal decline in suicide rate in the older population, accounting for the relative stability of the overall suicide rate. Again, this trend is seen in both Europe (1, 11), and the USA. (12, 13).

In South Africa, non-natural death was the leading cause of death in 1994 (14), and suicide accounted for approximately 8% of non-natural deaths in the first quarter of 1999 (15). Further, Flisher and Parry (14) showed that suicide contributed to 1.3% of all deaths between 1984 and 1986. However, little is known about suicide trends in South Africa. Mkize (16) studied the suicide statistics for Umtata, a district in the Transkei, between 1971 and 1990, finding that the suicide rate increased from 2.0 to 11.6 per 100,000 over the 20-year period. However, data for this study were obtained from police records and it is acknowledged

in the paper that these figures could be inaccurate due to deficiencies in reporting practices. There remains, therefore, a dearth of accurate studies investigating suicide trends in South Africa. Therefore, the aim of this analysis was to investigate suicide rates and proportional mortality trends in South Africa.

DATA

Suicide data for the time period 1968–90 were supplied on computer tapes by the South African Central Statistical Service (CSS). The period 1968–90 was selected as this is the most recent period for which accurate suicide data are available stratified by racially defined social group (RDSG). Between 1992 and 1998, race was not coded in mortality statistics. Also, from 1992 onwards the quality of data for the cause of death deteriorated as the data were no longer based on the findings from an inquest. The South African population falls mainly into 4 RDSGs: blacks (75% of the population in 1990), whites (13%), coloureds (derived from Asian, European, and Khoisan and other African ancestry) (9%) and Asians (mainly Indians) (3%). Although defining social groups by race has its disadvantages as these groups do not have anthropological or scientific validity, it is useful because there are important differences between the groups for many indicators of health. These differences are mediated by cultural, political, and economic factors. For example, the average monthly earnings in 1981 were 413, 216, 293, and 890 South African Rands for the Asian, black, coloured, and white RDSGs respectively (17). Life expectancies at the beginning of the study period for females were 64, 59, 56, and 72 years for the Asian, black, coloured, and white RDSGs respectively. The corresponding ages for males were 59, 51, 49, and 65 years (17).

Data on the black RDSG were only available for the years 1980–90. In addition, estimated population figures for this group are known to be inaccurate, thus we were unable to calculate meaningful mortality rates for this group. The CSS did not provide data for the territories of Transkei, Bophuthatswana, Venda, and Ciskei (“TBVC states”) and these were excluded from the analysis.

METHOD

Suicides were classified as all deaths coded in the range E950–959 of the International Classification of Diseases – 9th version (ICD-9), or the corresponding codes of earlier versions. In addition, we included the code E979, which uniquely in South Africa refers to suicide and self-inflicted poisoning by motor vehicle exhaust gas. We decided not to include undetermined

causes of death (E980–989) as we had no way of knowing how many were caused by suicide. Suicide rates were calculated per 100,000 population per year for whites, coloureds and Asians for the time period 1968–90. Proportional mortality rates were calculated per year for the time period 1980–90, for all four RDSGs. The usefulness of proportional mortality rates is limited as they are influenced by the number of deaths due to causes other than suicide. However, it was decided to include them, mainly because of the absence of suicide rates for blacks, who comprised 75% of the population. The analyses were stratified by RDSG, sex, and age group (15–24 years; 25–34 years; ...; 65 years and above). The 0–14 years age group was excluded from the analysis owing to small numbers of deaths due to suicide relative to the other categories (1980–90: $n=211$; 1.29%). Trends were interpreted using graphs depicting smoothed sex/race suicide rates and proportional mortality rates over time. In the Results section below, a selection of graphs that illustrate key findings will be provided.

Generalized linear models (GLM) were fitted within each of the six age groups to test for differences between race and sex over time. For the analyses involving suicide rates, the race variables were Asian, coloured, and white, while for the analyses involving proportional mortality the race variable black was added. The time periods were 1968 to 1990 and 1980 to 1990 for the analyses involving suicide rates and proportional mortality respectively. All main effects and a quadratic time effect and their interactions were included in the models. A quadratic time effect (as opposed to a linear time effect) was included because the data were not linear. All the interactions involving time were included because they were directly relevant for our aim, in that it was necessary to ascertain whether any trends that were present differed according to race, gender or an interaction between these variables. The remaining interaction term (race \times sex) was included as we knew from previous work that this interaction is relevant in explaining suicide rates and proportional mortality (14). Thus, the terms included in the initial imodels were:

$$\begin{aligned} &(\text{Race} \times \text{sex} \times \text{time}) + (\text{time} \times \text{time}) + (\text{time} \times \text{race}) + \\ &(\text{time} \times \text{sex}) + (\text{time} \times \text{time} \times \text{race}) + \\ &(\text{time} \times \text{time} \times \text{sex}) + (\text{time} \times \text{sex} \times \text{race}) + \\ &(\text{time} \times \text{time} \times \text{sex} \times \text{race}) + (\text{race} \times \text{sex}) \end{aligned}$$

Further analysis was done in which non-significant terms were discarded, or race or gender specific analyses were carried out to address interaction.

In the models, mortality rate was defined as:

$$\frac{\text{Number of suicides within specific race, sex, age group per year}}{\text{Total population within specific race, sex, age group per year}} \times 100,000$$

The total population was derived from census counts that were based on the actual censuses conducted during the study period with interpolation for intermediate years. Proportional mortality was defined as:

$$\frac{\text{Number of suicides within specific race, sex, age group per year}}{\text{Total mortality within specific race, sex, age group per year}} \times 100$$

The existence of a significant time effect does not have any implications for whether the effect is positive or negative, or a combination of these. Further details of the models are available from the authors.

RESULTS

There were 1,507,836 reported deaths of people aged 15 years and older between 1980 and 1990. Of these 16,389 (1.1%) were due to suicide. A further 7,312 suicides occurred in the white, coloured, and Asian populations between 1968 and 1979. Mean annual suicide rates and proportional mortality rates were highest in whites, followed by Asians and then coloureds (see Table I). Blacks had a similar proportional mortality rate to that of coloureds. The male mean annual suicide rate and proportional mortality rates were higher than those for females in all RDSGs (see Table I)

In the 15–24 age group, there was a significant time effect on suicide rate ($p < 0.01$), with a general increase in suicide rate between 1968 and 1990 (Fig. 1a). However, proportional mortality remained stable between 1980 and 1990 for all RDSG (Fig. 1b), except for blacks where a significant time \times sex interaction was present ($p = 0.04$). Proportional mortality in both sexes increased then decreased within the study

period, but in males the decrease was more prominent, explaining the interaction.

On race-specific analysis of the 25 to 34 age group, the suicide rate for whites increased significantly over time ($p = 0.01$). From Fig. 2, one can see the rise was more dramatic for males than females, increasing by 24.3% from 27.0 per 100,000 in 1968, to 33.5 per 100,000 in 1990. Suicide rates for coloureds and Asians remained stable. With regard to proportional mortality, race-specific analysis found the proportion of all deaths attributable to suicide in whites rose significantly over the study period ($p < 0.01$), while in blacks the proportion fell significantly ($p < 0.01$) (Fig. 2c). In the coloured and Asian populations, no significant effects of time were found.

In the 35–64 age group, suicide rates remained stable from 1968 to 1990. The only significant finding was in whites aged 35–44 where a significant time effect was found ($p < 0.01$), but no definite upward or downward trend was evident. Proportional mortality 1980–90, however, showed a definite upward trend in whites, where there were significant or marginally significant increases in proportion of deaths attributable to suicide in all 3 age groups from 35 to 64 ($p < 0.01$ for those 35–44 years, $p < 0.10$ for those 45–54 years, and $p < 0.02$ for those 55–64 years). This rise in proportional mortality was from 2.4 in 1980 to 3.9 in 1990, a 62% increase. There was a significant decrease in proportional mortality in the black population aged 35–44 years ($p < 0.01$). Significant effects of time were also found for blacks aged 45–64 years ($p < 0.01$) and Asians aged 45–54 ($p = 0.02$), but no definite upward or downward trends were evident.

In the population over 65 years old, suicide rates showed a significant time \times race \times sex interaction ($p = 0.04$). On race-specific analysis time effects were significant in Asians ($p = 0.01$) and whites ($p = 0.01$) (Fig. 3). Asian males showed a decrease until 1980

Table I. Proportional mortality and mean annual suicide mortality rates per 100,000 for suicide for each RDSG, gender and age group in South Africa: 1980–90

Age group (years)	Whites		Coloureds		Asians		Blacks ^a	
	Men (n=6486)	Women (n=1,812)	Men (n=1,129)	Women (n=311)	Men (n=559)	Women (n=135)	Men (n=5,066)	Women (n=891)
	PM	SR	PM	SR	PM	SR	PM	SR
15–24	10.8	22.1	8.6	5.7	2.3	8.5	2.4	3.26
25–34	14.8	34.7	11.1	9.8	2.6	15.0	1.4	3.6
35–44	10.1	34.8	6.1	10.6	1.5	13.2	0.6	3.0
45–54	4.7	37.8	2.8	12.1	0.6	10.4	0.2	2.6
55–64	1.8	37.9	0.9	9.7	0.2	8.3	0.0	0.8
65+	0.6	41.2	0.2	7.1	0.1	7.7	0.0	0.9
Total	3.0	33.1	1.00	9.0	0.9	11.1	0.4	2.9

Notes: PM=proportional mortality; SR=suicide mortality rate; ^amortality rates not valid for blacks (see text).

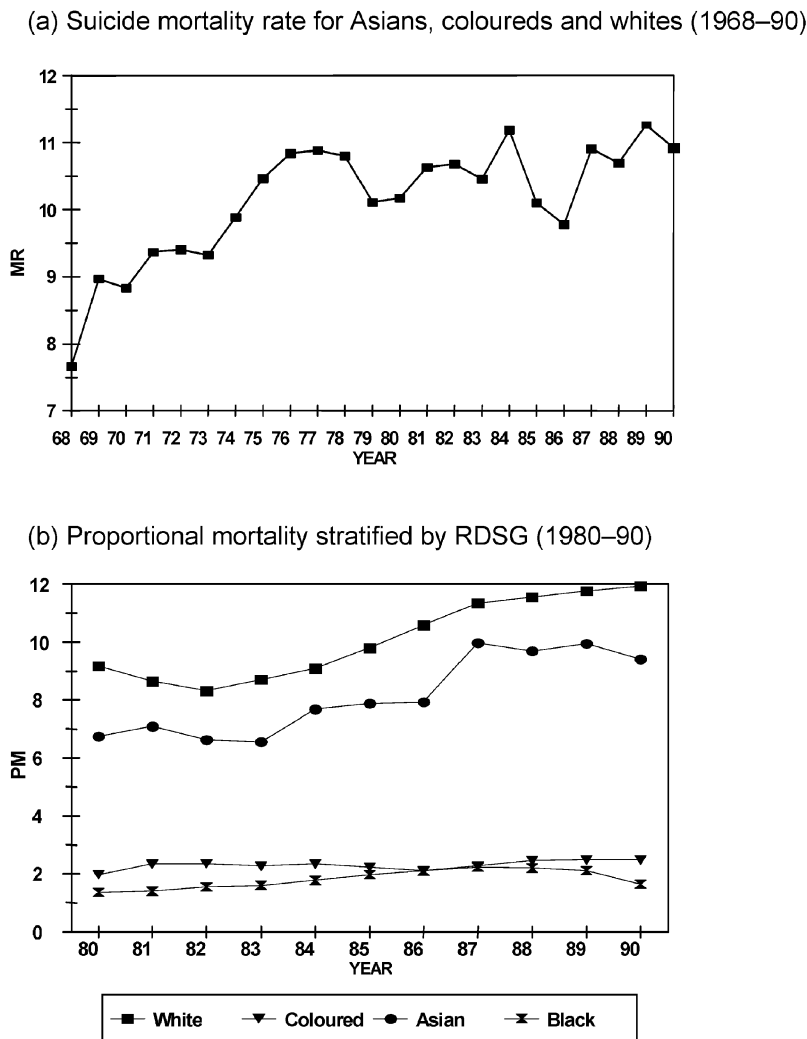


Fig. 1. Suicide mortality per 100,000 and proportional mortality for the 15–24 age group.

followed by an inconsistent increase. Asian females showed an inconsistent pattern. Whites showed an increase in suicide rate, peaking in 1987. From 1987 onwards the rate begins to decline. This increase in suicide rate was more marked in the male population (Fig. 3). No significant effect of time was found in the coloured population. There was a significant time effect on proportional mortality rates for all RDSGs ($p=0.04$), with an upward then downward trend (Fig. 3c).

DISCUSSION AND CONCLUSIONS

Both suicide rates and proportional mortality rates were higher in men than women, and this is consistent with previous findings in South Africa (14), Europe (1), and the USA (18). It has been suggested that this gender discrepancy may be due to a greater male propensity towards: (i) lethality of suicide method

(19); (ii) occupational stress (20); and (iii) alcohol abuse (21). Also in concordance with previous research in South Africa, Europe, and the USA, the suicide rate for whites is higher than the suicide rate for other RDSGs (14, 22). Suggestions for racial differences in suicide mortality in South Africa include: (i) decreased resilience and lack of external source of blame for hardships, due to expected high quality of life in whites (23); (ii) adherence to religions proscribing suicide in Asians and coloureds (24); and (iii) close family ties and cultural taboos against suicide in blacks (25).

Between 1968 and 1990, there was a significant increase in youth suicide in South Africa. This increase in youth suicide is particularly marked in the white population, where an increase is seen in people aged 15 to 34 years. In addition, the proportional mortality attributable to suicide in whites in the 25–34 age group rose significantly during the study

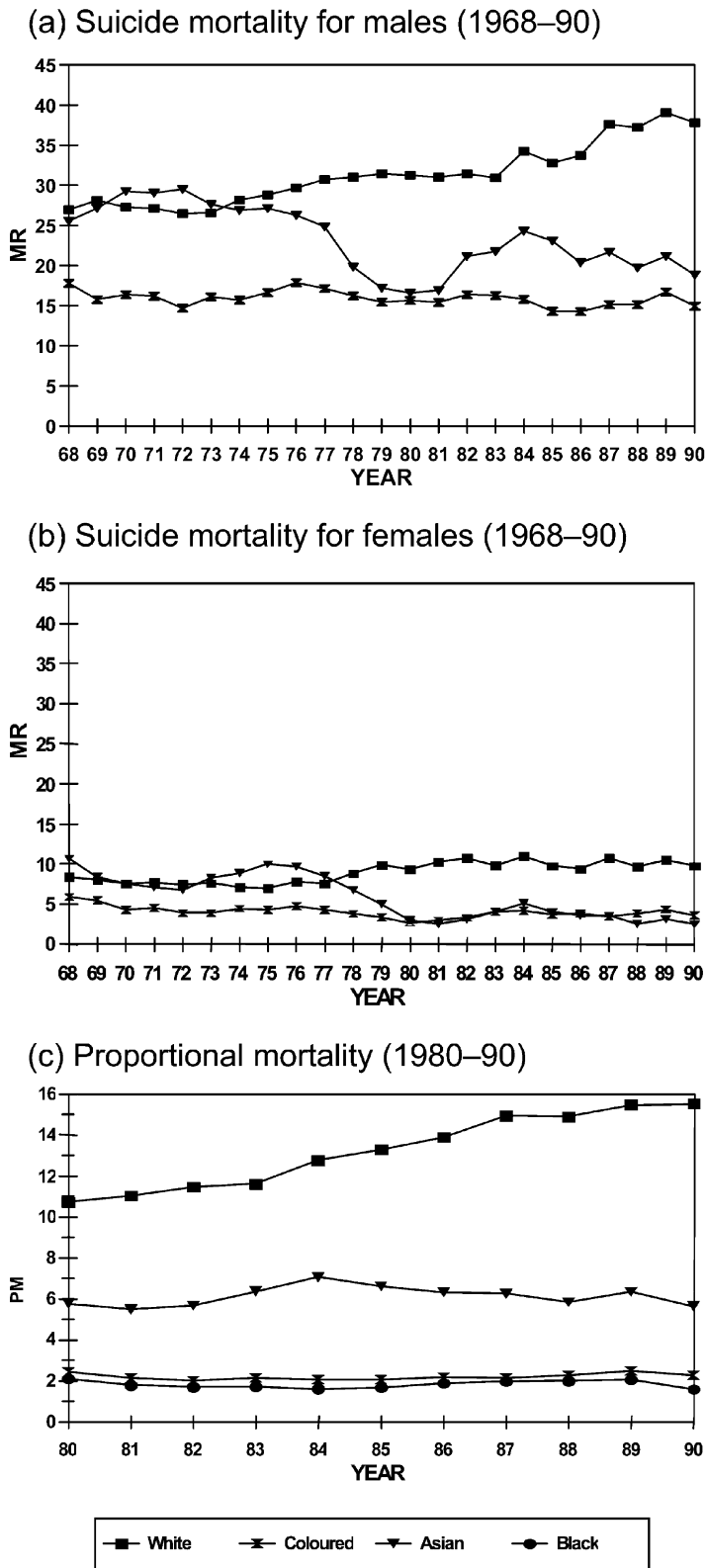
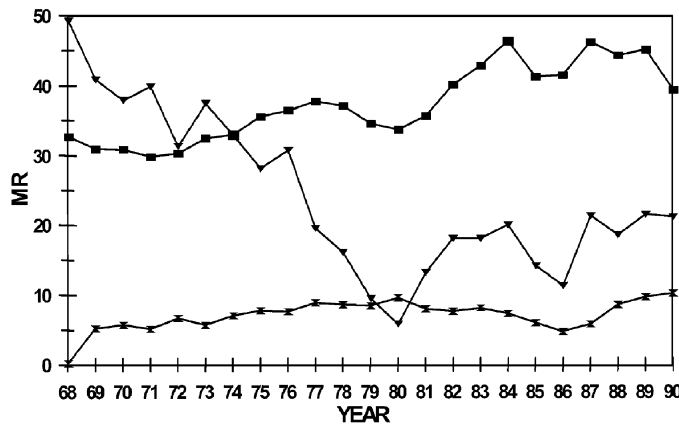


Fig. 2. Suicide mortality per 100, 000 and proportional mortality for the 25–34 age group, stratified by RDSG.

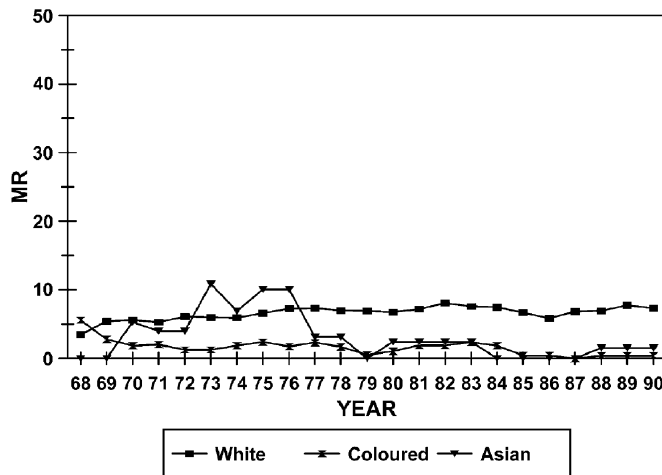
period. Although both males and females are affected, it is in the male population that the increase is particularly marked. This trend of a rise in youth

suicide, particularly affecting young white males mirrors trends seen abroad. The mechanisms involved in the rise of youth suicide remain purely speculative,

(a) Suicide mortality per 100,000 males stratified by RDSG (1968–90)



(b) Suicide mortality per 100,000 females stratified by RDSG (1968–90)



(c) Proportional mortality for all RDSG's (1980–90)

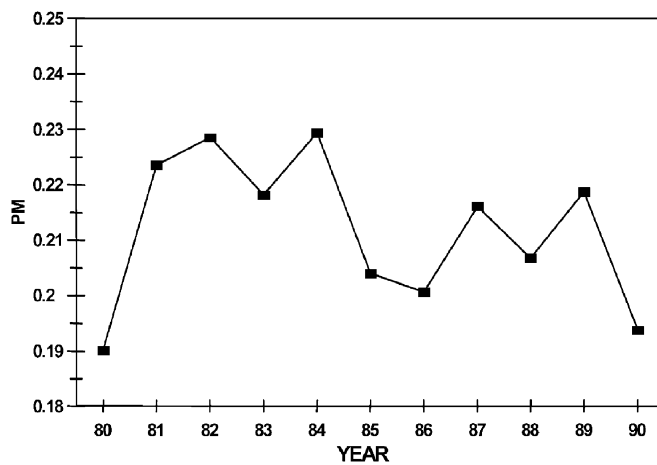


Fig. 3. Suicide mortality per 100,000 and proportional mortality for the over-65 age group.

but risk factors may include: (i) drug and alcohol abuse; (ii) an increase in family dissolution (7, 26); and (iii) the changing roles of men and women in society

(27). An additional factor that may be relevant for South African young white men in the study period is that they were required to undergo a period of

compulsory military training. This was a stressful experience for many young white South Africans, partly because many were involved in military action. This action took place either within the borders of South Africa, suppressing the widespread revolt against apartheid in the townships, or in neighbouring countries. Suicidal feelings may have occurred as a result of post-traumatic stress or guilt and remorse (28).

In the 35–64 age group, the suicide rate remained largely stable over the study period. However, amongst whites there was a 62% increase in proportional mortality in this age group, such that in 1990 suicide accounted for almost 4% of all deaths. This discrepancy between trends in suicide rate and proportional mortality is largely ascribed to the dramatic decline in the death rate, which almost halved between 1968 and 1990.

In the over 65 age group, the only consistent trend was a significant increase in the white suicide rate. Although both genders were affected, the increase was more marked in the male population. From 1987 onwards however, a decline in the suicide rate was seen. This contrasts with the trend in the USA, where a decline in elderly suicide mortality rates has been evident since the 1930s, reaching a low in 1981, after which it began to rise again (29). This increasing suicide rate in the elderly white may be due to the growth of the elderly population, resulting in decreasing resources per elderly person. In support of this, the white population over 65 in South Africa increased by 88.5% between 1968 and 1990. However, both the USA and Europe have seen decreasing elderly suicide trends despite increasing elderly population (11, 29). Several suggestions can be put forward to explain differences between South African and Western trends: (i) discrepancies in government expenditure on social security and healthcare resources for the elderly; (ii) preventive strategies in place in the West due to acknowledgement of the elderly suicide problem (30); and (iii) social disruption and political unrest during the period 1980–90 in South Africa. During this period futures were uncertain, particularly for the white population, and this may have had a greater impact on the elderly population who may have felt less able to adapt to new challenges. However, the suicide rate in this population began to decline towards the end of the 1980s. Whether this decline in elderly suicide rate will be found to have progressed into the 1990s, in contrast with the rise in the USA, remains to be seen.

This study has strength in that it is the first study of longitudinal mortality statistics using national data in South Africa. However, it has several limitations. The main limitation is the lack of accurate population statistics for the black RDSG such that mortality

rates were not able to be calculated. The black population make up the majority of the South African population and the addition of this information would greatly affect our understanding of suicide trends in South Africa. The availability of proportional mortality statistics for the black population allows for some, although limited, insight into suicide trends in the black population. However, definitive conclusions on trends among blacks are precluded. Second, only suicide trends up to 1990 were reported. Reasons for this have been discussed above. Third, the quality of the data supplied by the CSS was limited by: (i) incompleteness of CSS registered deaths (31); (ii) lack of data for the “TBVC” states; (iii) inaccuracies in cause of death coding due to vague or inadequate completions of death certificates (32); and (iv) inaccurate diagnoses of cause of death (32).

Conclusions should be regarded with caution as the last data year in this study was 1990. However, the finding that young and elderly white males in particular displayed increasing suicide rates highlights an important public health issue that warrants preventive intervention. It is of interest that similar patterns in suicide can be found between the young South African population with populations in Europe and the USA, and attention to trends in these countries may be helpful in the prediction of future trends in youth suicide in South Africa.

ACKNOWLEDGEMENTS

The authors would like to thank Drs Debbie Bradshaw and Charles Parry. Both contributed to the conceptualization of the project, and Dr Bradshaw also assisted in the preparation of the manuscript.

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Accepted 04 02 03

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