

Peering into the black hole — the quality of black mortality data in Port Elizabeth and the rest of South Africa

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Summary

In the year ending 30 June 1989, 26,8% of 5 345 deaths in the Port Elizabeth area were classified as ill-defined. A study was undertaken in an attempt to identify the reasons for the high proportion of such deaths. Copies of all death notifications and death register forms of black people in the area served by the Port Elizabeth City Health Department were collected for a 6-week period. Of the 316 deaths, 154 (48,7%) were certified by medical practitioners at a hospital, 158 (50%) by the police and 4 (1,3%) by private medical practitioners. Of the police-certified deaths 116 (73,4%) were recorded as due to 'natural causes', with the remainder being submitted to autopsy. Of the hospital deaths, 26% were not adequately described in the section for the cause of death on the death certificate.

Review of national mortality data for 1985 showed that only 29,9% of ill-defined deaths (in all population groups) were certified by a medical practitioner. The prime source of deaths classified as ill-defined, both in Port Elizabeth and nationally, were those not certified by a medical practitioner. Strategies aimed at minimising the number of deaths certified by the police need to be developed.

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Rationale

Previous authors have documented the poor quality and availability of black mortality statistics in South Africa.¹⁻³ Under-registration of both births and deaths has been shown to affect the interpretation of the infant and other mortality rates in South Africa.⁴ Botha and Bradshaw¹ have shown that available black mortality data in South Africa are characterised by a high proportion of deaths being classified as ill-defined (20% in 1979/1980). Kielkowski *et al.*² recently focused on the role of the medical practitioner in completing death certificates and emphasised the need for appropriate training.

Health authorities in Port Elizabeth were concerned about the high proportion of deaths classified as ill-defined in all population groups in the area, and the implications of this for planning urban health services. At present the causes of death in the area controlled by the Port Elizabeth City Health Department, which are summarised in the annual Health Reports, are abstracted from the death registers of the district (black deaths) and regional (white, coloured and Asian deaths) offices of the Department of Home Affairs. In the year ending 30 June 1989, a total of 26,8% of 5 345 deaths registered were classified as ill-defined (International Classification of Diseases

(ICD) codes 780 - 798).⁵ During this 1-year period the percentage of deaths that were ill-defined were: 29% in blacks; 35% in coloureds; 13,1% in whites; and 15,4% in Asians.

A study was undertaken to identify reasons for the high proportion of deaths in blacks classified as ill-defined in Port Elizabeth, so that strategies could be devised to reduce this. In the light of the local findings a secondary aim was introduced, namely to determine the proportion of deaths in South Africa during 1985 classified as ill-defined that were certified by medical practitioners in order to examine their contribution to the problem nationally.

Methods

Port Elizabeth study

This study included only deaths among blacks for logistical reasons, since death registrations for other population groups are sent to the regional office of the Department of Home Affairs and were not as readily accessible to the researchers at the time of the study. Copies of all death notifications and death register forms of blacks resident in the area served by the Port Elizabeth City Health Department, including the Ibhayi Municipality for which the Port Elizabeth City Health Department provides services on an agency basis, were forwarded by the Department of Home Affairs (District Office, Africa House, Port Elizabeth) to the City Health Department for a 6-week period (weeks ending 13 April 1990 - 18 May 1990). There were three forms of death notification: (i) a death certificate completed by a medical practitioner; (ii) form BI-71 ('declaration that a person died from natural causes after an official investigation of death has been instituted') completed by a police officer; and (iii) form DSO-725 ('particulars of a death and/or the causes of death in terms of section 13, 13A, 25 or 26 of the Birth, Marriage and Death Registration Act, Act No. 81 of 1963') in cases where the body has been submitted to a police autopsy. Stillbirths were excluded from the study.

All black deaths for which the death register gave an address in the study area were included. For each death, the person's age, sex, stated cause of death and contributory causes of death were abstracted from the relevant certificate and death register form.

National data review

The proportion of deaths classified as being due to 'ill-defined' causes (ICD main group XVI)⁶ in South Africa during the period 1984 - 1986 was determined for each of the four population group categories, using information from computer tapes supplied by Central Statistical Services (CSS). The number of deaths classified as ill-defined in the Port Elizabeth area during the year ending 30 June 1989 was obtained from *The City of Port Elizabeth Annual Health Report (1 July 1988 - 30 June 1989)*. The total number of deaths in each age-population group category during this period was obtained from City Health Department records.

Port Elizabeth City Health Department

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TABLE I. PERCENTAGE OF DEATHS CLASSIFIED AS 'ILL-DEFINED' (ICD XVI) IN SOUTH AFRICA (1984 - 1986) AND PORT ELIZABETH (1 JULY 1988 - 30 JUNE 1989) BY AGE AND POPULATION GROUP

Population group	Age (yrs)					Overall	Total No. of deaths
	< 1	1 - 4 / 1 - 5*	5 - 24 / 6 - 24*	25 - 64	65+		
Black							
SA	12,8	14,7	11,5	20,2	42,6	23,3	318 686
PE	22,8	25,6	17,9	30,4	33,6	29,0	2 713
Coloured							
SA	5,4	6,1	3,5	6,2	14,0	8,0	78 716
PE	29,5	24,4	14,6	38,4	38,0	35,0	1 375
White							
SA	6,5	5,8	2,4	3,9	8,7	6,8	117 697
PE	21,4	22,2	4,8	11,6	13,9	13,1	1 218

SA = South Africa; PE = Port Elizabeth.

* For South Africa age strata were 1 - 4 years and 5 - 24 years; for Port Elizabeth age strata were 1 - 5 years and 6 - 24 years.

The proportions of all deaths and deaths due to ill-defined causes in South Africa certified by medical practitioners were calculated for 1985 by age strata within each population group from data abstracted from CSS computer tapes of registered deaths.

Results

Magnitude of the problem of deaths classified as ill-defined

The percentages of deaths attributable to 'ill-defined' causes in South Africa during 1984 - 1986 compared with those in Port Elizabeth during the 1-year period ending 30 June 1989 are shown in Table I. (Asian deaths have been omitted due to relatively small numbers.) For most age-population group categories, the percentage of deaths classified as ill-defined was higher in Port Elizabeth than in South Africa. This was particularly marked in coloureds, in whom the proportion of deaths classified as ill-defined was similar to blacks in Port Elizabeth, whereas nationally coloureds had proportionally less deaths classified as ill-defined than blacks.

Port Elizabeth study

There were 316 deaths among blacks reported during the study period. Sources of death notification included hospitals in the Port Elizabeth area (Livingstone Hospital, Dora Nginza Hospital, the Provincial Hospital and the three tuberculosis hospitals), as well as police and private medical practitioners (Fig. 1). Fifty per cent of the deaths were police certified.

The main source of deaths classified as ill-defined in this study were those certified by the police as due to 'natural

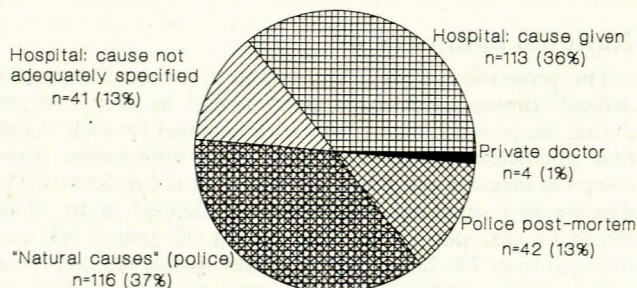


Fig. 1. Source of death registrations in blacks in Port Elizabeth during the 6-week study period.

causes' (form BI-71). This source of death registration accounted for 36,7% of all deaths in the study. However, in 25,9% of the medical certifications, the cause of death was not stated adequately on the death certificate. Information on the cause of death was outstanding for 39 of the 42 bodies subjected to police autopsy at the time of analysing the data.

The age and sex distribution of deaths in the Port Elizabeth study is shown by source of notification in Table II. Both the age and the sex distribution varied by the notification source. As expected, the male/female ratio was high (2,23) among those bodies submitted to a police autopsy. The age and sex profile of people certified by police officers as having died of 'natural causes' was similar to that of people for whom a death certificate was issued (Table II).

Further evaluation of the 158 death certificates completed by medical practitioners showed that in 40 cases signs of death (cardiac and/or respiratory arrest) were given rather than cause of death. In many of these cases direct and/or underlying causes of death were given as contributory causes. In 22 of the 40 deaths (55%) reported as being due to cardiac arrest and/or respiratory arrest, the contributory causes given on the death certificate did not indicate any underlying cardiac or respiratory disease. In 5 cases difficulties were experienced in determining the cause of death due to the use of abbreviations and illegible writing and in 1 case the cause of death was given as 'natural causes' with the contributing cause 'unknown'.

Proportion of deaths classified as ill-defined registered by medical practitioners, South Africa, 1985

Review of national death data showed that the overall proportion of deaths classified as ill-defined in South Africa was considerably higher among blacks than in other population groups. During this year deaths among blacks constituted 59,9% of all registered deaths, while 82,4% of deaths classified as ill-defined were in blacks. The proportion of deaths classified as ill-defined was highest in people aged ≥ 65 years in all population groups (Table III).

The overall percentage of deaths certified by medical practitioners was lowest among blacks and highest among whites. Extremely low certification rates by medical practitioners were found in the 5 - 24-year age group of all populations, but blacks had a higher proportion of deaths certified by medical practitioners than other population group subgroups.

The majority of deaths from ill-defined causes were not certified by a doctor. In blacks only 23% of the deaths from ill-defined causes were certified by a doctor, while in whites

TABLE II. PERCENTAGE OF DEATHS IN EACH AGE CATEGORY AND RATIO OF MALE : FEMALE DEATHS BY TYPE OF DEATH NOTIFICATION

Type of death notification	Age (yrs)						Male:female ratio (95% CI)
	< 1		1 - 4	5 - 24	25 - 64	65+	
Death certificate (N = 158)	Neonatal 3,2	Post-neonatal 13,9	1,9	3,8	41,8	35,4	1,29 (0,95 - 1,78)
Natural causes certificate (N = 116)	7,8	12,9	3,4	3,4	42,2	30,2	0,97 (0,67 - 1,39)
Police autopsy (N = 42)	—	—	—	31,0	57,1	11,9	2,23 (1,23 - 4,89)
Overall (N = 316)	4,4	11,7	2,2	7,3	44,0	30,4	1,24 (1,00 - 1,56)

CI = confidence interval.

TABLE III. PERCENTAGE OF TOTAL DEATHS AND DEATHS CLASSIFIED AS ILL-DEFINED CERTIFIED BY MEDICAL PRACTITIONERS, BY POPULATION GROUP AND AGE — SOUTH AFRICA, 1985

	Blacks	Whites	Coloureds	Asians
Total deaths	101 260	38 434	24 070	5 219
Ill-defined deaths	24 557	2 785	2 025	435
Percentage of all deaths certified by a medical practitioner				
< 1 yr	84,4	88,7	91,4	93,2
1 - 5 yrs	76,4	46,3	79,0	71,1
5 - 24 yrs	36,7	22,5	28,1	25,7
25 - 64 yrs	54,8	76,6	70,1	78,7
65+ yrs	64,5	95,2	93,2	95,8
All ages	62,0	86,4	76,8	81,5
Percentage of deaths classified as ill-defined certified by medical practitioners				
< 1 yr	17,1	54,6	39,4	66,7
1 - 5 yrs	24,0	50,0	38,6	63,6
5 - 24 yrs	23,3	12,2	11,5	45,0
25 - 64 yrs	17,0	25,6	26,3	49,4
65+ yrs	28,4	84,4	77,0	90,6
All ages	22,7	71,3	51,8	70,1

and Asians the majority of such deaths were certified by a medical practitioner (71% and 70%, respectively); in coloureds 52% were certified by a doctor. The proportion of deaths from ill-defined causes certified by medical practitioners also varied with age, being highest in the ≥ 65 -year age group in all population groups.

Discussion

Feinstein⁷ recently commented on the 'remarkably uncritical acceptance' of mortality data internationally. He claimed that mortality data are used within the prevailing doctrine of *faute de mieux* (for want of [anything] better), based on the belief that the data are passively rather than actively deceptive, and that with large samples random errors are presumed to cancel out. On the contrary, there is evidence that large samples convert small errors into larger blunders! It was this concern that motivated an investigation into the quality of Port

Elizabeth and national mortality data. The focus here is only on the problem of misclassification. Under-registration is likely to be as important, even in urban areas.⁴

The Port Elizabeth study revealed two major reasons for the high proportion of deaths classified as ill-defined: (i) the high proportion of deaths certified by police as being due to 'natural causes' in lieu of death certification by a medical practitioner; and (ii) signs of death being entered instead of either the direct or the underlying cause of death on the death certificate by medical practitioners, despite this information being known in most cases.

In Port Elizabeth, the family usually contacts an undertaker after a death in the home. If the deceased does not have a private medical practitioner (the majority), they are referred to the police to obtain a death certificate before burial. The police issue a 'declaration that a person died from natural causes after an official investigation of the death has been instituted' (form BI-71). This certificate does not give any information on the cause of death or previous disease history.

Nationally, as in the Port Elizabeth study, the relatively low proportion of deaths classified as ill-defined in blacks that are certified by a medical practitioner suggests that the use of BI-71 forms in lieu of a death certificate is the prime source of this classification. The certificate previously used by the police was, however, worse, since they were expected to enter a cause of death without being trained to do so. The cause of death was thus unreliable. For example, in young children police officers often attributed deaths to measles after enquiring whether the child had had a rash. Two of the BI-71 certificates analysed in this study had 'high blood and jondis' added by the police officer as a cause of death!

The high percentage of deaths certified as being due to natural causes reflects a failure to make use of medical records when people die in the community. It is likely that at least some of the people in the Port Elizabeth study whose deaths were certified as being due to natural causes had attended local health services in the period before their death. The relatively high proportion of neonatal deaths certified by the police in the Port Elizabeth study suggests that access to care may also be a problem, even in this urban setting. The reasons for the high proportion of deaths certified by the police needs further investigation.

Strategies should be implemented to minimise the number of deaths certified as due to natural causes. Undertakers and police should check whether the deceased person had previously attended a hospital or clinic. The likely cause of death could then be determined from medical records, and a death certificate completed by an attending medical practitioner or a district surgeon. If medical records are not available, nurses from the local authority could visit homes where a death has occurred to obtain details of symptoms before death in order to make a presumptive diagnosis of the likely cause of death. A recent study⁸ showed that 'verbal autopsies' can diagnose major illnesses contributing to death in children with acceptable sensitivity and specificity. A similar study is underway in Port Elizabeth.

Consideration should be given to permitting nurses to complete a death certificate in cases where the deceased had not been attended by a medical practitioner. In the long term, medical care needs to be made more accessible within the community (both in terms of cost and distance).

With respect to the death certificates completed by medical practitioners, this study reaffirmed the critical need for improved training in the completion of death certificates.² In particular, the need to distinguish between the mechanism of death and the underlying cause of death should be stressed. It is the latter that should be entered as the cause of death.

The similar age and sex profile of medically-certified deaths and deaths certified by the police as due to 'natural causes' suggests that the underlying causes of death may have been similar in these two groups. This has important implications for determining the relative importance of different causes of death. If it could be shown that the causes were similar in

these two groups, existing proportional mortality ratios (PMRs) would remain unchanged, and the use of PMRs in allocating priority for interventions would be valid. However, if the causes of death were very different among those deaths being certified by the police as due to natural causes compared with medically certified deaths where the cause of death is stated, the present priority ranking of causes of death could be very misleading. Further investigation of the spectrum of disease in people dying of 'natural causes' is required.

Previous investigators have commented on the high proportion of deaths classified as ill-defined among blacks.^{1,2} This investigation showed that this is largely due to a high proportion of deaths not being certified by a medical practitioner (50% of deaths in the Port Elizabeth study). However, it also reinforces the need for attention to be focused on improving the completion of death certificates. A national enquiry into deaths classified as ill-defined is required so that mortality data can be used with more confidence. In the interim, we recommend that mortality analyses take the source of death registration (medical practitioner or police) into account.

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Addendum

As a result of this study, co-operation received from the Regional Representative, Department of Home Affairs, Port Elizabeth, has led to all district offices in the eastern Cape being supplied on a weekly basis with death register forms and death certificates.

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