Information on death certificates: cause for concern?

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Abstract
Aims—To assess the frequency with which the cause of death on death certificates included the relevant details requested of certifying doctors, especially in deaths due to malignant disease, but also including certain other deaths where specific information would be expected to be included.

Methods—Consecutive series of certificates attributing death to malignancy, pneumonia, an acute cerebrovascular event, and renal failure were inspected and compared with the categories identified in the International Classification of Disease. Review of clinical notes and of laboratory data was used to determine the number of cases in which detailed histological diagnoses were available.

Results—A histological diagnosis was available in 79-1% of cases of deaths due to malignancy, but was recorded on only 23-6% of certificates. Haematologists performed best (69-6%) and general surgeons worst (2-8%). The sites of primary tumours were recorded in detail in only 23 of 89 cases of tumours of the large bowel (22/36), lung (1/35) and stomach (0/18). In cases of pneumonia the causative organism was recorded in only 4 of 330. In cases of an acute cerebrovascular event one of 70 was recorded as being due to haemorrhage. A distinction between cerebral or pre-cerebral arterial occlusion (embolism/thrombosis) and cerebral haemorrhage was not recorded in any of the other cases. In cases of renal failure a cause was not recorded in 75 of 95.

Conclusions—Despite consistent encouragement to record all relevant details on death certificates this study shows that doctors fail to do so in most cases. Such a failure diminishes information available to the Office of Population Censuses and Surveys, affecting mortality statistics and gives further cause for concern about standards of certification. Means by which the standard of certification might be improved are discussed, including screening of certificates by a medically qualified person prior to registration.


Keywords: death certification, cause of death, histological diagnosis, laboratory diagnosis.

The inclusion of detailed diagnoses on death certificates is valuable for producing high quality mortality statistics. The World Health Organization (WHO), in its guidance to physicians on the use of the International Form of Medical Certificate of Cause of Death, has consistently requested the inclusion of all relevant detail. Indeed, judging by its exhortations to doctors in that guidance, it is lack of detail which the WHO seems to regard as the most important deficiency on certificates. In addition to general statements requesting succinct use of accepted pathological nomenclature, the WHO specifically requests the precise primary site and histological type of tumours and, in infections, the organism isolated. The provision of this information is requested in the “notes to medical practitioners” located in the preface to books of death certificates and by the Office of Population Censuses and Surveys (OPCS), to which falls the task of coding causes of death from death certificates in this country. Such information is usually either known to the certifying doctor or is available from the clinical notes, which should be recorded when completing a death certificate. Compliance with such requests is facilitated by the use of the International Classification of Diseases, also published by the WHO, and updated on a decennial basis, whose coding scheme is used internationally in order to produce national mortality statistics from death certificates.

The aim of this study was to assess what proportion of hospital completed certificates contained the requested information in cases of malignant disease and selected other causes in which detail would seem appropriate and valuable.

Method
Causes of death recorded on death certificates from a large district general hospital and a teaching hospital were reviewed. These certificates recorded deaths where no referral to the coroner had been made and no postmortem examination had been carried out. Consecutive series of causes of death were compiled where death was attributed to malignant disease, pneumonia, an acute cerebrovascular event, and renal failure.

For cases of malignant disease the existence of a histological diagnosis prior to death was established by checking for a histopathology report and, in the absence of such a report, by reviewing the clinical notes.

The number of cases in which a tissue diagnosis enabling a morphological classification to be made of greater detail than carcinoma or lymphoma was recorded. The numbers of death certificates giving no detail other than
"malignancy unspecified" were recorded, as were diagnoses of "carcinoma" and "lymphoma" as well as those certificates where the full histological diagnosis was given.

The primary sites given were compared with the lists of primary sites classified in the International Classification of Disease (ICD) (9th revision; still in use at the beginning of this study) in order to establish to what extent certification allowed detailed ICD coding.

Death certificates citing "pneumonia" as the cause of death were reviewed and the number of certificates detailing the organism responsible was determined, along with the cases where more pathological detail of the nature of the pneumonia was supplied.

Certificates attributing death to an acute cerebrovascular event were examined, noting the number where the aetiological division into embolic/thrombotic and haemorrhagic events had been made—an important distinction considering the therapeutic use of thrombolitics.

Certificates attributing death to renal failure were examined for evidence of a causative factor.

The certificates used to investigate the recording of pneumonia, cerebrovascular accidents (CVA) and renal failure were from the teaching hospital alone, which was mainly composed of acute medical and surgical specialties and did not contain a geriatric unit.

Results
Histological diagnoses were available in 79.1% of deaths due to neoplastic disease, but only one in four of these diagnoses was recorded on the death certificate (table 1). Certificates from patients dying while under the care of a haematologist were much more likely to record the histology, which may reflect clinical involvement in making a tissue diagnosis. When haematological diagnoses are excluded, only one in seven certificates records available histology, falling to only one in 35 patients dying while under the care of a general surgeon (table 2).

The primary site is equally poorly addressed (tables 3, 4 and 5). Of 94 cases of carcinoma of the colon, lung and stomach, only 23 (24.4%) recorded a detailed site. In stomach tumours none of the certificates recorded a detailed site. Similarly, all but one of the lung tumour sites failed to enable coding beyond a general, "bronchus or lung, unspecified". Terms are used which do not appear in the ICD listing (for example, bowel cancer) or which are too general or which combine categories (for example, colorectal cancer).

The omission of detail is a problem that applies to diagnoses other than malignancy. This study has looked in a simple fashion at other conditions in which information is easily available for hospital patients and might be thought important. Table 6 shows that of 330 cases of pneumonia the organism was identified in only four cases and that in 307 cases the diagnosis was limited to pneumonia or bronchopneumonia, with the organism unspecified despite over 80 categories of pneumonia being identified by the ICD.

The incorporation of information from x-ray films might also be expected to be recorded on death certificates. Computed tomography (CT) scans are now routinely performed in order to distinguish infarction due to cerebral or pre-cerebral arterial occlusion from cerebral haemorrhage. Table 7 shows that such information rarely finds its way to the certificate as only one certificate attributed the CVA to haemorrhage and none to vascular obstruction. Indeed, only eight of 70 certificates record an aetiology, with 57 giving no exact site (either within the brain itself or detailing specific vascular involvement) or underlying cause.

Finally, deaths from renal failure seem to be a particular problem, with only 20 of 95 cases recording the aetiology (table 8). When obstructive causes are excluded, this falls to only six cases (out of 81). Of the seven certificates giving "acute renal failure" as the cause of death, none gave an underlying cause although this would seem to be necessary to allow registration.

Discussion
That mortality statistics are valuable is not in dispute. That death certificates have shortcomings is also not in dispute; indeed, there have been a number of publications in recent years cataloguing the various aspects of death certification that have appeared, to various authors, to be unsatisfactory: errors in clinical diagnosis when compared with necropsy diagnoses; lack of understanding of the principles underlying certification; failure to read instructions given in the "notes to medical practitioners"; error or confusion within pathological sequences; and failure to include relevant diagnoses or therapeutic intervention.

Such inadequacies may result in the certificate showing no true underlying cause of death or seeming to warrant referral to the Coroner for other reasons.

Many of these faults do not affect mortality data. Of those that do, most are well known to
the OPCS, and corrections, including rules of coding, are used in order to increase the utility of the data despite the recognised deficiencies. However, absence of detail is a fault, which, if not remedied by the provision of such detail at a later date, cannot be otherwise rectified. This is clearly recognised and explains, first, the exhortations to doctors by the WHO and the OPSC to include all relevant information and, second, the facility whereby the OPSC may write to the certifying doctor, or the consultant under whose care the patient died, to ask for further information. Whilst seeming superficially to be a satisfactory arrangement, this is time consuming and inconvenient for both the doctor concerned and the OPSC, with ensuing cost implications. Furthermore, such requests are not universally successful.

The present study shows that despite the easy availability of histological diagnoses to certifying doctors, such information is not used by them on death certificates. Such certificates also fail to include organisms responsible for infection and basic pathological detail; the most common terms used are basic terms which do not permit detailed coding. Encouragements to describe the sites of primary tumours have been issued since 1938 (when requests to differentiate between cancers of the cervix and corpus uteri were largely ignored) and include a more recent specific request to differentiate between different sites within the stomach, which, from this study, seems to have been completely ignored. It might be argued that cancer registries record such details of tumours but these organisations rely on the OPSC to provide detail from death certificates. More- over, death certificate diagnoses of malignancy have been held responsible for artefactual trends in incidence of specific tumours, indication of tissue diagnosis may help to alleviate such errors. In the absence of adequate detail on death certificates further research is necessary on the part of the registry to enable accurate diagnoses to be recorded.

The other conditions examined also fail to be recorded in detail on death certificates. It would be impossible from the figures given here to establish the incidence, or changes in the incidence, of primary cerebral haemorrhage as a cause of "stroke", of atherosclerosis as a cause of chronic renal failure, or of specific forms of pneumonia in hospital patients dying of specific disorders. This study has, admittedly, not looked at the actual numbers of organisms identified by the laboratory in each case nor has it looked at the CT findings in the cases of CVA. Given the figures, this cannot be regarded as a major problem as it is inconceivable that a causative organism is isolated in only 1-2% of cases or that only one CT scan was performed in 70 cases. It is also limited to a single geographical area but death certification practice has been shown to be uniform countrywide and it is unlikely, therefore, that these results may not be viewed in a national context.

The ICD is an extremely detailed classification and it might be considered un-
reasonable to suggest that every doctor should certify every death so that the most accurate classification possible might be made. Indeed, such degree of detail could be considered in excess of the statutory requirement for the doctor to state the cause of death "to the best of his knowledge and belief". However, it would seem reasonable that basic, readily available and relevant information be included in order that statistical information available from death certificates be optimised. The degree of information required could probably benefit from clarification and it would seem that this study confirms the recognised need for improvements in death certification practice.

Previous suggestions to improve the quality of death certification have concentrated on the importance of adequate education and on the involvement of senior staff in the completion of death certificates. Over a decade has passed since the joint report of the Royal Colleges of Physicians and Pathologists recommended that house officers should not complete death certificates without any sign that this is to be implemented. It is far from certain, however, that such a policy would materially affect matters. Research has shown that senior staff fare no better than junior staff at completing death certificates.

Furthermore, one study investigating the value of postgraduate education in death certification practice was not wholly successful, failing to deliver significant improvement; others have shown that retrospective analysis of death certificates on consultation with the certifying doctor failed to release further information or attain alteration of certificates. Such studies suggest that there is no "quick fix" for the problem and that even postgraduate education programmes on the subject might not result in significant improvement even if there was a will to institute such programmes. Moreover, this is not a problem peculiar to Britain; there is a worldwide difficulty in obtaining optimal standards of certification where the attending physician, in isolation, completes the certificate. One answer, which has been applied in Finland, is to require review of all death certificates by a regional "screener" prior to registration. In such a system whilst the attending doctor would complete a death certificate this would be reviewed by a regional screener—a doctor with special experience in the medicolegal aspects of death and in certification practice. This would have two effects: first, it would provide an effective "long-stop" ensuring adequate enquiry into a death—a function currently expected of the lay Registrars of Births and Deaths and which has been shown, not unexpectedly, to be imperfect—second, it would ensure that certificates were correctly completed and that adequate information was supplied. Such a system could not ensure that the cause of death was necessarily the correct one, but it could ensure that the view a clinician wished to give was given in full.

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