Medical Aspects of Death Certification

A JOINT REPORT OF THE ROYAL COLLEGE OF PHYSICIANS AND THE ROYAL COLLEGE OF PATHOLOGISTS

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Introduction

The history of death certification in this country, from its inception as a general requirement in 1837 up to the Brodrick Report of 1971, is well told in Chapter 2 of that report[1]. The original objectives of this system were 'first, to facilitate legal proof of death and, secondly, to produce more accurate mortality statistics.' Subsequent developments include the obligatory participation of qualified medical practitioners; the required notification to the coroner of deaths whose cause cannot be medically certified, deaths occurring under a variety of suspicious circumstances, deaths during operation or anaesthesia, and deaths certified as due to industrial disease or poisoning; and the development of international classifications of disease, with a view to standardising the certified causes of death. As it has developed, the system has amply proved its value in a number of ways—in deterring crime, in improving the standard of medical practice, in revealing important associations such as those between work in the dyestuffs industry and bladder cancer and between smoking and bronchial carcinoma.

Although the fact of death can almost always be established with certainty, there are possibilities of error inherent in the certification of its cause. Advances are regularly made in our knowledge of disease and in our means of detecting its presence. Nevertheless, clinical medicine is not an exact science. Many patients die at home, often of a chronic illness which may have been identified in the past, but in which the immediate cause of death is a complication whose precise characterisation might require investigations which in the circumstances would be meddlesome. Even for patients who die in hospital, probably an increasing number, comparison of postmortem findings with certified causes of death reveals notable discrepancies, particularly in older patients[2]. These observations suggest that death certification could be made more accurate by reversal of the present trend towards fewer hospital autopsies. It also has to be recognised that, in deaths due to metabolic disorders, even autopsy may not reveal the cause of death. In addition to the inherent difficulties of accurate certification of the cause of death, there are possibilities of error, even when the cause of death is known or knowable. These errors arise from inexperience or lack of training in the certifying doctor; failure to incorporate additional information coming to light after the certificate has been completed; and, at a later stage, errors or misleading artefacts of coding, e.g. the attribution of all cases of hydrops fetalis to haemolytic disease of the newborn[3], a source of confusion now fortunately clarified in the ninth revision of the International Classification of Diseases[4]. One factor that may occasionally lead to erroneous certification is the pressure from relatives or undertaker to complete the Medical Certificate of Cause of Death (hereafter referred to simply as the death certificate) promptly, so that the disposal of the body may be arranged. There is provision on the reverse side of the death certificate (Box B) for the doctor to indicate that he may be able later to give additional information; but the certifying doctor may not avail himself of this provision, or the necessary information may be received and filed away, but not submitted. The information given on death certificates may also be incomplete, when only the immediate cause of death is recorded and important preceding conditions are overlooked, even though provision is made for recording them. By tradition and international agreement the main disease coded and analysed in national statistics, known as the *underlying cause,* is the condition which *started* the process leading to death.

While these various possibilities of inaccuracy must detract from the complete fulfilment of the purposes of death certification, they fall far short of invalidating the whole procedure, which remains a social necessity and a valuable agent in the advancement of medical knowledge, for example in occupational medicine and epidemiology. It was in recognition of this that we set up our Working Party to consider how the accuracy of death certification could be further improved.

Although we deliberately did not enlarge our remit to consider the forthcoming perinatal death certificate, we commend the proposals to standardise birth information, introduce a specially designed perinatal death certificate, and expand the use of systems for linking certificates which notify births and register births and deaths[5].

The Working Party was set up in 1980, and held its first meeting on October 9th. In the following year, Mr Nigel Spearing, MP, introduced a bill on the notification of industrial diseases which recommended changes in the design of the death certificate to facilitate the detection of occupational causes of death. The debate on this bill reawakened interest (after a considerable interval) in the wider recommendations of the Brodrick Report—a coincidence that may make the present report opportune, even though it was not designed to be so.

Outline of Present Procedure

A general account of the procedures for certifying the medical causes of death and for registering death is given in the Brodrick Report. The particular responsibilities of the doctor certifying the medical causes of death are set out, together with illustrative examples, on pages i-v of the Books of Medical Certificates. The registrar of births and deaths has a duty to report certain deaths to the coroner (England and Wales) or the procurator-fiscal (Scotland); the circumstances in which this must be done are set out in the regulations made by the Registrar General.

There are, however, important differences in certification and procedure between England and Wales on the one hand, and Scotland on the other.

The certificate used in England and Wales is in two parts (Fig. 1):

1. A 'Notice to Informant', which requires a suitably qualified informant to cause the death to be registered; qualifications to act as informant are specified on the reverse of the notice.
2. The death certificate, which must be completed by the medical practitioner who was 'in attendance' during the patient's last illness. This practitioner is responsible for its delivery to the registrar forthwith, but in practice he usually hands it to the informant. The registrar then registers the death, except when he has a duty to report the death to the coroner; in the latter circumstances, he cannot register the death until he has received a certificate from the coroner. The medical practitioner may, and in some cases should, consult the coroner both on his status as having been 'in attendance' in the last illness, and about any difficulties in certifying the cause of death.

In Scotland, there is no 'Notice to Informant'. The death certificate (Fig. 2) must be delivered to the registrar within seven days of death and this is almost invariably done by the informant. There is no requirement for the certifying doctor to have been in attendance; any doctor who feels competent to do so may complete the certificate 'to the best of his knowledge and belief'.

In cases that have been reported to the procurator-fiscal, the certificate is completed by a doctor authorised by the procurator-fiscal, commonly a police surgeon or the fiscal's pathologist.

The doctor has no duty to report cases either to the coroner or to the procurator-fiscal, although by doing so he may save valuable time. On the reverse of the certificate in England and Wales there is a Box A where the doctor should indicate when he has reported the case to the coroner. There is no similar box on the Scottish certificate.

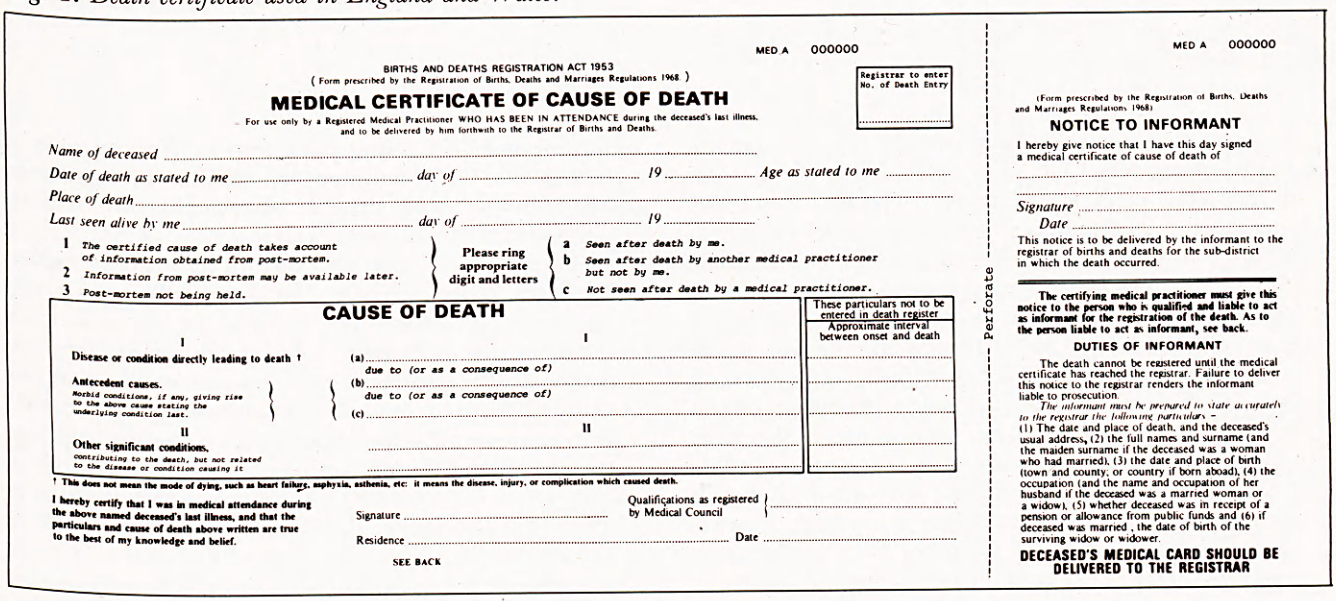
While recognising the importance of the legal and criminological aspects of death certification, we have felt it appropriate as a committee of doctors to limit our consideration to the responsibilities of doctors to ensure the accuracy of death certification. The later sections of this report consider the certifying of deaths in the community and in hospital; the way in which deaths are referred to the coroner, the role of the autopsy, more accurate delineation of 'occupation' and implications for medical education. In the concluding section we summarise our recommendations.

The Certifying Doctor

In General Practice

Twenty-five deaths occur annually in the average general practitioner's practice. Since approximately half of these take place in hospital, each general practitioner will be required to certify death on only 12 occasions during an average year. Some of the deaths will be expected and occur in patients who have been attended by the practitioner during their last illness; some will be sudden and unexpected.

Fig. 1. *Death certificate used in England and Wales.*



MED A 000000

BIRTHS AND DEATHS REGISTRATION ACT 1953
(Form prescribed by the Registration of Births, Deaths and Marriages Regulations 1968)

MEDICAL CERTIFICATE OF CAUSE OF DEATH

For use only by a Registered Medical Practitioner WHO HAS BEEN IN ATTENDANCE during the deceased's last illness, and to be delivered by him forthwith to the Registrar of Births and Deaths.

Registrar to enter No. of Death Entry

Name of deceased .....

Date of death as stated to me ..... *day of* ..... *19* ..... *Age as stated to me* .....

Place of death .....

Last seen alive by me ..... *day of* ..... *19* .....

1 *The certified cause of death takes account of information obtained from post-mortem.*
2 *Information from post-mortem may be available later.*
3 *Post-mortem not being held.*

Please ring appropriate digit and letters

a *Seen after death by me.*
b *Seen after death by another medical practitioner but not by me.*
c *Not seen after death by a medical practitioner.*

CAUSE OF DEATH

		These particulars not to be entered in death register: Approximate interval between onset and death
I Disease or condition directly leading to death †	(a) ..... due to (or as a consequence of)	
Antecedent causes. *Morbid conditions, if any, giving rise to the above cause stating the underlying condition last.*	(b) ..... due to (or as a consequence of)	
	(c)	
II Other significant conditions. *contributing to the death, but not related to the disease or condition causing it*	.....	

† This does not mean the mode of dying, such as heart failure, asphyxia, asthenia, etc: it means the disease, injury, or complication which caused death.

I hereby certify that I was in medical attendance during the above named deceased's last illness, and that the particulars and cause of death above written are true to the best of my knowledge and belief.

Signature ..... Qualifications as registered by Medical Council .....

Residence ..... Date .....

SEE BACK

Perforate

MED A 000000

(Form prescribed by the Registration of Births, Deaths and Marriages Regulations 1968)

NOTICE TO INFORMANT

I hereby give notice that I have this day signed a medical certificate of cause of death of

.....

.....

Signature .....

Date .....

This notice is to be delivered by the informant to the registrar of births and deaths for the sub-district in which the death occurred.

The certifying medical practitioner must give this notice to the person who is qualified and liable to act as informant for the registration of the death. As to the person liable to act as informant, see back.

DUTIES OF INFORMANT

The death cannot be registered until the medical certificate has reached the registrar. Failure to deliver this notice to the registrar renders the informant liable to prosecution.

The informant must be prepared to state accurately to the registrar the following particulars –
(1) The date and place of death, and the deceased's usual address, (2) the full names and surname (and the maiden surname if the deceased was a woman who had married), (3) the date and place of birth (town and county; or country if born abroad), (4) the occupation (and the name and occupation of her husband if the deceased was a married woman or a widow), (5) whether deceased was in receipt of a pension or allowance from public funds and (6) if deceased was married, the date of birth of the surviving widow or widower.

DECEASED'S MEDICAL CARD SHOULD BE DELIVERED TO THE REGISTRAR

Medical Certificate of Cause of Death Form 11 D2(R) Jul 75

This certificate is intended for the use of the Registrar of Births, Deaths and Marriages, and all persons are warned against accepting or using this certificate for any other purpose.

To the Registrar of Births, Deaths and Marriages. *See note overleaf*

Registrar to enter
Dist no .....
Entry no .....
Year .....

I hereby certify that ..... died at ..... hours
time
on ..... 19..... at .....
date *place of death*

and that to the best of my knowledge and belief, the cause of death and duration of disease were as stated below.

Not to be entered in register

Approximate interval between onset and death.

years	months	days

Cause of death	Please PRINT CLEARLY
I	I
Disease or condition directly leading to death*	a ..... *due to (or as a consequence of)*
Antecedent causes Morbid conditions, if any, giving rise to the above cause, the underlying condition to be stated last.	b ..... *due to (or as a consequence of)*
	c .....
II	II
Other significant conditions contributing to the death, but not related to the disease or condition causing it.	.....
	.....

Specimen

**This does not mean the mode of dying such as heart failure, asthenia, etc.; it means the disease, injury or complication which caused death.*

Please ring appropriate letter and appropriate figure:—

Certified cause takes account of post-mortem information ... A
Information from post-mortem may be available later ... ... B
Post-mortem not proposed C

Seen after death by me 1
Seen after death by another medical practitioner but not by me 2
Not seen after death by a medical practitioner 3

If deceased was a married woman and death occurred during pregnancy, or within six weeks thereafter, write 'yes'. ☐

Signature..... date ..... 197.....
Name in BLOCK CAPITALS.....
Registered medical qualifications.....
Address.....
.....
.....

Fig. 2. *Death certificate used in Scotland.*

In completing the death certificate the doctor is guided by the following note:

A registered medical practitioner who was in attendance on the deceased person during the last illness is required to give a medical certificate of cause of death in the prescribed form. No other person or practitioner may sign the certificate on his behalf and no certificate may be given unless the certifying practitioner was in attendance during the last illness.

It is for the practitioner to decide whether he was in attendance during the last illness and therefore whether he has a duty to give a certificate. The question whether a practitioner was or was not in attendance during the last illness is normally a question of fact but exceptionally there may be occasions when the practitioner would wish to seek the advice of the coroner in deciding this question. If in the light of that advice the practitioner decides that he was not in attendance during the last illness then he has no obligation to issue a certificate.

In every case of violent or unnatural death or sudden death the cause of which is unknown, the practitioner is advised to notify the coroner or his officer [in Scotland the procurator-fiscal or his officer] immediately. If it is possible for the practitioner to state the cause of death to the best of his knowledge and belief, a certificate to that effect should also be given and in that case he should initial Statement A on the back of the certificate. It will then be the duty of the registrar to await the coroner's decision in the matter before proceeding with the registration of the death or issuing a certificate for disposal of the body. The practitioner

will no doubt advise the relatives that it will not be possible for the death to be registered until the coroner informs the registrar of his decision.

When a doctor is uncertain as to the cause of death, it is important that he should discuss his difficulty with the coroner.

Remember that what is asked for is the whole array of diseases which contributed to death; this must include the 'underlying' cause which, by internationally agreed convention, is the disease that began the process leading to death. It should appear *last* in Part I of the certificate; each item should be as specific as possible, and certifiers should remember that by marking Box B further information can be sent for more precise classification. Such information will not appear in the register of deaths, and is used only for statistics.

In general practice all certifying doctors are fully registered and will in future be vocationally trained. An appreciation of the epidemiological importance of death certification and its methodology should be enhanced through the inclusion of the topic in vocational training and continuing education programmes.

A regular review of deaths occurring within general practice could be seen as the foundation of a system of medical audit.

The ultimate accuracy of certification can only be improved through an increase in the autopsy rate, by facilitating arrangements for postmortem examinations of deaths occurring outside hospital, and by educating general practitioners and the general public as to the importance of both.

In Hospital

As has been indicated in the introductory section, a number of studies have shown that the cause of death as certified by the clinician is fully confirmed in only about half of all the patients on whom an autopsy is performed[6-9].

A recent large prospective study on consecutive autopsies has shown that the main clinical diagnosis is confirmed by autopsy in only 61 per cent of cases. Accuracy is particularly poor in the elderly and in the certification of cerebrovascular disorders and infections in which the diagnosis is more often wrong than right[2]. In many cases the discrepancy is of academic interest only, but sometimes it is of practical significance.

Some discrepancies are clearly due to lack of precision in clinical diagnosis but there are other factors that must be taken into account. First, the autopsy is not always the final arbiter of truth. It only reveals anatomical changes and takes no account of functional and metabolic changes, which are often the immediate cause of death and may not always be directly related to the anatomical abnormalities present. For instance, the fact that a patient's serum potassium was grossly disordered or that there had been some cardiac arrhythmia might not be reflected in the autopsy findings.

There are also certain administrative matters which allow, or even encourage, inaccurate certification. The certification of death in hospital is usually done by the most junior doctors, often during their pre-registration appointments, and their relative inexperience inevitably leads to some discrepancies. Furthermore, they may avoid any mention of septicaemia or alcohol-related disorders because they know that if these words appear on the death certificate the issue of a burial order is likely to be delayed because the coroner will become involved. Consequently, these disorders are consistently under-reported.

Another problem arises when the Office of Population Censuses and Surveys writes to the certifying doctor to try to clarify the cause of death. In many instances the doctor has moved to another post and the letter is never answered. If the death certificate were to be stamped with the name of the consultant in charge of the patient, and if the Registrar General were to address his letter of enquiry to the consultant rather than to the certifying doctor, we think a higher proportion of these letters would be answered.

Recommendations

1. Death certificates should not normally be completed by a provisionally registered house officer, but by a more experienced medical practitioner.
2. The proportion of cases in which an autopsy is requested should be increased for both epidemiological purposes and local medical audit. This recommendation presupposes a capacity for some increase in the level of the pathology services.
3. Death certificates given in hospitals should be stamped with the name of the consultant in charge.
4. When Box B on the reverse of the death certificate is initialled, or when the Registrar General requires additional information, he should write to the consultant rather than to the certifying doctor.

How Deaths are Referred to the Coroner

Many doctors who certify death are aware that certain terms included on the certificate attract the attention of the local registrar and lead to the death being referred to the coroner. With this knowledge they may avoid the use of such terms. The extent of this practice is not known; it is not referred to specifically in the Brodrick Report. The statutory duty is that the certifying doctor shall state that the cause of death is true to the best of his knowledge and belief.

Local registrars commonly refer by telephone such certificates as appear to them to require notification to the coroner, and the matter may be simply disposed of by this means if unfamiliar terminology has made a natural death appear suspicious or unnatural. If the circumstances of the death cannot be so simply resolved, the informant is referred to the coroner and often brings the offending certificate. From such referrals it is possible to build up a picture of the types of death so referred. Table 1 gives a breakdown of such referrals in an eleven-year period in an inner London jurisdiction containing some 30 hospitals. (In that period some 40,000 deaths were dealt with from hospitals, family practitioners and po-

Table 1. Reference of deaths to the coroner by the registrar.

Reg 51 (1) category	Apparent reason	Sex	Age-groups Under 25	25–49	50–74	75 +	Totals M	F	B
(a)	Not attended by doctor in the last illness	M	—	—	—	1	1		
		F	—	—	—	2		2	3
(c)	Last seen by the doctor more than 14 days before death	M	—	—	2	1	3		
		F	—	—	—	2		2	5
(d)	Cause of death unknown	M	—	—	1	1	2		
		F	—	—	2	1		3	5
(e)	Unnatural death								
	Liver disease								
	Alcohol mentioned	M	—	1	5	—	6		
		F	—	2	2	—		4	10
	Alcohol not mentioned	M	—	2	5	2	9		
		F	—	—	3	—		3	12
	Violence								
	Fracture of hip	M	—	—	2	5	7		
		F	—	—	3	18		21	28
	All other injury	M	4	2	6	2	14		
		F	3	—	2	10		15	29
	Neglect	M	—	—	—	—	—		
		F	—	—	—	2		2	2
	Suspicious death								
	Mention of bleeding	M	—	1	—	1	2		
		F	—	—	1	—		1	3
	Mention of infection	M	—	1	3	—	4		
		F	1	—	—	1		2	6
	All other reasons	M	—	—	3	1	4		
		F	—	—	—	2		2	6
(f)	Operation death	M	—	1	—	—	1		
		F	—	—	3	—		3	4
(g)	Industrial disease								
	Mention of mesothelioma	M	—	—	4	—	4		
		F	—	—	3	1		4	8
	Mesothelioma not mentioned	M	—	—	3	—	3		
		F	—	—	—	—		—	3
	Totals		8	10	53	53	60	64	124

M = male
F = female
B = both

lice.) The apparent reason for the reference has been made according to the categories (a) to (g) in Sub-regulation 51(1) of the 1968 Regulations (*see* Appendix A). The table does not include category (b) as there were no instances falling within it. It can be seen that the largest groups are 'violent' deaths in which an injury has been certified, and deaths attributed to liver disease whether or not alcohol is mentioned. In interpreting the regulation, local registrars use a document, regarded as confidential, which is issued to them by the Registrar General's department, although its effect may be clear from the types of death referred. This document contains regulations, and we suggest that the Registrar General should review them, as some may be out of date.

When a death has been referred to the coroner, an autopsy may be ordered, if one has not already been performed. In England and Wales, if it discloses a natural cause of death, the coroner informs the registrar by means of the pink form 'B' procedure; otherwise an inquest is inevitable. This will be the procedure until the part of the Brodrick Report recommending a wide discretion in the holding of inquests on deaths in which there is no public interest is implemented. We strongly recommend that this be implemented, although we recognise that there may be practical difficulties and delay in enacting it.

In Scotland, when a case is reported to the procurator fiscal, he invites his medical officer to investigate its medical aspects. If he feels competent to do so, the medical officer may certify the cause of death without autopsy and will inform the procurator-fiscal of his action. On the other hand, the procurator-fiscal or the medical officer may decide that an autopsy is required, in which case the pathologist certifies the cause after autopsy.

The Role of the Autopsy

'. . .perhaps the most serious criticism of the existing law is that it does not ensure that deaths are certified as accurately as they could be, or even as accurately as society has a right to expect'[1].

In England and Wales, one-third of death certificates are provided by coroners; of the remainder about two-thirds are issued from hospitals and institutions, and one-third from general practitioners. The greatest number of certificates from hospitals are completed and signed by the most junior and inexperienced members of the profession.

In hospital, there is the opportunity of using the autopsy to monitor and correct clinical diagnoses before they are permanently and unchangeably recorded. However, at present, the proportion of autopsies in most hospitals is only about 20-30 per cent of deaths, and little use seems to be made of this valuable source of information. A number of surveys has shown a very high frequency of disagreements between autopsy and clinical diagnosis, and demonstrates that an intelligently-used autopsy service could contribute much to improving the accuracy of death certificates and mortality statistics. One obvious requirement is adequate communication between pathologists and clinicians.

Certificates provided by the coroner, procurator-fiscal and general practitioner are not subject to any form of review or audit.

The Working Party agrees with the criticism quoted above from the Brodrick Report, and proposes that much more use should be made of autopsies to improve the accuracy of certification.

Autopsies fall into two categories:

1. Those carried out at the request of clinicians, subject to permission being granted by relatives.
2. Those carried out at the demand of the coroner (in England and Wales) or procurator-fiscal (in Scotland).

These have differing objectives; each can be used to improve the accuracy of certification, but their respective contributions tend to be dissimilar.

Hospital Autopsies

Hospital autopsies make valuable contributions to medical education and research. At a more immediate level, they provide the opportunity of reviewing critically the entire body of evidence in the individual case; this includes the clinical, laboratory and radiological evidence, as well as the morphological findings at autopsy and the subsequent histological examination.

Death certificates are concerned with more than the cause of death. As they are also used for monitoring the health of the nation and for epidemiological purposes it is highly desirable that their accuracy should be improved. It is also desirable that important conditions found at autopsy should be recorded even if they have not contributed to the death.

Systematic enquiries into the accuracy of clinical diagnoses, which compare them with autopsy findings[2, 8-12], consistently show that disagreement between the two is common: disagreement on the cause of death is found in 40-55 per cent of cases; disagreement on the main diagnosis and contributory conditions in 50-60 per cent. In a recent survey (with a high autopsy rate), clinicians and pathologists agreed that 15 per cent of cases showed diagnostic discrepancies[11] that were considered to be 'clinically significant' (i.e. if the correct diagnoses had been suspected in life, different investigation and/or treatment would have been required).

There is thus no doubt that hospital autopsies could do much to improve death certification, and the findings should be systematically applied to medical audit.

Hospital Autopsy Rates

These findings pose the question 'what proportion of patients who die in hospital should be subjected to autopsy?' Most active general hospitals in the UK used to have an autopsy rate of 60 per cent or more, but nowadays the figure is more commonly 20-30 per cent. The decision to ask for an autopsy rests with the clinician, and there is no onus on him to ask for an autopsy on cases in which he is confident of his diagnosis. It has, however, been shown that 15-25 per cent of 'confident diagnoses', even in major medical centres, may be incorrect.

In the UK, hospital autopsies require the consent of the next of kin. It seems to be widely believed that reluctance on the part of relatives to grant permission has increased. This may be so, but the evidence indicates that it is not an insuperable problem, given an adequate level of interest on the part of clinicians. While some units obtain permission in only a minority of cases, others in the same geographical areas have autopsy rates of 60-90 per cent. Thus it seems unlikely that a modest increase would be difficult to achieve. The Working Party believes that the autopsy rate can and should be raised above present levels. It accepts that it would be unrealistic to ask for autopsies on all deaths, but proposes that one should be performed on at least a *sample of cases over and above those which would normally be requested* so that the hospital autopsy rate was raised by about 20 per cent—the so-called *partial audit.*

Autopsies required by the Coroner and Procurator-Fiscal

In England and Wales, the coroner's concern, which was originally with violent, unnatural or sudden deaths, has been extended—although without any change in the law—to include 'almost all deaths of which the causes are not known'[1]. The Brodrick Report notes (11.40) that many coroners have 'standing instructions for their subordinates to order automatic post-mortem examinations when a death is reported to them . . . and see their prime task . . . the furnishing of accurate medical causes of death . . .' In recent years there has been an expansion of the establishment of pathologists in the National Health Service, which has enabled coroners to call on a greater number of pathologists. As a consequence, there has been a dramatic increase in the number of cases referred for autopsy (now about 99 per cent): in absolute numbers, an increase from 43,000 autopsies in 1949 to 145,000 in

1979[13]. The number of cases now referred by the coroner for autopsy seems to be limited only by the number of cases notified to him.

Death is due to natural causes in most coroners' cases. (It is estimated that unnatural causes are responsible for between one-fifth and one-sixth.) The main purpose of autopsy on these is to establish the cause of death. Identification of other diseases is of secondary importance and there need not be a thorough review of the case as a whole. Consequently, coroners' autopsies do not always provide the searching examination of all the evidence which is so important to accurate certification. Standards vary greatly: in some localities, coroners' autopsies are carried out to the same standard as hospital cases, but it must be admitted that elsewhere they are frequently carried out hastily, uncritically and to a quite inadequate standard. There is some doubt as to whether medico-legal autopsies can make a major contribution to medical audit, education and research; but if they are conducted at a suitably high standard, the results could lead to a marked improvement in the accuracy of death certification.

The position in Scotland differs from that in England and Wales. The procurator-fiscal's responsibilities remain the investigation of deaths which are sudden, violent or suspicious, or in which the cause is not known. The primary objective is to exclude criminality or negligence. Only about 25 per cent of fiscal cases are referred for autopsy[14]; the remainder are certified by a police surgeon on the basis of information collected by the police acting on behalf of the procurator-fiscal. It is believed that the autopsies are well conducted, but in the latter case, the evidence is entirely presumptive and not subject to any form of check or audit.

It has been noted that the purpose of the coroners' autopsy has progressed from the detection of deaths from unnatural causes to the identification of the cause of death. The Working Party wishes to see a further progression: that all medico-legal autopsies should involve a complete review of all the diseases present, taking into account such clinical information as may be available. With this in mind, the Working Party recommends that every effort should be made to raise the quality of medico-legal autopsies to the standards observed in the best centres. It should be noted that infant and neonatal autopsies call for special skills and, where possible, such autopsies should be carried out in hospital by pathologists with appropriate experience.

Staffing

Some pathology departments would be embarrassed by any increase in workload; this should not prevent a start being made in departments in which policies and staffing permit. It must be noted that the provision of training posts in pathology is inadequate; the President of the Royal College of Pathologists has stated that 'while the numbers of trainees in the popular acute clinical specialties far exceed the numbers of consultant posts available to them . . . the numbers of SHO and Registrar posts in Pathology are grossly inadequate *even to maintain the present levels* of consultant posts . . . would-be applicants are being turned away . . . for lack of posts'[13]. A distinguished senior physician has expressed his concern at this, and, quoting Osler's dictum, 'As is your pathology, so is your medicine', has advocated that training posts be transferred from medicine, surgery and obstetrics to pathology[15]. Since in the acute clinical specialties there are too many junior staff chasing too few consultant posts[16], the Working Party supports this proposal.

It is also pertinent to enquire into the effects of the large number of coroners' autopsies. In view of the figures quoted above, the extension of the coroners' concern to include 'any death . . . if they (the doctors) cannot confidently certify its cause' (Brodrick Report 14.20) would logically have to include an enormous number of natural deaths which at present are—more appropriately—dealt with through the hospitals. It should be noted that the increase in coroners' autopsies which has already occurred has been made possible by the expanded staffing of NHS departments of pathology; these were created for presumably necessary NHS work, and it would be unfortunate if an increasing workload of coroners' cases were to lead to additional diversion of NHS resources. This presents a dilemma, since pathologists are encouraged financially to undertake work for the coroner, whereas there is no specific reward (other than cremation fees) for doing hospital autopsies.

Recommendations

1. The Working Party accepts that the results of past autopsy surveys can be taken as representative of hospitals throughout the country. While these investigations may not at present need to be repeated in the same form, the Working Party recommends that further more detailed investigations be undertaken into the correlation of clinical and autopsy diagnoses in defined clinical fields, e.g. infections, acute abdominal conditions, alimentary haemorrhage, sudden cardiac death, neoplasia, etc. These may require modest funding.
2. Hospital staff should be encouraged to make more use of autopsy findings to review death certificates and hospital mortality returns. Routine monitoring of recorded diagnoses in the light of autopsy findings would go far towards improving certification and mortality statistics. It will make demands on both pathologists and clinicians; the pathologist will have to report autopsy results promptly and engage in discussions with clinical colleagues; and clinicians will have to take trouble to oversee the accurate modification of recorded diagnoses in the light of autopsy findings (e.g. the completion of Box B on the back of the death certificate, and the subsequent provision of accurate data).
3. Steps should be taken to improve the quality of medico-legal autopsies throughout the country, so that they all provide information as reliable as that provided in the best centres.
4. A system of 'partial audit' should be introduced, whereby hospital clinicians would obtain permission for an additional 20 per cent of hospital autopsies.
5. Since there are at present too few pathologists to meet

expanded demands, and since, on present projections, staffing will get worse because of retirements and the paucity of training posts, representations should be made to the health departments to increase the number of training posts in pathology.

6. Steps should be taken to promote the adoption of medical audit throughout the profession and, in particular, the application to it of hospital and medico-legal autopsy findings.

7. In order to promote medical audit and improve the accuracy of death certification, the Royal College of Physicians should be asked to convene a major symposium on medical audit, inviting the participation of the Royal Colleges of Physicians of Edinburgh, of Surgeons, of Physicians and Surgeons of Glasgow, of Psychiatrists, of General Practitioners, of Obstetricians and Gynaecologists and of Pathologists.

Registration of Occupation

The occupation of the deceased person is one of the items of information recorded on registration of death. This has proved of sufficient scientific interest to justify the publication by the Registrar General of a decennial supplement on occupational mortality since the beginning of this century. A slight increase in the quantity of data recorded would improve the usefulness of these supplements and would also have benefits when the occupational data on death certificates are used as a starting point in epidemiological research studies.

According to a statement in the most recent decennial supplement, the guidance given to the registrar for the recording of occupation is currently as follows:

> If the deceased is male and aged 15 or over his own occupation is recorded. If he is under the age of 15 the registrar is required to enter 'son (or daughter) of . . .' and give the name and occupation of the father or, if not available for the father, the name and occupation of the mother. For a married woman or widow the registrar is required to enter the deceased's occupation and the words 'wife (or widow) of . . .' and the name and occupation of the husband (or deceased husband). For other females aged 15 or over their own occupation should be recorded.
>
> It is the aim of the registrar to record the latest full-time gainful employment followed by the deceased and to ignore subsequent irregular part-time occupations of short duration. 'Full-time' employment is not rigidly defined so that regular paid employment for a few hours a day should be recorded if it is the latest employment. Terms such as 'housewife' should not be used and in the case of a woman who is not employed at the date of her death the last full-time occupation should not be recorded unless she has been in paid employment for most of her life. The last full-time occupation should be recorded for unemployed persons, prisoners and persons unable to work through disability. For retired persons their last full-time occupation should be recorded and an indication given that they had retired.

Suggestions for the Future

The usefulness of these data would be much increased if not only the occupation but the type of industry in which the person was employed were recorded whenever practicable and made available. At present, for example, when such terms as 'fitter', 'process worker', 'machinist' or 'messenger' are recorded by the registrar they do not always indicate the nature of the industry and give no clue to the substances to which the person concerned has been exposed. Sometimes this information is recorded for the use of the Office of Population Censuses and Surveys but is of no assistance to outside investigators. Occupation and industry are both recorded at the decennial census in respect of all persons over 16 years of age. The recording of industry as well as occupation would, therefore, bring these data into line with the census, and would make possible the types of analysis in the decennial supplements, which should be more generally available. *Ad hoc* research studies using death certificates would also become easier.

A further point which should be considered is whether the registrar should be invited to record, in addition to 'latest full-time occupation', the main occupation, that is to say the occupation in which the person worked for the longest period of years, or, failing this, the number of years employed in the 'latest full-time employment'. This would have the advantage that it would make more likely the recording of an occupation relevant to a particular cause of death where, as in cancer or pneumoconiosis, an interval occurs between cause and effect. On the other hand, it would add to the length of the interview between informant and registrar and that might be regarded as unacceptable. The compilation of a complete occupational history at the time of registration of a death is clearly impracticable and quite rightly would be regarded as an unacceptable burden on registrar and informant, whatever the scientific advantages might be.

Classification of Occupational Data in the Decennial Supplement

In the most recent decennial supplement dealing with occupational data, married women have been classified for the first time not only under the occupation of the husband but also under their own full-time occupation. In view of the trend towards an increasing proportion of women working outside the home we welcome this new analysis and hope that it will be continued in future supplements and, where possible, extended.

Recommendations

1. In future, the type of industry in which the deceased person was employed in his/her 'latest full-time occupation' should be recorded.
2. In the case of a married woman her 'latest full-time occupation' should be recorded as well as the occupation of the husband and an analysis of occupational mortality should be published for each category.
3. Consideration should be given to the recording of

main occupation and type of industry (i.e. that occupation in which the deceased person worked for the longest period) where this differs from 'latest full-time occupation'.
4. In the case of perinatal deaths the occupation (and type of industry) of both parents should be recorded.

Implications for Education

In the endeavour to improve the efficiency of death certification, the role of suitable training is of considerable importance. This is true even if the death certificate remains unaltered. It would be even more important if the certificate were to be altered in form.

Unless doctors are adequately instructed on the origin and purpose of the certificate, and on the correct procedure for its completion, they are unlikely either to understand the function of the certificate or have any interest in trying to use it efficiently. The certificate will simply represent, to them, another example of an irritating and somewhat incomprehensible administrative procedure.

The importance of good training is due in part to the fact that the subject is not one which is at first sight particularly interesting compared to other aspects of medical practice. Yet it forms the most frequent point of contact for many doctors, particularly in the early stages of their careers, with medico-legal matters.

The form of education can be divided into two areas, undergraduate and postgraduate instruction.

In the undergraduate curriculum all students should receive formal instruction on the nature and objectives of death certificates, and their relationship to other procedures involved in the disposal of the dead, such as the procedure for cremation or for enquiry by the coroner. In some medical schools at the present time this instruction is provided as part of a course in forensic medicine. Other institutions lack such a course or else have one which is so abbreviated that adequate teaching on this subject is impossible. The value of the inclusion of this topic in a course of forensic medicine is that other aspects of the course, such as the consideration of unnatural causes of death, provide an opportunity for expanding and reinforcing the study of death certification. It also means that the teaching of what could, it must be confessed, be a rather dull topic can be linked to matters having more immediate power to stimulate or catch the attention of an audience.

In addition, during the undergraduate course, opportunities arise for further instruction in this subject, especially when students are being taught statistics, often during courses of community medicine, or public health. Finally, as part of the students' clinical instruction, opportunities arise for further emphasis on the correct use of death certificates, both in ward-round and in autopsy room teaching.

In the postgraduate field there are two settings in which further consideration of the procedure of death certification can be of value. Recently qualified house officers, faced for the first time with the practical problems of completing these certificates, can benefit considerably from some tutorial instruction. Such an occasion provides an ideal opportunity for using improperly completed certificates, which have fallen foul of the local Registrar of Births and Deaths, as objects for study and discussion. At this stage the young doctor is principally concerned with getting the form of words correct, so that the certificate will be acceptable to the registrar. Therefore, the doctor should also have easy access to some clear and reliable instruction in a ward handbook or other readily available reference source.

Medical audit, with discussions between clinicians and pathologists, would be a particularly appropriate means of increasing the recently qualified doctor's knowledge of the purpose and need for accuracy of the death certificate.

Finally, during the later stages of a doctor's career, refresher courses, for instance for general practitioners in a locality, provide a useful means of informing doctors of any change in the structure or use of the certificate, and of enabling them to consider, in the light of their now substantial medical experience, the value of the certificates in mortality statistics, and their role in the process of disposal of the body. Such sessions clearly benefit from the presence of representatives of the local coroner, and of the Office of Population Censuses and Surveys.

Where such schemes or instruction have been instituted the value has been apparent in the decrease in certificates referred by the registrar, and the resulting fewer distressed relatives. This value is particularly marked in undergraduate teaching. However, the fact that it was necessary to undertake the present survey into the value and form of death certificates is in part an obvious reflection on the present lack of adequate teaching on the subject, which is part of a general lack of interest in the provision for teaching the more legal aspects of medicine, compared with the past. Adequate provision could be made by the setting aside of relatively little teaching time, but at present there is often no adequate provision at all.

Recommendations

1. Instruction in completion of death certificates should be part of undergraduate education in all medical schools.
2. Recently qualified doctors should receive training in the accurate certification of cause of death, both by tutorial instruction and during discussion on autopsy findings, as part of the process of medical audit.
3. Postgraduate instruction, given in refresher courses, for hospital doctors and general practitioners in the role and value of death certificates should be encouraged.

Summary of Recommendations

There is a degree of awareness among doctors, and among the general public, that death certification, in addition to deterring crime, has made a significant contribution to epidemiology, but its potential value in medical audit and in relation to occupational hazards is less appreciated. A number of studies have also revealed a disturbing level of discrepancy between the certified cause of death and the findings at subsequent autopsy. We

believe that doctors and the public would benefit from greater awareness of the importance of death certification, and from improved accuracy; we therefore recommend improved education of doctors, and steps to increase the accuracy of certification.

Education

Formal instruction in the completion of death certificates should be given to undergraduates in all medical schools. This should be reinforced for recently qualified doctors, during the period of general professional training or vocational training for general practice. Instruction should include not only procedural and legal aspects, but also illustration of the value of accurate certification in medical audit, in occupational medicine and in epidemiology. A major conference might give impetus to the educational process.

Procedural Matters

Since it is the consultant who in the main supplies continuity in hospital practice, he should be more intimately involved in death certification, both formally by having his name stamped on the death certificate and by having later enquiries by the Registrar General addressed to him; and informally by emphasising the importance of accurate certification to members of his clinical team, and by encouraging an increase in the autopsy rate. It would also be desirable that the doctor actually completing the certificate should be someone more experienced than a provisionally registered house officer. More senior doctors would be better equipped to undertake informal consultation with coroners, a practice to be encouraged.

The Autopsy

An autopsy may be ordered by the coroner or the procurator-fiscal (the medico-legal autopsy) or done at the request of the relevant clinician with the consent of the next of kin. Unlike the procurator-fiscal, the coroner almost invariably orders an autopsy in cases referred to him, unless one has already been carried out; we believe that, as recommended in the Brodrick Report, he should be given much wider discretion in this matter.

For deaths occurring in hospital, and where practicable in the community, permission for autopsy should be more commonly sought and obtained, and this would be helped by greater medical and public awareness of the value of the autopsy. Clinicians and pathologists should jointly explore the value of the autopsy in medical audit. General surveys of discrepancy between certified cause of death and autopsy findings may not be further required for the present; but studies in particular clinico-pathological contexts are still necessary. For these recommendations to be realistic staffing of departments of pathology must clearly be increased.

Information on Occupation

The Registrar General is asked to examine the practicability of including the *main* occupation, as well as the most recent. The main previous occupation of a housewife should be recorded in addition to the husband's occupation. In the case of general occupations such as 'cleaner' the type of industry should be recorded as well as the actual occupation.

We recognise that some of the recommendations, in particular those on the autopsy, have staffing and financial implications; but we believe the importance of more accurate death certification is sufficient to justify them.

Acknowledgements

The Working Party is grateful to members of the staff of the Office of Population Censuses and Surveys for attending as expert witnesses.

Appendix A

(Extract from Forms for Medical Certificates of the Cause of Death—R15 OPCS 7/80)

REPORTING OF DEATHS TO THE CORONER BY REGISTRARS

Regulations made by the Registrar General with the approval of the Secretary of State for Social Services impose a duty on registrars of births and deaths to report certain deaths to the coroner and provide that the registrar must await the coroner's decision before registering a death in any case where he has himself reported it or knows that it has been, or is required to be, reported by any other person. Regulation 51 of the Registration of Births, Deaths and Marriages Regulations 1968 is reproduced below for the information of practitioners.

51 (1) Where a registrar is informed of the death of any person before the expiration of 12 months from the date of the death, he shall report the death to the coroner on a form provided by the Registrar General if the death is one—

(a) in respect of which the deceased was not attended during his last illness by a medical practitioner; or

(b) in respect of which the registrar has been unable to obtain a duly completed certificate of cause of death; or

(c) with respect to which is appears to the registrar, from the particulars contained in such a certificate or otherwise, that the deceased was seen by the certifying medical practitioner neither after death nor within 14 days before death, or

(d) the cause of which appears to be unknown; or

(e) which the registrar has reason to believe to have been unnatural or to have been caused by violence or neglect, or by abortion, or to have been attended by suspicious circumstances; or

(f) which appears to the registrar to have occurred during an operation or before recovery from the effect of an anaesthetic; or

(g) which appears to the registrar from the contents of any medical certificate to have been due to industrial disease or industrial poisoning.

(2) Where the registrar has reason to believe, with respect to any death of which he is informed or in respect

of which a certificate of cause of death has been delivered to him, that the circumstances of the death were such that it is the duty of some person or authority other than himself to report the death to the coroner, he shall satisfy himself that it has been reported.

(3) The registrar shall not register any death which he has himself reported to the coroner, or which to his knowledge it is the duty of any other person or authority to report to the coroner, or which to his knowledge has been reported to the coroner, until he has received a coroner's certificate or a notification that the coroner does not intend to hold an inquest.

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Book Review

Women Doctors: Choices and Constraints in Policies for Medical Manpower, by Patricia Day. King's Fund Project Paper No. 28, 1982. 136 pages. Price £2.30 + 26p postage.

This interesting report commissioned by the King's Fund surveys existing literature and research to provide much information on the current working pattern of women doctors set against recent national and international demographic changes.

It examines the special constraints placed on women's career choice and development, the preference for general practice and the difficulties of career imbalance in the hospital service, but demonstrates an increasing professional commitment from medical women over the past 15 years, despite the increased percentage who marry. There is a tendency to delay having families until training is completed, and there has been a rise from 46 per cent to 58 per cent in those attaining higher qualifications.

A detailed account of the regional implementation of central DHSS policy and the part-time training and retainer schemes (HM (69) 6 and HM (72) 42), and the Scottish equivalents (SHM 14/1969 and SHM 51/1972) is given and the difficulties are enumerated. Despite publicity, there is a surprising lack of awareness of the part-time training schemes. The report draws attention to the incomplete monitoring and evaluation of these schemes.

Although individual surveys give numbers of doctors in post, throughput and eventual success in obtaining career posts is less well documented. Information on those unsuccessful in applying for part-time training posts is entirely lacking. This may be remedied in the assessment of the latest departmental memorandum on part-time training, PM (79) 3, which requires Central Manpower approval and thus information on numbers of applicants who have been successful or rejected. However, since finance, educational approval and local arrangements have still to be overcome, confusion is common and the figures of those getting manpower approval are a guide to rather than a summary of those successful in obtaining posts. The part-time training schemes are shown to be a useful experiment but it is thought that social change will come to create a greater need for part-time establishment posts, rather than for the special schemes.

In the chapter on policy implications the options are clearly set out and the constraints between career aspirations and training versus national manpower planning are recognised for both men and women. Yet the different emphasis which men and women place on patient contact, scientific interest, research, finance and prestige in their contribution to job satisfaction, which was detailed in the Institute of Manpower Studies report, may well help with a policy aimed at more effective use for medical manpower. This is a refreshing and positive, if provocative, approach showing the difficulty of assessing contribution to the NHS on a strictly sessional basis in current career post terms, and of examining one category of doctors in isolation.

A welcome final chapter contains a critical view of the information available and makes suggestions for further research into women's optimum contribution to medical manpower. The proportion and absolute number of women graduating from medical school are rising, so their importance should not be under-estimated. This paper is valuable reading for all those intent on seeing that such a contribution is not wasted at individual or national level.

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