PRACTICE OBSERVED

Practice Research

Be your own coroner: an audit of 500 consecutive deaths in a general practice

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Abstract

General practitioners' medical records of a geographically defined population of about 1600-1800 have been retained since 1964. Details of care by general practitioners and hospital correspondence were available for 500 deaths (277 men, 223 women) from 1964 to 1985, including deaths at home, at work, in the street, in short term and long term institutional care, and within six months of release from institutional care. The periods 1964-73 and 1974-85 were compared. The proportion of men aged ≥80 who died increased from 20 (14%) in 1964-73 to 22 (16%) in 1974-85, but the proportion of women aged ≥80 who died increased from 21 (23%) to 50 (39%). Of all deaths, 223 (45%) were thought to have had avoidable causal factors, of which 132 (59%) were attributed to patients, 45 (20%) to the general practitioner, 9 (4%) to hospitals, and 37 (17%) to others. The number of deaths related to smoking decreased from 31 (43%) in men aged <70 to 19 (30%) but in women aged <70 increased from 4 (10%) to 11 (26%). The proportion of deaths in women who were already dependent six months before death increased from 55 (58%) to 81 (63%) but in men remained constant at 64 (46%) in the first period and 62 (46%) in the second. Nearly two thirds of all deaths occurred at home in both periods—about twice the proportion for England and Wales—but the proportion of men dying at home decreased from 87 (62%) to 76 (56%).

A critical analysis of deaths in whole populations by primary

care teams can identify changes that are needed both in the work and organisation of the team and in the behaviour of the population itself.

Introduction

For the evaluation of medical care measures of outcome are better than measures of process, but few practicable measures of outcome are available. A change in the mean age at death is a simple and meaningful measure, and a retrospective search for avoidable factors in individual deaths is perhaps the most stringent form of self criticism available to any clinical team. Our principal aims were to use such measures to improve the care of patients in our own unit by informally studying our errors and by directing local attention to the need for action by the patients themselves; and to encourage other primary care teams to devise and adapt similar but not necessarily identical procedures for self criticism in line with the recommendations and experience of the quality initiative programme of the Royal College of General Practitioners.[1] Attempts to standardise such methods would probably fail and could impede rather than help these aims.

It is difficult to study all the deaths in the population covered by a general practice. Though National Health Service regulations allow patients' records to be retained after their death by the general practitioner, few doctors take advantage of this. Some deaths occur during long term institutional care or shortly after release from such care prompted by terminal illness, when records will normally have been transferred and are no longer available for audit. Emergency admissions may not be entered in the records of the practice, and a letter from the hospital may never be received after a death. When, as in the present series, all births occur in hospital perinatal deaths that occur before the baby is registered with the general practitioner are easily missed. Several such infant deaths, whose inclusion would have required a long search through maternal records, are missing from this series.

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Presumably because of these difficulties and the still embryonic state of true community medicine we have been unable to find any published studies covering all the deaths in any whole geographically defined population, including people admitted (sometimes in childhood) to long term institutional care. There are many published studies of terminal illness and death in the community,[2-5] the best general account being the classic study of Cartwright et al.[6] We have been unable to find any review of avoidable deaths in general practice, though there has been a revealing discussion of personal responsibility for clinical error by Hilfiker.[7]

Materials and methods

Glyncorrwg is a coal mining village that had a population of about 1700 in 1965, which had fallen to about 1500 by 1985. JTH came to the village in 1961 with an initial list of about 500 patients; by 1965 virtually the whole village was registered with the practice. About 200 people living in other villages in the Afan valley had also registered, bringing the total population covered by the practice to about 1900 in 1965; by 1985 this had fallen to about 1650. This study is based on this total of 1650, which has of course varied slightly and continues to fall slowly because of mass unemployment. Information from the age-sex registers has been available every year since 1970.

Since 1961 it has been the policy of the practice to write an entry in the patient's record at every contact between the doctor and the patient, including home visits and calls out of hours. Since 1964 we have retained the general practitioner's medical records of patients who died, migrated, or transferred their care to other general practitioners. For patients transferring and migrating we sent clinical summaries and hospital correspondence to the new general practitioner, retaining the rest of the clinical record. For patients who died we retained the entire record and pathologist's reports for all necropsies. Information from necropsy was available for 128 (26%) of all deaths, 94 (51%) of deaths of all men and 34 (15%) of deaths of all women. For the rest the cause of death was accepted as that stated on the death certificate, nearly always by JTH for deaths at home and by hospital staff in other cases.

People who had been registered with the practice at birth but had been transferred to long term institutional care were followed up by personal inquiry to relatives or friends or occasionally by writing to their new general practitioner. We included transfers out that occurred before 1964 for patients from Glyncorrwg but not for the 10-12% of the practice population from adjoining villages. It is unlikely that more than two or three deaths of this kind have been missed.

All the material was analysed by JTH and then reviewed by CH. Avoidable factors relating to the certified causes of death were sought. We did not attempt to compare each other's decisions, as our knowledge of the patients was too unequal for this to be practicable. Avoidable factors were attributed to the patient, the general practitioner, hospital care, or others. This analysis began to be routine only in 1983, and some avoidable factors have certainly been missed in the earlier records, the quality and completeness of which have since improved, particularly since we converted all records to A4 format in 1977.

Heavy smoking (>20 cigarettes a day), social isolation, alcohol abuse, obesity (body mass index >30), and delayed presentation were the main avoidable factors assigned to the patients. Delay was included only if it was likely to have had a material effect on outcome—for example, delayed presentation of bowel cancer was included but delayed presentations of breast cancer and stomach cancer were not. Late diagnosis, failure to follow up actively, failure to initiate contact with housebound or socially isolated

TABLE I—Age and sex distribution of population of Glyncorrwg

	1970			1975			1980			1985		
	M	F	Total (%)	M	F	Total (%)	M	F	Total (%)	M	F	Total (%)
Age (years):												
0-19	298	274	572 (35)	279	272	551 (32)	279	278	557 (31)	245	226	471 (28)
20-39	205	194	399 (25)	238	236	474 (28)	238	273	511 (28)	250	233	483 (29)
40-59	198	195	393 (24)	184	198	382 (22)	184	204	388 (22)	183	181	364 (22)
60-79	113	131	244 (15)	121	152	273 (16)	121	173	294 (16)	135	153	288 (17)
≥80	6	14	20 (1)	10	29	39 (2)	11	43	54 (3)	12	38	50 (3)
Total	820	808	1628 (100)	832	887	1719 (100)	833	971	1804 (100)	825	831	1656 (100)

TABLE II—Number (%) of deaths by sex and age

	Men			Women			Total		
	1964-73	1974-85	Total	1964-73	1974-85	Total	1964-73	1974-85	Total
Age (years):									
0-19	6 (4)	4 (3)	10 (4)	6 (6)		6 (3)	12 (5)	4 (2)	16 (3)
20-39	4 (3)	2 (1)	6 (2)	2 (2)	2 (2)	4 (2)	6 (3)	4 (2)	10 (2)
40-59	26 (18)	21 (15)	47 (17)	14 (15)	16 (12)	30 (13)	40 (17)	37 (14)	77 (15)
60-69	36 (26)	37 (27)	73 (26)	18 (19)	25 (19)	43 (19)	54 (23)	62 (23)	116 (23)
70-79	49 (35)	50 (37)	99 (36)	33 (35)	36 (28)	69 (31)	82 (35)	86 (32)	168 (34)
≥80	20 (14)	22 (16)	42 (15)	21 (22)	50 (39)	71 (32)	41 (17)	72 (27)	113 (23)
Total	141	136	277	94	129	223	235	265	500

TABLE III—Number of deaths that had avoidable causal factors

	Men				Women				Total	
	1964-73		1974-85		1964-73		1974-85			
	No	Mean age (years)	No	Mean age (years)	No	Mean age (years)	No	Mean age (years)	No	Mean age (years)
Avoidable factors attributed to:										
Patient	51	61	45	67	12	62	24	61	132	63
General practitioner	11	64	11	71	10	67	13	71	45	68
Hospital	1	5	3	78	2	37	3	56	9	50
Other	15	39	13	67	3	38	6	76	37	55

TABLE IV—*Number of deaths from common causes*

| | Men | | | | Women | | | | Total | |
| | 1964-73 | | 1974-85 | | 1964-73 | | 1974-85 | | | |
Common causes of death	No (%)	Mean age	No (%)	Mean age	No (%)	Mean age	No (%)	Mean age	No (%)	Mean age
In patients aged >70:										
Smoking	31 (43)	59	19 (30)	62	4 (10)	54	11 (26)	59	65 (30)	60
Alcohol	1 (1)	67	3 (5)	49			2 (5)	57	6 (3)	55
Ischaemic heart disease	24 (33)	60	24 (38)	61	8 (20)	63	13 (30)	63	69 (32)	61
In patients of all ages:										
Delayed bowel cancer	6 (4)	63	6 (4)	63	3 (3)	66	4 (3)	81	19 (4)	68
Accidents	8 (6)	24	5 (4)	35	2 (2)	56	3 (2)	57	18 (4)	36
Progressive massive fibrosis	7 (5)	66	10 (7)	71					17 (3)	69

TABLE V—*Number (%) of deaths by age and social dependence six months before death*

| | Men | | Women | | |
Social dependence	1964-73	1974-85*	1964-73	1974-85	Total
Independent:					
Aged <70	50 (69)	47 (73)	27 (68)	30 (70)	154 (70)
Aged ≥70	27 (19)	26 (19)	12 (13)	18 (14)	83 (17)
Dependent:					
Aged <70	22 (31)	17 (27)	13 (33)	13 (30)	65 (30)
Aged ≥70	42 (30)	45 (33)	42 (45)	68 (53)	197 (39)

* Data missing for one man aged ≥70.

Table IV shows the numbers of deaths due to some of the commoner avoidable factors. The deaths caused by lung cancer in smokers and by ischaemic heart and arterial disease in heavy smokers (≥20 cigarettes daily) were considered to be partly or wholly attributable to smoking.

Table V shows the number of deaths by age and social dependence six months before death. The proportion of deaths in women who were already dependent six months before death increased from 55 (58%) in the first period to 81 (63%) in the second.

Table VI shows the number of deaths by sex and place of death. Nearly two thirds of all deaths occurred at home in both periods—about twice the rate for England and Wales—but the proportion of men dying at home decreased slightly. Table VII shows the place of death of people who died from cancer, a group in which sudden unexpected deaths rarely occur and therefore a better indicator of choice by the general practitioner and patient.

TABLE VI—*Number (%) of deaths by sex and place of death*

| | Men | | | Women | | | Total | | |
Place of death	1964-73	1974-85	Total	1964-73	1974-85	Total	1964-73	1974-85	Total
Home	87 (62)	76 (56)	163 (59)	56 (60)	78 (61)	134 (60)	143 (61)	154 (58)	297 (59)
Institutions	40 (28)	59 (43)	99 (36)	35 (37)	48 (37)	83 (37)	75 (32)	107 (40)	182 (37)
Other	14 (10)	1 (1)	15 (5)	3 (3)	3 (2)	6 (3)	17 (7)	4 (2)	21 (4)
Total	141	136	277	94	129	223	235	265	500

TABLE VII—*Number of deaths from cancer by sex, age, and place of death*

| | Men | | | | Women | | | | Total | |
| | 1964-73 | | 1974-85 | | 1964-73 | | 1974-85 | | | |
Place of death	No (%)	Mean age	No (%)	Mean age	No (%)	Mean age	No (%)	Mean age	No (%)	Mean age
Home	21 (68)	70	15 (47)	70	12 (67)	68	20 (65)	68	68 (60)	69
Institutions	10 (32)	65	18 (53)	65	6 (33)	57	11 (35)	62	45 (40)	62

patients, and clinical mismanagement were included in the avoidable factors assigned to the general practitioner. Factors attributed to the hospital group were confused organisation and lack of communication, unnecessarily delayed diagnoses, and clinical mismanagement. Road traffic accidents, accidents at work, and industrial disease came in the "other" group.

Results

In an attempt to study trends we grouped the results into two periods—namely, the 10 years of 1964-73 and the 11 years of 1974-85.

Table I shows the age and sex distribution of the Glyncorrwg population at intervals of five years from 1970 to 1985. Table II shows the number of deaths by sex and age. There was a small increase in the second period in the proportion of deaths of men aged 80 or over and a big increase in the number of deaths of women of this age. Nearly one quarter of men who died were still aged under 60.

Table III shows the number of deaths that had recognisable avoidable causal factors and the mean age at which they occurred. The proportion of deaths that had recognisable avoidable factors was about the same in the first period (105 deaths (45%)) as in the second (118 deaths (44%)).

Discussion

Despite the long period covered by the study the numbers of deaths from any particular cause were inevitably small. The figures relate to a defined population and are therefore a population statistic, but as we studied all deaths rather than a sample the usual tests of significance do not apply. We doubt if precise statistical comparisons between local and national data would be either feasible or of much practical help. Our criteria for avoidable factors are neither standardised nor reproducible, but they are internally consistent bearing in mind that we had more information about avoidable factors relating to patients and general practitioners than to hospital management and that the quality of recording was better in the second period than in the first.

On the credit side there were no homicides and only one death by suicide compared with four deaths expected from national rates. Perhaps we were just lucky, but an estimated total of 777 hours of personal counselling of vulnerable patients given over the 20 years of the study might have helped. This total was estimated roughly from the recorded annual consultation rate of 4·9-5·0 per patient for

1965-85; the mean consultation time of seven minutes in 1965, increasing to eight minutes in 1970 and 10 minutes in 1984; and the assumptions that 15% of all consultations are largely for emotional reasons, that 10% of such patients have suicidal potential, and that they take twice as long as the average doctor-patient contact. The reduction in the number of men dying outside the home in the first period is mainly accounted for by fewer industrial accidents because of the collapse of heavy industry and beginning of mass unemployment. Deaths from progressive massive fibrosis (complicated penumoconiosis) have decreased in line with national trends.

Deaths that might have been avoided but for the patient's behaviour were chiefly due to heavy smoking (≥20 cigarettes a day) and delayed presentation of serious illness because of denials by the patient. Deaths related to smoking in men decreased encouragingly from 31 (43%) of all deaths of men aged under 70 in the first period to 19 (30%) in the second, but deaths related to smoking in women increased from 4 (10%) of all deaths of women aged under 70 to 11 (26%). These data fit in with a decrease in the stated prevalence of smoking from 57% of all Glyncorrwg men aged 20-64 in 1968 to 29% in 1985, with 45% of women continuing to smoke in both years. The increase in avoidable deaths of women is almost entirely attributable to lung cancer. We have little confidence in our data on deaths related to alcohol, which are grossly inadequate at least until 1975; since then we have become increasingly aware of the huge contribution made by alcohol to premature death.

The patients who died from bowel cancer stand out as a group with an unnecessarily poor outcome. Nationally, the five year survival increased from 24% in 1959 to only 30% in 1975, though patients with tumours limited to the gut lumen have five year survival of 80-90% after surgery.[8] Average delays of eight to nine months between the onset of symptoms and surgical treatment that were found in other studies[9-11] were also seen in our population. Four of 19 patients began their course of treatment before the period covered by good records, but, of the other 15 patients with complete documentation, only five showed no evidence of great delay in presentation (mean delay six weeks), two of these presenting with acute obstruction.

The other 10 had a mean delay of 31·5 months between the estimated onset of symptoms and proper treatment. The patients who delayed comprised a man who clung to an initially correct diagnosis of piles as sufficient explanation for 19 years of intermittent rectal bleeding and another who defaulted from an appointment for a barium enema, having denied continual bleeding for four years because he was afraid that cancer might be discovered. Four patients were already attending a hospital outpatient department for some other reason at the onset of symptoms, which were then misinterpreted as symptoms of other diseases already recognised. One patient had a rectal biopsy, the results of which showed a possible malignant change that was misreported as being normal to both the general practitioner and the patient and was not followed up by the hospital. A biopsy sample from another patient got lost in the hospital between investigations and was remembered only four months later. Four cases were examples of the retrospectively incomprehensible clinical blindness of the general practitioner so often ridiculed in teaching hospitals. All 10 delayed cases were essentially failures of the general practitioner to be an effective generalist with personal responsibility to help patients cope both with their own fears and with the pitfalls of referred hospital care. General practitioners need to keep an eye on what is and what is not being done by specialists and their junior staff as much as hospital doctors need to correct the errors of general practitioners.

Most errors made by the general practitioner were the result of poor organisation and follow up and failure to apply consistent criteria for diagnosis and treatment. There were also errors made by previous general practitioners, partners, and trainees, whose supervision was not always adequate. The small proportion of errors attributed to hospitals was probably due chiefly to their better organisation and teamwork, which could and should be equalled by primary care teams if they were adequately staffed and trained. A concentration of patients with serious illness in hospitals maintains a heightened awareness of serious risks, an awareness that is

inherently impossible to maintain in general practice. Patients' denials delay and obscure presentations, and the habitual presentation of self limiting minor illnesses blunts clinical awareness in general practitioners, but the skills of specialists may also be diminished, usually by tunnel vision and a lack of real interest in communication. We did not have access to hospital records, so there was seldom enough information to identify errors. It has to be said that in some cases where doubt and confusion surrounded inexplicably delayed action or an unexpected death in hospital it was impossible to get any relevant information, despite repeated letters, the best efforts of hospital records officers, and assurances that litigation was not being considered.

The rising proportion of deaths in people who were socially dependent six months before death is an important trend, especially in women. It has serious implications for the smaller, more dispersed families, who have problems finding someone to do the hardest work of caring, and the health and social services, who are supposed to support them. Though a higher proportion of deaths occurred in hospital in the second period, the recent introduction of a terminal care unit in Swansea, which supports three times as many people at home as on its wards, probably slowed this trend.

Conclusions

A confidential review of all the deaths occurring in patients who are or should be registered in a community general practice (including those in long term institutional care of any kind) is a useful exercise. We want to emphasise the value to primary care teams and their populations of analysing work in these simple terms, despite the necessary limitation of small numbers. Figures that relate to our own work and neighbours are far more likely to lead to constructive criticism and remedial action than the more stable statistical background of regional or national rates. The abolition of the medical officer of health during the reorganisation of the National Health Service in 1974 left a gap that should be filled by primary care teams with practical assistance from district community physicians.

Self criticism of this kind is possible because the British public still generally regards the NHS as its own collective right and possession and its health workers with affection and respect. Litigation and defensive medicine in the United States should remind us of the ultimate effects of a marketed service. We should do more to take advantage of the opportunities offered by our generally good relations with the communities that we serve to learn and teach systematically from our and their measured errors.

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