

The health of coal mining communities

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Summary

EVIDENCE is given of a widening gap in mortality from all causes at ages 20–64, and in infant mortality, between coal mining communities and the rest of the population in England and Wales; the evidence is drawn chiefly from South Wales. Between 1934 and 1968, weighted mean standardized mortality from all causes in the Glamorgan and Monmouthshire valleys rose from 128 per cent of the England and Wales rate to 131 per cent. Between 1921 and 1968, weighted mean infant mortality rose from 115 per cent of the England and Wales rate to 124 per cent. Between 1930–32 and 1949–53, mortality of miners (all grades, above and below ground) in England and Wales from all causes at ages 20–64 rose from 106 per cent of that for all men 20–64, to 112 per cent: the mortality of miners' wives aged 20–64 persisted at 128 per cent in both periods: and the mortality of miners' infants rose from 134 per cent of expectation to 150 per cent. The mortality of miners in South Wales rose from 115 per cent of expectation in 1930–32 to 158 per cent in 1949–53: the mortality of their wives, not recorded in 1930–32, was 146 per cent of expectation in 1949–53. Their infant mortality, also not recorded in 1930–32, was 169 per cent of expectation in 1949–53. The results of the 1961 occupational mortality tables were not available at the time of going to press, but I am assured by the Registrar General's office that they do not contradict these trends.

Prevalence of disability affecting employability in men aged 35–64 in one South Wales mining community is reported: of 320 men at risk, 104 (32 per cent) were judged clinically to have chronic disabilities affecting local employability. Of the 253 men aged 35–54, 63 (25 per cent) were clinically disabled, and of the 67 aged 55–64, 41 (61 per cent) were disabled. Of the same 320 men, 45 (14 per cent) were registered under the Disabled Persons Employment Act: many of these were judged clinically not to have disability serious enough to include in the clinically disabled group, and many in the latter group were not registered. Of men aged 20–64, eight per cent were currently unemployed, with a mean period of unemployment just under one year; the mean period of unemployment of unemployed men who were also registered as disabled persons was 77 weeks. Existing lists of disabled persons are probably unreal and under-estimate the size of the problem in areas of high unemployment, and some unemployment is concealed as certified long-term incapacity for work.

Other evidence on morbidity in mining communities, its relation to primary care workload and mortality, the clinical content of traditional patterns of mining practice, and evidence on the threshold of complaint in miners and their wives, is discussed. Some features of the situation in mining communities are shared by other residual industrial populations in areas currently unprofitable to investors, and suffer similarly from the centripetal tendencies of our society. Without fundamental change the relative differences in health are likely to increase.

Introduction

In 1962 I entered single-handed practice in a mining village in South Wales. My consultation rate was half as great again as it had been in a mixed working- and middle-class residential area in London, but the proportion of consultations that arose directly from problems of diagnosis or treatment was much less. A large part of the work-load

arose from certification or other forms of non-clinical, irrelevant or superficial service; concealed by this was a great deal of sickness, disability and unhappiness. This was described by Stephen Taylor in his study of good general practice in 1954; he visited seven doctors in three practices in Swansea:

"The most striking point about the patients is the large amount of really serious illness seen both at the surgeries and on visits. This is in great contrast with typical southern English practice. There appears to be scarcely a family without at least one member suffering from serious illness. . . . A high general morbidity is also seen in many industrial pockets in the midlands and south, though there are few places to compare with even the average South Wales picture . . . the ultimate remedy . . . is for the medical profession to join with all other men of goodwill in a determined effort to wipe out the causes of high morbidity as fast as it can be done."¹

The disparity between health in South Wales, at least in the valleys, and that in the rest of England and Wales, is as great now as it was then. Tables I and II show the relationship of mortality from all causes and of infant mortality in my own valley, to that in England and Wales. Standardized mortality from all causes shifted from 128 per cent of the England and Wales rate in the 1954 of Stephen Taylor, to 134 per cent in 1968; the last figure is 158 per cent of the rate for the Outer Metropolitan area of London. Infant mortality has fallen dramatically in the past 50 years; but in relation to England and Wales rates we show an increasing excess, a shift from 102 per cent of England and Wales rates in 1921-25 to 205 per cent in 1966-68. The last figure is 247 per cent of the rate for the Outer Metropolitan area of London.

TABLE I

ARITHMETIC MEAN RATIO OF AGE- AND SEX-STANDARDIZED LOCAL MORTALITY FROM ALL CAUSES AND IN BOTH SEXES, GLYNCORRWG URBAN DISTRICT TO ENGLAND AND WALES, 1934-68.
England and Wales = 100

1934-39	128	1954-58	125
1940-48	not available	1959-63	134
1949-53	116	1964-68	134

Calculated from the Registrar General's Annual Reports

TABLE II

ARITHMETIC MEAN INFANT MORTALITY RATES FOR GLYNCORRWG URBAN DISTRICT COMPARED WITH ENGLAND AND WALES, 1921-68
All rates per 1,000 live births

	Mean infant mortality		Ratio Glyncorrwg rate to England and Wales rate (England and Wales = 100)
	Glyncorrwg U.D.	England and Wales	
1921-25	78	76	102
1926-30	71	64	111
1931-35	76	62	122
1936-40	60	55	109
1941-45	57	50	114
1946-50	66	36	183
1951-55	40	27	148
1956-60	35	23	152
1961-65	39	21	186
1966-68	37	18	205

Calculated from the Registrar General's Annual Reports

Mortality in the South Wales valleys

Ours is a small valley, worse off than most, every pit closed from January 1971, our only other small local factory is in a precarious state, and we face an apparently bleak future unless government powers and policy on the distribution of industry are

changed. Our figures are worse than those for the Glamorgan and Monmouthshire valleys as a whole, which are shown as means weighted by population in tables III and IV. The local authority areas I have included as valleys have been listed elsewhere.² Standardized mortality at all ages and from all causes moved from 128 per cent of England and Wales rates before the war to 131 per cent in 1968. Infant mortality shifted from 115 per cent of England and Wales rates in 1921 to 124 per cent in 1968. Table V shows that the excess of infant mortality is not due to a diagnostic shift from stillbirths to neonatal deaths, as the excess in the stillbirth rate is greater than that for neonatal mortality.

The valleys of Glamorgan and Monmouthshire are often described as single-class communities; so far as this can ever be true it is true of mining villages, and they retain this character even after pits have closed. An occupational census of men aged 20-64 in our village in 1966 showed that about half of them were employed in or about coal mines, and a much higher proportion had at some time worked underground. The

TABLE III

MEAN RATIO OF AGE- AND SEX-STANDARDIZED MORTALITY FROM ALL CAUSES AND IN BOTH SEXES, GLAMORGAN AND MONMOUTHSHIRE VALLEYS TO ENGLAND AND WALES, WEIGHTED BY POPULATIONS, 1934-68

England and Wales = 100

1939-43	128	1954-58	122
1940-48	not available	1959-63	128
1949-53	119	1964-68	131

Calculated from the Registrar General's Annual Reports

TABLE IV

ARITHMETIC MEAN INFANT MORTALITY RATES PER 1,000 LIVE BIRTHS, WEIGHTED BY POPULATION FOR GLAMORGAN AND MONMOUTHSHIRE VALLEYS, COMPARED WITH ENGLAND AND WALES RATES, 1921-68

	<i>Weighted mean infant mortality, Glamorgan and Monmouth valleys</i>	<i>Arithmetic mean infant mortality, England and Wales</i>	<i>Ratio of valley rates to England and Wales rates (England and Wales = 100)</i>
1921-25	87.7	76.0	115
1926-30	80.5	67.9	118
1931-35	73.5	62.2	118
1936-40	66.9	55.0	122
1941-45	60.6	49.5	122
1946-50	46.9	36.3	129
1951-55	37.3	26.9	139
1956-60	30.5	22.6	135
1961-65	25.8	20.6	125
1966-68	22.9	18.5	124

Calculated from the Registrar General's Annual Reports

mortality of the valleys therefore reflects to an extent the mortality of coalminers and their families. Table VI shows that South Wales miners aged 20-64 had a mortality from all causes 115 per cent of the rate for all men of that age in England and Wales in 1930-32, which rose to 158 per cent in 1949-53. The 1961 Registrar General's Occupational Mortality Tables are still not published at the time of going to press, though they should appear shortly; the relation of valley rates to England and Wales rates suggests that they are unlikely to show much improvement. The regional mortality of miners' wives was not reported in 1931, but for South Wales in 1949-53 it was 146 per cent of the rate for all married women in England and Wales; their infant mortality again only for 1949-53, was 169 per cent of the England and Wales rate. These mortality differences do not depend on the occupation environment alone, but on the whole social context of mining and ex-mining communities, including their past history.

Mortality in miners and semi- and un-skilled manual workers in England and Wales

There is something special about Welsh mortality, as also about Scottish mortality. Genetic theories are sometimes invoked as an explanation; they ignore the proportion and variety of immigrants during the coal-rush of the later nineteenth century, which should have produced enough hybrid vigour to withstand several generations of inbreeding. The really big difference lies in social history, including contemporary history; a past of mass unemployment and emigration of the healthiest young men on a mass scale, together with brutal working conditions in coal-mines, steelworks and foundries, malnutrition in infancy and youth, remote government—and a good deal more of all of these in the present than many care to admit. The Welsh and the Scots have no more inherent ill health than other nationalities, and their perpetual rains are no more damaging than those of the salubrious English Lake District.

Table VI shows similar, though less dramatic changes in the mortality of miners and their families throughout England and Wales: men aged 20–64 moved from 106 per cent of the rate for all men in 1930–32 to 112 per cent in 1949–53: their wives remained at 128 per cent of the rate for all married women in both periods: infant mortality

TABLE V
MEAN STILLBIRTH RATE, AND DEATH RATE UNDER ONE WEEK OF AGE, MEAN FOR GLAMORGAN AND MONMOUTHSHIRE VALLEYS WEIGHTED BY LIVE BIRTHS, COMPARED WITH ENGLAND AND WALES RATES, 1964–68

	<i>Stillbirths per 1,000 total births</i>	<i>Deaths under one week of age per 1,000 live births</i>
Glamorgan and Monmouth valleys	21·14	14·23
England and Wales	15·32	11·16
Ratio of valley rates to England and Wales rates .. (England and Wales = 100)	138	127

Calculated from the Registrar General's Annual Reports

TABLE VI

DEATHS, AND RATIOS OF ACTUAL TO EXPECTED DEATHS, OF COAL MINERS (ALL GRADES ABOVE AND BELOW GROUND) AND THEIR WIVES, AGES 20–64, AND THEIR LEGITIMATE CHILDREN UNDER ONE YEAR OF AGE, SOUTH WALES (BRECKNOCK, CARMARTHEN, GLAMORGAN AND MONMOUTHSHIRE) AND ENGLAND AND WALES, 1930–32 AND 1949–53

	<i>Deaths</i>		<i>Ratio of actual to expected deaths (expected = 100)</i>	
	<i>1930–32</i>	<i>1949–53</i>	<i>1930–32</i>	<i>1949–53</i>
Coal miners, England and Wales	20,007	20,229	106	112
Miners' wives, England and Wales	11,949	10,501	128	128
Miners' infants, England and Wales	14,832	6,627	134	150
Coal miners, South Wales ..	4,970	4,822	115	158
Miners' wives, South Wales ..	—	1,894	—	146
Miners' infants, South Wales ..	—	1,092	—	169

Calculated from the Registrar General's Decennial Supplements on Occupational Mortality, 1931 (published 1938) and 1951 (published 1958)

rose from 134 per cent of England and Wales rates for all classes, to 150 per cent. Again, we await the 1961 figures.

This widening gap may be limited to declining and unhealthy industries, which tend to be located in areas with much decayed housing and low social amenity: it is less evident if the mortality of combined social classes I and II (wholly non-manual) is compared with combined social classes IV and V (wholly manual), (table VII). There

TABLE VII

DEATHS, AND RATIOS OF ACTUAL TO EXPECTED DEATHS FROM ALL CAUSES AT AGES 20-64, IN MEN AND WOMEN, SOCIAL CLASSES I + II AND IV + V COMPARED, ENGLAND AND WALES 1930-32 AND 1949-53

	<i>Deaths</i>		<i>Ratio of actual to expected deaths (expected deaths=100)</i>	
	<i>1930-32</i>	<i>1949-53</i>	<i>1930-32</i>	<i>1949-53</i>
Social classes I + II	52,660	77,241	93	88
Social classes IV + V	106,078	142,875	107	105

Calculated from the Registrar General's Decennial Supplements on Occupational Mortality, 1931 (published 1938) and 1951 (published 1958)

is a percentage gap of 14 in 1930-32 rising to 17 in 1949-53 for male mortality from all causes ages 20-64, and of 20 falling to 18 for wives. Table VIII shows the variation of infant mortality with social class, with a percentage gap between social classes I and V of 72 in 1930-32, falling to 65 in 1949-53. These figures show a stable or slightly

TABLE VIII

LEGITIMATE INFANT MORTALITY BY SOCIAL CLASS, ENGLAND AND WALES 1930-32 AND 1949-53

<i>Social classes</i>	<i>Infant mortality rate per 1,000 live births</i>		<i>Ratio to England and Wales rate (England and Wales=100)</i>	
	<i>1930-32</i>	<i>1949-53</i>	<i>1930-32</i>	<i>1949-53</i>
I	32·7	18·7	53	63
II	45·0	21·6	73	73
III	57·6	28·6	94	97
IV	66·8	33·8	108	114
V	77·1	40·8	125	138
All classes	61·6	29·5	100	100

From the Registrar General's Decennial Supplements

diminishing gap between classes, certainly not a disappearing one. It is true that the numbers and proportions of men of working age who are miners, have fallen since 1931, and so have the populations of the South Wales valleys; the populations to which all these rates apply are diminishing relatively and absolutely. They have some of the qualities of residual populations, in which out-migration may be selective for healthier people, and in-migration for unhealthy people, though it should be remembered that mining as an occupation is still highly selective against major disabilities on entry. However, it would be wrong to assume that because ill-health is accumulating in diminishing populations, the problem will solve itself; if existing trends continue, it will get worse.

Morbidity in coal mining communities

It is generally thought that differences in mortality understate differences in morbidity, particularly from chronic illness: this is the case with chronic obstructive lung disease, for instance, which may produce many years of disability affecting employment, yet perhaps hardly shorten life. Many measures of morbidity are rates of use of medical services, the result of complex and conflicting forces that bear an indirect relation to sickness. Once the baseline of mortality is ignored, such rates can be interpreted to support almost any hypothesis.

In 1970 I went through the medical records of all the 435 men in my practice living in Glyncoerrwg, aged 20–64; this included all but eight men in this age group living in the village. All those with disabilities affecting local employability were listed. Seven men had work neurosis, by which I mean the form of demoralization in which a man evades consistent employment; this is usually associated with growing up in a family in which long-term unemployment was the norm. Although this is a form of disability which is certainly preventable, if not treatable, I have excluded it from this material because the unemployment was more or less voluntary. I also excluded those with any disability to which they had adjusted to the extent that they were available for the full range of work normal to their training. Among these were all the diabetics and controlled epileptics, and all but two of the treated hypertensives. The distribution by age and cause is shown in table IX. Inevitably the decision to regard each man as either significant

TABLE IX
DISTRIBUTION OF CHRONIC DISABILITY AFFECTING EMPLOYABILITY, GLYNCOERRWG MEN AGED 35–64,
BY AGE AND CAUSE, 1970

Age	35–54	55–64	35–64
Total at risk	253	67	320
Total disabled	63	41	104
Percent disabled	25	61	32
Serious neuroses	9	2	11
Psychoses	1	2	3
Mental defect	—	1	1
Alcoholism	4	2*	6
Chronic respiratory disease ..	17	20	37
Unstable spine	10	1	11
Unstable knee	3	—	3
Unstable ankle	1	—	1
Other major injuries	7	3	10
Coronary disease, hypertension, and claudication	4	5	9
Stroke	1	2	3
Dermatitis	3	—	3
Other	3	3	6

*Three more alcoholics who also had other disabilities are listed under them.

antly disabled or not disabled was subjective, taken in the light of knowledge not only of the men themselves, but of the nature of the work available for them; the figures can be no more than indications of orders of magnitude. Only severe disabilities such as the total loss of hands or legs, or deafness or blindness, can be easily quantified in different social contexts and usefully compared; but the impossibility of standardizing the definition of, say, significant disability for employment from chronic obstructive lung disease, is no excuse for not studying this in different communities as well as we can. The age group 20–34 was analysed but is excluded because of difficulties of forecasting chronicity

in this group. The seriously disabled included three respiratory cripples and two paraplegics.

Our disabled persons resettlement officer (DPRO), prepared a list of registered disabled persons at the same time as this clinical list, and from the same population. Of 45 men aged 35–64 registered as disabled, only 34 appeared on my clinical list; and 70 who were on my list were not registered as disabled. Of 435 men aged 20–64, 37 (8 per cent) were unemployed, and of 320 aged 35–64, 28 (9 per cent) were unemployed, when these lists were defined. Their mean period of continuous unemployment at that time was 51·7 weeks. Fifteen of the 28 unemployed aged 35–64 were registered as disabled, and had a mean period of continuous unemployment of 77 weeks. Nine of them were also judged clinically disabled. Thirteen were not registered as disabled, and had a mean period of continuous unemployment of 28 weeks; four of them were judged clinically disabled. Registration as a disabled person is often an effective means of obtaining suitable work in areas of labour shortage, but not in areas of high unemployment with little light industry, where prevalence of disability is also high. Of our 45 registered disabled between 35 and 64, 18 were in employment, 15 were unemployed, and 12 were certified as long-term sick and unfit for any work. In most cases such certification reflects the availability of suitable work, and to this extent conceals unemployment; general practitioners in areas like ours are familiar with requests from employment exchanges that a man be certified as unfit for work where there appears to be no reasonable prospect of finding suitable work for him.

Under the Disabled Persons Act of 1944, employers of 20 people or more are legally obliged to employ the registered disabled as 3 per cent of their work force. As 14 per cent of our men of working age were registered as disabled, and 33 per cent were clinically disabled, the terms of the Act clearly bear no relation to reality in areas like ours. The real advantage of registration is that the DPRO is then involved and may help selected cases a great deal, though not always by use of the Act: most workers regard the 'green card' as a handicap rather than a help in obtaining a job, as a last resort to be used seldom and concealed often. The Act would be of much greater value if, as Williams⁸ has suggested, the industries with high rates of injury and disease "had an obligation to provide their casualties with suitable work, and were only to be excused from it on satisfying the local Disabled Persons Advisory Committee or some such body that it was not possible . . . it might be found that this was a powerful incentive to prevent the diseases and accidents occurring at all". Some large industries, particularly the nationalized ones, have good records in honouring this obligation, at least in respect of major injuries, though for dermatitis the record is uniformly shameful. Paradoxically, the National Coal Board's responsible attitude in the past has created a particularly serious problem now where pits have closed, and large numbers of disabled men have suddenly been thrown on the market. The position is not improved by a few modern firms whose pre-employment medical examinations exclude men with disabilities irrelevant to the work they are offered; such cases are not rare. In areas like ours, which already have DPRO's and industrial rehabilitation units doing splendid work, and yet still present this miserable picture, it is clear that new industry must be introduced into the valley communities on a large scale, or transport to shift work elsewhere must be greatly improved. It should also be noted that as our most dangerous national industry runs down, its runner-up, the constructional engineering industry, is rapidly expanding. This industry produces large numbers of seriously injured men whom it will not re-employ, and the shifting and transient nature of its contracts permits it to evade even the inadequate provisions of the Act. Here again is a problem highlighted by the coal mining industry, but not unique to it, and that will not solve itself.

An additional factor in this situation is demoralization. Whatever the initial cause of long-term absence from work, and with even the best initial personality, there is

often a final common pathway of passivity. Specialists who have not known a man before an illness or an accident having this result, seem often not to realize the change that has come about, and assume that a weak personality was always present. Unemployment at this ultimate stage, common after 18 months of continuous absence from work, can be interpreted as voluntary or at least acquiescent. This interpretation has the sometimes irresistible attraction of blaming the unfortunate for their misfortune, while reinforcing the confidence of everyone else concerned in their own toughness and infallibility. It is a defeatist attitude, which we must overcome if we are to make any progress. The disabled man may be additionally discouraged by high levels of unemployment among the healthy, which tend to make all of us aim much lower in our efforts to rehabilitate the severely disabled, particularly those with disabilities that have not started with an injury.

In 1969 I went through the records of all the men aged 20–64 in our village who were on my list, and identified all those with industrial injuries leading to continuous absence from work of 14 days or more, during the eight years I had been in the practice. There were 2,989 man-years at risk, from January 1962 to September 1969. During this time there were two fatal industrial accidents, both in coal mines. Twenty-eight men were absent from work for more than 14 days, 23 for more than 3 months, 18 for more than 4 months, 12 for more than 5 months, 10 for more than 6 months, 8 for more than 7 months, 6 for more than 8 months, and 5 for more than 12 months. Of the last, 3 are still unemployed at the time of writing, and a careful review of these 5 out for more than 12 months showed serious problems of communication between general practitioner and hospital, of delay and administrative fumbling in shifting the patient from treatment to rehabilitation, and from rehabilitation to employment. Much delay was occasioned by the haggling of industrial injury tribunals (there were no common law cases), and interminable indecision about release from or re-employment in the coal industry, often involving redundancy payments. Months go by in these cases, in which almost nothing appears to be happening, and it is often not clear who, if anyone, is responsible for taking any decision. Two obvious conclusions can be drawn from any collection of cases of this sort: that we must help men to participate in decisions about themselves at every stage from the time of an accident, which means permitting and encouraging them to ask us questions and to insist upon reasonable answers; and that any man out for more than 12 months (at most) really needs a case conference, which must include someone who knew him well before his accident. In practice, neither of these lessons is generally accepted despite any amount of lip service.

These were the new cases that occurred in eight years; serious injuries with chronic disability accumulated before this time, and who have remained in the village among the same group of 435 men, were one case each of amputated foot, avulsion of the arm and shoulder, fibrous union of fractured femoral shaft, fractured pelvis with urethral stricture, extensive full-thickness burns of the face and hands, and fractured spine with paraplegia.

In 1969 the secretaries of the six district hospitals serving the Glamorgan valleys supplied me with the figures on outpatient waiting-lists for their orthopaedic departments for one month (five for June, one for April). These showed a total of 1,340 patients in the one cohort; assuming that half of them had been seen halfway through the maximum waiting time, they waited a mean 10·5 weeks to be seen. For my own district hospital the mean waiting time calculated on this basis was 12 weeks. At the time there was no access for general practitioners to the x-ray department, because of an unfilled vacancy for a consultant radiologist. It is true that most injuries will be referred to a casualty department and there will then be no referral delay; but a great deal of industrial orthopaedics does not arise immediately from acute injuries, and is referred for specialist advice like any other chronic illness. Orthopaedic departments are overworked and

understaffed at consultant level. Considering the financial losses involved in delayed return to work, economy in the employment of orthopaedic consultants and ancillary staff is madness. As, for many years, we exported senior orthopaedic registrars who could not obtain consultant posts here, any present shortage of applicants is difficult to justify.

The hospital secretaries also reported the number of social workers employed in their hospitals: three, including my own, had no social workers, one had a part-time untrained social worker, one had a full-time untrained social worker, and one had three trained workers, two full-time and one part-time. At least one of the hospitals had stopped advertising for social workers as there were no applicants.

Certification and consultation rates of miners

The special enquiry of the Ministry of Pensions and National Insurance on the incidence of incapacity for work⁴ gave valuable data on the social and geographical distribution of morbidity, relevant parts of which are shown in table X. Of the South

TABLE X

NUMBER OF MEN RECORDING AT LEAST ONE SPELL OF INCAPACITY FOR WORK IN THE YEAR 1961-62 PER 100 SAMPLED (INCEPTION RATES): AND AVERAGE NUMBER OF DAYS OF INCAPACITY RECORDED PER 100 SAMPLED, ALL AGES TO 63, ALL RATES STANDARDIZED FOR AGE: VARIOUS REGIONS AND OCCUPATIONS

	<i>Inception rates</i>		<i>Days of incapacity</i>	
	<i>Rate</i>	<i>Ratio to Great Britain</i>	<i>Rate</i>	<i>Ratio to Great Britain</i>
Great Britain	28.13	100	885	100
Southern England	24.75	88	683	77
South East Wales	37.89	135	1,400	158
Rhondda	50.74	180	2,072	234
All miners and quarrymen, Great Britain	51.19	182	1,925	217

From Enquiry into the incidence of incapacity for work, Ministry of Pensions and National Insurance, 1965.

Wales valleys only the Rhondda was separately reported, but this is typical; inception rates for incapacity were 180 per cent of expected rates, and average days of incapacity 234 per cent (the highest in Britain). Taken in conjunction with mortality, these figures are not surprising; their interpretation without regard to mortality is difficult, if not impossible. Certification of incapacity for work and its relation to workload in a mining practice in the Thorne Rural District of the South Yorkshire coalfield has been analysed by Rider and others⁵ and by Lunn and others.^{6,7} The pattern they describe is similar to that found in the South Wales valleys, but they do not relate their findings to local mortality rates or to occupational mortality. The arithmetic mean standardized mortality from all causes for 1963-68 for the Thorne Rural District was 113 per cent of the England and Wales rate: arithmetic mean infant mortality was 27.3 per 1,000 live births, 142 per cent of the England and Wales rate for the same period (Registrar General's annual reports).

Though these rates do not exceed expectation so much as ours, they show the need for caution in discounting consultation rates that involve much certification, as being unrelated to real illness. Certainly the clinical situation of the "certificate only" consultation involves a minimum of diagnosis or treatment; neither is expected by either doctor or patient. Such administrative consultations may supplement or displace clinical consultations; the task of transforming them so that they acquire real clinical

content is the central problem of general practice in the older industrial areas. I know from experience that this can be achieved only by great effort over several years, and that the first condition for this is to recognize the real disease and unhappiness that is concealed by the traditional style of consultation, and the low level of patient-expectation that accompanies it. The studies from Thorne do not seem fully to recognize this. For example, they report a rate of 156 consultations per 100 patients per year for lower respiratory infections in men aged 45-64, compared with 45 for women. They conclude from this that "It is unlikely that the morbidity pattern for lower respiratory infections differs to this extent between males and females, and the pattern for females is far more believable when the nature of the illnesses is considered. It seems, therefore, that once again this measure of workload in the males may be influenced by sickness certification".⁷ Of course it is influenced by certification; but is it not influenced far more by the fact that "lower respiratory tract infections in males" consist largely of acute and chronic bronchitis in men and are not distributed between men and women as infectious disease, but as disability of multifactorial causation with a large occupation component? My own experience in an area of similar social composition is that morbidity from bronchitis is much greater in men than in women. The Thorne figures may understate the true difference, for the difference between death rates in men and in women from bronchitis is even greater. Using unpublished data supplied by the Registrar-General's office, giving deaths by cause and 5-year age groups for men and for women in the Glamorgan valleys for 1963-67, I have calculated the ratio of male to female death rates for bronchitis for the age-group 35-64; few deaths occurred in either sex below age 45, so these mortality rates can be reasonably compared with the Thorne morbidity rates: 573 deaths were registered from a mean annual population of 88,761 men, and 74 among a mean annual population of 95,630 women. This gives a male : female ratio of bronchitis death rates of 8 : 1, compared with a male : female ratio of bronchitis consultation rates for the Thorne Rural District of 3 : 1. There may well be important differences between patterns of morbidity and mortality in South Wales and those in the South Yorkshire coalfield, but they are unlikely to be large enough to justify Rider and others' assumptions.

Williams⁸, in a study of 68 practices in South Wales including 11 mining practices and 18 industrial practices that included mining, found mean annual consultation rates per patient per year for all causes of 6.4 for mining, 5.7 for industrial including mining, 4.9 for urban residential, and 5.4 for all practices studied. He concluded that there was "little doubt that the regional differences in consultation rates are due to greater prevalence of serious illness in South Wales, and this is particularly true for respiratory diseases". The first national morbidity survey of the College of General Practitioners reported by Logan and Cushion⁹ in 1960 showed no systematic social gradients in consultation rates from all causes, but the rate for miners was 124 per cent of expectation; their rate for bronchitis was 210 per cent, for arthritis and rheumatism 309 per cent, and for purely administrative consultations 308 per cent of expectation.

It is important to know whether miners are more or less likely to complain about a given level of disability than other occupational groups. I know of only one attempt to measure this variable objectively. Lawrence and Aitken-Swan¹⁰ studied 1,742 miners, 499 engineering manual workers, 204 male office workers, 299 non-miners in mining families, and 929 randomly sampled men from Leigh, near Manchester; and 1,935 women from miners' families, and 822 from non-mining families. Ninety-eight per cent of the sampled groups were interviewed regarding symptoms of joint pains, muscular pain, and pains in the back, and loss of working time because of these. They found the gross incidence of complaint no greater in miners than in the other male groups, but they lost more working time, and there was evidence of onset of symptoms in miners at earlier ages, particularly of back pain in the fourth decade. The miners' families

had, at all ages, fewer complaints than other families. Kellgren and Lawrence¹¹ in a companion study examined 94 miners, 47 engineering manual workers, and 47 male office staff, randomly sampled from the same groups. They carried out a radiological skeletal survey, a clinical assessment for arthritis, and psychometric tests of emotional stability; the latter were reported in detail by Heron and Braithwaite.¹² They concluded that the increased loss of working time in miners from rheumatic complaints

“ . . . might have been simply due to the more arduous nature of the miners' work, but the present x-ray study has shown that miners do in fact have more advanced pathological changes in the joints, and that the complaint rate and disability in relation to these radiological changes is much the same in the miners as in the manual and office workers. Thus the miner with a given degree of x-ray change, in spite of the arduous nature of his work, appears to be no more disabled or complaining than the more favourably placed office or manual worker.”

Comparison between scores for subjective complaints of pain with the results of psychometric tests showed no significant association between these. Heron and Braithwaite did find evidence of more emotional instability in coalface workers than in surface workers, which they thought might be due to selection (unlikely, I think) or to the danger of their work. Certainly an important component of coalface absenteeism is fear of real danger, seen particularly after a fatal accident or a narrow escape from such an accident; this is usually presented to the general practitioner in some more respectable form. The relative deficiency of rheumatic complaints in miners' families compared with the other families was interpreted as a raised threshold of complaint, in reaction to the presence in the family of a member with more severe pain, doing dangerous and arduous work.

These observations are formidable evidence that medically-certified absenteeism in miners is related to real disability, however complex that relation may be. Lawrence and others' conclusions agree with my own experience of mining practice, though clearly there are demoralized men who inflate consultation rates, as there are also stoics who deflate them. By and large the demoralized are a much smaller group than the stoics, though more obtrusive to their doctors, and the working conditions tolerated by many middle-aged miners in poor health are to me more astonishing than the number of men who capitulate to them. An advantage of living and working in a small community is that one has many forms of contact with patients outside the clinical setting, and access to a rich variety of sources of information. The lesson from this is that attitudes to work need to be evaluated with more caution and local knowledge than is usually possible. It is necessary to observe men over several years before making more than tentative judgements, and even then these can never be final; I have known several who for two or three years seldom worked more than a week or two without losing time for some trivial complaint, but later became regular workers. Such changes often occur when a miner leaves the industry for another less dangerous occupation, when a wife matures and ceases to manipulate her husband, or for many other reasons which we seldom discover. It is easier for a doctor to frustrate such progress by a punitive and hostile attitude, than to initiate it by any positive steps, and this is likely to remain so until we face up to the real motivations for work in our society.

Conclusion

The weight of the evidence favours the view that the excessive mortality of miners is matched by excessive morbidity, and that the high consultation and certification rates of miners are associated with real illness to the same extent as in other occupations. It is likely that this is also true of other class, occupational and geographical differences in mortality and consultation rates; they probably represent real differences in sickness, despite the many and complex intervening variables. These require study, but are not the main substance of the problem.

The health of mining and probably of other residual industrial populations is getting

worse relative to that of the nation as a whole. Most of this probably arises from differences in earnings, housing, education and social amenity, rather than access to medical care. The problems of industrial and consequent social decay, like the parallel problem of urban slums, are a hitherto permanent feature of our society, and as the pace of technological change accelerates in an essentially unplanned economy without agreed social objectives, they may become relatively worse than they are. With industrial and social decline goes increasing difficulty in recruiting staff to the social services that are more than ever necessary, and selective out-migration that concentrates medical and social problems precisely in those areas least able to cope with them. The coal industry will not be the last to reduce manpower, casting middle-aged men to the periphery of life and leaving whole communities unused. The new housing which alone would permit an appropriate redistribution of population to growth areas is not being built, nor is it in the interests of our country that our communities with their valuable traditions of mutual help and humanity should be dispersed. The delivery of improving standards of medical care to them will continue to be necessary for the foreseeable future. In the absence of planned redistribution of new industry, the gap between the health of mining communities and the rest of the population is likely to widen.

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