

Socio-economic factors and mortality in Switzerland¹

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Socio-economic differences in mortality have been observed in many countries, with lower socio-economic strata consistently showing higher mortality. In fact, the impression one gets from the literature is that such differences manifest themselves wherever one cares to investigate the possibility^{1–6}. We also know from studies in England and Wales that mortality differences are fairly stable over long periods of time. This is not to say that there are no changes. However, socio-economic differences in mortality tend to change slowly with time, much more slowly than the general level of mortality has changed over the past 150 years. In addition, individual differences between countries can be observed. There remain, however, considerable difficulties with comparisons between epochs and countries: the basic data available may not be comparable; concepts and definitions of socio-economic groups may vary, and the choice of a suitable overall measure of differential mortality poses further problems⁷. With regard to the latter, it is not easy to decide, for example, whether the socio-economic mortality gradient is growing when the size of the lowest social class is shrinking with time, but its relative mortality is increasing.

Which aspects of socio-economic differences are being investigated today? In almost every Western country we have definitions of *socio-economic strata*, *social classes* or *socio-economic groups*. While these definitions are not identical, they all convey the idea of a population subdivided by reference to its economic activities, affluence and social position. Historically, *three dimensions* have been used to measure socio-economic position: *income*, *occupation and position* within the occupation, and *education*. For the analysis of the Swiss mortality data, we can only rely on occupation and position at the moment. With the availability of record linkage, the other two dimensions may soon be added to the range of options. Further characteristics such as home or car ownership have been used to discuss even finer subdivisions in England recently^{8,9}.

Some other primarily *social factors* affecting health and mortality include *marital status* (single mothers

and their children) and *nationality* (migrants, foreign workers, refugees), as well as membership of some marginal group like the unemployed, drug addicts, prisoners etc. These factors will only be touched on in this presentation but they must not be forgotten.

Since analyses by income are hardly possible at the moment, the one *economic dimension* available is *occupation* and position within occupation. Some results regarding occupations and cancer mortality will be presented, too.

The choice of a socio-economic classification for a population rests on three arguments:

- data availability
- data quality, and hence reliability of classification
- distribution in the population

The classifications to be presented all rely on available data and have been checked for data quality as well as for population distribution.

Socio-economic situation and mortality

Socio-economic groups and social classes

General remarks. Building on a sociological analysis of Swiss society, a subdivision of the Swiss male population into *socio-economic groups* was made¹⁰. These socio-economic groups rely on occupation and position in the occupation and can serve as the basis of an *emulation* of the (*British*) Registrar General's Social Classes which is given in Table 1. Both socio-economic groups and Social Classes were investigated with regard to their reliability¹⁰, and both were found to be usable, with the exception of a few small subgroups. If these socio-economic classifications are applied to death certificates and to census forms, numbers of deaths and of person-years at risk may be compiled for each socio-economic group or Social Class, and hence the relative mortality of each socio-economic group may be determined.

Why did we choose to emulate the Registrar General's Social Classes? This classification is well tested and has proven useful. It can be realized quite reliably for Switzerland, and it gives some measure of comparability with external studies.

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Tab. 1. Percentage of Swiss and foreign nationals in social classes I to IV/V (Switzerland, 1980).

Social class	No.	Swiss nationals	Foreign nationals
I (professional)	43 994	90.3 %	9.7 %
II (middle class)	532 676	88.3 %	11.7 %
III NM (skilled non-manual)	344 737	90.2 %	9.8 %
III M (skilled manual)	464 868	76.0 %	24.0 %
IV/V (semi- and unskilled manual workers)	747 282	59.5 %	40.5 %
	(including seasonal workers)		
LW (farmers)		—	—

Census data obtained from Federal Bureau of Statistics combined with data obtained from Central Registry of Foreign Nationals (excluding 110 122 in agriculture and 153 685 without social class assignment).

Egger, Minder, Smith, 1990.

Perinatal mortality. Applying the Social Classes to a linked data set of births and deaths in the first year of life, Bodenmann et al.¹¹ obtained the following result with regard to total *perinatal mortality* (Figure 1): increasing mortality with decreasing Social Class. Perinatal mortality of the lowest Social Class is about 36% higher than the mortality of the highest Class. For the unclassified births, the situation is even worse. This result is based on a linked data set, hence there is little possibility of bias (in particular, no numerator-denominator bias). Together with the reliability investigations¹⁰ one can conclude that the Social Class definitions are reliable.

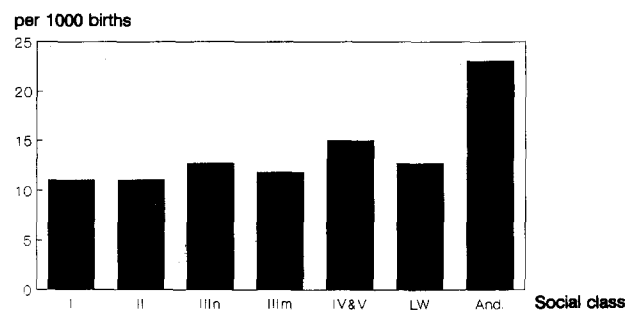


Fig. 1. Perinatal mortality by social class. Source¹¹.

Adult male mortality. Applying the same Social Class system to *adult men of Swiss nationality*¹² resulted in the following picture for total mortality: Figure 2. This result is startling in so far as the *gradient is broken*: Class III m exhibited the highest mortality, while the lower Classes IV & V again showed about average mortality. This can hardly be an artifact, as the previous analyses of reliability and of perinatal mortality have shown. Furthermore, the feature is present also in the finer subdivision into socio-economic groups¹². Possibilities of a numerator-denominator bias exist as there was a comparison of two unlinked data-sets: number of deaths, originating from death certificates; and number at risk, from the census. However, a small linked data set of deaths from 1981 with corresponding census records from 1980 permitted the calculation of correction factors and hence a statistical correction of the effect of misclassification¹⁰. Thus any remaining bias from different definitions in numerator and denominator should be small.

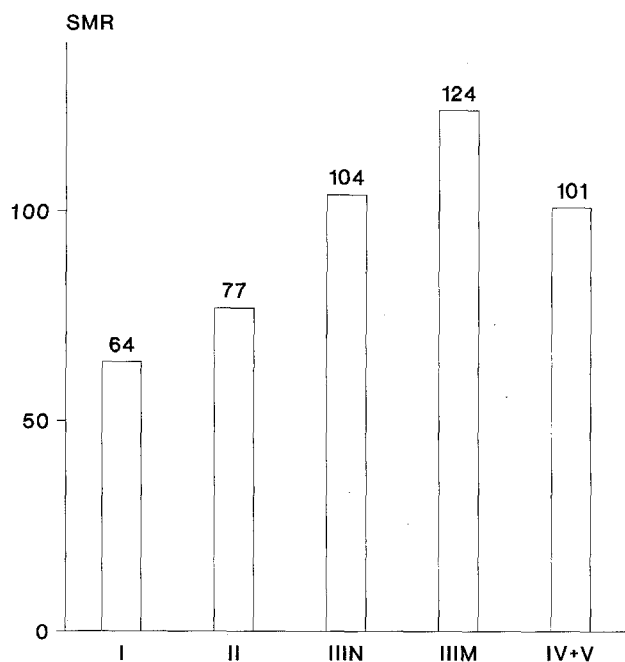


Fig. 2. SMR by social class: Total mortality Switzerland, 1979–82, men aged 15–74. Source¹².

Moreover, a similar picture is projected when looking at broad *groups of causes* of death: neoplasms, cardiovascular disease and motor vehicle accidents (Figures 3–5). Each of these causes of death showed a broken trend in mortality. Taking all the evidence together, the broken trend must be considered real. How then can one explain this

observed anomaly of the Swiss situation, if it is not an artifact? For social reasons, it is likely that foreign workers bear a sizeable part of the burden of socio-economic health inequalities. Switzerland has a large seasonal foreign work force. For methodical reasons this group is excluded in the analyses

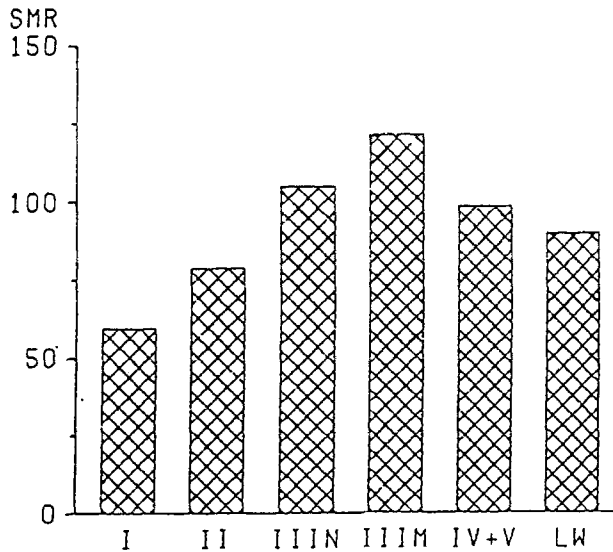


Fig. 3. SMR by social class: All neoplasms Switzerland, 1979–82, men aged 15–74. Source: Minder Ch. E., Beer V. NF-Projekt „Beruf & Sterblichkeit. ISPM Bern, 1987.

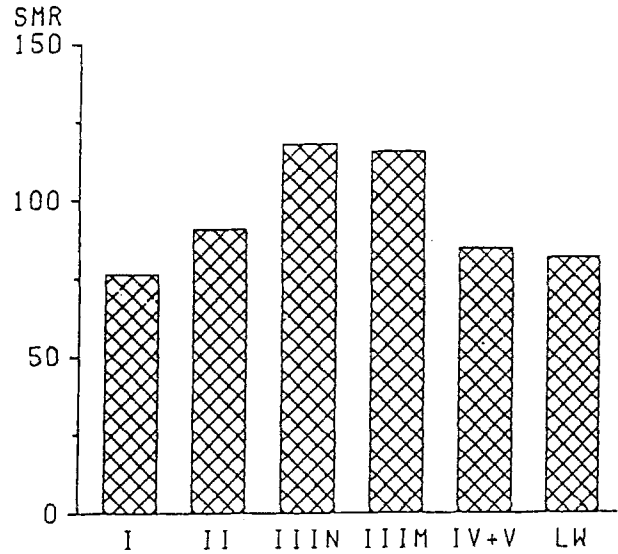


Fig. 4. SMR by social class: Ischemic cardiopathies (ICD-8: 410–429), Switzerland, 1979–82, men aged 15–74. Source: Minder Ch. E., Beer V. NF-Projekt „Beruf & Sterblichkeit. ISPM Bern, 1987.

Cases per million person-years

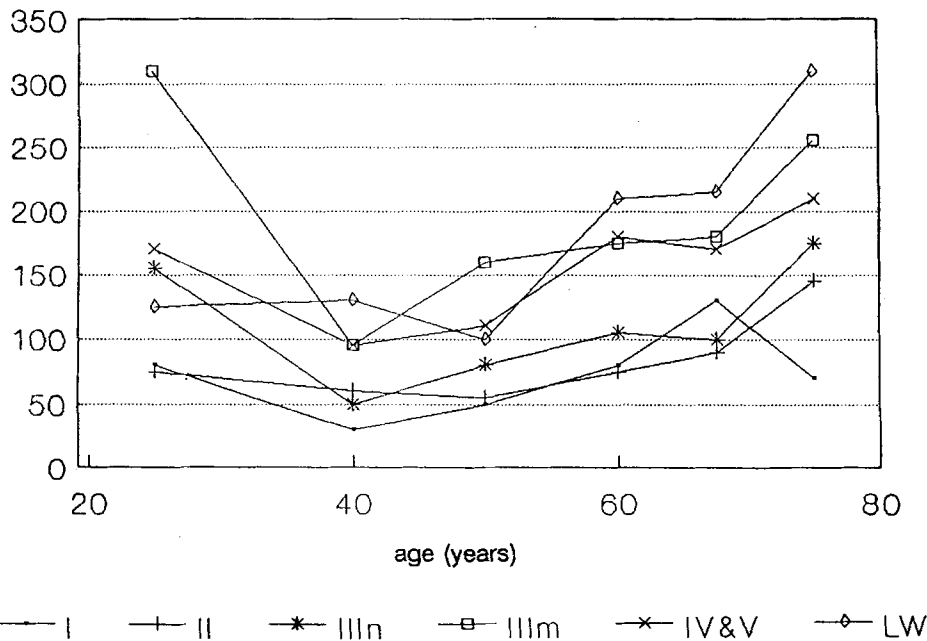


Fig. 5. Traffic accidents by age and social class. Source: Minder Ch. E., Beer V. NF-Projekt „Beruf & Sterblichkeit. ISPM Bern, 1987.

presented in Figures 2–5. Unfortunately, we know of no reliable way of assessing the mortality experience of the seasonal foreign workers in Switzerland. However, it was natural to investigate the percentage of foreigners belonging to each Social Class¹³: Classes IV & V had a much larger fraction of foreigners (40%) than the other Classes (Table 1). Thus, one possible explanation is that by analysing the data on Swiss nationals only, we missed out on an important mortality gradient. Reliable analysis of the data on foreigners is possible for accidents, as accident insurance covers all workers in Switzerland

regardless of nationality. Foreigners, who make up almost half of the lowest Social Class, have an accident risk almost one and a half times higher than their Swiss counterparts¹⁴. While we have no data on other causes of morbidity or death at present, it is not unlikely that the situation is rather similar for other causes. Thus, our presently favoured explanation is that the abnormal Swiss situation reflects the restriction of our analysis to Swiss nationals. To put it in another way, the Swiss nationals in Social Class IV & V make up the upper stratum of this Social Class. The lower stratum,

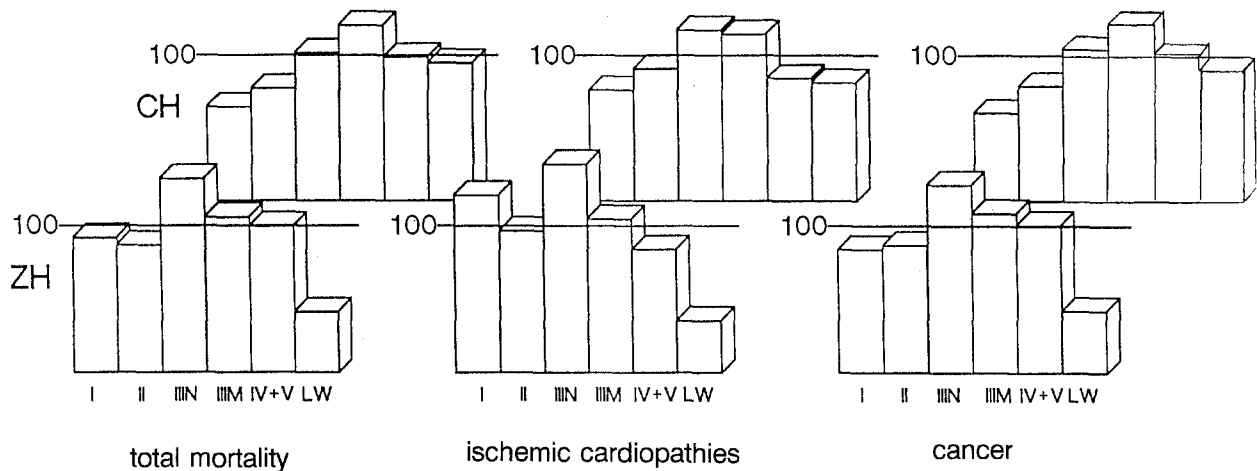


Fig. 6. SMR by social class: Comparison canton of Zurich – Switzerland, men aged 15–75, 1979–82. Source: Minder Ch. E., Beer V. NF-Projekt „Beruf & Sterblichkeit. ISPM Bern, 1987.

with a considerably higher mortality, is made up of foreign workers.

There are other possible explanations which may not be discounted entirely. The occupations based on an apprenticeship and leading to an industrial worker's job made up a large portion of the Swiss economic base in 1980. It is this group which was, at the time, most crucially involved in generating the economic product. The number of jobs in the industrial sector was declining steadily in the 1960s and 1970s. Thus the Social Class of manual workers was under greatest pressure on account of job demands and job insecurity. This point of view is supported by an analysis of data from the *canton of Zurich* where Class IIIIn has the highest mortality. The canton of Zurich is Switzerland's economically most advanced and draws its economic strength mostly from a well-educated base of IIIIn-workers. This group has to bear the greatest job pressure and hence shows the highest mortality (Figure 6). This explanation puts more emphasis on the process of economic change and its effects on mortality. There is some recent evidence that changes in economic activity can have profound effects on the mortality of certain socio-economic groups^{15,16}. Which of these views, whether single, combined or complemented by others, provides an explanation of the observed phenomenon, remains to be seen.

Childrens' mortality. For children, only results of lesser reliability are available^{17,18}. Death rates by cause and Social Class for *young people 1–14 years old*, using the number of newborns during the same epoch as a base are given for various causes in Figures 7–10. This is faulty, since for investigating the mortality of e.g. 14 year olds, one would have to determine the exact number at risk for this age group. However, the error incurred by using births of the same epoch rather than birth cohorts is likely to be of minor importance. Again, total mortality from traffic accidents, cancer and congenital mal-

formations showed a socio-economic gradient with a distinctly worse situation for farm children, even with respect to cancer mortality.

Marital status and socio-economic situation

Mortality of adult women. Owing to technical difficulties (on the death certificate of women, there is only the occupation of their husbands if they were married) it is difficult to give a complete, reliable picture of female mortality by socio-economic group. Here, we only treat a special situation which is greatly disturbing.

Mortality of babies of single mothers. A comparison of Figures 11 and 12 shows that the mortality of infants of single mothers was much higher than the mortality of infants of married mothers. Figure 11 shows that within the group of children of single mothers there is a steep gradient of mortality from the well-off to those without occupation or out of work^{17,18}. It is a safe bet that the situation of the single mothers themselves is like that of their offspring. We only have data on morbidity to illustrate this point (Figure 13¹⁹).

Information from another study provides an indication of the complexity of the situation. Table 2 shows the percentage of poor people among men and women by age²⁰. The high percentage of poor women is due to the predominance of widows among old women: these women are poor largely because they have outlived their husbands.

Other determinants; Switzerland and other countries

Obviously, membership of a socio-economic group is an important predictor of mortality in Switzerland, the same as it is in other countries. Apart from socio-economic group and marital status, nationality and residency status can be expected to

Social origin

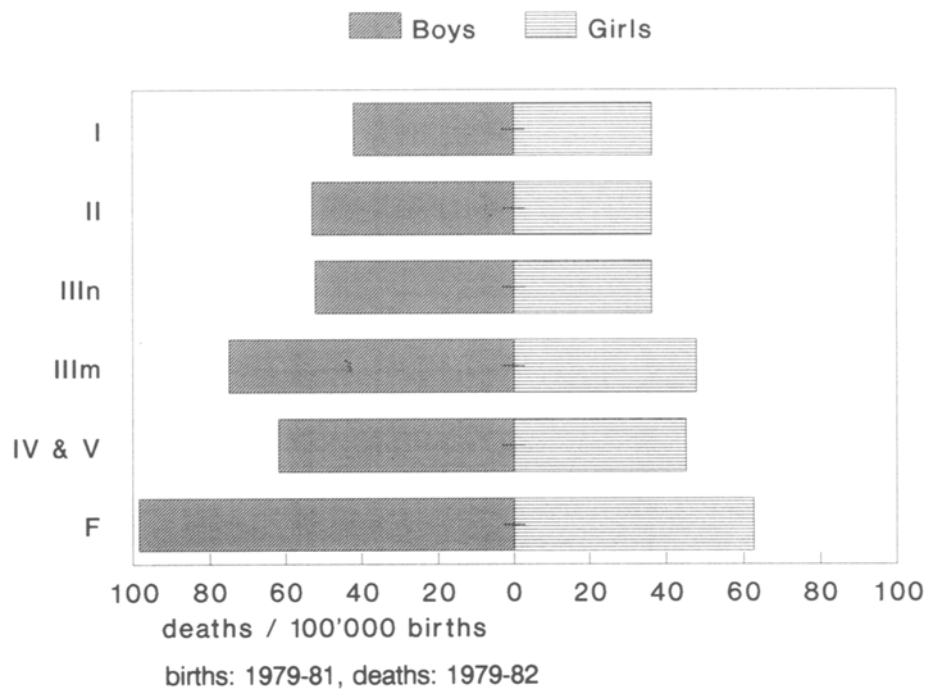


Fig. 7. Annual deaths due to all causes among children aged 1–14. Source¹⁸.

Social origin

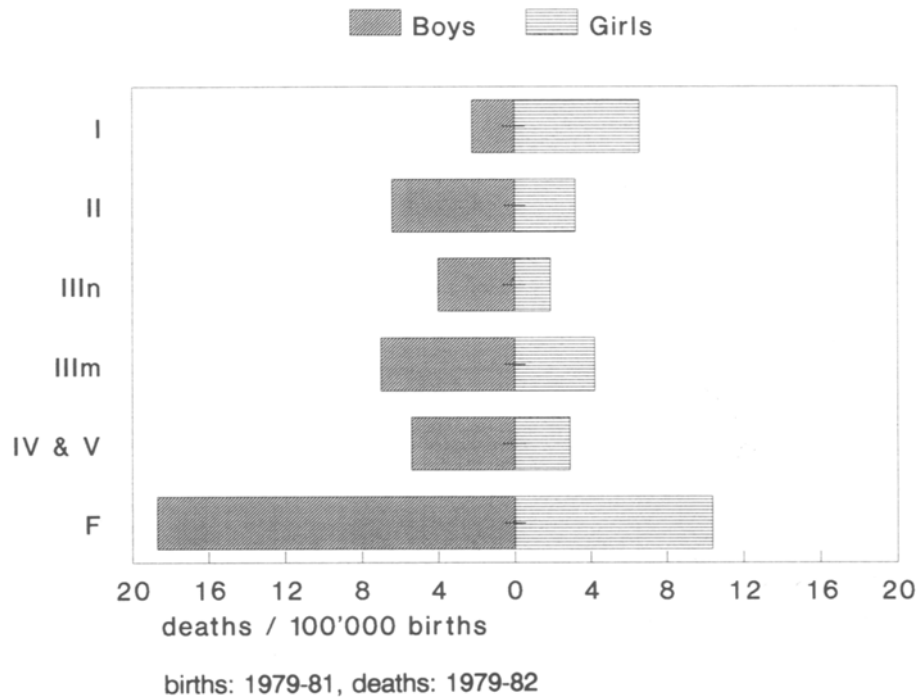


Fig. 8. Deaths due to traffic accidents among children aged 1–14. Source¹⁸.

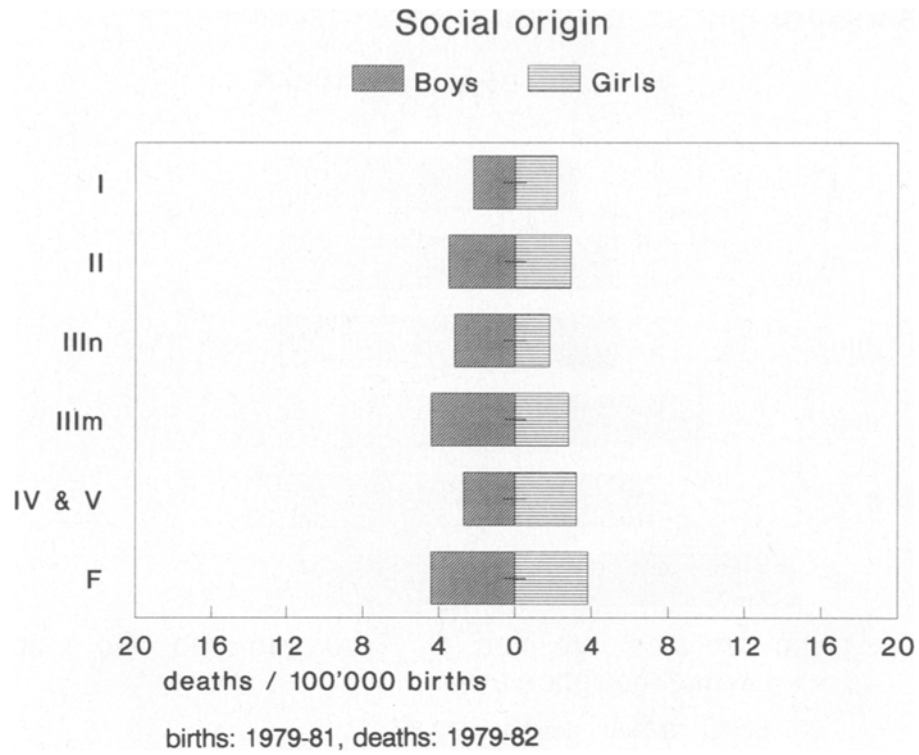


Fig. 9. Annual deaths due to cancer among children aged 1–14.
Source¹⁸.

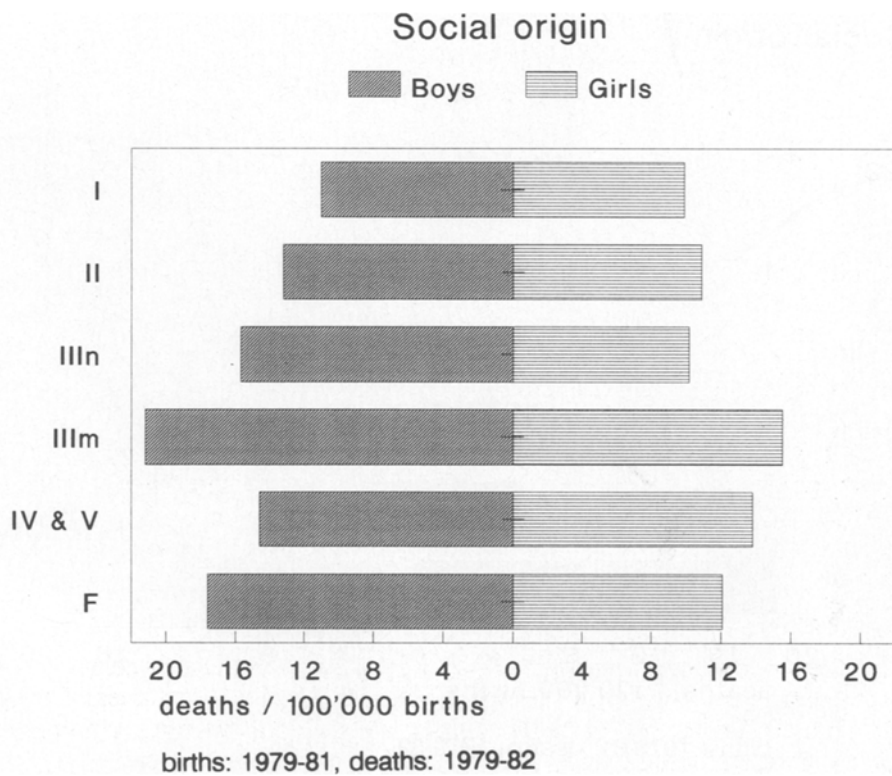


Fig. 10. Congenital malformations. Deaths among children aged 1–14.
Source¹⁸.

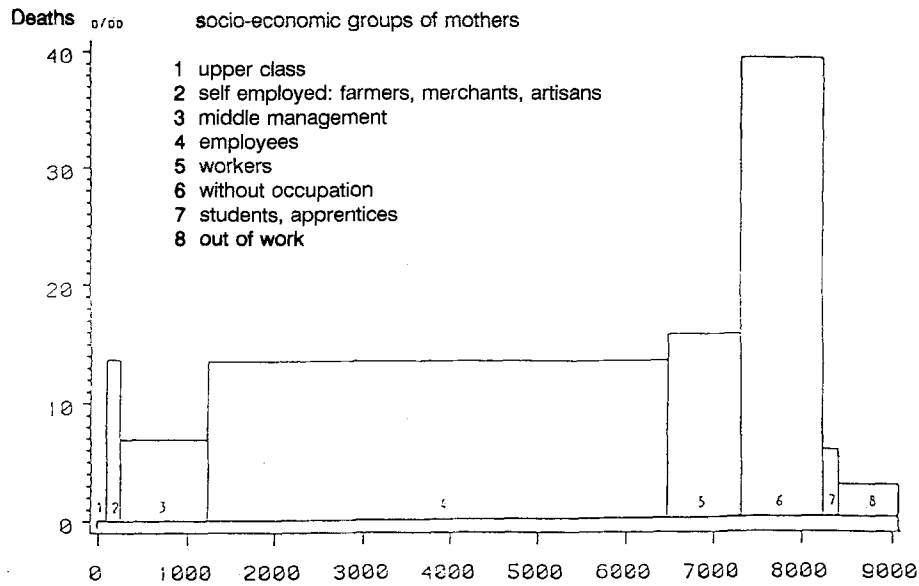


Fig. 11. Infant mortality of unmarried mothers by socio-economic group. Source¹⁸.

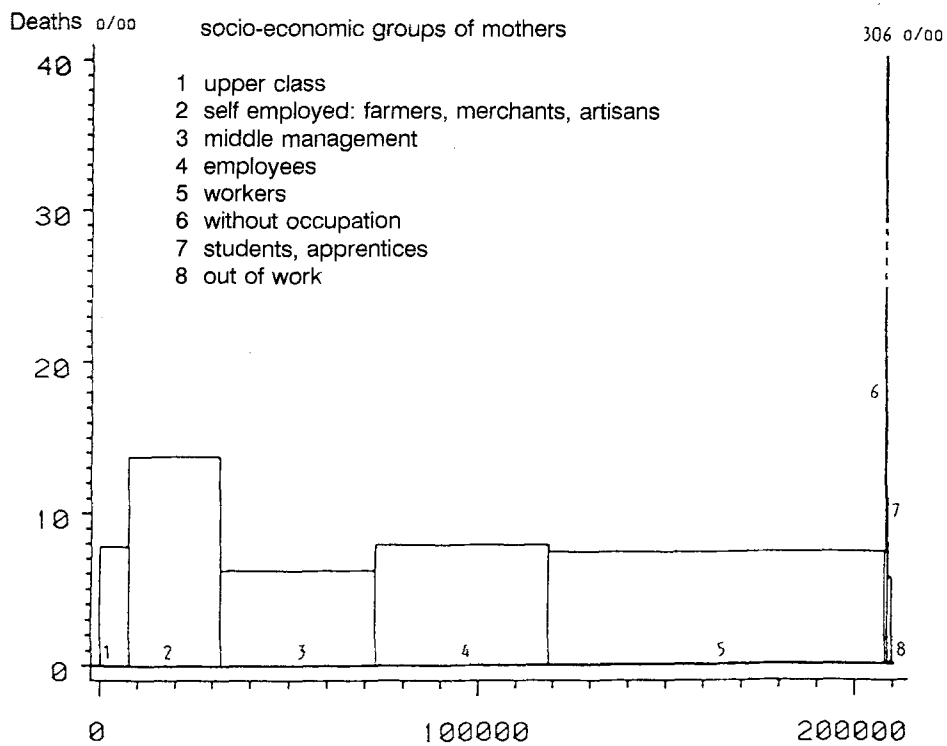


Fig. 12. Infant mortality of married mothers by socio-economic group. Source¹⁸.

influence mortality, with low mortality for the “regular” situation and a higher mortality for any “anomalous” situation. Unfortunately, evidence is largely lacking with regard to these factors.

What is the situation of *Switzerland relative to other countries*? Figure 14 shows a particular representation of the (occupation and position based) socio-economic differences for working men in three countries^{7,21}. We observe that Swiss men showed at least as large a socio-economic mortality gradient as British men. However, the socio-economic mor-

tality gradient among Swedish men was about half that of Swiss and British men. The question of how the situations of women and children compare is open.

The interplay of factors giving rise to the observed differences is probably very complicated. Indeed, social gradients in health pose a vexing problem to social epidemiologists: they are a universal phenomenon, and yet all the explanations that have been put forward so far are of a specific nature and hence do not apply to all observations.

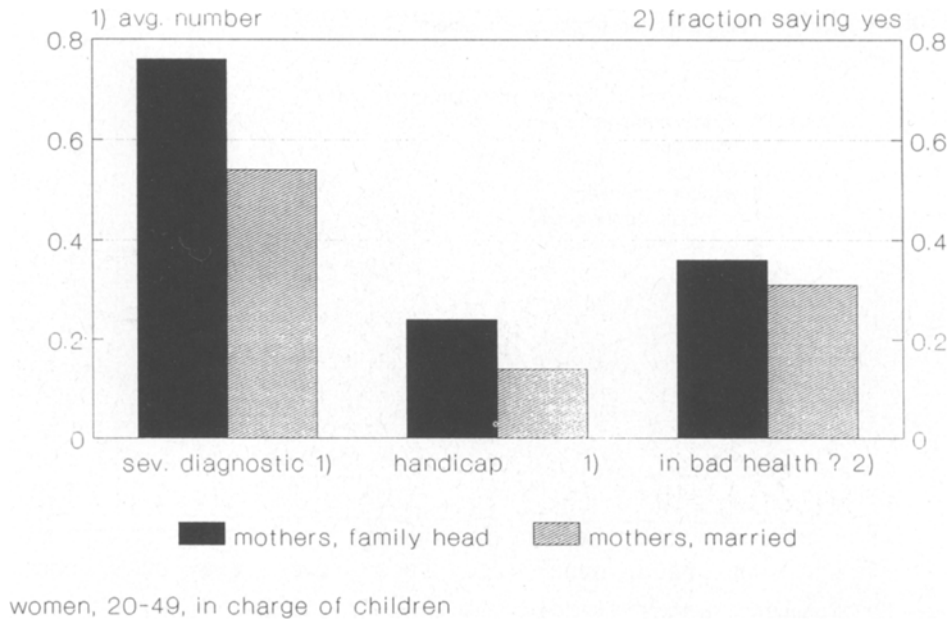


Fig. 13. Health of mothers SOMIPOPS 1981. Source¹⁹.

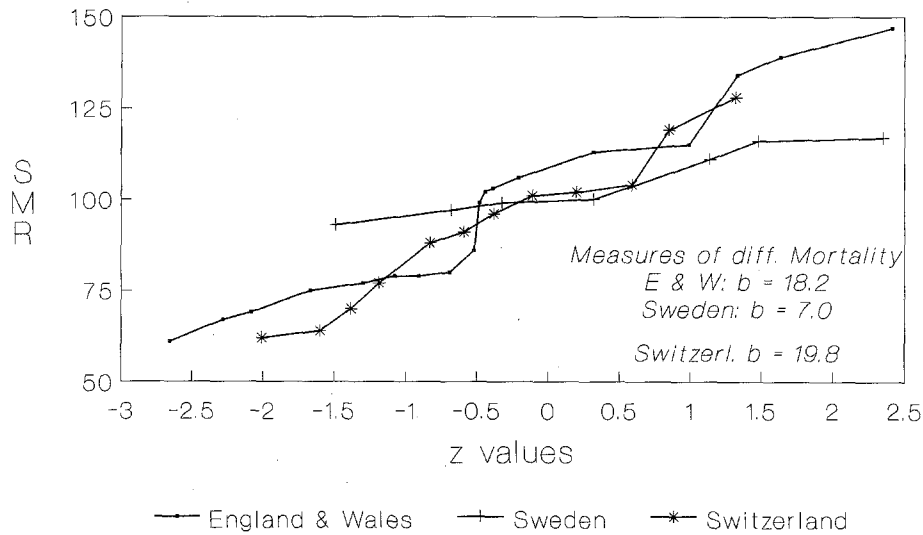
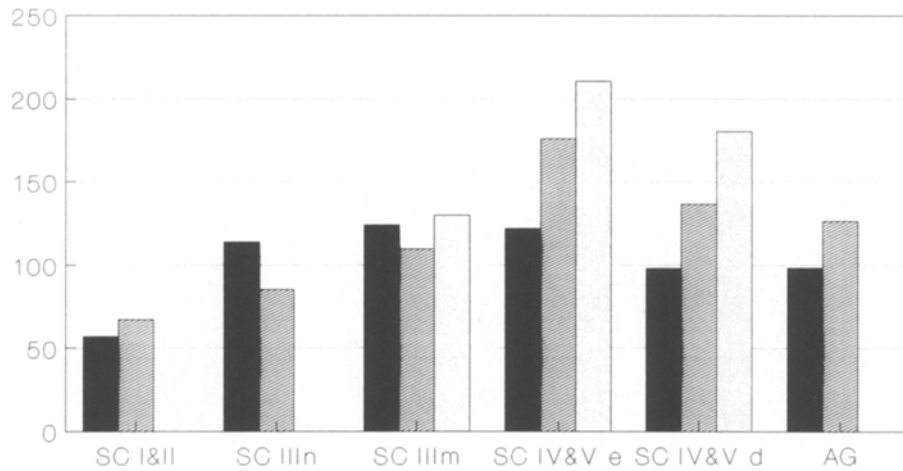


Fig. 14. Graphical comparison of male mortality, England & Wales, Sweden and Switzerland. Source⁷.

Tab. 2. Sample of aged Swiss population ages 65 up, urban and suburban setting.

Index	Age	% of all men in group	% of all women in group
With little means	66–75	21	26
	76–85	14	35
	> 85	16	28
Widowed	all	18	47

Abelin, Schlettwein, 1986.



For identity of occupations, see table 3

Fig. 15. SMRs for selected occupations total mortality, by social class.
Source: Minder Ch. E., Beer V. NF-Projekt „Beruf & Sterblichkeit. ISPM Bern, 1987.

Tab. 3. Corrected and uncorrected SMRs for selected professional groups Swiss males, 1979–82.

	Total	Raw SMR	Corr. factor	Corr. SMR
<i>Group I and II (professionals)</i>				
830 physicians	218	61.8	0.92	56.9
903 primary school teachers	312	75.2	0.89	66.9
<i>Group III n (skilled employees)</i>				
650 commercial employees	4766	102.6	1.11	113.9
730 information ¹	676	76.3	1.12	85.5
<i>Group III m (skilled labourers)</i>				
520 painters, upholsterers	1041	133.5	0.93	124.2
212 bakers	613	114.3	0.96	109.7
485 watch makers	1545	112.1	1.16	130.0
<i>Group IV & V (unskilled employees)</i>				
683 “other” sales personnel ²	1468	125.8	0.97	122.0
754 waiters, stewards, barmen	113	151.7	1.16	176.0*
770 “other” dom. and hotel empl. ³	140	132.4	1.59	210.5
<i>Group IV & V (unskilled labourers)</i>				
787 other cleaning & maintenance	896	68.7	1.43	98.2
790 street sweepers, garbage collectors	47	41.3	3.3	136.6*
514 construction labourers	2014	153.2	1.18	180.5
<i>Group LW (agriculture)</i>				
100 farmers	5351	96.6	1.02	98.5
122 other agricultural workers	1129	129.2	0.98	126.6

¹ Telephone operators, postal workers etc.

² Newspaper vendors, itinerant salesmen, other gros & detail.

³ Hotel auxiliary help, concierges, hotel chauffeurs, other.

* Note: quality of data on certain professions does not allow reliable correction.

Mortality by occupation

Socio-economic groups and occupation

One way of validating a socio-economic classification is to investigate singly the occupations making up certain socio-economic classes. One can gain some insight into the validity of the socio-economic

grouping used from the variability of mortality among these occupations as compared between occupations in different Social Classes. Figure 15 and Table 3 show that, while socio-economic groups predict an important part of mortality, there is still important variability between occupations within the same socio-economic group. Socio-economic groups do not explain all of the variability in

Tab. 4. Cancer categories, major male cancers, Switzerland, 1979–82.

Description	ICD-8-code	Retrieval fractions ¹		Autopsies ² or operations
		RDH	RHD	
Mouth & pharynx	140–149	85	78	57
Esophagus	150	88	93	50
stomach	151	88	90	59
Colon	153	80	88	69
Rectum	154	77	84	69
Pancreas	157	83	93	66
Lung & bronchi	162	91	97	47
Prostate	185	89	97	48
Bladder	188	92	92	63
Leukemia	204–207	94	95	37
Other blood & lymph organs	200–203, 208–209	87	92	53

¹ RDH: retrieval fraction (% found) of principal cause of death certificate in corresponding hospital records; RHD: retrieval fraction of main diagnosis on hospital record in death certificate.

² Percentage of death certificates with autopsy or operations.

Source²².

mortality. This could hardly be expected, since it is well known that certain occupations have, in themselves, some health risks which are not shared by other occupations of similar standing. Thus it is legitimate to investigate mortality by occupation on its own. We have done a series of such investigations, all of them concerned with cancer mortality and occupation.

Cancer mortality by occupation

Data quality, statistical correction

Data validity has to be a prime consideration in a study of mortality by occupation. Great care was taken to validate diagnostic data on the death certificate. Using a linked data set of hospital records and mortality data, we checked how often a *death certificate diagnosis* was also found in the hospital record and vice-versa. Table 4 gives a list of these retrieval fractions. It can be seen that for most cancers, registration on the death certificate is fairly reliable. Furthermore, we investigated diagnostic quality across broad socio-economic groups and regions. There is little variation by socio-economic group and some variation by region, with the Western region showing consistently lower than average agreement of diagnosis between hospital record and death certificate, and the North-Western region consistently higher agreement for most major cancer causes of death. A further concern was the concordance of occupational descriptions on death certificates and census records²². In this regard the picture was mixed. However, we were in a position to separate occupations with a good description from those with a poor description. We have also applied a statistical correction for misclassification on the basis of these investigations. Table 5 gives a list of some occupations with indications of their quality.

Tab. 5. Concordances (C_c , C_d) of occupations.

Code occupation	C_c %	C_d %
<i>Agriculture, forestry</i>		
100 Farmers	80	81
122 Other farming occupations	50	49
<i>Food industry</i>		
212 Bakers	70	68
218 Butchers	54	47
<i>Textile industry</i>		
262 Other textile industry	53	21
<i>Wood working industry</i>		
306 Furniture makers	81	72
<i>Metal industry</i>		
410 Foundry workers	73	35
<i>Building trades</i>		
500 Masons	59	67
520 Painters	82	77
<i>Transport occupations</i>		
700 Railway engine drivers	84	74
703 Professional drivers	40	58
<i>Hostellery & restaurants</i>		
759 Cooks	64	49
<i>Medicine</i>		
830 Physicians	100	92
<i>Teachers & clergy</i>		
900 University professors	20	67
901 Intermediate school teachers	60	77
903 Primary school teachers	89	79
920 Ordained clergymen	64	77

Source²².

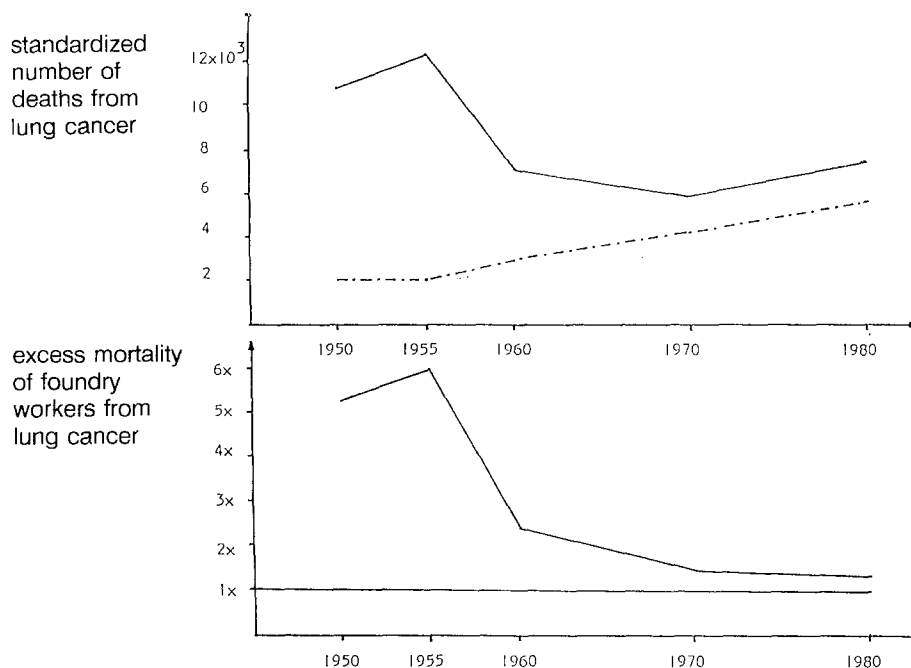


Fig. 16. Time profile of lung cancer mortality: Foundry workers and general male population. Source²⁵.

Some well-known occupational cancers

Based on these quality considerations, the investigation of cancer by occupation was started with some well-known cancers. Our first attempts concerned *sinonasal cancer* with *furniture makers*: furniture maker is a well-coded occupation and sinonasal cancer is a well-known occupational cancer. Essentially the same results hold for Switzerland as those found by Acheson²³ in his initial cohort study, even down to the increased proportion of adenocarcinomas among the sinonasal cancer deaths: 5 out of 9 for Swiss furniture makers compared to about 16% in the general population²⁴.

An investigation of the *lung cancer mortality of foundry workers*²⁵ gave an extremely high proportional lung cancer mortality ratio for foundry workers in the fifties and sixties, decreasing in the seventies but still showing a 1.5-fold excess mortality in 1980 (Figure 16). The age profile of lung cancer deaths in 1980 also suggested an occupational cause for this cancer (Figure 17).

We further investigated *brain cancer* with *chemists*. In this study, adjustment for socio-economic class modifies the picture. Nevertheless, there remains a suspicion that chemists had an excess risk for brain cancer, at least for the period of 1979 to 1982 (unpublished report).

For *painters*, an investigation done in the framework of our study showed excess mortality from cancer of the lungs, pneumonia, bronchitis, emphysema and asthma, cancers of the urinary organs and

diseases of the liver and pancreas, drug dependency, alcoholism and cerebrovascular diseases. While such a picture could arise from the misuse of tobacco and alcohol, it is equally likely to arise from the effects of organic solvents inhaled over prolonged time periods²⁶. The results are in good agreement with the outcome of a cohort study of Geneva painters done by E. Gubéran²⁷.

We found *reduced lung cancer mortality* for *medical doctors, mathematicians, chemists, teachers and clergymen*. It is clear that good information and good health practices play a major role in reducing lung cancer rates. Low smoking rates have been shown for medical doctors²⁸.

We could not confirm *bladder carcinoma risks of chemical workers*²⁹ nor the *purported lung cancer risk of butchers*³⁰. It is likely that chemical workers have been under strict health supervision for a substantial time period and that work hygiene has probably eliminated a once present bladder cancer risk.

What *new evidence for associations* between occupations and cancer did the Swiss mortality data yield? One of our early analyses showed an increased risk for *mesothelioma* for *furniture workers*. We have investigated this in more detail. While it is possible that the risk stems from insulation work involving asbestos, no asbestos fibres could be confirmed for any of the seven deaths (two: no medical records available; two: asbestos exposure excluded in medical record; three: asbestos exposure considered possible, tests for asbestos nega-

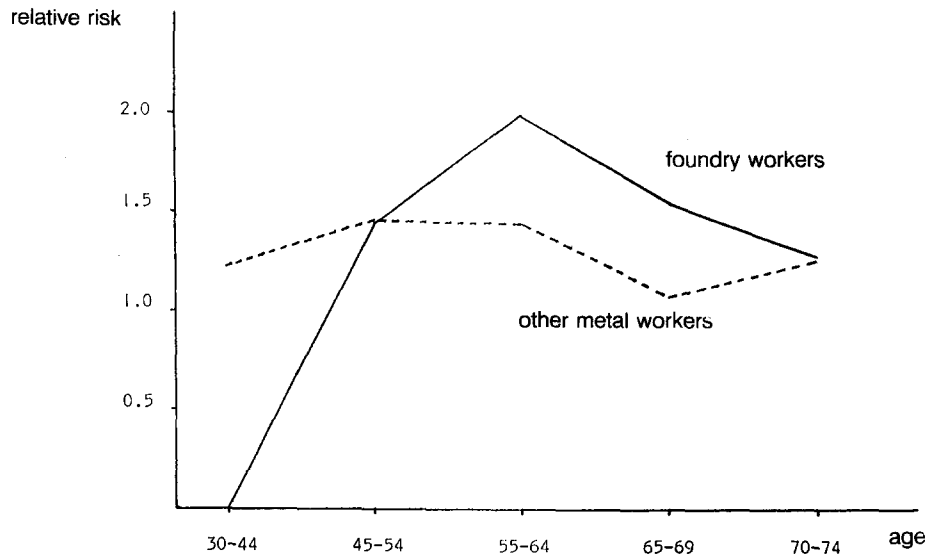


Fig. 17. Age profile of lung cancer mortality: Foundry workers. Source²⁵.

tive). While this is weak evidence, it leaves open the possibility of alternatives to asbestos as causes for mesothelioma³¹.

Based on literature reports on a link between exposure to extremely low frequency electromagnetic fields and leukemia, we decided to investigate the mortality from cancers of the *haematopoietic and lymphatic system* in *locomotive engine drivers*. This broad group of diseases was chosen since leukemia proper is not coded as reliably as the broader group. The investigation of the years 1969–1983 showed that locomotive engine drivers have an excess mortality from these cancers³². As a consequence of this, the Swiss Federal Railways have undertaken a measurement programme for electromagnetic fields in the driver's stand of locomotive engines. At the moment we are conducting a cohort study of locomotive engine drivers, hoping to get a definite answer to this problem.

An investigation of a high relative mortality from *cancers of the mouth and pharynx* in *cooks* has given some indication of a possible occupational exposure³³. We found a greatly elevated mortality from cancer of the tongue and a still elevated risk for other cancers of the mouth & pharynx in the cooks. The age profile, with higher relative mortality at young ages and lower, still excess mortality at higher ages, suggests an occupational cause.

Conclusion

General remarks. This paper has covered two aspects of socio-economic factors and mortality. *Factors related to the structure of society* are at work in generating mortality differences between socio-economic groups and high mortality for children of single mothers, for instance. It is somewhat differ-

ent with *occupational mortality*. There we can see the *effect of production processes and work habits* as well as the consequences of *life habits* of a whole *group of occupations*. Thus, construction workers, for example, show high mortality from cancer of the mouth and pharynx, oesophagus, stomach, liver and gall-bladder and lung & bronchi, independently of the exact occupation in which they are employed²². Such a mortality pattern is probably linked to habits peculiar to this group of workers. It is similar with the low lung cancer mortality of medical doctors, teachers and clergymen. Mortality data will not be sufficient to disentangle these different causal bundles. However, mortality studies can indicate where it is necessary and profitable to conduct more detailed studies. We are trying to exploit these possibilities.

Historical situation. Looking at occupational mortality is by no means new, not even for Switzerland. We have succeeded in dusting off some tables from the late 19th century. Table 6³⁴ gives total mortality by occupation, Table 7³⁴ tuberculosis mortality by occupation. Table 8³⁵ is interesting in that it is based on the underlying idea of socio-economic differentials in mortality. These tables indicate that differential mortality existed at this time and that some occupations have kept their relative position over the last 100 years, while others have changed.

Other work. This article does not give an overview of all work done in Switzerland concerning socio-economic mortality. Rather, it has concentrated on work connected with the Department of Social and Preventive Medicine at the University of Berne.

Tab. 6. Die Gesamtzahl der im Alter von 15 und mehr Jahren Verstorbenen und ihr Verhältnis zur Bevölkerung, unterschieden nach Beruf, während der Zeitperiode 1879–90.

Auf je 10000 Lebende einer Berufsart und einer Altersgruppe kommen im Jahresdurchschnitt Sterbefälle									Berufsart (Die nähere Bezeichnung der Berufsart bezieht sich auf das vollständige Berufsschema in Tab. 16)	
Auf je 10000 Lebende überhaupt	Zurückgelegte Altersjahre								(Spalte 10)	
	15–19	20–29	30–39	40–49	50–59	60–69	70–79	80 oder mehr		
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)		
208,8	46,3	75,3	103,1	155,0	260,6	511,3	1155,8	2412,1	Gestorbene Männer im ganzen	
212,6	32,7	79,6	104,2	196,4	371,0	771,4	1627,0	7083,5	1.	I. A. Berg- und Kohlenbau, Steinbruch u. Salinen
212,0	34,2	54,8	76,0	120,5	215,5	459,7	1263,2	4290,6	2.	B 1 u. 2. Land- und Milchwirtschaft
184,6	37,8	51,9	97,7	145,2	262,3	525,4	1343,5	5757,5	3.	B 3. Gartenbau
185,4	31,6	45,7	79,1	125,7	199,1	436,0	980,4	4955,0	4.	C. Forstwirtschaft
208,4	36,9	56,2	79,1	174,9	375,3	769,9	2522,0	5530,3	5.	II. A 1. Müller
180,7	52,7	67,1	119,9	159,7	338,8	836,3	2703,3	–	6.	A 2. Bäcker
175,0	57,5	100,4	147,8	170,5	397,0	791,7	1617,6	8333,3	7.	A 3. Zuckerbäcker, Chocol.- u. Surrogatfabr.
197,1	32,7	66,0	166,1	239,7	338,3	722,9	1750,7	6730,8	8.	A 5. Metzger und Würster
158,6	35,4	101,8	165,6	239,4	348,2	524,3	3333,4	–	9.	A 6. Bierbrauer
97,3	39,6	45,4	79,4	124,3	249,6	248,2	645,2	2222,3	10.	A 9. Tabak- und Cigarrenfabr.
259,0	77,3	94,2	107,9	175,1	309,6	628,9	1803,2	5138,9	11.	B 1. Schneider
205,9	37,3	79,2	94,2	145,8	295,6	678,0	1806,1	5733,3	12.	B 4. Schuhmacher
185,5	89,8	110,1	187,1	231,2	396,1	707,5	1309,5	5555,3	13.	B 12. Barbier und Haararbeiter
198,9	70,0	73,0	103,1	154,7	315,2	829,4	1525,4	–	14.	C 1. Baumeister und Architekten
176,2	28,7	45,9	89,7	117,6	278,1	671,2	1523,2	8076,9	15.	C 2. Kalk- und Ziegelbrenner
292,5	55,7	79,1	161,6	294,8	443,4	872,6	2320,1	6527,8	16.	C 4. Steinhauer und Marmoristen
238,9	63,7	84,1	118,8	186,2	329,1	699,2	1888,5	6294,1	17.	C 5. Maurer, Gipser u. Handlanger
252,4	46,2	87,6	126,5	211,7	356,6	723,7	2013,0	8518,4	18.	C 7. Dachdecker
125,0	42,0	42,5	67,1	94,9	190,2	342,5	950,6	4861,2	19.	C 9. Säger
254,6	48,3	57,2	95,9	174,9	306,3	691,0	2110,7	7976,2	20.	C 10. Zimmerleute
218,6	55,1	81,1	114,1	179,9	298,7	629,1	1590,2	5323,1	21.	C 12. Schreiner und Glaser
254,2	95,3	125,8	182,3	261,7	482,0	842,5	1972,6	–	22.	C 15. Schlosser
243,4	60,8	130,0	177,7	307,7	461,2	851,9	2195,1	–	23.	C 16. Flach- und Dekorationsmaler
200,4	56,1	81,5	146,2	169,7	333,3	650,6	1605,8	3725,5	24.	C 18. Sattler
233,9	69,7	109,1	117,7	178,9	343,6	871,3	2347,4	9166,5	25.	C 19. Hafner und Ofenfabrikation
169,6	57,1	79,2	116,1	185,5	345,6	633,4	1160,7	5151,5	26.	C 20. Spengler und Lampisten
320,6	25,3	103,1	211,7	239,6	342,7	695,5	1493,5	5102,0	27.	C 25. Küfer und Kübler
159,1	84,4	110,8	126,9	173,9	260,2	740,7	1485,5	–	28.	D 3. Buckdruckerei
169,0	52,0	97,7	124,4	152,6	312,2	603,9	1464,6	8333,3	29.	D 6. Buchbinder
200,4	54,0	72,1	72,0	121,7	241,0	606,8	1740,2	5396,8	30.	E 1, 2, 3 u. 4. Spinnerei, Zwirnerei, Weberei u. dgl.
84,9	53,0	61,3	61,5	121,6	206,5	522,6	1481,5	6000,0	31.	E 5. Stickerei
177,4	38,6	58,7	80,4	137,4	244,9	587,8	2425,8	–	32.	F 1, 2 u. 3. Färberei, Bleicherei, Appretur und Zeugdruckerei
181,7	70,1	107,3	137,7	201,0	310,5	539,5	1361,0	4209,1	33.	G 1. Uhren- u. Uhrwerkzeugfabr.
143,8	58,9	82,0	94,5	140,8	245,7	620,9	1644,1	6309,6	34.	G 3, 4 u. 5. Eisengiesserei, Maschinen- und Mühlenbau
214,8	46,2	73,7	113,3	178,4	350,4	733,5	2122,5	9066,6	35.	G 6. Hammer-, Huf- und Zeugschmiede
202,2	38,0	54,8	78,1	144,3	252,0	628,2	1488,6	5868,0	36.	G 12 u. 13. Wagner u. Waggonfabr., Fabr. hölz. Arbeitswerkzeuge
230,5	81,1	122,8	144,3	205,0	311,5	586,1	1416,3	4884,3	37.	III. A u. B. Handel, Bank-, Agentur- u. Versicherungswesen
245,0	45,7	87,6	172,4	253,5	389,6	601,6	1635,7	5364,6	38.	C 1. Wirtschaftswesen
192,2	51,2	68,8	110,1	162,4	231,2	432,3	1239,1	3480,4	39.	IV. A. Strassen- u. Wasserbau u. Unterhalt
94,2	51,5	59,1	73,1	107,5	193,4	424,4	1082,5	–	40.	B. Eisenbahnbau und -betrieb
174,9	54,4	64,5	109,6	151,6	270,3	603,4	1205,5	2936,5	41.	C. Post, Telegraph und Telephon
286,7	52,6	103,1	172,9	265,7	523,6	1028,2	3249,3	7291,6	42.	D. Expedition, Fuhr- u. Botenwesen
249,8	15,8	83,3	143,7	216,8	376,6	614,9	1327,0	4682,6	43.	V. A 1. Advokaten und Notare
315,8	34,2	72,6	112,4	195,2	350,5	687,8	1664,0	5877,2	44.	A 2 u. 4. Öffentliche Beamte u. Angestellte, Weibel u. dgl.
193,4	156,3	75,0	104,2	124,3	302,9	513,4	1513,8	4743,5	45.	A 3. Polizei u. Strafvollzug
295,8	138,9	89,4	58,6	103,7	221,6	530,9	1370,0	3379,6	46.	C 1 u. 2. Geistliche u. Missionare
188,9	53,9	70,2	81,3	126,9	249,3	647,0	2750,4	–	47.	C 3. Lehrpersonal
214,4	57,1	86,4	119,3	185,4	300,5	548,0	1532,2	4335,8	48.	Alle übrigen nicht gen. Berufe
453,6	338,2	391,9	242,0	224,9	269,0	352,0	621,6	1176,9	49.	VII. A. Rentiers u. Privatiers
191,6	51,6	173,6	290,9	324,5	377,4	366,2	359,5	416,0	50.	B, C, D u. E. Andere Personen ohne Berufe oder ohne Angabe desselben

Tab. 7. Die Sterblichkeit infolge Lungentuberkulose bei Männern im erwerbsfähigen Alter, für einzelne wichtige Berufe, 1879–90.

Berufsart	Wird die Sterblichkeit einer Altersgruppe gleich 100 gesetzt, so beträgt sie für die vorbezeichnete Berufsart			
	20–29	30–39	40–49	50–59
Land- und Milchwirtschaft	48	51	54	64
Forstwirtschaft	28	54	55	52
Eisenbahnbau und -betrieb	49	55	65	72
Strassen- und Wasserbau und Unterhalt	65	76	93	82
Schuhmacher	116	108	112	152
Schneider	154	134	150	161
Schreiner und Glaser	142	140	157	151
Schlosser	194	252	261	354
Küfer und Kübler	146	271	221	173
Flach- und Dekorationsmaler	214	207	249	209
Eisengiesserei, Maschinen- u. Mühlenbau	144	115	130	138
Hammer-, Huf- und Zeugschmiede	108	125	144	150
Uhren- und Uhrwerkzeugfabrikation	206	198	184	168
Handel, Bank-, Agentur- und Versicherungswesen	220	168	152	130
Wirtschaftswesen	164	199	189	158
Post, Telegraph und Telephon	112	134	125	115
Öffentliche Beamte und Angestellte, Weibel u. dgl.	128	131	148	172

Source³⁴.

Tab. 8. Angaben über die sanitärischen Wohnungsverhältnisse der Kranken, welche in den 15 grösseren städtischen Gemeinden an tuberkulösen Krankheiten gestorben sind.

Jahr	Gesamtzahl der Sterbefälle infolge Tuberkulose	Wohnungsverhältnisse							
		günstig	%	ungünstig	%	In einem Spital gestorben	%	nicht angegeben	%
1892	1983	514	25,9	315	15,9	716	36,1	438	22,1
1893	2075	542	26,1	286	13,8	762	36,8	485	23,3
1894	2148	392	18,3	287	13,4	783	36,4	686	31,9
1895	2288	361	15,8	224	9,8	874	38,2	829	36,2
1896	2238	351	15,6	195	8,7	838	37,4	854	38,2
1897	2193	378	17,2	200	9,1	809	36,9	806	36,8
1898	2307	361	15,6	191	8,3	861	37,3	894	38,8
1899	2237	356	15,9	181	8,1	874	39,1	826	36,9
1900	2436	363	14,9	172	7,0	976	40,1	925	38,0
1901	2608	375	14,4	183	7,0	1060	40,6	990	38,0
Total	22 513	3 993	17,8	2 234	9,9	8 553	38,0	7 733	34,3

Source³⁵.

Summary

This review paper is concerned with the topic of mortality differences by socio-economic group in Switzerland. After a short introduction to the topic and the pitfalls associated with it, the paper reviews work done in the course of a ten year programme investigating socio-economic mortality differentials in Switzerland. This programme was carried out by a working group at the Department of Social and Preventive Medicine of the University of Berne. The paper reviews methodological difficulties and pitfalls and relates the Swiss results to findings from other countries including England and Wales and Sweden. The disadvantages of socially isolated groups such as children of single women are shown. The relatively high mortality of groups under economic pressure, such as skilled manual workers in Switzerland, is demonstrated.

The Swiss situation is interesting in that skilled manual workers have a higher mortality than the unskilled and semi-skilled groups. It is concluded that this is not an artifact but may be due to the fact that only Swiss workers were investigated and that Switzerland has a large proportion of foreign workers, especially in the less skilled groups. In addition, some results of an investigation of cancer mortality by occupation are reported too. Apart from some occupation-specific findings, there are some interesting cross-references to socio-economic differential mortality.

Résumé

Différences socio-économiques de la mortalité en Suisse

Après une courte introduction sur les différences de mortalité entre les différents groupes socio-

économiques ce travail présente un programme de recherche de l'Institut de médecine sociale et préventive de l'Université de Berne, un programme dans lequel un groupe de travail a étudié ce problème. En dehors de réflexions méthodologiques (qualité des données, possibilités de biais) l'accent est surtout mis sur la mauvaise situation de personnes socialement désavantagées, comme les enfants de mères seules et de groupes sous pression de la situation économique, comme les travailleurs manuels. Avec les études par groupes socio-économiques les résultats sur la mortalité par le cancer de différentes professions sont présentés. Il en résulte de nouvelles connaissances sur le plan professionnel et des comparaisons transversales avec les études sur les différences socio-économiques de mortalité.

Zusammenfassung

Sozio-ökonomische Sterblichkeitsunterschiede in der Schweiz

Nach einer kurzen Einführung in das Thema „Unterschiede in der Sterblichkeit nach sozio-ökonomischen Gruppen“ befasst sich diese Übersichtsarbeit mit einem Forschungsprogramm am Institut für Sozial- und Präventivmedizin der Universität Bern, in dem eine Arbeitsgruppe dieses Problem seit 10 Jahren von verschiedenen Seiten umfassend angegangen hat. Neben methodologischen Überlegungen (Datenqualität, Verzerrungsmöglichkeiten) wird vor allem auf die ungünstige Lage von sozial Benachteiligten, wie den Kindern alleinerziehender Mütter sowie von ökonomisch unter Druck stehender Gruppen, wie den manuellen Arbeitern, hingewiesen. Nebst Untersuchungen nach sozio-ökonomischen Gruppen werden auch Ergebnisse zur Krebssterblichkeit nach Berufen vorgestellt. Es ergeben sich hier neue Erkenntnisse auf dem berufsspezifischen Gebiet und Quervergleiche zu den Untersuchungen über sozio-ökonomische Sterblichkeitsunterschiede.

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