

# Social class, marital status, and cancer of the uterine cervix in England and Wales, 1950-1983

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## Abstract

**Study Objective**—The aim was to investigate whether trends in mortality from cancer of the cervix uteri by age, marital status, and social class are compatible with current beliefs about the epidemiology of the disease.

**Design**—Data on mortality from cancer of the cervix for single and married women by age and social class were obtained from the Registrar General's Decennial Supplements on occupational mortality for the years 1950-53, 1959-63, 1970-72, and 1979, 1980, 1982, and 1983. Age standardised mortality rates were calculated directly by social class and marital status.

**Setting**—The data relate to all cases of carcinoma of the cervix reported in England and Wales in the years studied.

**Main results**—There was a marked convergence of mortality between single and married women over the period within every social class grouping examined. The social class differential, however, remained essentially unchanged for both single and married women considered separately.

**Conclusions**—Trends in mortality by marital status appear to reflect accurately the changes in the pattern of marriage and sexual behaviour that have taken place in the post-war period, whereas the patterns of other risk and protective factors such as screening explain these trends less well. In contrast, it seems likely that factors other than patterns of sexual behaviour and screening operate to maintain the social class differential in England and Wales.

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Cervical cancer is now regarded as a disease which is initiated by a sexually transmitted agent.<sup>1-3</sup> Other factors which may affect its development include fertility history, use of the oral contraceptive pill, cigarette smoking, and diet.<sup>4-9</sup> The onset of malignant disease (and subsequent mortality) is largely avoidable through effective screening and treatment.<sup>10</sup> In England and Wales its incidence and mortality in the manual social classes (as defined by occupation) are twice as great as in the non-manual, a difference which long antedates screening.<sup>11</sup> Invasive disease and its precursor lesions are also sharply differentiated by marital status, being commonest among widows and divorcees and occurring least among the single.<sup>12</sup>

Although information about the sexual behaviour of men and women by social group is

limited,<sup>13</sup> the pivotal role of sexual activity in producing these patterns is often hypothesised.<sup>12 14</sup> If this were the case it would suggest that, because of post-war changes in patterns of marriage and sexual behaviour,<sup>15-17</sup> social class and marital status differences in the burden of disease would be narrowing, particularly among younger women. Accordingly, we have examined time trends since 1950 by age, marital status, and social class.

## Methods

Mortality data were obtained from the Registrar General's *Decennial supplements on occupational mortality*, available for cancer of the cervix for the years 1950-53, 1959-63, 1970-72, 1979-80, and 1982-3. Most of the material exists in published form, except for 1970-72.<sup>18-21</sup> Population denominators by social class were obtained from the same sources and relate to the 1951, 1961, 1971, and 1981 census counts. The published age groups available for social class analysis in the decennial supplements and censuses have varied and numbers of deaths are small at the younger ages, so we analysed the data for women of working age below 45 years and 45-54 years. Although we present data for the age group 55-74 years for completeness, this is not an age group for which valid cross sectional social class analysis for women is possible. As indicated in successive decennial supplements only proportional mortality analyses are appropriate above age 59 years in this context.<sup>18 19 22</sup> The social class groupings chosen for our analysis reduce the "numerator-denominator bias" introduced by the different methods of collection of social class data at census and at death registration.<sup>23</sup> In view of the difficulty of coding social class in women who are separated, widowed, or divorced the analysis was restricted to single and married women, and the data are presented separately for each group. Social class assignment in these data was based on husband's occupation for married women and own occupation for single women. More detailed analyses of secular trends by marital status are, of course, possible and will be reported elsewhere (Murphy MFG, unpublished). Cohort patterns for each of the single, married, widowed, and divorced are also considered separately.<sup>24</sup>

## Results

Figures 1, 2, and 3 show the trends in mortality rates per million women in the different age groups 15(16)-44, 45-54, and 55-74 years, directly age standardised in each case to the 1961 England and Wales population distribution of all

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women. The same marked convergence of the rates for single and married women is found within each social class group, although the convergence is less in the manual classes at age 45–54 years. The trends by social class vary with age, with no evidence of a decreasing gradient at age 15–44 years, though in each case they are similar for single and married women. The general pattern is of social class differences being maintained with only slight variation of the differential by age. For the comparison between manual and non-manual social classes, possible only for 1971 and 81, the same pattern is found. Tables I

and II show the scanty available data from the decennial supplements, reorganised to present the age specific death rates within birth cohorts centred approximately on census years, by social class for the single and married separately. The increased risk among post-war generations can be seen throughout, as can the risk associated with membership of the inter-war generation, though less clearly.

**Discussion**

The marked convergence of mortality rates between single and married women within every age and social class group suggests that mortality rates accurately reflect changes in the pattern of marriage and sexual behaviour in the post-war period. As increasing numbers remain single or get divorced, cohabitation has emerged as a widespread form of premarital living arrangement and is virtually the norm between marriages.<sup>16 17</sup> There is no doubt that information obtained about legal marital status at census or death can misrepresent the domestic situation and sexual activity possibly implied by the category, eg, cohabiting (single) and separated (married). But the crucial feature of this misclassification is the extent to which numerator/denominator bias, arising from the different methods of collection of data at census and death registration, is contributed by discrepant statement of marital status, since we have restricted the social class analysis to the manual and non-manual groups as far as possible to eliminate precisely this bias. For marital status there is every reason to believe that the single and married have been so described in a highly consistent fashion at census and death registration between 1951 and 1981. (Murphy MFG, unpublished.) Elsewhere, we discuss more fully why it is unlikely that screening primarily accounts for the marital status pattern observed when considering the widowed and divorced as well (Murphy MFG, unpublished). This makes the social class trends over time of considerable interest, since it would seem likely that post-war change in marriage patterns and sexual behaviour has nevertheless not affected the social class distribution of cervical cancer by the early 1980s. Although the data have been analysed to minimise the known errors, there have been changes in the social structure of the labour force and in occupational classification during the time period in question which make social class data more difficult to interpret than marital status patterns.<sup>25</sup> Nevertheless, it is unlikely that these difficulties have obscured important changes in the social class differentials presented here. For this reason we might have expected some convergence in mortality rates, since it has been suggested that social class differences in sexual behaviour have narrowed over time<sup>26</sup>; that for women the average number of sexual partners is now higher in the non-manual classes<sup>27</sup>; and that working class males have no more partners than others.<sup>28</sup>

The absence of narrowing in social class mortality differences is even less easily explained by cervical screening than the marital status pattern. Even if social class differences in screening were held to explain the maintained gradient in mortality rates in women over 55 years

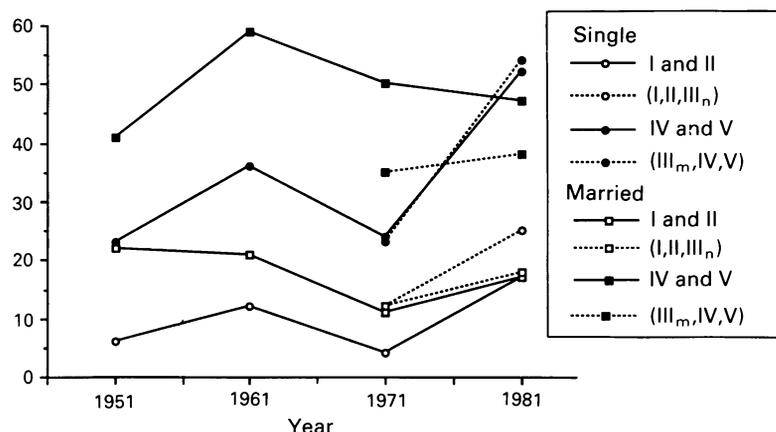


Figure 1 Age standardised mortality rates for cervical cancer per million women aged 15–44 years over the period 1951–1981, by grouped social class and marital status.

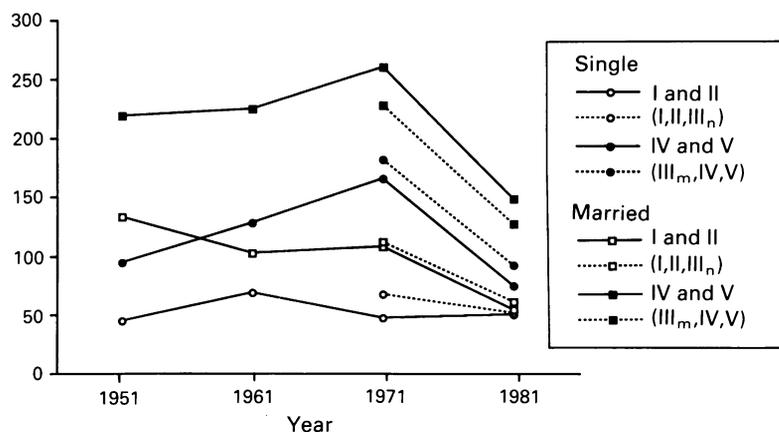


Figure 2 Age standardised mortality rates for cervical cancer per million women aged 45–54 years over the period 1951–1981, by grouped social class and marital status.

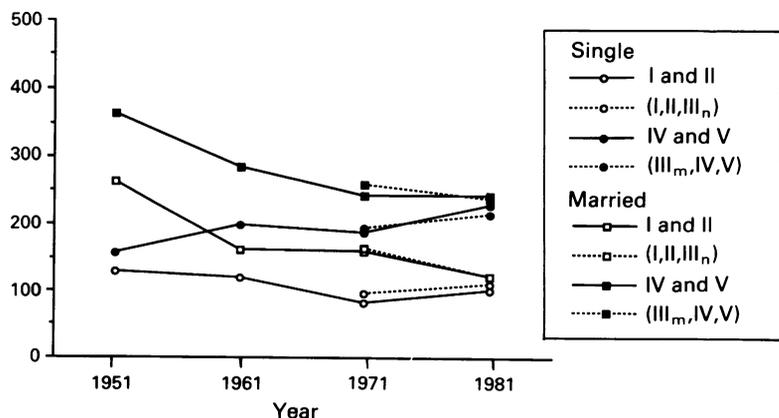


Figure 3 Age standardised mortality rates for cervical cancer per million women aged 55–74 over the period 1951–1981, by grouped social class and marital status.

of age, a reduction in the social class differential would have been expected in the young. At the very least there was, in the 1980s, a much narrower social class difference in the screening of younger women compared to older women,<sup>29</sup> and one study shows manual social class women in the youngest age groups were more likely to have been screened than the non-manual, perhaps because of smears taken during attendance for antenatal care and contraceptive advice.<sup>30</sup> Equally, in so far as the known cohort effects can be seen in the data, they do not vary markedly by social class within marital status categories, though elsewhere we show that the experience of the single versus the ever married was different for the generations born in the inter-war years but similar for all marital status groups born in the post-war years.<sup>24</sup> There also seems to be no important social class variation in hysterectomy<sup>31</sup> or survival<sup>32 33</sup> to explain the static picture.

Changing exposure to other risk factors may have maintained the social class differences despite similar exposure to risk through sexual behaviour, but the only factor for which a clear negative social gradient exists is smoking.<sup>34 35</sup> Clear evidence of differences in host resistance

related to diet has so far not been forthcoming, though evidence for deficiencies of vitamin C, vitamin A,  $\beta$  carotene, and folate has been found for women with invasive cancer and precursor lesions, and such a mechanism might plausibly explain some of the social class differences observed.<sup>6 8 36 37</sup> There is little evidence that working class women have had a markedly higher exposure to the oral contraceptive pill, at least in Scotland (Bone M, personal communication). In England and Wales the possibility of important social class variation in pill use is suggested only by studies which are unrepresentative of all women, being confined to those who had recently given birth.<sup>38</sup> Although there remains a clear social class gradient in age at first intercourse<sup>27</sup> and age at first pregnancy,<sup>39</sup> the independence of such effects from that of number of sexual partners in the aetiology of cancer of the cervix is uncertain.<sup>8</sup>

Accordingly, while cancer of the cervix is undoubtedly a sexually transmitted disease and the pattern of sexual behaviour may primarily determine its overall level in a community,<sup>3</sup> there is, as yet, no good evidence that the social class distribution is maintained in this way in England and Wales. Our results are open to one of three interpretations. The data assembled are inadequate; age at first intercourse or subsequent fertility exerts an important independent effect on the risk of cervix cancer; or factors other than sexual behaviour account for social class differences in distribution. Not surprisingly, we favour the latter alternatives.

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Table I Mortality rates per million, by social class, age, and birth cohort. Single women.

Age (years)	Approximate central year of birth								
	1961	1951	1941	1931	1921	1911	1901	1891	1881
	Social class I and II								
15-24	0	0	0	0	—	—	—	—	—
25-34	—	8	0	5	5	—	—	—	—
35-44	—	—	41	13	29	12	—	—	—
45-54	—	—	—	50	47	69	44	—	—
55-64	—	—	—	—	—	74	99	96	—
65-74	—	—	—	—	—	—	94	145	174
	Social class III								
15-24	1	1	0	0	—	—	—	—	—
25-34	—	30	20	9	2	—	—	—	—
35-44	—	—	78	34	34	36	—	—	—
45-54	—	—	—	68	113	84	64	—	—
55-64	—	—	—	—	—	100	103	130	—
65-74	—	—	—	—	—	—	178	152	175
	Social class IV and V								
15-24	7	0	0	1	—	—	—	—	—
25-34	—	25	20	19	15	—	—	—	—
35-44	—	—	119	51	84	52	—	—	—
45-54	—	—	—	74	166	128	94	—	—
55-64	—	—	—	—	—	142	156	135	—
65-74	—	—	—	—	—	—	246	249	176

Table II Mortality rates per million, by social class, age, and birth cohort. Married women.

Age (years)	Approximate central year of birth								
	1961	1951	1941	1931	1921	1911	1901	1891	1881
	Social class I and II								
15-24	2	0	0	3	—	—	—	—	—
25-34	—	17	4	7	13	—	—	—	—
35-44	—	—	31	26	55	49	—	—	—
45-54	—	—	—	54	107	102	133	—	—
55-64	—	—	—	—	—	143	123	241	—
65-74	—	—	—	—	—	—	182	206	291
	Social class III								
15-24	4	1	1	1	—	—	—	—	—
25-34	—	30	10	14	18	—	—	—	—
35-44	—	—	61	62	99	72	—	—	—
45-54	—	—	—	106	187	170	185	—	—
55-64	—	—	—	—	—	225	196	301	—
65-74	—	—	—	—	—	—	282	305	363
	Social class IV and V								
15-24	5	6	2	2	—	—	—	—	—
25-34	—	40	28	25	28	—	—	—	—
35-44	—	—	96	112	145	92	—	—	—
45-54	—	—	—	148	260	223	219	—	—
55-64	—	—	—	—	—	254	246	349	—
65-74	—	—	—	—	—	—	223	332	380

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