Variations in self-reported health by occupational grade in the British Post Office: The Q-health project

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Between 1995 and 1998 a national sample of 58,501 (42,885 males, 15,616 females) Post Office employees (29%) completed and returned a postal questionnaire survey providing information on demographic characteristics, physical and psychological health, health and lifestyles and health screening behaviour. Response rates by occupational grade were as follows: manual (male 69.3%, females 43.6%); clerical (male = 11.8%, female, 42.3%); middle management (males 15.5%, females 10.7%) and senior management (males 3.4%, females 3.3%). A number of differences in health status occurred with occupational grade. Angina, high blood pressure, obesity, smoking, arthritis, disability, GP consultations and abnormal smears were all more prevalent in higher occupational grades. Height, job satisfaction, seat belt use and breast self-examination were also lower in lower status jobs. Some findings were unexpected: GHQ scores indicated better mental health in lower grades, whilst knowledge and frequency of testicular self-examination and attendance for mammograms were higher in lower grades. These findings are considered in terms of response bias, health selection, the psychosocial work environment, occupational health interventions and the nature, meaning and organization of social position within the Post Office.

Key words: Health questionnaire; health risk behaviour.

INTRODUCTION

There is consistent evidence in all industrialized nations of social class differences in health status.1-3 Wilkinson4 notes that mortality rates for approximately 80% of the 80 most important causes of death were higher in lower socioeconomic groups. Available evidence indicates that socioeconomic status influences health independently of established risk and prognostic factors.5 In the UK, socioeconomic gradients in ill-health have been extensively studied in the Whitehall I and II studies of Civil Servants.6 These show steep inverse gradients between social classes (as measured by grade of employment) in mortality and morbidity across a wide range of conditions and in many health risk behaviours (e.g., smoking and exercise). These studies have a major advantage in being able to study workers in relatively stable employment within a uniform occupational culture using a simple reliable measure of social class without having to contend with problems arising from people working in different occupational settings and cultures, where grade levels and measures of socioeconomic status may not be comparable.7 These usual difficulties in methodology have meant that replication elsewhere in the UK of the kind of data collection undertaken in the Whitehall studies has been considered too difficult a task.

The present study has its origins in a voluntary health screening programme undertaken by the Post Office Occupational Health Services in the early 1990s. Subsequently, over a 3-year period, all of the Post Office's...
190,000 UK staff were offered the opportunity to complete a lifestyle and health risk questionnaire, with those participating receiving within two weeks a free personal health profile, a comprehensive generic health education manual and, if desired, further sources of health advice. As respondents were required to also provide information on their current employment grade, the data generated in this study afforded the opportunity to examine job grade differences for a broad range of health conditions, health risk behaviours and health screening attendance. The current paper reports the first results of this analysis. The data are of interest for a number of reasons. First, the database — the largest UK database of its kind — provides information regarding occupational variations in health status and health behaviours; second, the data are being actively used for strategic health care planning within the Post Office’s five main areas of business (Royal Mail, Post Office Counters Ltd., Parcel Force Worldwide, Subscription Services Ltd, Post Offices Services Group).

Third, the data forms a valuable source for epidemiological investigation and fourth, with the mass privatisation of public companies over the past two decades, the Post Office stands as the UK’s most successful state owned company and as such offers one of the last opportunities to examine the efficacy of large scale planned organizational influences upon health outside of the National Health Service.

MATERIALS AND METHODS

Participants and design

A cross-sectional survey design was used. Between April 1995 and April 1998, 203,869 Post Office employees (79.59% males, 20.41% females) were asked to complete a questionnaire comprising 67 questions, providing information on demographic characteristics, occupational position, physical health, health behaviours and lifestyle and psychological well-being. Following completion respondents were asked to return the questionnaire in a pre-paid envelope. Completed questionnaires were received from 58,501 subjects (42,885 males, 15,616 females), a completion rate of 29% (males, females). Attempts to improve the response rate included further publicity at Post Office sites though no repeated mailings were undertaken owing to cost limitations.

The mean age of respondents was 40.71 years (SD = 11.10) for men and 38.94 (SD = 10.61) for women. Respondents were mainly white European (n = 54,429, 93%). Response rates by occupational grade were as follows: manual (males 69.3%, females 43.6%); clerical (males = 11.8%, females, 42.3%); middle management (males 15.5%, females 10.7%) and senior management (males 3.4%, females 3.3%). Comparison with non-respondents shows that females were more likely to be represented in the respondents (26.7%) than non-respondents (18.3%). Comparisons on the basis of age show only minor discrepancies in the proportions of respondents and non-respondents in the different age groups (see Table 1) with a slight excess of younger respondents (under 20 years of age) and an under representation of those over 60 years of age (‘normal’ retirement age for Post Office employment is 60 years). No data is available on the grade composition of the workforce to enable comparison of respondents with non-respondents.

Table 1. Comparison of respondents and non-respondents by proportions in each age group

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Respondents</th>
<th>Non-respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>Under 20 yrs</td>
<td>(1.47%)</td>
<td>(0.03%)</td>
</tr>
<tr>
<td>20-29 yrs</td>
<td>(20.94%)</td>
<td>(17.45%)</td>
</tr>
<tr>
<td>30-39 yrs</td>
<td>(30.47%)</td>
<td>(32.00%)</td>
</tr>
<tr>
<td>40-49 yrs</td>
<td>(26.65%)</td>
<td>(23.18%)</td>
</tr>
<tr>
<td>50-59 yrs</td>
<td>(17.56%)</td>
<td>(19.22%)</td>
</tr>
<tr>
<td>Over 60 yrs</td>
<td>(2.87%)</td>
<td>(7.83%)</td>
</tr>
</tbody>
</table>

Demographic variables: Data were obtained on gender, age, ethnic origin and employment grade. Ethnic origin was coded using six categories: Afro-Caribbean, Asian (Indian sub-continent), Asian (oriental), European (UK), European (other) and Jewish. Occupational grade was divided into four bands in order of increasing socioeconomic status: manual, clerical/administrative, middle management/technical and senior management/professional.

Physical health: Self-reports were obtained of lifetime occurrence of a variety of conditions including arthritis, asthma, angina, heart attack, chronic back pain, bronchitis, migraine and whether respondents were disabled. These lists were generated on the basis of occupational health data on reasons for sickness absence. Subjects indicated family history of heart disease by whether their parents (individually or both) had died from a heart attack or heart disease and family history of cancers of the bowel, breast and ovaries by whether any member of their natural family (mother, father, sister, brother or grandparents) had previously had these cancers. Those subjects who had their blood pressure measured in the past year were asked to report this — responses were then coded as low, normal or high. Items pertaining to height and weight permitted computation of body mass index.

This was subsequently coded into the four categories of: underweight (men < 20 kg/m², women < 18.6 kg/m²); acceptable/normal weight (men 20.1-25.0 kg/m², women 18.7-23.8 kg/m²); mildly overweight (men 25.1-29.9 kg/m², women 23.9-28.5 kg/m²) and obese (men > 30.0 kg/m², women > 28.6 kg/m²). Because of its importance as a proxy variable for childhood health height was also reported separately. Finally, number of days in hospital in the preceding 6-month period was reported together with the number of visits made to the General Practitioner in the same period.
Psychological and psychosocial measures: The 12-item version of the General Health Questionnaire (GHQ-12)\(^\text{10}\) was included in the questionnaire. Scoring was modified so that respondents endorsed items in a yes/no format according to how they had been feeling during the previous 2 months. This is comparable to the chronic method of scoring the GHQ-12 with lower scores indicative of better health. Job satisfaction and ability to cope with current situation were also assessed using a dichotomous variable.

Health behaviours: A range of health behaviours were also assessed. These included units of alcohol consumed during the preceding week (with a unit defined as a half pint of beer/lager, a glass of wine, a single measure of spirits), smoking status (cigarette or pipe smoking, numbers of cigarettes/pipes/cigars smoked per day, exercise, seat belt use (percentage of time wearing a seat belt, either as a driver or as a passenger) and behaviour related to health screening. For women, three questions inquired into breast self-examination, mammography and cervical screening. For men, knowledge and frequency of testicular self-examination was assessed in two items.

Analyses

Where the dependent variable was dichotomous, logistic regression models (SPSS version 7.0) adjusted for age were used to explore the relationship between occupational grade and a number of variables pertaining to physical and mental health and health behaviours. Significance tests for independent variables in logistic models were made using Wald chi-square tests.\(^\text{11}\) General linear models were used where the dependent variable was continuous. Tests for trend were made by entering occupational grade as a continuous variable. Models were constructed separately for each sex.

Gender differences in reporting rates were analyzed via logit models adjusted for age. For continuous variables general linear models adjusted for age were used to examine differences in values.

Weighted means were calculated for the GHQ-12 based on the age/gender distribution of the sample used by Cox et al.\(^\text{12}\) in the UK Health and Lifestyle Survey (HALS). The sociodemographic characteristics of the sample in that study closely resemble the 1991 UK population estimates and so provide a suitable means for comparing our sample with population norms. Independent t-tests were subsequently performed to determine if the mean GHQ-12 scores in our sample differed significantly from the population. To enable suitable comparisons, age was grouped as follows: 18–24 years, 25–34 years, 35–44 years, 45–54 years, 55–64 years and over 64 years.

Z-scores for the GHQ-12 were calculated for each subject based on norms established for people of the same gender and age group. As above, norms for the GHQ were based on data gathered from the Health and Lifestyle Survey.\(^\text{12}\) This enabled computation of the proportions in the current sample scoring above or below one standard deviation from the norm.

RESULTS

Physical health

Statistically significant trends for report rates to increase with occupational grade were observed for men with asthma (\(p < 0.00005\)), chronic back pain (\(p = 0.05\)), diabetes (\(p = 0.0005\)) and migraine (\(p < 0.00005\)) and for report rates to decrease with grade for arthritis (\(p < 0.00005\)) and heart attacks (\(p = 0.008\)). Trends were less apparent in the data for women with only a weak trend for asthma rates to decline with occupational grade (\(p = 0.06\)) and for arthritis (\(p < 0.00005\)) and migraine rates (\(p = 0.0005\)) to increase with grade. No trends were observed in either gender for chronic bronchitis. Time spent in hospital during the 6-month period showed no clear trends with grade, although more GP visits were made by men and women in lower grades (\(p < 0.00005\)).

Manual workers of both genders were more likely to report that both parents had died from heart disease when compared with clerical, middle or senior grades, although this trend was marginally significant for women only (\(p = 0.06\)). Significant trends were found in both genders for report rates of a family history of breast cancer (\(p < 0.05\)) and bowel cancer (for males; \(p < 0.00005\); females; \(p < 0.05\)) to increase as occupational grade increased. A trend for report rates of ovarian cancer to decrease as grade increased was also found (\(p = 0.01\)).

Of those respondents who had their blood pressured measured in the preceding 6 months, 3.9% (\(n = 924\)) reported results indicative of low blood pressure, 88.1% (\(n = 20,946\)) normal blood pressure and 8% (\(n = 1908\)) high blood pressure. For both men and women the proportion of respondents with low blood pressure increased with occupational grade (\(p < 0.00005\)), though the trend of high blood pressure to decrease with grade was significant only for men (\(p < 0.00005\)). For both men (\(p = 0.0003\)) and women (\(p = 0.06\)) proportions with normal blood pressure decreased with grade.

Overall, 3.8% were found to be underweight, 47.8% acceptable/normal weight, 38.8% overweight and 9.5% obese. A clear trend existed in men (\(p < 0.00005\)) for the proportions of underweight respondents to increase with lower occupational grades. A less clear trend was present in women with higher proportions in the senior and manual groups than the clerical and middle management groups. Contrasting pictures emerged with respect to normal weight with proportions increasing with higher grades for women (\(p = 0.03\)) and decreasing for men (\(p < 0.00005\)). Overweight and obesity were more common in manual, clerical and middle management women than senior though the overall trends were not significant.

A converse pattern was observed in men with proportions of those overweight (\(p < 0.00005\)) and obese (\(p < 0.00005\)) increasing with higher occupational grades. Height increased with occupational position for both genders (\(p < 0.00005\)).
Gender differences for physical health

These are summarized in Table 2. Men were more likely to report having angina, high blood pressure, to have had a heart attack, for both parents to have died from heart disease, as well as being more likely to be either underweight, of normal weight or overweight. Men were also more likely to report being disabled. Women were more likely to report having asthma, arthritis, bronchitis, chronic back pain, migraine, low blood pressure, normal blood pressure, family histories of bowel cancer, breast cancer and ovarian cancer and were more likely to be obese. The women also reported spending significantly more days in hospital during the preceding 6 months as compared with the men, and made more visits to their General Practitioner during this period (p < 0.0005). No gender differences in report rates for diabetes were found.

Mental health

Mean GHQ score for the sample was 2.19 (SD = 2.77). The weighted value based on the Health and Lifestyle population Survey \(^1^2\) was slightly lower at 2.01. This is significantly higher than the population mean (1.89) derived from HALS (t = 108.33; df = 64,956; p < 0.00005). Over one-fifth of the sample (21.7%) scored more than one standard deviation above the population norms and none of the sample scored more than one standard deviation below the norms.

Age-adjusted GHQ scores for both men (p < 0.00005) and women (p = 0.034) showed significant linear trends with scores rising with higher occupational grades, although the data for both genders evidence a non-linear relationship with scores higher in the middle management group compared to the senior/professional group. Job satisfaction also exhibited a highly significant association with occupational grade for men (\(\chi^2 = 603.8; \text{df} = 3; p < 0.00005\)) and for women (\(\chi^2 = 58.9; \text{df} = 3; p < 0.00005\)), with the proportions indicating satisfaction increasing with higher occupational grades. Ability to cope with the current situation was also related to grade for both men (\(\chi^2 = 10.45; \text{df} = 3; p = 0.015\)) and women (\(\chi^2 = 13.04; \text{df} = 3; p = 0.005\)) though a statistically significant trend for higher scores in higher grades was observed only for women (p < 0.00005). Neither of these additional psychosocial variables (job satisfaction and coping) were able to explain the inverse relationship between job grade and GHQ score. In fact the addition of these to the age adjusted regression model strengthened the linear relationship between GHQ scores and grade whilst maintaining the direction of the existing relationship (see Table 3).

### Table 2. Gender differences in self-reported physical health

<table>
<thead>
<tr>
<th></th>
<th>Males</th>
<th>Females</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angina</td>
<td>1.5%</td>
<td>0.5%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>High blood pressure</td>
<td>8.8%</td>
<td>6.6%</td>
<td>0.0008</td>
</tr>
<tr>
<td>Heart Attack</td>
<td>0.9%</td>
<td>0.1%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Both parents died from heart disease</td>
<td>2.0%</td>
<td>1.9%</td>
<td>0.041</td>
</tr>
<tr>
<td>Underweight</td>
<td>3.8%</td>
<td>2.3%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Normal weight</td>
<td>47.8%</td>
<td>46.4%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Overweight</td>
<td>38.9%</td>
<td>34.9%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Disabled</td>
<td>4.8%</td>
<td>3.4%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Asthma</td>
<td>8.0%</td>
<td>8.8%</td>
<td>0.037</td>
</tr>
<tr>
<td>Arthritis</td>
<td>11.7%</td>
<td>14.2%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Bronchitis</td>
<td>6.8%</td>
<td>8.5%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Chronic back pain</td>
<td>10.1%</td>
<td>10.5%</td>
<td>0.0015</td>
</tr>
<tr>
<td>Migraine</td>
<td>7.7%</td>
<td>17.2%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Low blood pressure</td>
<td>2.7%</td>
<td>6.0%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Normal blood pressure</td>
<td>31.3%</td>
<td>48.3%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Family history of bowel cancer</td>
<td>10.7%</td>
<td>13.9%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Family history of breast cancer</td>
<td>8.9%</td>
<td>14.1%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Family history of ovarian cancer</td>
<td>3.1%</td>
<td>6.4%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Obese</td>
<td>9.5%</td>
<td>16.4%</td>
<td>&lt;0.00005</td>
</tr>
<tr>
<td>Days in hospital during last 6 months</td>
<td>0.26</td>
<td>0.40</td>
<td>&lt;0.0005</td>
</tr>
<tr>
<td>Visits to GP</td>
<td>1.18</td>
<td>1.93</td>
<td>&lt;0.0005</td>
</tr>
</tbody>
</table>

### Table 3. Standardized regression coefficients (beta values) and adjusted mean GHQ scores by occupational grade

<table>
<thead>
<tr>
<th></th>
<th>Adjusted for age and gender</th>
<th>Adjusted for age, gender and job satisfaction</th>
<th>Adjusted for age, gender and coping</th>
<th>Adjusted for age, gender, job satisfaction and coping</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual</td>
<td>2.21</td>
<td>2.07</td>
<td>2.14</td>
<td>2.04</td>
</tr>
<tr>
<td>Clerical</td>
<td>2.38</td>
<td>2.22</td>
<td>2.35</td>
<td>2.23</td>
</tr>
<tr>
<td>Middle</td>
<td>2.55</td>
<td>2.61</td>
<td>2.50</td>
<td>2.56</td>
</tr>
<tr>
<td>Senior</td>
<td>2.28</td>
<td>2.50</td>
<td>2.34</td>
<td>2.52</td>
</tr>
<tr>
<td>Beta (grade)</td>
<td>0.037</td>
<td>0.065</td>
<td>0.043</td>
<td>0.086</td>
</tr>
</tbody>
</table>

Gender differences for mental health

Age-adjusted GHQ scores were significantly higher (p < 0.00005) for women (2.54) than men (2.07), who were more likely to say they could cope with their current situation [94.4% cf 92.2%; odds ratio (OR) = 1.38; \( \chi^2 = 77.37; \text{df} = 1; p < 0.00005\)]. The women, however, were more likely to say they were satisfied with their jobs (62.4% cf 53.6%; OR = 1.48; \( \chi^2 = 398; \text{df} = 1; p < 0.00005\)) than the men.

Health behaviours

Gender-specific health issues: Knowledge of testicular self-examination in men was highest in the manual groups (38.8%) and tended to decline with grade (p < 0.00005), although the lowest rates (20.4%) were in the clerical group. Similarly there was a trend (p = 0.0005) for the most frequent self-examination (once a month) to be more prominent in lower grades.

For women, report rates for breast self-examination and attendance for cervical smears increased with grade (p < 0.00005), although respondents were more likely to have had a mammogram the lower their occupational grade.
grade \((p = 0.007)\). No gradients were present for either abnormal smear results or abnormal mammograms.

**Smoking and drinking:** Smoking prevalence declined with rising occupational grade in both genders \((p < 0.00005)\). Conversely the proportion of ex-smokers and lifetime non-smokers increased with grade \((p < 0.00005)\). Trends \((p < 0.00005)\) for levels of alcohol intake to rise with occupational position were observed for both men and women at most levels of consumption. Abstention rates followed the reverse trend.

**Exercise and seat belt use:** The proportions engaging in exercise at least three times weekly declined for both men and women with rising occupational position \((p < 0.00005)\). Low seat belt use (less than 10% of the time) was proportionately more common in lower grades for men and women and high seat belt use (more than 90%) more likely in higher grades \((p < 0.00005)\) in all cases.

Given the wording in the questionnaire it was not possible to ascertain whether the lower seatbelt use in the lower grades pertained to use during working hours (e.g., by employed van drivers) or in out-of-hours free time.

**Gender differences for health behaviours**

Women were more likely to abstain from alcohol \((35.7\% \text{ cf} \ 21.6\%); \ OR = 2.08; \chi^2 = 1262; \ df = 1; \ p < 0.00005\), to have never smoked \((54.9\% \text{ cf} \ 48.6\%); \ OR = 1.22; \chi^2 = 112; \ df = 1; \ p < 0.00005\) and were also more likely to practise self-examination of their breasts than men were to practise testicular self-examination \((64.4\% \text{ cf} \ 49.5\%); \ OR = 1.91; \chi^2 = 1118; \ df = 1; \ p < 0.00005\). Men were more likely to be ex-smokers \((27.7\% \text{ cf} \ 22.0\%); \ OR = 1.26; \chi^2 = 105; \ df = 1; \ p < 0.00005\) or current smokers \((23.7\% \text{ cf} \ 23.2\%); \ OR = 1.04; \chi^2 = 3.68; \ df = 1; \ p = 0.055\) and to engage in frequent exercise \((40.2\% \text{ cf} \ 29\%); \ OR = 1.29; \chi^2 = 647; \ df = 1; \ p < 0.00005\).

**DISCUSSION**

Of the health parameters reported in this study many show socioeconomic gradients in health. Findings in a number of the areas where previous research has indicated poor health and health behaviours are more prevalent in lower socioeconomic groups have been replicated here — these include angina, high blood pressure, obesity, smoking, arthritis, disability, height, numbers of GP consultations, attendance for cervical smears and frequency of seat belt use. The higher reporting of breast cancer in the families of higher grade workers might also be expected on the basis that breast cancer is one of the few diseases which shows a social gradient in which higher groups are more vulnerable. The lower prevalence of breast self-examination is consistent both with this and the generally observed lower take-up of preventive services amongst disadvantaged groups, although some studies have found no evidence of social gradients in this area. The gradients for job satisfaction, alcohol consumption and back pain (greater in higher occupational grades) are in agreement with previous findings.

Additional aspects of these data, for example, the differential reporting of angina between men and women and the greater take up of self-examination in women than men also concur with previous research.

The increased prevalence of migraine in higher occupational grades represents a novel finding, although existing research has yet to establish a consistent pattern of relationship between migraine, headache and social status. A number of our findings however must be considered unexpected. The usual gradients for utilization of breast cancer screening, regular exercise, ovarian cancer, bowel cancer, diabetes, asthma and GHQ scores were not just absent but followed the reverse pattern — with better health and healthier behaviours in lower grades. Another anomaly was the absence of a social gradient for the distribution of bronchitis — this was particularly surprising given that the expected gradients for smoking were present. Recall of a family history of heart disease also followed a contrary pattern to that observed in a previous study of British workers, the Whitehall II study, in that recall of parental death was higher in lower grades. In this instance however it can plausibly be argued that it is the Whitehall data that must be considered puzzling, given the greater incidence of cardiovascular disease in lower socioeconomic groups.

One possible explanation for the better health observed in lower grade workers here stems from the low response rate. Respondents may form a healthier subset of the Post Office population and this response bias may be more pronounced in lower occupational grades, though this cannot be demonstrated empirically as data is not available on the occupational classification of the national population. Another possibility is that this trend mirrors uptake of basic health education/promotion material which has been widely available within the organization, aimed at lower grade workers. There is some suggestion that employees over 60 years of age are under-represented in the sample, though, as these employees comprise less than 2% of the sample and the analyses are adjusted for age, any bias introduced is likely to be small. The hypothesis of a health selection effect however does not account for the expected distribution of health and health behaviours in the majority of areas investigated. Consider the distribution of GHQ scores for example (a trend toward poorer scores in higher grades: comparison of GHQ scores with normative national data show that the psychological well-being of our sample was in fact markedly worse, not better than that of the general population. One possible explanation for this is that the Post Office disproportionately recruits people of poorer mental health from the population. Whilst this could plausibly account for the overall higher GHQ scores compared to the population one would have to imagine that this selection bias is more pronounced in higher grades — a possibility which we consider unlikely. Hence, mental health selection does not provide a compelling explanation of the failure to find the usual socioeconomic gradient.
If alternative explanations to selection bias are to be sought to account for the distribution of mental health in our respondents, the psychosocial characteristics of the work environment would seem a promising place to start. A number of findings from the Whitehall II study in recent years have shown these to be a major factor behind socioeconomic differentials in health. Our own data in this regard are confined to self-reports of job satisfaction and the ability to cope with the current situation. Data for both of these showed better health in higher grades; thus, when added to a linear regression model of GHQ scores adjusted for age, gender and social grade, both job satisfaction and coping merely increased the linear relationship between GHQ scores and occupational grade and maintained the direction of the current relationship between GHQ and job grade. The extent to which other psychosocial variables such as work pace, job variety, job control or social support at work might explain the distribution of GHQ scores can only be guessed at and certainly merits further consideration. The possibility that such psychosocial variables rather than response bias may explain the current pattern of data raises a very important question. For if such factors were sufficient it would mean that the existence of social hierarchies by themselves do not necessarily lead to inequalities in health.

In the present context this might mean that the organization of the social and cultural environment at different work grades in the Post Office could provide a protective effect against the normally damaging effects of social status and its accoutrements. One variant of this may concern the organizational changes undertaken by the Post Office in response to the threat of privatization and increased competition for its markets. It is possible that the brunt of the stresses engendered by these have been felt more in senior positions with attendant effects on mental health (not to omit the possibility of the knock-on effect of this on physical health), whilst the Post Office culture in lower grades has remained relatively insulated from these effects. However, in the absence of further data to support either the selection or psychosocial model, accounting for the variation in GHQ scores across the occupational spectrum must remain undecided if intriguing.

If we turn to the issue of attendance for breast cancer screening, selection does not provide an obvious explanation, because the expected class gradients pertaining to breast self-examination, attendance for cervical smear and distribution for abnormal smears are all found here. Why should breast cancer screening provide an exception? This is all the more puzzling given the greater recall interest in extending the take-up of such services by lower grades, whilst the Whitehall II study shows prevalence rates with those in higher grades even lower than the general population. That extensive change in health behaviours is possible in this setting is also suggested by responses to a client satisfaction survey undertaken with approximately 10% of the recipients during the latter part of the programme. Of these, 78% felt they would make positive changes in their lifestyle as a result of the programme. If these data are valid then further investigation is merited, in particular by those with an interest in extending the take-up of such services by more disadvantaged groups in society. Further work is planned to explore this topic in greater detail.

Our data with respect to bronchitis might have been expected to follow the trend for smoking; indeed they confirm the higher prevalence of bronchitis in smokers (8.9%) and ex-smokers (8.9%) as compared with non-smokers (5.7%). With respect to smoking there is evidence that our sample was healthier than the national sample (HALS) with fewer Post Office employees smoking (23% of 30%). This might conceivably represent the results of health education initiatives which have a long tradition in the Post Office. Alternative explanations are available, however, for both the absence of occupational gradients for bronchitis and the reduced proportion of smokers in this sample as compared with the general population.

Healthier employees responding to the survey could account for these data. However, if there is such a response bias, then it needs to be asked why the usual socioeconomic gradients have been observed in many of the conditions we investigated. A more plausible variant of selection bias may arise from the premature retirement of respondents in lower grades on the grounds of their ill-health from specific conditions. This could have the effect of attenuating or possibly reversing the usual socioeconomic gradients in the workforce that remains and might plausibly explain the reverse gradients found with asthma, diabetes and history of bowel cancer and the absence of a gradient with bronchitis. We stress, however, that data are needed to support this argument and in the case of diabetes available baseline data from the Whitehall II study shows prevalence rates with those in this study are broadly comparable (for men 1.2 of 0.9% in Whitehall and for women 0.9% of 1.0%). The area where the data might indicate the presence of selection bias — under representation of those aged over 60 years — is unlikely to be of assistance here as the majority of this age group (86.6%) in our sample are concentrated in the lowest grade. Such a 'selection out' hypothesis would need considerable work in order to explain the data with respect to GHQ, mammography and testicular self-examination, not to mention the higher frequency of exercise reported by employees in lower grades.

As for exercise, it is more likely that the greater frequency of regular exercise in lower grades stems from the very nature of the work undertaken in the largest business — mail and parcel handling — involving as it does the ambulatory activities of postmen and women. As with mental health, it could be hypothesized that the Post Office disproportionately recruits people of poorer health from the general population; however, our data on the mean levels (men = 1.77 metres, women = 1.63 metres) and distribution of height (often used as a proxy
measure to reflect general growth and development in childhood) do not lend any support to this contention.

In conclusion then, whilst we have found the expected socioeconomic gradients for a variety of conditions and health behaviours, there are several examples (GHQ, mammography, testicular self-examination, diabetes and exercise) which are not easily explained as arising from confounding due to recruitment bias, respondent bias or health selection via premature retirement. There is a suggestion that these reversals of the usual distribution of ill-health by socioeconomic position may owe something to health initiatives undertaken within the organization as well as the particular culture of the Post Office and how occupational position is represented within it. If this is the case then socioeconomic gradients in ill-health within occupational settings need not necessarily be seen as inevitable.

The results of the present study are currently being used to promote initiatives throughout the organization. In particular, work is underway with local business managers in different areas of the country to highlight specific areas of health for interventions.

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REFERENCES
