Health and Pink Collar Work

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Abstract (250)

Introduction

In recent years, there has been a decline in the manufacturing sector of the United Kingdom economy with a corresponding growth of service-orientated pink collar jobs in some regions. Whilst the health outcomes of white and blue collar workers are well-established, less is known about this emerging pink collar group.

Aims

The aim of this study was to identify the long-term health outcomes of pink collar workers in comparison to their white-collar counterparts across a range of indicators.

Methods

Area-level percentages for white, pink and blue collar workers were derived from routinely collected employment data in a northern English town. Area-level health data pertaining to male and female life expectancy; respiratory deaths; and deaths from cardiovascular and circulatory causes (all-age and under 75) were obtained from the local authority and public health observatory. Multivariate regression analyses were performed to assess relationships between job collar and health.

Results

When adjusted for deprivation, there was a protective relationship for deaths for circulatory disease under age 75 and increasing percentages of pink collar workers within an area in comparison to white collar workers. Other relationships between collar status and health outcomes were not statistically-significant.

Conclusions

The reasons underlying the protective effect of pink collar status for deaths from circulatory disease is uncertain and merits further study. Possibilities include differences in job strain and lifestyle behaviours. Our work has a number of limitations and longitudinal studies with detailed exposure data should assess the long-term health outcomes of these workers using agreed definitions.

MAIN PAPER (2027)

Introduction

Although there has been much work examining the relationship between measures of socio-economic status (SES) such as income and education and their relationship with health; until recently less attention has been paid to the role of occupation. The complex interplay of these three measures of SES has been the subject of much study, and findings analysing their relative influence in determining health have been inconclusive. A large German study suggested that the effect of income upon mortality was more important than education or occupation, whereas a Norwegian study attributed observed health inequalities more heavily towards education. [1,2] This has led some to suggest that these three metrics should not be used interchangeably in social science research. [3]

When examining inequalities in health by occupation alone, it is apparent that there are significant differences between different job grades. The Whitehall II study of 10,308 British civil servants established that the long-term health outcomes of white collar workers are superior to those of blue collar workers. [4] Several follow-up studies of the Whitehall cohort have examined differences in work exposures and their association with ill-health, such as high job strain and an increased incidence of coronary heart disease. [5] International studies including the Belgian Job Stress Project, Danish MONICA II study and Finnish Longitudinal Study on Municipal Employees have demonstrated a negative relationship between occupational psychosocial hazards and health. [6,7]

In recent years however, many western economies such as that in the United Kingdom (UK) have shifted away from an industry-based model towards service provisions. In some regions, this has led to a rapid growth of service sector jobs in the economy. [8] The term 'pink collar' work was initially coined after the Second World War to describe jobs that were traditionally the preserve of women. Such roles included administrative, clerical, assistant and secretarial work. Nonetheless, it has been recognised that in modern times such occupations are no longer the preserve of women, and the term has been applied more widely to refer to all service sector jobs. [9]

One difficulty in studying characteristics of pink collar work is the absence of a standardised definition. Some roles once considered pink collar work such as teaching and nursing have now gained professional status in many countries and are now considered white collar work. Despite these issues, it is plausible that with the continued decline of manufacturing seen in many developed countries, the size of this workforce will expand. [10] It seems reasonable therefore that occupational and public health professionals should gain an understanding of the epidemiological features of this emerging group, including an understanding of health outcomes. This could, for example, shed light

upon the need for workplace and wider public health interventions to address ill-health. This study explores the distribution and area-level health outcomes associated with pink collar work in a northern English town and compares and contrasts these with those of white and blue collar work.

Methods

Our study was ecological in design. Area-level health outcome data for Rotherham residents were obtained at Medium-Super Output Area (MSOA) level over a five year period (2006-2010 inclusive). Super Output Areas are geographical regions developed following the 2001 census in England to facilitate the calculation of population-level neighborhood statistics such as socio-economic deprivation, crime and health data. On average across the country, each MSOA contains 7,200 residents according to the Office for National Statistics Mid-2012 Estimates in England.[5] Rotherham has 33 MSOAS and at the time of the study, population sizes ranged from 5,036 to 10,936 residents. Health data relating to life expectancy and deaths due to cardiovascular (CHD), circulatory (CVD) and respiratory (RESP) disease was collected and calculated as Indirectly-Age Standardised Ratios (IASR's all ages) for each MSOA. Stratified data was also available for CHD and CVD deaths for those aged under 75. Causes of death were coded using the International Classification of Diseases Version 10 (ICD-10 Version 2010).[6]

Individual-level employment data for Rotherham residents (2010) was obtained from the local council. Workers were aggregated at MSOA level into three major categories: white collar (professional/managerial/executive); pink collar and blue collar (trade/manual). In the absence of a standardised definition, in our study we defined pink collar workers as those employed in assistant, customer service, entertainment, sales industry, administrative and personal service orientated work.[7] Jobs which were once considered pink-collar work such as "registered nurse" and "teacher" was classified as white-collar since such roles are affiliated with professional bodies in the United Kingdom.

The distribution of percentages of pink-collar workers by MSOA was mapped using ESRI ArcGIS 10.[8] The relationship between residents' occupational collar and health outcomes at area level was assessed using seperate linear regression models. In our model, we assigned pink and blue-collar groups as predictor variables and allocated white-collar workers as the reference group given their established superior health outcomes.

We wished to determine the influence of residents' deprivation status in the relationship between occupational collar and health. Area-level Indices of Multiple Deprivation (IMD) scores calculated by the Office for National Statistics in the UK are a composite of several domains including income; employment status; health deprivation and disability; educational skills and barriers to housing. The highest weighting however is given to income and in the absence of detailed education data, we

only included the income domain as a third predictor variable in our regression model. This is because we did not wish to introduce further confounding by including two separate measures of employment and health.

Multicolinearity was assessed using scatter plots and Pearson's correlation coefficients. It should be noted that our analysis identified that residents' deprivation status and education level were highly correlated (Pearson's coefficient >0.8), adding further weight to our decision to exclude the latter domain as an additional predictor variable. Statistical analysis was performed using IBM SPSS Version 22.0.[9] A weighted least- squares adjustment was made to account for variable MSOA populations in Rotherham. Statistical significance was set at the 0.05 level. Ethical approval was not required as the study used publically available, non-person identifiable data and was considered normal occupational health practice.

Results

86,928 Rotherham residents were registered as in-work in 2010. Using our occupational classifications 36,079 (41.5%) individuals were employed in white-collar, 23,860 (27.5%) in pink-collar and 26,989 (31.0%) in blue-collar jobs. In total, 60% of the pink collar workforce were female. The spatial distribution of the pink collar workforce is shown in Figure 1. The central white belt extended diagonally across the map represents the town centre suggesting that the number of pink collar workers as a proportion of all individuals in employment is relatively low in these MSOAs. The highest concentrations (coloured black) are seen in the areas adjacent to the town centre with concentrations in rural settings located at the outskirts of the map.

Insert Figure 1 here

Table 1 shows the results from our regression analysis assessing the relationship between pink-collar status and health at area-level. Although statistically significant relationships were identified for pink-collar work and respiratory deaths, CHD deaths under 75 and CVD deaths under 75; only the relationship with CVD deaths under 75 remained significant following adjustment for IMD. The negative β co-efficient suggests that pink collar work has a protective effect in comparison to white-collar work for this health outcome, indicating that for each unit increase in pink-collar workers there is a corresponding 3.45 unit decrease in circulatory deaths under the age of 75 at MSOA level.

Insert Table 1 here

Table 2 displays the results of the regression assessing the relationship between blue-collar work and health. Statistically-significant relationships for all health outcomes in relation to white-collar work were identified in the unadjusted analysis which disappeared when IMD was included in the model.

Insert Table 2 here

Discussion

As far as we are aware, this is the first study to outline the health outcomes associated with pink collar work in a systematic fashion. Our findings corroborate existing knowledge of the social stratification of health outcomes in that at a population-level, blue-collar workers experience worse health outcomes than their white-collar counterparts. [4] After adjustment for deprivation, the statistically significant differences between the two groups which were observed for all measured health outcomes (apart from circularity deaths under 75 and pink collar workers) disappear, suggesting income disparity is a key underlying explanation.

Differences in health outcomes between pink and blue collar workers were assessed against the health outcomes of white collar workers rather than directly against each other. Prior to adjustment for deprivation, there were statistically significant differences in three health outcomes between pink and white collar workers. For two, respiratory deaths and deaths from coronary heart disease under the age of 75, adjustment for deprivation explained our findings. Nonetheless, a significant difference in population deaths from circulatory disease under the age of 75 remained. The negative standardised Beta co-efficient value suggests that for each unit increase in the proportion of pink collar workers within an MSOA, there is a corresponding 3.45 unit decrease in deaths from circulatory disease.

The reasons underlying the protective effect of pink collar work status are unclear but may well be multi-factorial. Possible explanations include differences in lifestyle factors such as smoking rates, dietary behaviours, physical activity and sedentary behaviours for which our data was either incomplete or not available. There are also likely to be differences between groups in nature of work itself such as occupational stress. Features of job strain such as demand-control model, effort-reward imbalance and organisational justice have received much attention in the literature, particularly in relation to white and blue-collar work. [6, 17] Another contributing factor could be that disparities of income and educational attainment traditionally seen between different occupational classes, such as in the nine major groups of the Standard Occupational Classification system, [18] do not apply in the same way to modern white, pink and blue collar workers. The “collared” groups may be more heterogeneous, and thus these disparities become blurred. In any case, longitudinal studies with comprehensive exposure data will likely provide more detailed information to address these questions.

From a population-health perspective, this type of analysis can supplement existing data which outline the likely long-term health outcomes associated with belonging to specific occupational groups. Broad categorisations such as those applied here may be more useful in risk profiling and

developing strategic interventions aimed at improving the health of a large workforce at area-level both in and outside the immediate workplace. A number of avenues already exist through which such measures can be implemented. For example, local occupational health and wellbeing agendas provide one such opportunity. A lever through which occupational and public health professionals can work together is the Joint Strategic Needs Assessment (JSNA). This is a document produced by local governments in England outlining multi-disciplinary strategies for addressing key population-health concerns. We would encourage occupational health professionals to contribute their ideas and experience to such work.

Our study has a number of limitations. It is ecological and thus it is not possible to attribute causality in discussing our observed associations. We also were unable to match data regarding the age-structure of the workforce to employment data, since the former was only available at population level. In the absence of this information, we performed our analyses assuming that age profiles were similar across the three collared groups. Although in our comparison of health outcomes of blue collar workers against white collar, findings were consistent with previous research; the implications for our analysis of pink collar worker are uncertain. A longitudinal study with access to age-stratified rates for population-level health outcomes would shed more light on this. We have also assumed that the recorded job reflects an individual's main lifetime type of work which will have introduced further bias. Finally, our employment and health data has been aggregated on an area basis and thus has limited application at individual-level.

Key Points

- There has been a growth in the size of pink collar workforces in many Western economies but their health demographics are unknown
- Our study suggests that status as a pink collar worker has a protective effect against death from circulatory disease under the age of 75 as compared to white collar status
- Further work should explore whether age stratification of the workforce and health outcomes identifies similar protective effects

Figures and Tables

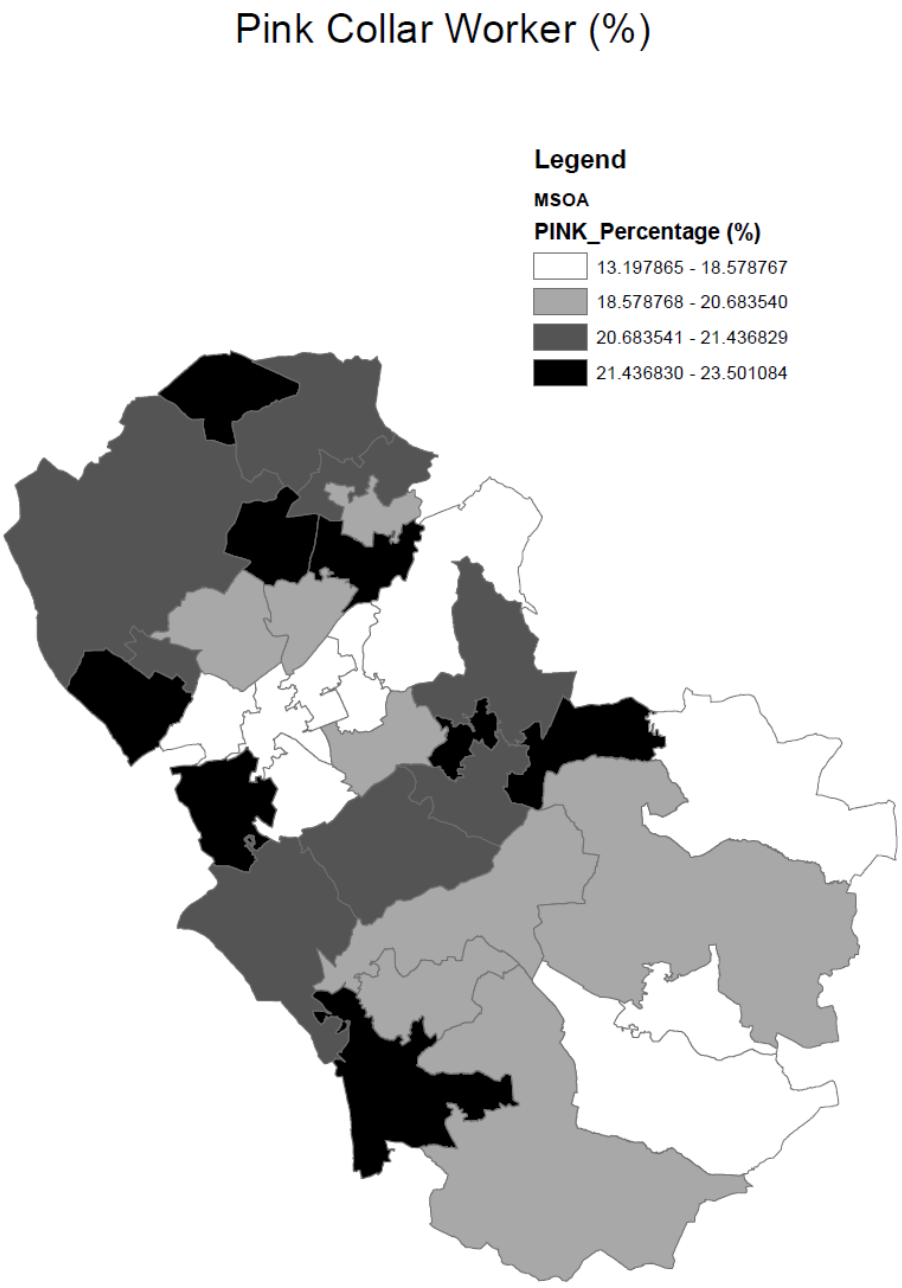

Figure 1: Distribution of Pink Collar Workers by MSOA

Health Outcome	Standardised β Coefficient (U)	95% Confidence Interval (U)	P-Value (U)	Standardised β Coefficient (A)	95% Confidence Interval (A)	P-Value (A)
Male Life Expectancy	0.073	-0.122 to 0.267	0.452	-0.068	-0.224 to 0.088	0.377
Female Life Expectancy	0.117	-0.108 to 0.342	0.298	0.032	-0.199 to 0.263	0.777
Respiratory Deaths All Ages	-4.141	-8.423 to 0.142	0.050	-2.763	-7.233 to 1.708	0.216
CHD Deaths All Ages	-0.080	-3.772 to 3.612	0.965	1.144	-2.699 to 4.986	0.547
CHD Deaths <75	-5.625	-10.764 to -0.488	0.033	-2.680	-7.419 to 2.056	0.257
Circulatory Deaths All Ages	-1.218	-3.822 to 1.386	0.347	-0.359	-3.071 to 2.352	0.788
Circulatory Deaths <75	-5.865	-8.303 to -1.621	0.005	-3.453	-6.766 to -0.141	0.042

Table 1: Health outcomes for Pink-Collar Work

U = Unadjusted; A=Adjusted for Deprivation Status

Health Outcome	Standardised β Coefficient (U)	95% Confidence Interval (U)	P-Value (U)	Standardised β Coefficient (A)	95% Confidence Interval (A)	P-Value (A)
Male Life Expectancy	-0.341	-0.427 to -0.256	0.000	0.963	-0.151 to 0.158	0.963
Female Life Expectancy	-0.309	-0.408 to -0.210	0.000	0.102	-0.33 to 0.126	0.369
Respiratory Deaths All Ages	5.175	3.291 to 7.060	0.000	1.802	-2.623 to 6.226	0.412
CHD Deaths All Ages	3.103	1.479 to 4.728	0.001	0.109	-3.694 to 3.911	0.954
CHD Deaths <75	6.581	4.320 to 8.842	0.000	0.632	-5.319 to 4.056	0.785
Circulatory Deaths All Ages	2.870	1.725 to 4.016	0.000	0.768	-1.915 to 3.451	0.563
Circulatory Deaths <75	5.865	4.395 to 7.335	0.000	2.171	-1.107 to 5.449	0.186

Table 2: Health outcomes for Blue-Collar Work

U = Unadjusted; A=Adjusted for Deprivation Status

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