SHORT REPORT

Mortality in NHS Greater Glasgow and Clyde employees: 2007–2009

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Background
Just over a fifth of all deaths in Scotland occur in those under the age of 65. This study examined deaths in service in employees of the National Health Service Greater Glasgow and Clyde (NHS GG&C) Health Board over a 3-year period.

Aims
To assess crude death rates by occupational group, the main causes of death and evidence of causes that could have been prevented or modified by lifestyle changes.

Methods
Demographic details, occupational grouping and death certificate data were obtained for all NHS GG&C employees who died in service between 2007 and 2009.

Results
A total of 138 employees died in this period. The occupational groups in which most deaths occurred were support services (porters, domestic and catering staff; 35%) and nurses (34%). The commonest causes of death were lung cancer (15%), ischaemic heart disease (9%) and suicide (9%). The overall crude death rate was 1.2/1000 persons/year (females 1.0 and males 1.7) and was highest among support services employees (2.4) and lowest among medical staff (0.5). The relative risk of death in support services was significantly greater than the majority of occupational groups.

Conclusions
These findings suggest health inequality within this workforce. The main causes of death identified in the support services group could potentially be modified through workplace risk factor screening and health promotion.

Key words
Death rates; disease; health promotion; healthy workplaces; hospital employees; NHS workforce.

Introduction
National Health Service Greater Glasgow and Clyde (NHS GG&C) Health Board is the biggest in Scotland, employing around 40,000 people. Scotland has one of the highest rates of mortality in western Europe, although rates for the whole population have steadily decreased in recent years. Just over a fifth of all deaths in Scotland occur under the age of 65. The highest mortality rates are generally found in the west of the country, including GG&C [1]. There are strong moral, social and economic arguments for preventing death in the working age population [2]. We identified deaths of current NHS GG&C employees over a 3-year period, 2007–2009, in order to assess the frequency of deaths and crude death rates, in comparison with national Scottish data, the age and occupational distribution of deaths, the main causes of death and evidence of causes of death that could have been prevented or modified by lifestyle changes.

Methods
Demographic data, staff grouping and cause of death were obtained for current NHS GG&C employees who died between January 2007 and December 2009, using payroll department data to identify employees who died in service. Using demographic details provided by payroll, health information technology services linked with the General Register for Scotland to obtain the International Statistical Classification of Diseases and Related Health Problems—10th Revision codes for cause of death. Occupations, identified from the occupational health electronic record system, were grouped by National Services Scotland, Information...
Services Division (ISD), and NHS Scotland workforce staff groupings. Collected data were transferred into SPSS for analysis. ISD NHS Scotland workforce statistics for NHS GG&C were used to identify workforce and staff grouping denominators to provide death rates. National crude death rates for people aged 20–64 years were obtained from the General Register for Scotland and Office for National Statistics for 2007 and causes of death data from the Scottish Public Health Observatory. The advice of the West of Scotland Research Ethics Service was that the study did not require review by the local NHS Research Ethics Committee. Caldicott Guardian approval was obtained.

Results
A total of 138 current NHS GG&C employees died over the 3-year period. Ninety-four (68%) of the deaths were in females and 43 (31%) in males. Gender information was not available in one case. The majority of deaths occurred in the 45- to 54-year-old (n = 52, 38%) and 55- to 64-year-old (n = 48, 35%) age groups. Occupational data were available in 133 cases but were missing for five subjects. The occupational groups in which most deaths occurred were support services (mainly consisting of porters, domestic and catering staff; 35%) and nursing (34%). Cause of death data were available in 130 cases and the commonest five causes were lung cancer (15%, n = 19), ischaemic heart disease (acute and chronic; 9%, n = 12), suicide (9%, n = 12), breast cancer (n = 5, 4%) and cancer, no site specified (n = 5, 4%; Figure 1).

The overall crude death rate per 1000 per year was 1.2 (females 1.0 and males 1.7), which was lower than national crude death rates for the UK (England and Wales) and Scotland in people of working age (20–64 years old) at 2.5 and 3.3, respectively. The support services group had the highest crude death rate at 2.4 and the medical group the lowest at 0.5. The relative risk of mortality in the support services group was significantly higher than in the medical (doctors), nursing, health care science (biomedical, clinical and physiology scientists and associated technicians) and administrative service groups (Table 1).

Discussion
We found a significantly higher death rate among support services employees compared with other occupational groups, suggesting health inequality within this workforce. Employees in support services are more likely to have lower socioeconomic status and educational status. Socioeconomic position is associated with mortality, and in the Whitehall II study, Stringhini et al. found that mortality was substantially accounted for by adjustment for health behaviours. The death rates are well below national rates, which would be expected in an employee population due to the ‘healthy worker effect’.

The proportions of deaths by gender are not unexpected due to our predominantly female workforce (78% female). It is also not surprising to see a high proportion of deaths in the nurses as they make up 40% of the workforce. The proportion of deaths in the support services is higher than expected compared with the proportion of the workforce they account for (13%), and this is also reflected in the higher death rate in this group than in other staff groupings.

The top five causes of death in Scotland in those under the age of 65 in 2007 were, in order of incidence, ischaemic heart disease, lung cancer, alcoholic liver disease, breast cancer and suicide. Of the most frequent causes of death in this study, worryingly suicide was joint second (with ischaemic heart disease), but this

Figure 1. Top five causes of death in NHS GG&C employees: 2007–2009.
Table 1. Relative risk of mortality in the support services group compared to other staff groupings

<table>
<thead>
<tr>
<th>Staff grouping</th>
<th>Relative risk of mortality in support services compared with other staff groupings</th>
</tr>
</thead>
<tbody>
<tr>
<td>Medical</td>
<td>6.46 (95% CI 2.57–16.24; ( P &lt; 0.001 ))</td>
</tr>
<tr>
<td>Nursing</td>
<td>3.27 (95% CI 2.19–4.89; ( P &lt; 0.001 ))</td>
</tr>
<tr>
<td>Allied health professionals</td>
<td>1.38 (95% CI 0.62–3.06; NS)</td>
</tr>
<tr>
<td>Other therapeutic services</td>
<td>2.42 (95% CI 0.87–6.72; NS)</td>
</tr>
<tr>
<td>Health care science</td>
<td>3.37 (95% CI 1.34–8.48; ( P &lt; 0.001 ))</td>
</tr>
<tr>
<td>Administrative services</td>
<td>3.5 (95% CI 2.2–6.13; ( P &lt; 0.001 ))</td>
</tr>
</tbody>
</table>

CI, confidence interval; NS, not significant.

may be a result of people dying from conditions such as alcoholic liver disease and breast cancer having already left work due to morbidity affecting work capability rather than an unusually high frequency of suicide in this workforce.

The main limitations of this study are the small numbers of deaths and the exclusion of those who died after leaving NHS service. Further work to increase the number of years studied and to include deaths in those who have retired due to ill-health would be useful.

The main causes of death are, however, associated with risk factors that could be modified. Risk factor screening and health promotion within the workplace could therefore prevent deaths from these causes. Risk factor modification should incorporate multiple behaviour (as opposed to single behaviour) interventions, as there is likely to be clustering of multiple risk factors [7]. Improving ‘health literacy’ is an important aspect of successful health-promoting behaviour [8], which should also be addressed if such interventions are to be successful.

Relevant interventions should therefore include targeting health education and health promotion initiatives to the support services employee group, as they are most likely to benefit; concentrating on health promotion initiatives that have the best evidence of success [9]; providing on-going employee smoking cessation initiatives; and providing on-going initiatives to recognize and support mental health problems within the workplace. Finally, success in such interventions will also require close and continuing collaboration between management, staff, health promotion departments and occupational health services [10].

Key points

- This study suggests health inequality in this National Health Service workforce.
- The main causes of death are similar to those occurring nationally in Scotland.
- The main causes of death are likely to be amenable to risk factor screening and health promotion initiatives, and the support services group is likely to benefit most from such interventions.

Conflicts of interest

None declared.

References