An investigation into the possibility of an excess in cardiovascular mortality amongst aerospace workers exposed to aero-engine noise

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ABSTRACT

Background: Literature reviews of the non-auditory effects of noise have consistently found a possible, but not conclusive, link between environmental or occupational noise exposure and cardiovascular disease (CVD); in particular, ischaemic heart disease and hypertension. Portuguese work has implied an entity of vibroacoustic disease from low frequency occupational noise exposure, although this has not been substantiated by other research.

Aims: To determine whether there may be an excess of cardiovascular deaths in aerospace workers exposed to aero-engine noise by means of a pilot study at an aircraft manufacturing unit in the North West of England.

Methods: Exposed and unexposed aerospace workers were identified by department number from the company’s finance/personnel database. All workers who had ever been employed between 1989 and 2002 were searched for. The exposed subjects were aircraft/production fitters and electricians who had ever worked in the flight-line support of operational aircraft. The unexposed were electricians identified as working in electrical shops away from the flight-line. Airfield fire-fighters, who provide emergency cover for all flights and engine testing, formed a third group for interest (as potentially exposed to intermediate noise levels). Those identified as ever having worked on the flight-line were so assigned. Employees found by the finance information technology (IT) system were cross-referenced through the pensions database to identify deaths and death certificate details of those identified as deceased and were supplied to the Office for National Statistics (ONS). ICD9 or ICD10 coding of underlying cause of death for hypertensive disease, ischaemic heart disease and other forms of cardiovascular disease (CVD) were used to determine a proportional mortality ratio (PMR) and standardised mortality ratio (SMR) for all causes and CVD deaths.

Results: Of the 795 subjects who satisfied the criteria of department and job description, 32 had deceased; 11 exposed (5 from CVD), 16 unexposed electricians (6 from CVD) and 5 firemen (1 CVD). The PMR was 125 (95%CI 53-301). The external
SMR (all causes) for unexposed was 41 (95%CI 24-67) and for exposed 58 (95%CI 29-104). External SMR (CVD); unexposed 37 (95%CI 13-80), exposed 66 (95%CI 21-154). Internal SMR (all causes) 148 (95%CI 69-321) and for CVD causes of death 197 (95%CI 57-641).

**Conclusions:** Due to the small number of subjects eventually studied, definitive conclusions on an excess of deaths from cardiovascular disease are not possible. However, the findings of this pilot study suggest, through the raised internal SMR and PMR results, that development into a larger study is warranted.

**Keywords:** cardiovascular mortality; aerospace; noise.

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