

Published in final edited form as:

Occup Med (Lond). 2010 August ; 60(5): 348–353. doi:10.1093/occmed/kqq040.

OCCUPATION AND MORTALITY RELATED TO ALCOHOL DRUGS AND SEXUAL HABITS

David Coggon¹, E. Clare Harris¹, Terry Brown², Simon Rice³, and Keith T Palmer¹

¹MRC Epidemiology Resource Centre, University of Southampton, UK

²Institute of Environment and Health, Cranfield University, UK

³Mathematical Sciences Unit, Health and Safety Laboratory, Buxton, UK

Abstract

Aims—To identify opportunities for targeted prevention, we explored differences in occupational mortality from diseases and injuries related to alcohol consumption, sexual habits and drug abuse.

Methods—Using data on all deaths among men and women aged 16-74 years in England and Wales during 1991-2000, we derived age- and social class-standardised proportional mortality ratios (PMRs) by occupation for cause of death categories defined a priori as potentially related to alcohol consumption, sexual habits or drug abuse.

Results—The highest mortality from alcohol-related diseases and injuries was observed in publicans and bar staff (both sexes), and in male caterers, cooks and kitchen porters, and seafarers. Male seafarers had significantly elevated PMRs for cirrhosis (179), “other alcohol-related diseases” (275), cancers of the liver (155), oral cavity (275) and pharynx (267), and injury by fall on the stairs (187). PMRs for HIV/AIDS were particularly high in tailors and dressmakers (918, 95%CI 369-1890, in men; 804, 95%CI 219-2060, in women) and male hairdressers (918, 95%CI 717-1160). Most jobs with high mortality from HIV/AIDS also had more deaths than expected from viral hepatitis. Of seven jobs with significantly high PMRs for both drug dependence and accidental poisoning by drugs, four were in the construction industry (male painters and decorators, bricklayers and masons, plasterers, and roofers and glaziers).

Conclusions—Our findings highlight major differences between occupations in mortality from diseases and injuries caused by alcohol, sexual habits and drug abuse. Priorities for preventive action include alcohol-related disorders in male seafarers and drug abuse in construction workers.

Keywords

Occupation; alcohol; drug abuse; HIV; AIDS

Introduction

Historically, national and regional analyses of mortality by occupation have been carried out mainly to identify and characterise hazards in the workplace, and to assess the impact of controls on such hazards. However, the health of occupational groups may also differ importantly for other reasons. We here present findings from a 10-year analysis of occupational mortality in England and Wales, focusing on diseases and injuries related to

alcohol consumption, sexual habits and abuse of drugs. In some cases the findings point to opportunities for targeted preventive measures.

Methods

The Office for National Statistics supplied us with data on all deaths at ages 16-74 years in England and Wales during 1991-2000. For each death, we were given the sex, age, year of death and last full-time occupation of the decedent, together with the underlying cause of death. Occupations were coded to the Standard Occupational Classification 1990 (SOC 90), [1] categories of which were aggregated to 181 non-overlapping job groups.[2] Causes of death were coded to the ninth revision of the International Classification of Diseases (ICD 9). Social class was defined from occupation according to a standard algorithm.[3]

Analysis was based on deaths for which there was an adequately described occupation (1,202,888 men and 408,152 women). Associations between job group and cause of death were summarised by sex-specific proportional mortality ratios (PMRs) standardised for age (in five-year bands) and social class. PMRs were expressed as percentages, with associated 95% confidence intervals (CIs) based on the Poisson distribution.

For the purposes of this report, we focused primarily on a pre-defined set of cause of death categories potentially related to one or more of alcohol consumption, sexual habits and drug abuse. In addition, we examined mortality from two smoking-related diseases (cancer of the bronchus and chronic obstructive pulmonary disease (COPD)), where this might shed light on patterns of mortality from the diseases of main interest. Full details of the causes of death analysed are given in Appendix A. For a part of the study period (1993-2000), we were also given the decedent's place of birth. This information was also used to explore possible explanations for observed patterns of mortality.

Results

Five job groups had significantly elevated PMRs (lower 95% confidence limit >100) for at least four of the eight categories of alcohol-related disease that we examined – male seafarers, publicans and bar staff, caterers, and cooks and kitchen porters; and female publicans and bar staff. Table 1 summarises patterns of mortality in these job groups for diseases caused by alcohol and also for cancer of the bronchus and chronic obstructive pulmonary disease (COPD). PMRs were consistently elevated for all the alcohol-related diseases other than cancer of the oesophagus, although their relative magnitudes varied between job groups. For example, caterers and cooks and kitchen porters had markedly higher PMRs than seafarers and publicans and bar staff for cancer of the liver, but lower PMRs for “other alcohol-related diseases”, cirrhosis, and cancers of the oral cavity and larynx. PMRs for cancer of the bronchus and COPD were also lower in caterers and cooks and kitchen porters.

Table 2 shows mortality in the same job groups from four categories of injury and from suicide. Deaths from falls and from injury by fire, were generally more frequent than expected, the largest excesses being for deaths caused by falls on stairs. On the other hand, PMRs for motor vehicle traffic accidents and suicide were consistently (and often significantly) less than 100.

Table 3 lists job groups with significantly elevated PMRs for HIV/AIDS, and shows also their PMRs for viral hepatitis and the ratios of PMRs for the two diseases. Several of the PMRs for HIV/AIDS were remarkably high, notably in tailors and dressmakers (918, 95%CI 369-1890, in men; 804, 95%CI 219-2060, in women), and in male hairdressers (918, 95%CI 717-1160). Furthermore, most of the job groups with high mortality from HIV/AIDS also

had more deaths than expected from viral hepatitis. For most job groups, the ratio of the PMR for HIV/AIDS to that for viral hepatitis was between 0.8 and 1.3, and for several others, the 95%CI for the ratio embraced this range. Exceptions, however, were male hairdressers (ratio = 5.8, 95%CI 1.6-49) and “other service personnel” (ratio = 3.5, 95%CI 1.9-6.6).

Analysis of deaths by place of birth indicated that among cooks and kitchen porters the proportion of men who had been born in South Asia (6.9%) was higher than in all occupations combined (1.8%). Moreover the proportion of deaths from viral hepatitis was much higher in men born in South Asia (0.4%) than in those born in the UK (0.03%).

Table 4 summarises mortality from drug dependence and accidental poisoning by drugs in job groups that had significantly elevated PMRs for both of these causes of death. All seven of the job groups that satisfied this criterion were in men, including four in the construction industry together with literary and artistic occupations, retailers and dealers, and “other labourers”. The ratio of PMRs for the two causes of death was fairly consistent across these occupations.

Discussion

The findings presented highlight major differences between occupational groups in mortality from diseases and injuries related to alcohol, sexual activity and abuse of drugs. In some cases, the high risks identified, although not directly attributable to hazards in the workplace, may point to useful opportunities for prevention.

Our method of analysis was subject to various well-documented limitations. Errors are known to occur in the recording of occupations and causes of death on death certificates, [4,5] and even where accurate, occupational data related only to the decedent’s last full-time job. Also, the PMR of a job group for a specific cause could be spuriously inflated if mortality in the job group from all causes combined was unusually low. However, it is extremely unlikely that biases of this sort could explain the substantially elevated PMRs that we have demonstrated in this report.

The job groups with highest mortality from alcohol-related diseases were mostly in the catering industry, a finding that has been noted before,[6] and which has persisted through to 2005.[7] It is unsurprising, given the ready access to alcoholic drinks in these occupations. Indeed, publicans and bar staff may be directly encouraged to consume alcohol during the course of their work by offers of free drinks from customers. To this extent, their risk of alcohol-related disease could be regarded as a true occupational hazard. In addition, however, there may be a tendency for people who drink more heavily, selectively to seek jobs in establishments where alcohol is served.[8] Moreover, employment in such environments may encourage a culture of drinking outside working hours.

Cultural influences of this sort could also be one reason why male seafarers have high mortality from alcohol-related diseases. Many sailors work in small, closed communities, in which drinking habits can easily be transmitted to others. In addition, the stresses associated with absence from home for prolonged periods may be a further contributing factor. High rates of alcohol-related disease in seamen have been reported also in other countries,[6,9,10] and should be a priority for preventive action. There is scope for employers to control access to alcohol while ships are at sea, as some already do.[11] Furthermore, statutory periodic health checks of a kind that British merchant seamen are obliged to undergo, offer opportunities for health promotion at the individual level.

Interestingly, relative mortality from different alcohol-related diseases differed markedly between job groups. Caterers and cooks and kitchen porters had higher PMRs for liver cancer than publicans and bar staff and seafarers, but lower PMRs for oral cancer, laryngeal cancer, cirrhosis and “other alcohol-related diseases”. Their lower mortality from oral and laryngeal cancer may in part reflect a lower prevalence of smoking, in support of which, they also had their lower PMRs for cancer of the bronchus and COPD (Table 1). In addition, however, it is notable that caterers and cooks and kitchen porters also had unusually high mortality from viral hepatitis (Table 3). Chronic hepatitis B and C infections are a major cause of liver cancer in their own right,[12,13] and the risk of liver cancer from these infections is enhanced by alcohol consumption.[13,14]

Occupations with high mortality from diseases related to alcohol also had high PMRs from injury by falls (especially falls on stairs) and by fire (Table 2). This seems likely to reflect an increased risk of such injuries in people who are intoxicated by alcohol, and is consistent with previous findings on mortality by occupation from falls on stairs.[15] In contrast, however, their mortality from motor vehicle traffic accidents and suicide was lower than expected. In the case of motor vehicle accidents, this may be because people in the occupations concerned drive less than those in other jobs.

Mortality from HIV/AIDS varied widely between jobs, with PMRs in male hairdressers and tailors and dressmakers more than nine times the average for all occupations. A major factor in this is likely to be differences between job groups in the prevalence of homosexuality, rates of HIV infection being higher in male homosexuals.[16] A second influence may be the frequency of intravenous drug abuse, shared use of needles being another important route by which the virus is transmitted.[17] Hepatitis B and C can also be transmitted in this way, and this may explain why many of the job groups with high PMRs for HIV/AIDS also had high mortality from viral hepatitis. In addition, rates of hepatitis are likely to be elevated in occupations that include higher proportions of immigrants from countries where the infection is prevalent in early life. For example, the cooks and kitchen porters in our study included a relatively high proportion of men who had been born in South Asia (6.9% compared with 1.8% for all occupations combined), while the overall proportion of deaths that was from viral hepatitis was much higher in South Asian men (0.4%) than among men born in the UK (0.03%). This additional reason for hepatitis in some occupations may partly explain why the ratio of the PMR for HIV/AIDS to that for viral hepatitis varied between job groups.

Consistent with an increased risk of HIV/AIDS and viral hepatitis from shared use of needles, male literary and artistic occupations were among the job groups with high mortality from drug dependence and accidental poisoning by drugs. Interestingly, however, most of the other job groups with elevated PMRs for drug-related deaths were in the construction industry (painters and decorators, bricklayers and masons, plasterers, and roofers and glaziers). This may be because men who abuse drugs tend to seek work in casual jobs, and it does not necessarily imply a culture of drug abuse in the construction industry. Nevertheless, it could contribute to the high rate of occupational injuries in construction trades.[18] There would be merit, therefore in further research to establish the scale of the problem, and the potential for targeted interventions to reduce it.

In summary, this analysis has highlighted major variation between occupations in mortality from a number of diseases and injuries that are unlikely to be caused directly by work. In the case of alcohol-related disorders in male seafarers, there may be immediate opportunities for preventive action. In addition, there would be value in exploring further the extent of drug abuse in construction workers, and the scope for preventive measures in the workplace.

Acknowledgments

We thank the Office of National Statistics for providing us with data. The Health and Safety Executive provided financial support for analytical work carried out by the Health and Safety Laboratory. Clare Harris was funded by the Colt Foundation. Vanessa Cox helped in preparation of data files at the MRC Epidemiology Resource Centre.

Appendix A: Causes of death analysed

Cause of Death	Component ICD9 Categories	
Cancer of oral cavity	141	Malignant neoplasm of tongue
	143	Malignant neoplasm of gum
	144	Malignant neoplasm of floor of mouth
	145	Malignant neoplasm of other and unspecified parts of mouth
Cancer of pharynx (specified)	146	Malignant neoplasm of oropharynx
	147	Malignant neoplasm of nasopharynx
	148	Malignant neoplasm of hypopharynx
Cancer of oesophagus	150	Malignant neoplasm of oesophagus
Cancer of liver	155	Malignant neoplasm of liver and intrahepatic bile ducts
Cancer of larynx	161	Malignant neoplasm of larynx
Other alcohol-related diseases	303	Alcohol dependence syndrome
	305.0	Alcohol abuse
	425.5	Alcoholic cardiomyopathy
	535.3	Alcoholic gastritis
	571.0	Alcoholic fatty liver
	571.1	Acute alcoholic hepatitis
	571.2	Alcoholic cirrhosis of liver
	571.3	Alcoholic liver damage (unspecified)
	E860.0	Accidental poisoning by alcoholic beverages
	E860.1	Accidental poisoning by other and unspecified ethyl alcohol and its products
Cirrhosis (without mention of alcohol)	571.5	Cirrhosis of liver without mention of alcohol
Pancreatitis	577.0	Acute pancreatitis
	577.1	Chronic pancreatitis
Cancer of the bronchus	162	Malignant neoplasm of trachea, bronchus and lung
Chronic obstructive pulmonary disease	491	Chronic bronchitis
	492	Emphysema
	496	Chronic airway obstruction not elsewhere classified
Motor vehicle traffic accidents	E810-E819	Motor vehicle traffic accidents
Fall on stairs	E880	Fall on or from stairs or steps
Fall unspecified	E888	Other and unspecified fall
Injury by fire	E890-E899	Accidents caused by fire and flames
Suicide	E950-E959	Suicide and self-inflicted injury

HIV/AIDS	042	Human immunodeficiency virus (HIV) infection
	279.1	Deficiency of cell-mediated immunity
Viral hepatitis	070	Viral hepatitis
Drug dependence	304	Drug dependence
Accidental poisoning by drugs	E850-E858	Accidental poisoning by drugs, medicinal substances and biologicals

References

- Office of Population Censuses and Surveys. Standard Occupational Classification. Vol. 1. Structure and definition of major, minor and unit groups . HMSO; London: 1990.
- Coggon, D.; Harris, EC.; Brown, T.; Rice, S.; Palmer, KT. Occupational mortality in England and Wales 1991-2000. http://www.statistics.gov.uk/downloads/theme_health/Occupational-mortality.pdf (accessed 16.11.09)
- Office of Population Censuses and Surveys. Standard Occupational Classification. Vol. 3. Social classifications and coding methodology. HMSO; London: 1991.
- Alderson MR. Some sources of error in British occupational mortality data. *Br J Indust Med.* 1972; 29:245–54.
- Swift B, West K. Death certification: an audit of practice entering the 21st century. *J Clin Pathol.* 2002; 55:275–9. [PubMed: 11919211]
- Olkinuora M. Alcoholism and occupation. *Scand J Work Environ Health.* 1984; 10:511–5. [PubMed: 6535254]
- Baker A. Alcohol-related deaths by occupation: what do data for England and Wales in 2001-05 tell us about doctors' mortality? *Alcohol and Alcoholism.* 2008; 43:121–2. [PubMed: 18367538]
- Plant M. Occupation and alcoholism: cause or effect? A controlled study of recruits to the drinks trade. *Int J. Addictions.* 1978; 13:267–73.
- Pukkala E, Saarni H. Cancer incidence among Finnish seafarers 1967-92. *Cancer Causes Control.* 1996; 7:231–9. [PubMed: 8740736]
- Hemmingsson T, Lundberg I, Nilsson R, Allebeck P. Health-related selection to seafaring occupations and its effects on morbidity and mortality. *Am J Indust Med.* 1997; 31:662–8.
- Oil Companies International Marine Forum. Guidelines for the control of drugs and alcohol onboard ship. 1995. http://www.ocimf.com/view_document.cfm?id=339 (last accessed 22/07/09)
- Crook PD, Jones ME, Hall AJ. Mortality of hepatitis B surface antigen-positive blood donors in England and Wales. *Int J Epidemiol.* 2003; 32:118–24. [PubMed: 12690022]
- Yuan JM, Govindarajan S, Arakawa K, Yu MC. Synergism of alcohol, diabetes, and viral hepatitis on the risk of hepatocellular carcinoma in blacks and whites in the U.S. *Cancer.* 2004; 101:1009–17. [PubMed: 15329910]
- Gitto S, Micco L, Conti F, Andreone P, Bernardi M. Alcohol and viral hepatitis: a mini review. *Dig Liver Dis.* 2009; 41:67–70. [PubMed: 18602355]
- Drever, F., editor. Occupational Health Decennial Supplement. HMSO; London: 1995. p. 71Series DS no. 10
- Dougan S, Evans BG, Macdonald N, Goldberg DJ, Gill ON, Fenton KA, Elford J. HIV in gay and bisexual men in the United Kingdom: 25 years of public health surveillance. *Epidemiol Infect.* 2008; 136:145–56. [PubMed: 17662168]
- Mathers BM, Degenhardt L, Phillips B, Wiessing L, Hickman M, Strathdee SA, et al. Global epidemiology of injecting drug use and HIV among people who inject drugs: a systematic review. *Lancet.* 2008; 372:1733–45. [PubMed: 18817968]
- Health and Safety Executive. Health and safety statistics 2007/08. <http://www.hse.gov.uk/statistics/overall/hssh0708.pdf> (last accessed 22/07/09)

Table 1
Mortality from diseases caused by alcohol and smoking in selected job groups

Cause of death (ICD 9 codes)	MEN						WOMEN			
	Seafarers		Publicans and Bar Staff		Caterers		Cooks and Kitchen Porters		Publicans and Bar Staff	
	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)
Cancer of oral cavity (141, 143-145)	53	275 (206-360)	110	311 (256-375)	31	148 (100-210)	43	176 (127-236)	22	180 (113-272)
Cancer of pharynx (specified) (146-148)	39	267 (190-365)	67	238 (184-302)	47	294 (216-391)	40	197 (140-268)	16	187 (107-304)
Cancer of oesophagus (150)	129	100 (84-119)	273	113 (100-127)	133	98 (82-116)	97	70 (57-85)	91	122 (98-150)
Cancer of liver (155)	60	155 (118-199)	125	153 (127-182)	102	228 (186-277)	100	263 (214-319)	25	78 (50-115)
Cancer of larynx (161)	61	253 (194-325)	100	277 (225-337)	37	169 (119-234)	30	106 (72-151)	14	204 (112-343)
Other alcohol-related diseases (303, 305.0, 425.5, 535.3, 571.0- 571.3, E860.0, E860.1)	215	275 (239-314)	449	241 (219-265)	134	112 (94-133)	208	145 (126-166)	146	222 (188-261)
Cirrhosis (without mention of alcohol) (571.5)	58	179 (136-232)	170	236 (202-274)	54	129 (97-168)	58	145 (110-188)	55	197 (148-256)
Pancreatitis (577.0, 577.1)	20	131 (80-203)	32	102 (70-144)	27	130 (86-190)	34	151 (104-211)	22	161 (101-244)
Cancer of the bronchus (162)	797	108 (101-116)	1399	130 (123-137)	736	113 (105-122)	699	90 (83-97)	727	138 (128-148)
Chronic obstructive pulmonary disease (491, 492, 496)	386	114 (103-126)	575	150 (138-163)	273	105 (93-119)	334	103 (92-115)	392	155 (140-171)

Table 2
Mortality from injury and suicide in job groups with high PMRs for alcohol-related diseases

Cause of death (ICD 9 codes)	MEN								WOMEN	
	Seafarers		Publicans and Bar Staff		Caterers		Cooks and Kitchen Porters		Publicans and Bar Staff	
	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)
Motor vehicle traffic accidents (E810-E819)	43	91 (66-122)	108	60 (49-73)	149	84 (71-99)	219	76 (66-87)	47	89 (66-119)
Fall on stairs (E880)	15	187 (105-308)	20	134 (82-207)	9	88 (40-167)	21	169 (105-258)	14	178 (97-299)
Fall unspecified (E888)	11	132 (66-237)	29	188 (126-270)	14	125 (68-210)	19	142 (86-222)	11	131 (65-234)
Injury by fire (E890-E899)	7	141 (57-291)	17	141 (82-226)	7	65 (26-133)	20	121 (74-187)	9	182 (83-346)
Suicide (E950-E959)	67	76 (59-96)	257	91 (80-103)	173	72 (62-83)	263	76 (67-86)	52	84 (63-110)

Table 3

Mortality from HIV/AIDS and viral hepatitis in selected job groups

Job Group	HIV / AIDS (ICD9 042, 279.1)		Viral hepatitis (ICD9 070)		Ratio of PMRs (95% CI)
	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)	
Men					
Lawyers	21	169 (105-258)	5	184 (60-428)	0.9 (0.3-3.1)
Vocational trainers, social scientists etc	29	174 (116-250)	1	37 (1-205)	4.7 (0.8-205)
Welfare workers	42	153 (110-207)	5	158 (51-369)	1.0 (0.4-3.1)
Clergy	11	219 (109-391)	3	172 (36-503)	1.3 (0.3-7.1)
Nurses	46	171 (125-228)	4	141 (38-360)	1.2 (0.4-4.6)
Literary and artistic occupations	242	237 (208-269)	27	249 (164-362)	1.0 (0.6-1.5)
Caterers	107	300 (246-362)	23	387 (245-580)	0.8 (0.5-1.3)
Hairdressers	71	918 (717-1160)	2	157 (19-567)	5.8 (1.6-49)
Office workers and cashiers	224	126 (110-144)	42	108 (78-147)	1.2 (0.8-1.7)
Cooks and kitchen porters	93	420 (339-515)	24	511 (327-760)	0.8 (0.5-1.4)
Other service personnel	78	308 (243-384)	14	89 (49-150)	3.5 (1.9-6.6)
Hospital porters and ward orderlies	34	235 (163-328)	4	106 (29-271)	2.2 (0.8-8.6)
Tailors and dressmakers	7	918 (369-1890)	0	0 (0-1070)	∞ (0.7-∞)
Women					
Nurses	18	186 (111-295)	6	101 (37-220)	1.8 (0.7-5.7)
Literary and artistic occupations	10	281 (135-517)	2	137 (17-494)	2.1 (0.4-19)
Tailors and dressmakers	4	804 (219-2060)	0	0 (0-567)	∞ (0.9-∞)

Table 4
Mortality from drug dependence and accidental poisoning by drugs in selected male job groups

Job Group	Drug dependence (ICD9 304)		Accidental poisoning by drugs (ICD9 E850-E858)	
	Deaths	PMR (95% CI)	Deaths	PMR (95% CI)
Literary and artistic occupations	32	264 (181-373)	73	192 (150-241)
Retailers and dealers	46	205 (150-273)	86	157 (125-194)
Painters and decorators	67	270 (209-343)	137	216 (182-256)
Bricklayers, masons	22	178 (112-270)	64	208 (160-265)
Plasterers	16	235 (134-381)	30	178 (120-254)
Roofers and glaziers	24	184 (118-273)	49	160 (119-212)
Other labourers	233	122 (107-139)	553	124 (113-134)