

# Letters

## RESEARCH LETTER

### Association of Occupation as a Physician With Likelihood of Dying in a Hospital

Although most people report a preference to die at home vs at a medical facility,<sup>1,2</sup> most deaths occur in a hospital or nursing home.<sup>3</sup> Some articles have proposed that physicians die after receiving less intensive medical care and in a manner more consistent with end-of-life preferences than the general population,<sup>4</sup> although studies on this topic are lacking.<sup>5</sup> This study compared location of death for physicians with that of other clinicians, non-health care professionals with similar education levels, and the general population.

**Methods** | We used the National Longitudinal Mortality Study, a prospective random national sample of noninstitutionalized individuals based on US Census Bureau surveys

matched to the National Death Index.<sup>6</sup> We included individuals aged 30 to 98 years who died between 1979 and 2011 and excluded those missing the location of death (n = 12 205). This study was deemed not to involve human subjects research by the New York University School of Medicine institutional review board.

We categorized decedents into 4 mutually exclusive categories based on self-report of occupation or education: physician, other health professional (dentist, veterinarian, optometrist, podiatrist, nurse, pharmacist, dietician), other higher education, and all others. Other higher education included decedents not employed in health care who completed 6 or more years of postsecondary education and were therefore comparable with physicians in this marker of socioeconomic status. We assessed 2 outcomes: death in an inpatient hospital and, more broadly, death in a facility (ie, hospital, skilled nursing facility, professional center, physician office, or clinic).

Table 1. Characteristics of 471 243 Decedents From the National Longitudinal Mortality Study Who Died Between 1979 and 2011

		Weighted Estimated % (95% CI) of Individuals by Occupation Category <sup>a</sup>							
		Physicians (n = 815)		Other Health Professionals <sup>b</sup> (n = 2635)		Other Higher Education (n = 15 308)		All Others (n = 452 485)	
Age, mean (SD), y		74.0 (12.5)		71.1 (12.9)		74.9 (12.9)		75.6 (12.6)	
Female sex		8.5 (6.7-10.7)		67.8 (66.0-69.6)		31.9 (31.2-32.6)		51.4 (51.3-51.5)	
Race <sup>c</sup>									
	Black	2.3 (1.4-3.7)		7.7 (6.7-8.8)		5.6 (5.2-6.0)		10.4 (10.3-10.5)	
	White	92.9 (90.9-94.5)		91.0 (89.8-92.1)		92.4 (92.0-92.8)		88.0 (87.9-88.1)	
	Other	4.9 (3.6-6.7)		1.4 (1.0-2.0)		2.0 (1.8-2.2)		1.6 (1.6-1.6)	
Hispanic ethnicity <sup>c</sup>		3.4 (2.3-5.0)		1.3 (0.9-1.8)		1.6 (1.4-1.8)		3.4 (3.4-3.5)	
Leading causes of death									
1	Diseases of the heart	32.7 (29.4-36.0)	Malignancies	31.1 (29.3-32.9)	Diseases of the heart	29.3 (28.6-30.0)	Diseases of the heart	32.2 (32.1-32.3)	
2	Malignancies	29.3 (26.1-32.5)	Diseases of the heart	25.3 (23.6-27.0)	Malignancies	27.7 (27.0-28.4)	Malignancies	24.4 (24.3-24.5)	
3	All other diseases	6.7 (5.1-8.7)	All other diseases	8.7 (7.7-9.9)	All other diseases	8.3 (7.9-8.8)	All other diseases	7.7 (7.6-7.8)	
4	Cerebrovascular disease	5.4 (4.0-7.2)	Cerebrovascular disease	5.7 (4.9-6.7)	Cerebrovascular disease	6.1 (5.7-6.5)	Cerebrovascular disease	6.9 (6.8-7.0)	
5	Accidents	3.1 (2.1-4.6)	Chronic lower respiratory disease	4.8 (4.0-5.7)	Chronic lower respiratory disease	3.4 (3.1-3.7)	Chronic lower respiratory disease	5.3 (5.2-5.4)	
6	Pneumonia and influenza	3.0 (2.0-4.5)	Diabetes	3.4 (2.8-4.2)	Accidents	3.2 (2.9-3.5)	Pneumonia and influenza	2.9 (2.9-2.9)	
7	Chronic lower respiratory disease	2.6 (1.7-4.0)	Accidents	3.3 (2.7-4.1)	Pneumonia and influenza	2.9 (2.6-3.2)	Diabetes	2.8 (2.8-2.8)	
8	Alzheimer disease	2.0 (1.2-3.3)	Alzheimer disease	2.3 (1.8-3.0)	Alzheimer disease	2.4 (2.2-2.7)	Accidents	2.5 (2.5-2.5)	
9	Suicide	2.0 (1.2-3.3)	Pneumonia and influenza	1.7 (1.3-2.3)	Diabetes	2.3 (2.1-2.6)	Alzheimer disease	2.0 (2.0-2.0)	
10	Parkinson disease	1.6 (0.9-2.8)	Kidney disease	1.6 (1.2-2.2)	Parkinson disease	1.5 (1.3-1.7)	Kidney disease	1.6 (1.6-1.6)	

<sup>a</sup> Unless otherwise indicated.

<sup>b</sup> Included dentist, veterinarian, optometrist, podiatrist, nurse, pharmacist, and dietician.

<sup>c</sup> Self-reported and assessed because of prior association with place of death.

Table 2. Association Between Occupation and Location of Death Among 471 243 Decedents

	Death at Hospital				Death at Facility <sup>a</sup>			
	Both Sexes		Males Only <sup>b</sup>		Both Sexes		Males Only <sup>b</sup>	
	All Deaths, Weighted % (95% CI)	Odds Ratio (95% CI)	All Deaths, Weighted % (95% CI)	Odds Ratio (95% CI)	All Deaths, Weighted % (95% CI)	Odds Ratio (95% CI)	All Deaths, Weighted % (95% CI)	Odds Ratio (95% CI)
Physicians (n = 815)	38.3 (34.9-41.7)	1 [Reference]	37.8 (34.2-41.4)	1 [Reference]	63.3 (59.9-66.7)	1 [Reference]	62.8 (59.3-66.3)	1 [Reference]
Male dentists (n = 289)			35.1 (29.4-40.8)	0.89 (0.86-0.92)			65.3 (59.6-71.0)	1.12 (1.07-1.14)
Other health professionals (n = 2635) <sup>d</sup>	37.4 (35.5-39.3)	0.96 (0.94-0.98)	36.1 (32.8-39.4)	0.93 (0.91-0.96)	65.4 (63.6-67.2)	1.10 (1.08-1.12)	64.9 (61.6-68.2)	1.10 (1.07-1.13)
Other higher education (n = 15 308)	37.1 (36.3-37.9)	0.95 (0.93-0.97)	37.8 (36.9-38.7)	1.00 (0.98-1.02)	66.1 (65.3-66.9)	1.13 (1.11-1.15)	65.8 (64.9-66.7)	1.14 (1.12-1.16)
All others (n = 452 485)	40.4 (40.3-40.5)	1.09 (1.07-1.11)	41.9 (41.7-42.1)	1.19 (1.16-1.21)	72.4 (72.3-72.5)	1.52 (1.50-1.55)	70.8 (70.6-71.0)	1.44 (1.41-1.46)

<sup>a</sup> Includes hospital, skilled nursing facility, professional center, physician office, or clinic.

<sup>b</sup> There were 744 physicians; 826 other health professionals; 10 421 employed in other higher education; and 219 855 in all others category.

<sup>c</sup> Adjusted for age, sex, race, ethnicity, and year of death.

<sup>d</sup> Includes dentists.

Location and cause of death were obtained from death certificates. We developed logistic regression models to determine the association of occupation with location of death after adjusting for age, sex, race/ethnicity, and year of death. We performed subgroup analyses on males given the high number of male physicians, and male dentists, which is the subgroup thought to be most similar to physicians. Counts of decedents were presented as raw numbers; all other results incorporated survey weights.

Analyses were performed using SAS version 9.0 (SAS Institute Inc). Significance was prespecified with a 2-sided a level of .05.

**Results** | Of the 471 243 decedents in the study, 815 were physicians, 2635 other health professionals, 15 308 other higher education, and 452 485 all others. Physicians were more likely to be male and less likely to be black compared with other groups, but the top 10 causes of death were similar among groups (Table 1).

Of deaths, 40.3% occurred in an inpatient hospital and 72.1% occurred in any facility. After adjusting for covariates and compared with physicians, other health occupation and other higher education were not associated with in-hospital death (Table 2). However, those in the all others category were more likely than physicians to die in a hospital (40.4% vs 38.3%; adjusted odds ratio [AOR], 1.10 [95% CI, 1.08-1.12]).

Rates of death in a facility were 63.3% for physicians, 65.4% for other health professionals, 66.1% for other higher education, and 72.4% for all others. Compared with physicians, the other 3 groups had higher likelihoods of dying in any facility (other health professionals: AOR, 1.14 [95% CI, 1.12-1.17]; other higher education: AOR, 1.12 [95% CI, 1.11-1.14]; all others: AOR, 1.34 [95% CI, 1.32-1.37]). Results were similar for subgroups of male decedents and male dentists, except both male health professionals and male dentists were less likely to die in a hospital than male physicians (Table 2).

**Discussion** | Physicians were slightly less likely to die in a hospital than the general population, but equally as likely to die in a hospital as others in health care or with similar educational attainment. In addition, physicians were the least likely group to die at any facility.

Our results suggest that familiarity with health care (supported by the subgroup results) and educational attainment may have a small association with experience of death. These results may also be related to socioeconomic differences besides education, which we could not measure, or to differential treatment by clinicians.

Study limitations include that occupation or education may have changed between time of survey and death. Furthermore, death location may not reflect individual choice and was based on the death certificate, which may be subject to misclassification.

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**Author Contributions:** Dr Johnson had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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**Conflict of Interest Disclosures:** The authors have completed and submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest and none were reported.

**Funding/Support:** Dr Blecker was supported by grant K08HS23683 from the Agency for Healthcare Research and Quality.

**Role of the Funder/Sponsor:** The Agency for Healthcare Research and Quality had no role in the design and conduct of the study; collection, management, analysis, and interpretation of the data; preparation, review, or approval of the manuscript; and decision to submit the manuscript for publication.

**Disclaimer:** Any views expressed on statistical, methodological, technical, or operational issues are those of the authors and not necessarily those of the US Census Bureau.

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## End-of-Life Care Intensity for Physicians, Lawyers, and the General Population

Care at the end of life must balance intensity of treatment with quality of life. Previous research has not determined whether physicians, the group most familiar with end-of-life care, receive higher or lower intensity end-of-life treatments compared with nonphysicians.<sup>1</sup>

**Methods** | Non-health maintenance organization Medicare beneficiaries aged 66 years or older who died between 2004 and 2011 in Massachusetts, Michigan, Utah, and Vermont were included due to availability of electronic death records and ability to link to Medicare. The Partners human research committee determined the study was not human research.

Death records were not available for Massachusetts in 2011 and Utah for 2004 through 2005, and approximately 10% of decedents could not be linked to Medicare claims. Death certificates documented age, education, Social Security number, and usual industry and occupation (the type of job engaged in for most of his/her working life). Industry and occupation are typically provided by family members to the funeral director and are highly accurate.<sup>2</sup>

From Medicare records, we obtained data on 5 validated measures of end-of-life care intensity during the last 6 months of life: surgery,<sup>3</sup> hospice care,<sup>4</sup> intensive care unit (ICU)

Table 1. Characteristics of Deceased Physicians, Lawyers, and General Population in 4 States, 2004-2011<sup>a</sup>

	No. (%) [95% CI] <sup>b</sup>		
	Physicians (n = 2396) <sup>c</sup>	Lawyers (n = 2081) <sup>c</sup>	General Population (n = 665 579) <sup>c,d</sup>
Sex			
Male	2092 (87.3) [85.9-88.6]	1906 (91.6) [90.3-92.7]	301 309 (45.3) [45.1-45.4]
Female	304 (12.7) [11.4-14.1]	175 (8.4) [7.3-9.7]	364 263 (54.7) [54.6-54.9]
Age, mean (SD), y	83.3 (8.0)	82.6 (8.3)	83.1 (8.3)
Race/ethnicity <sup>e</sup>	(n = 2310)	(n = 2020)	(n = 645 936)
Non-Hispanic white	2136 (92.5) [91.3-93.5]	1964 (97.2) [96.4-97.9]	591 733 (91.6) [91.5-91.7]
Asian/Pacific Islander	93 (4.0) [3.3-4.9]	7 (0.35) [0.17-0.71]	2897 (0.45) [0.43-0.47]
Non-Hispanic black	61 (2.6) [2.1-3.4]	42 (2.1) [1.5-2.8]	45 230 (7.0) [6.9-7.1]
Hispanic	7 (0.3) [0.15-0.62]	6 (0.3) [0.14-0.65]	5354 (0.83) [0.81-0.85]
Other	13 (0.6) [0.33-0.96]	1 (0.05) [0.01-0.28]	722 (0.11) [0.10-0.12]
Education level	(n = 2376)	(n = 2067)	(n = 654 992)
<College	0	45 (2.2) [1.6-2.9]	495 737 (75.7) [75.6-75.8]
≥Some college	2376 (100.0) [100.0-100.0]	2022 (97.8) [97.1-98.4]	159 255 (24.3) [24.2-24.4]

<sup>a</sup> Age of 66 years or older and receiving Medicare coverage at the time of death.

<sup>b</sup> Unless otherwise indicated.

<sup>c</sup> Totals vary in column due to missing data. Data on deaths were not available in electronic format for 2011 from Massachusetts and for 2004 and 2005 from Utah.

<sup>d</sup> Excludes lawyers and health care workers.

<sup>e</sup> Race/ethnicity has been shown in prior work to be associated with end-of-life care intensity and therefore was included in this analysis. The race/ethnicity variable is contained in Medicare's enrollment data/master beneficiary file. Information on race/ethnicity is obtained from the Social Security Administration, which obtains the information from the beneficiary.