DOES MORTALITY DIFFER BETWEEN PUBLIC AND PRIVATE SECTOR WORKERS?

*By Alicia H. Munnell, Jean-Pierre Aubry, and Geoffrey T. Sanzenbacher**

INTRODUCTION

Defined benefit plans pay pension benefits from retirement until death. Thus, the longer workers live, the higher the expense for the plan. On average, states and localities *assume* their workers will live slightly than longer private sector workers.[1] This *brief* asks a simple question: do state and local workers *actually* live longer on average than their private sector counterparts? If so, why?

The discussion proceeds as follows. The first section explains the nature and limitations of the available data – the *National Longitudinal Mortality Study*. The second section presents the percentage of public and private sector workers ages 55-64 who died within either an 11-year period or a separate 6-year period after being interviewed. The third section uses regression analysis to assess how various factors impact the likelihood of dying. The final section concludes that public sector workers – especially women – do live

longer than their private sector counterparts and that most of the difference can be explained by the higher education levels of public sector workers.

THE NATIONAL LONGITUDINAL MORTALITY STUDY

The analysis uses the *National Longitudinal Mortality Study* (NLMS) to analyze public versus private sector mortality. This study is sponsored by the National Institute on Aging, the Center for Health Statistics, and the Census Bureau. The NLMS links demographic data from the *Current Population Survey* (CPS) to death certificates, providing a way to study how a person's characteristics may relate to his death.

More specifically, the data in this *brief* come from a publicly available version of the NLMS – the *NLMS Public Use Microdata Sample* (NLMS PUMS) – which

Alicia H. Munnell is director of the Center for Retirement Research at Boston College (CRR) and the Peter F. Drucker Professor of Management Sciences at Boston College's Carroll School of Management. Jean-Pierre Aubry is assistant director of state and local research at the CRR. Geoffrey T. Sanzenbacher is a research economist at the CRR.

LEARN MORE

Search for other publications on this topic at:
crr.bc.edu

is designed to protect respondents' confidentiality. Each observation in the NLMS PUMS has a subset of the demographic variables that are collected through the CPS when an individual enters the sample. If the individual dies, each observation contains a subset of information from the person's death certificate (including age of death). The death certificate data are collected at the end of the individual's "follow-up period" – either 11 years or 6 years after the CPS data were collected depending on the NLMS PUMS data year.

The NLMS PUMS differs from the full NLMS in two main ways that affect our analysis. First, the NLMS PUMS does not include the CPS survey year in which the individual was first observed. Instead, the NLMS PUMS creates three separate samples of CPS respondents that are representative of the U.S. population at particular times. The first two samples are from the early 1980s and are constructed to be representative of the U.S. population as of April 1, 1983. One of these samples has an 11-year follow-up period and the other just a 6-year follow-up. The third sample is from the early 1990s and is constructed to represent the U.S. population as of April 1, 1993. This 1993 sample has a 6-year follow-up period.
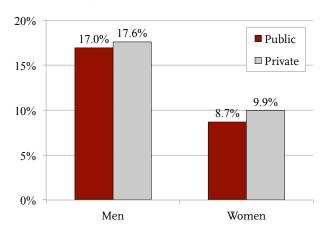
The second difference between the full NLMS and the NLMS PUMS is that the latter includes only a subset of CPS variables. Importantly, the NLMS PUMS does not differentiate between state and local workers and federal workers. The analysis below reflects both these restrictions – that is, the analysis is performed only for 1983 and 1993 and combines federal and state and local workers.[2]

Do Public Sector Workers Have Lower Mortality?

To compare the mortality of public and private sector workers, the NLMS PUMS samples described above were restricted to 55-64 year olds working at the time the CPS data were collected. It is necessary to restrict the sample to working individuals in order to determine whether the individual was a public or private sector employee. Once these samples are constructed, it is simple to tabulate mortality rates by gender
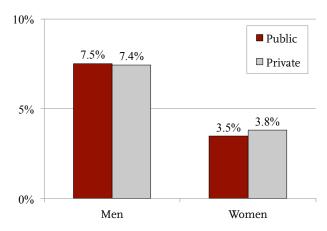
and examine the percentage of individuals who died in the survey follow-up periods. Figure 1A shows the results for the 1983 sample with an 11-year follow-up period and Figure 1B shows the results combining the 1983 and 1993 samples with 6-year follow-up periods.

FIGURE 1A. 11-YEAR MORTALITY RATES FOR 55-64 YEAR OLD WORKERS, 1983 NLMS PUMS

Source: Authors' calculations from the NLMS PUMS, 1983 Sample (11-year follow-up).

FIGURE 1B. 6-YEAR MORTALITY RATES FOR 55-64 YEAR OLD WORKERS, 1983 AND 1993 NLMS PUMS

*Source*s: Authors' calculations from the NLMS PUMS, 1983 Sample (6-year follow-up) and 1993 Sample.

Figure 1A supports the notion that public sector workers live longer. Public sector men ages 55-64 were 0.6 percentage points less likely to die within 11 years (i.e., by the time they were ages 66-75) than private sector men. For women, the gap was larger – 1.2 percentage points.[3] Figure 1B has smaller differences overall and is less conclusive, perhaps because the follow-up period is shorter and differences have less time to develop. In any case, public sector men are slightly *more* likely to die during the 6-year follow up than private sector men, a reversal from the earlier pattern. For women, the earlier pattern is preserved.[4]

Why Do Public Sector Employees Have Lower Mortality?

The generally lower mortality rates shown in Figures 1A and 1B suggest an obvious question – why? It is tempting to develop a story around the nature of public sector work – perhaps it is somehow easier, less stressful, or more stable than private sector work or perhaps public sector workers have better health benefits and these factors lead to lower mortality.[5] The reality is somewhat more mundane: 1) public sector workers, on average, are more educated than private sector workers; and 2) more educated people have lower mortality. Table 1 illustrates the first fact by combining the three NLMS PUMS samples and tabulating rates of education by gender.

As Table 1 shows, public sector men are nearly twice as likely as private sector men to be college graduates and less likely to be high school dropouts. This pattern is even more pronounced for public sector women, who are four times more likely to be college graduates and much less likely to be high school dropouts than their private sector counterparts.[6]

Given these stark differences in educational attainment, it is important to determine how the mortality gap changes when controlling for educational differences between the two sectors. This exercise involves estimating six probit regressions – one set of three for men and one set of three for women – on the probability of dying for the 1983 11-year follow-up sample.[7] The 11-year sample was chosen for this analysis because of its lengthier follow-up time, which allows differences between the two sectors to develop. The first probit regression run for each gender included no controls, the second controlled for education only, and the third controlled for education and other factors (e.g., age, race/ethnicity, urban/rural residence, and occupation in police or fire).
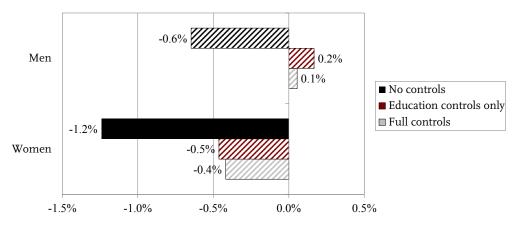
Figure 2 on the next page shows that, in the case of men, the 11-year mortality gap between public and private workers of 0.6 percentage point is not statistically significant, and introducing education controls turns the negative gap positive, albeit still not statistically significant. This positive difference is reduced when controls are introduced for those working in police and fire. In the case of women, 1.2 percent fewer public sector workers died over the 11-year period

Table 1. Public and Private Sector Workers Ages 55-64 by Educational Attainment, 1983 & 1993 NLMS PUMS

Level of education	Men		Women	
	Public sector	Private sector	Public sector	Private sector
Less than high school	23.6%	34.0%	15.0%	29.6%
High school only	31.8	35.6	40.0	48.3
Some college	13.3	13.7	16.7	14.5
4-year college degree	31.3	16.7	28.3	7.6
Observations	12,579	48,582	12,241	37,090

Source: Authors' calculations from the NLMS PUMS, 1983 Sample (11-year follow up), 1983 Sample (6-year follow-up), and 1993 Sample.

FIGURE 2. PERCENTAGE-POINT DIFFERENCE IN 11-YEAR MORTALITY BETWEEN PUBLIC AND PRIVATE SECTOR WORKERS, AGES 55-64

Note: Striped bars are not statistically significant.
Source: Authors' calculations from the NLMS PUMS, 1983 Sample (11-year follow-up).

than private sector workers, and the mortality gap was statistically significant. The second bar shows that controlling for differences in women's education dramatically reduces the 11-year mortality gap, and it is no longer statistically significant. Introducing further controls has a minimal effect on the difference for women. Figure 2 suggests that whether an individual is a public or private sector worker has little impact on their mortality; instead other individual characteristics drive the differences seen in Figures 1a and 1b.

CONCLUSION

The public sector takes care to align its mortality assumptions to the mortality experience of its members. In practice, this alignment results in assumptions that public sector workers live slightly longer than private sector workers. The data in the NLMS PUMS seem to support this idea – especially for women. The explanation for this lower mortality turns out to be relatively simple: the public sector tends to employ more educated workers on average than the private sector, and these workers are less likely to die over a given period. After controlling for education, the rates of mortality between public and private sector workers are comparable.

Endnotes

1 The average life expectancy at age 65 for men and women in the *Public Plans Database* (PPD) sample of 150 state and local pension plans is higher than that calculated under the IRS's most recently published tables for private plans. For more information on the mortality assumptions used by state and local plans, see Munnell, Aubry, and Cafarelli (2015).

2 About 80 percent of public sector workers are in state and local government.

3 For men, the difference is not statistically significant. For women, it is statistically significant at the 1-percent level.

4 Neither difference is statistically significant.

5 For information on the relative stability of public sector workers, see Munnell and Fraenkel (2013). For information on the quality of health benefits, see Munnell et al. (2011).

6 Although the share of high school dropouts may seem high and of college graduates low, it is worth remembering that the 1983 and 1993 samples of 55-64 year old workers were born from 1918-1928 and 1928-1938, respectively. These birth cohorts have low rates of educational attainment compared to more recent birth cohorts.

7 The full regression results are in the Appendix.

References

Munnell, Alicia H., Jean-Pierre Aubry, and Mark Cafarelli. 2015. "How Will Longer Lifespans Affect State and Local Pension Funding?" *State and Local Pension Plans Issue in Brief* 43. Chestnut Hill, MA: Center for Retirement Research at Boston College. Jointly published by the Center for State and Local Government Excellence.

Munnell, Alicia H., Jean-Pierre Aubry, Joshua Hurwitz, and Laura Quinby. 2011. "Comparing Compensation: State-Local Versus Private Sector Workers." *State and Local Pension Plans Issue in Brief* 20. Chestnut Hill, MA: Center for Retirement Research at Boston College. Jointly published by the Center for State and Local Government Excellence.

Munnell, Alicia H. and Rebecca Cannon Fraenkel. 2013. "Public Sector Workers and Job Security." *State and Local Pension Plans Issue in Brief* 31. Chestnut Hill, MA: Center for Retirement Research at Boston College.

National Institutes of Health, National Center for Health Statistics, and U.S. Census Bureau. 1983, 1993. *National Longitudinal Mortality Study Public Use Microdata Samples.* Washington, DC.

Public Plans Database. 2001-2013. Center for Retirement Research at Boston College, Center for State and Local Government Excellence, and National Association of State Retirement Administrators.

APPENDIX

APPENDIX

Three probit regressions were run for each gender. The first probit regression included no controls, the second controlled for education only, and the third controlled for education and other factors (e.g., age, race/ethnicity, urban/rural residence, and occupation in police or fire). Table A1 includes summary statistics for the variables in these regressions.

TABLE A1. SUMMARY STATISTICS FOR VARIABLES IN 11-YEAR MORTALITY PROBIT REGRESSIONS

	Males	Females
Age	58.7	58.7
Education		
Less than high school	33.2%	27.3%
High school only	35.0	46.5
Some college	12.9	14.0
4-year college degree	19.0	12.1
Race		
White, not Hispanic	85.9	84.4
Black, not Hispanic	6.9	9.4
Other race, not Hispanic	2.0	2.2
Hispanic	5.2	4.1
Rural	27.1	25.6
Fire/police worker	2.7	0.3
Observations	27,452	21,740

Source: Authors' calculations from the NLMS PUMS, 1983 Sample (11-year follow-up).

The results from the probit regressions are in Table A2 (on the next page). The results are reported as marginal effects. The reported coefficient can be interpreted as the percentage-point-change in 11-year mortality given the person either has the indicated characteristic (e.g., the person is in the public sector) or given a one-year change in age.

TABLE A2. MARGINAL EFFECTS OF SELECT VARIABLES ON 11-YEAR MORTALITY PROBIT REGRESSIONS, 55-64 YEAR OLD WORKERS

Variable	Men			Women		
	(1)	(2)	(3)	(1)	(2)	(3)
Government worker	-0.0065	0.0017	0.0006	-0.0124***	-0.0046	-0.0042
	(0.0056)	(0.0058)	(0.0058)	(0.0045)	(0.0048)	(0.0048)
Education						
(Base=dropout)						
High school, no college		-0.0231***	-0.0233***		-0.0198***	-0.0162***
		(0.0053)	(0.0054)		(0.0046)	(0.0047)
Some college		-0.0288***	-0.0285***		-0.0274***	-0.0253***
		(0.0069)	(0.0070)		(0.0056)	(0.0057)
4-year college degree		-0.0630***	-0.0621***		-0.0393***	-0.0372***
		(0.0058)	(0.0059)		(0.0057)	(0.0058)
Age			0.0117***			0.0074***
			(0.0008)			(0.0007)
Race/Ethnicity						
(Base=White, not Hispanic)						
Black, not Hispanic			0.0299***			0.0270***
			(0.0095)			(0.0076)
Other race, not Hispanic			-0.0334**			-0.0120
			(0.0149)			(0.0128)
Hispanic			-0.0619***			-0.0266***
			(0.0087)			(0.0087)
Rural			-0.0074			-0.0113**
			(0.0052)			(0.0045)
Fire/police worker			0.0272*			
			(0.0147)			
Pseudo R-squared	0.0001	0.0041	0.0144	0.0005	0.0039	0.0141
Observations	27,452	27,452	27,452	21,740	21,740	21,740

Note: Coefficients are significant at the 10-percent (*), 5-percent (**), or 1-percent (***) level.
Source: Authors' calculations from the NLMS PUMS, 1983 Sample (11-year follow-up).

About the Center

The mission of the Center for Retirement Research at Boston College is to produce first-class research and educational tools and forge a strong link between the academic community and decision-makers in the public and private sectors around an issue of critical importance to the nation's future. To achieve this mission, the Center sponsors a wide variety of research projects, transmits new findings to a broad audience, trains new scholars, and broadens access to valuable data sources. Since its inception in 1998, the Center has established a reputation as an authoritative source of information on all major aspects of the retirement income debate.

Affiliated Institutions

The Brookings Institution
Massachusetts Institute of Technology
Syracuse University
Urban Institute

Contact Information

Center for Retirement Research
Boston College
Hovey House
140 Commonwealth Avenue
Chestnut Hill, MA 02467-3808
Phone: (617) 552-1762
Fax: (617) 552-0191
E-mail: crr@bc.edu
Website: http://crr.bc.edu

Visit the:

PUBLIC PLANS DATABASE

pubplans.bc.edu