Comparative Analysis of the Public-Use and Restricted-Use LSOA II Linked Mortality File

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Introduction

The National Center for Health Statistics (NCHS) periodically conducts mortality follow-up studies through record linkage to administrative data sources for its major population-based surveys (see NCHS Data Linkage Activities), providing a longitudinal component to nationally representative data. These linked mortality files, in general, fill research gaps by creating data resources that contain high quality socio-demographic, health, and mortality information for nationally representative U.S. samples. The mortality update for the Second Longitudinal Study on Aging (LSOA II), completed in 2006, allows researchers to examine aging-related health and risk factors collected over time with subsequent mortality.

Due to requirements to protect the confidentiality of the LSOA II participants, the LSOA II Linked Mortality File was made available only through the NCHS Research Data Center (RDC). Recognizing that this would place restrictions on researchers' use of a unique aging-related data source, NCHS developed a data perturbation plan in order to allow for a public-use release of the LSOA II Linked Mortality data. The LSOA II Linked Mortality data perturbation plan eliminates re-identification of survey participants, while limiting the amount of synthetic data introduced to the data file, and is consistent with the perturbation rules implemented for the public-use National Health Interview Survey (NHIS) Linked Mortality Files, since the LSOA II cohort is drawn from the 1994 NHIS.

This report describes a comparative analysis of the public-use and restricted-use LSOA II Linked Mortality Files. We used Cox proportional hazards models to compare the relative hazards for a standard set of socio-demographic covariates for all-cause as well as cause-specific mortality risk. NCHS is conducting this comparative analysis to demonstrate the comparability between the two versions of the linked mortality files.

Description of Linked Mortality Data Resources

The mortality update for LSOA II was conducted through a linkage of the LSOA II survey participants to death certificate data found in the National Death Index (NDI). Mortality information is based upon the results of a probabilistic match between LSOA II and NDI death certificate records, as well as previously identified deaths collected during the Second Longitudinal Study on Aging. For more information on the matching methodology, refer to the LSOA II Linked Mortality File Matching Methodology Report. All LSOA II participants are included on the linked mortality file. NCHS has created two versions of the new LSOA II Linked Mortality File: a restricted-use file that includes detailed mortality information and a public-use file that includes a limited set of mortality variables.

The restricted-use file includes the following variables: survey respondent eligibility status, mortality status, age at death, age last presumed alive, date of death (month and year), underlying and multiple cause-of-death, and LSOA II interview date (month, day, and year). The public-use file was subjected to standard data perturbation techniques that introduce statistical noise into the data set, in order to reduce the risk of respondent re-identification. Synthetic data were substituted for the actual date and underlying cause-of-death data for selected decedent records. Information regarding vital status was not perturbed. Variables provided on the public-use LSOA II Linked Mortality File include: survey respondent eligibility status, mortality status, date of death (quarter and year), and underlying cause-of-death 113 group recode. In addition, three variables were created to indicate the presence of diabetes, hypertension, or hip fracture in the multiple cause-of-death codes, as these conditions are most often reported as contributing, rather than underlying, causes of death.

Methods

Analytic sample

To effectively compare the public-use and restricted-use data sets, we merged the public-use LSOA II baseline data file (The Second Supplement on Aging, 1994), with the accompanying public-use and restricted-use mortality files, respectively, to create the analytic samples. We restricted all analyses to those eligible for mortality follow-up, who were non-Hispanic white, non-Hispanic black, or Hispanic, and with no missing values for education level, marital status, region and cause of death.

Outcome measurement

We examined all-cause and cause-specific mortality in the public-use and restricted-use LSOA II Linked Mortality Files using time from LSOA II interview until death; respondents who were not identified as dying by the end of the follow-up period were assumed to be alive. For the public-use file, duration of follow-up was calculated in person-months using LSOA II interview month and year, which is available from the LSOA II public-use baseline data[1] and quarter and year of death. Month of death was assigned as the midpoint of each quarter. For the restricted-use file, duration of follow-up was calculated using information on the month and year of the LSOA II interview[2] and the month, day, and year of death or, for respondents assumed alive, until the end of the follow-up period, December 31, 2002. Thus, minor differences in model results may be evident in the comparative results below because of the differing calculations of the duration of follow-up time that were used for the two files.

In addition to all-cause mortality, we examined five specific causes of death. The LSOA II Linked Mortality File encompasses both the Ninth Revision of the *International Classification of Diseases* (ICD-9) and the Tenth Revision (ICD-10) cause of death coding for all U.S. deaths. In order to have the same cause of death codes across all years in the

[1] This is referred to as the Second Supplement on Aging, 1994.
[2] Since the day of LSOA II interview is not available, it was assigned as 15 for all respondents.

study period, we used the ICD-10 underlying cause-of-death 113 group recode, which recodes all deaths occurring prior to 1999 into ICD-10 codes.[1] However, even though the code numbers are the same for all years of mortality data, the coding rules for determining underlying cause-of-death differ for deaths that occurred prior to 1999 under ICD-9 and those that occurred in later years under ICD-10. The analyses presented in this paper do not control for the transition in coding rules between ICD-9 and ICD-10 because that transition does not affect the comparisons of interest in this paper.

The cause-specific death categories include the following Underlying Cause-of-Death Recoded 113 Groups (UCOD-113): heart disease (55-68), ischemic heart disease (59-61), cancer from all sites (20-44), lung cancer (27), and cerebrovascular disease (70).

Covariates

All models included a standard set of socio-demographic characteristics, which were collected at the time of LSOA II interview: age (70-79 yrs, 80-89 yrs, 90+ yrs), sex, race/ethnicity (non-Hispanic black, non-Hispanic white, Hispanic), educational attainment (less than high school, high school diploma, more than high school), marital status (widowed, divorced/separated, never married, married), and region of the country (South, Midwest, Northeast, West).

Data Analysis

We used Cox proportional hazards models to compare the relative hazards for the covariates for all-cause as well as cause-specific mortality risk. All relative hazards were calculated with the survival procedure in Software for Survey Data Analysis (SUDAAN), version 9.0.1 to take into account the complex survey design of the LSOA II.[2] The Efron method was used for handling tied failure times.[3] Due to an insufficient number of deaths for several causes in this older cohort for non-Hispanic blacks and Hispanics, the cause-specific mortality analyses are restricted to non-Hispanic whites.

Results

Descriptive Results

The public-use and restricted-use LSOA II Linked Mortality Files each contain 9,447 records and 3,958 deaths. The final sample for the comparative analyses included 8,867 records (Table 1) and 3,671 deaths. Table 2.1 shows the unweighted sample sizes and weighted percentage distributions for the covariates used in the analysis. Note that these descriptive statistics for covariates do not differ between the public-use and restricted-use files because the only differences between the two files are associated with the variables taken from the mortality file. Using the weighted distributions of covariates for this sample, the average age is 76.3 years, reflecting that over two-thirds of the sample is between 70-79 years. Females make up approximately 60 percent of the sample, and non-Hispanic whites make up 88 percent of the sample while non-Hispanic blacks (7.6 percent) and Hispanics (4.2 percent) account for considerably smaller proportions.

Table 2.2 shows the comparative descriptive statistics for mortality outcome variables in the public-use and restricted-use files, respectively. Note first that the total number and percentage of persons who were identified as dying in each of the two files (n = 3,671; percent = 41.4) is identical. As mentioned above, this illustrates the fact that the vital status of individuals was not changed for anyone as a result of the perturbation process for the public-use file. However, due to the perturbation process modest differences in the cause of death distributions is expected. Among the selected cause-specific deaths examined, the number of deaths attributed to heart disease (n = 1,302) in the public-use file is greater than the number of deaths attributed to heart disease (n = 1,273) in the restricted-use file. For the other underlying causes-of-death presented, there are only modest differences when looking at the numbers and percentage distribution of deaths.

All-Cause Mortality Model Results

Table 3.1 displays results from two Cox proportional hazards models of all-cause mortality: one estimated from the public-use file and one estimated from the restricted-use file. The results of both models are consistent. As expected in this older cohort, age is very strongly and positively related to the risk of mortality, and mortality risk is significantly higher for

men compared to women. In addition, mortality risk differs by educational groups and marital status. Moreover, coefficients and standard errors are nearly identical when comparing the results from the public-use and restricted-use files, with only slight differences occurring in the second and third decimal places of the coefficients and standard errors, respectively. Recall that there are differences in the way that the duration of follow-up variable was calculated for these two versions of the LSOA II Linked Mortality Files; thus, these very slight differences in model results for all-cause mortality are due to the differences in the duration of follow-up variable.

The results of all-cause Cox proportional hazards models of mortality that are estimated separately by sex are shown in Table 3.2. For each sex, results from the public-use and restricted-use files are shown. The sex-specific models yield consistent results, with very similar coefficients and standard errors when the public-use and restricted-use files are compared.

Cause-Specific Mortality Model Results

Tables 4.1 through 4.5 display the results of the Cox proportional hazards models for five specific underlying causes-of-death. Each cause-specific table provides a comparison of the model results from the public-use version and the restricted-use version of the LSOA II Linked Mortality File. As previously mentioned, these cause-specific results are limited to individuals who are identified as non-Hispanic white (n=7,586). Females and males are included in these cause-specific models, with a dummy variable for sex in each model. Those with missing data on education, marital status, region or cause of death were excluded. Some of the specific causes (e.g., lung cancer, ischemic heart disease) are subsets of a larger underlying cause category (e.g., all-cancer mortality, heart disease).

A comparison of the results for the public-use and restricted-use files for each of the five causes yields no substantive differences in conclusions, with coefficients and standard errors that are very similar. To illustrate an example of the consistency between results from the public-use data and restricted-use data, Table 4.1 provides comparative models that specify heart disease mortality as the outcome variable. Both versions of the LSOA II

Linked Mortality Files, show that for non-Hispanic whites mortality risk from heart disease increases with age and mortality risk is 1.6 times greater for men than women. The results also show that over the course of the follow-up period, those with less than a high school education experience 26 percent higher heart disease mortality risk than those with more than a high school education according to the public-use data and 25 percent higher heart disease mortality risk according to the restricted-use data.

Discussion

This report describes analyses comparing results obtained from the public-use version and restricted-use version of the LSOA II Linked Mortality File. In the public-use version of the data file, a limited amount of information for decedents was perturbed. Further, there is less detailed date of death information in the public-use version, compared to the restricted-use file, where no information has been perturbed and there is complete information on date of death.

The comparative analysis finds that the two data files yield very similar descriptive and model results. This is particularly true when examining all-cause mortality. Because the perturbation process in the public-use file did not affect the vital status of any individuals in the file, the only differences in results between the two files when examining overall (all-cause) mortality arose because the public-use file has less specific information available regarding timing of death for individuals compared to the restricted-use file. The differences that resulted from the comparisons of all-cause mortality between the public-use file and restricted-use file were very minor.

The comparative analysis of cause-specific mortality across the public-use and restricted-use versions of the LSOA II Linked Mortality Files also yielded only very slight differences in model results. The frequency distributions that were shown for selected causes of death for the public-use and restricted-use versions of the LSOA II Linked Mortality Files demonstrated that the perturbation process in the public-use version had a small effect on the number of persons identified as dying of each cause as well as the overall distribution of deaths. This should be kept in mind when conducting cause-

specific analyses of the public-use file. Nevertheless, the coefficients and standard errors in the cause-specific models that we have estimated for non-Hispanic whites demonstrate that such differences in the identification of causes of death for some cases result in only very slight changes in the comparative results. Moreover, for non-Hispanic whites, no differences in conclusions could be reached based on these cause-specific models when comparing the public-use and restricted-use data sets.

Our findings should provide analysts with the confidence to use this data file providing updated mortality follow-up for eligible LSOA II respondents. However, some analytic considerations should be noted by all potential users. First, because the LSOA II is based upon a complex survey design, we used the statistical software package SUDAAN 9.0.1, which fits Cox proportional hazards models to sample surveys. Moreover, caution should be used when examining the mortality patterns of small subgroups of the population, such as numerically small racial/ethnic minority groups, in this aged cohort. This is particularly the case when cause-specific analyses of such numerically small demographic subgroups are performed.

In sum, the new public-use version of the LSOA II Linked Mortality File provides the public health, social science, demographic, and medical communities interested in aging research with a data set that is rich in detail for both mortality covariates and specificity in outcomes. The public-use file is an important resource for researchers and policymakers in further understanding the risk factors for mortality among the elderly population.

References

1. Anderson RN, Minino AM, Hoyert DL, Rosenberg HM. Comparability of cause of death between ICD-9 and ICD-10: Preliminary estimates. National Center for Health Statistics. *National Vital Statistics Reports 49*. 2001;No.2.

2. SUDAAN: Software for the Statistical Analysis of Correlated Data, 9.01. RTI International.

3. Hertz-Picciotto I; Rockhill B. Validity and efficiency of approximation methods for tied survival times in Cox regression. *Biometrics.* 1997;53:1151-1156.

Table 1. Selection criteria for comparative analyses: LSOA II Linked Mortality File

	Number of records	Excluded cases
Total records	9,447	
Sample selection criteria		
Eligible for mortality follow-up		24
Race/ethnicity restricted to non-Hispanic whites, non-Hispanic blacks, and Hispanics. Non missing values for education and marital status.		494
Non missing values for underlying cause-of-death 113 group recode.		62
Total number of excluded cases		580
Final cases included in sample	**8,867**	

Table 2.1. Sample characteristics, LSOA II person level variables: n=8,867

	Unweighted n	Weighted percentage
Age in years, mean	76.4	76.3
Age in years (grouped)		
70-79	6,028	68.7
80-89	2,488	27.5
90+	351	3.8
Sex		
Male	3,526	40.2
Female	5,341	59.8
Race/ethnicity		
non-Hispanic white	7,586	88.2
non-Hispanic black	940	7.6
Hispanic	341	4.2
Marital status		
Married	4,722	53.7
Widowed	3,315	36.9
Divorced/Separated	491	5.6
Never married	339	3.8
Education level		
Less than high school	3,627	39.7
High school	3,032	34.5
More than high school	2,208	25.7
Region		
Northeast	2,018	22.7
Midwest	2,395	26.2
South	2,876	33.0
West	1,578	18.2

Table 2.2. Sample characteristics, LSOA II linked mortality variables: n=8,867

	Public-use		Restricted-use	
	Unweighted n	Weighted percentage	Unweighted n	Weighted percentage
Follow-up period in years, mean	4.40	4.42	4.39	4.41
Assigned vital status				
Dead	3,671	41.4	3,671	41.4
Alive	5,196	58.6	5,196	58.6
Cause-specific deaths (113 group recode)[1]				
Diseases of the heart (55-68)	1,302	34.9	1,273	34.2
Ischemic heart disease (59-61)	340	9.0	338	9.0
Cancer, all sites (20-44)	797	21.7	808	22.0
Lung cancer (27)	204	5.7	204	5.7
Cerebrovascular diseases (70)	312	8.3	313	8.3

[1]Weighted percentages based upon sample of decedents (n =3,671)

Table 3.1. Relative hazards for all-cause mortality: Comparative analyses of public-use and restricted-use LSOA II Linked Mortality File (n=8,867)

	Public-use			Restricted-use		
	Coefficient	SE	Hazard ratio	Coefficient	SE	Hazard ratio
Age in years (70-79)						
80-89	0.649 ***	0.0397	1.913	0.653 ***	0.0399	1.922
90+	1.136 ***	0.1011	3.113	1.129 ***	0.1021	3.091
Sex (Female)						
Male	0.427 ***	0.0392	1.532	0.420 ***	0.0390	1.522
Race/ethnicity (NHW)						
NHB	0.073	0.0597	1.076	0.080	0.0599	1.083
Hispanic	-0.253 *	0.1212	0.777	-0.237	0.1231	0.789
Education (More than high school)						
Less than high school	0.213 ***	0.0467	1.237	0.201 ***	0.0461	1.223
High school	0.204 ***	0.0473	1.226	0.202 ***	0.0471	1.224
Marital status (Married)						
Widowed	0.190 ***	0.0475	1.209	0.189 ***	0.0480	1.209
Divorced/Separated	0.261 **	0.0835	1.298	0.258 **	0.0829	1.294
Never married	0.210 *	0.0834	1.234	0.204 *	0.0836	1.226

Notes:
Models also controlled for region.
Relative hazards are estimated from a Cox proportional hazards model.
All models use sample weights and take into account the LSOA II complex survey design using the SUDAAN software program (9.0.1).
NHW is non-Hispanic white; NHB is non-Hispanic black. The values in parentheses are reference categories.
* p <.05; ** p <.01; *** p <.001.

Table 3.2. Relative hazards for all-cause mortality by sex: Comparative analyses of public-use and restricted-use LSOA II Linked Mortality File (n=8,867)

	Men						Women					
	Public-use			Restricted-use			Public-use			Restricted-use		
	Coefficient	SE	Hazard ratio	Coefficient	SE	Hazard ratio	Coefficient	SE Beta	Hazard ratio	Coefficient	SE	Hazard ratio
Age in years (70-79)												
80-89	0.656 ***	0.0587	1.927	0.658 ***	0.0595	1.931	0.645 ***	0.0520	1.906	0.653 ***	0.0518	1.921
90+	1.086 ***	0.1919	2.962	1.076 ***	0.1930	2.933	1.201 ***	0.1163	3.323	1.200 ***	0.1158	3.321
Race/ethnicity (NHW)												
NHB	0.015	0.1040	1.016	0.026	0.1048	1.026	0.140 *	0.0638	1.151	0.146 *	0.0624	1.157
Hispanic	-0.262	0.1623	0.769	-0.242	0.1658	0.785	-0.209	0.1292	0.812	-0.193	0.1280	0.825
Education (More than high school)												
Less than high school	0.245 ***	0.0693	1.277	0.230 **	0.0686	1.258	0.193 **	0.0618	1.213	0.184 **	0.0617	1.202
High school	0.205 **	0.0689	1.228	0.207 **	0.0682	1.230	0.202 **	0.0663	1.224	0.196 **	0.0664	1.217
Marital status (Married)												
Widowed	0.160 *	0.0804	1.174	0.164 *	0.0806	1.178	0.200 ***	0.0542	1.222	0.195 ***	0.0546	1.215
Divorced/Separated	0.307 *	0.1260	1.359	0.300 *	0.1254	1.350	0.248 *	0.0988	1.281	0.246 *	0.0972	1.279
Never married	0.174	0.1291	1.190	0.168	0.1280	1.183	0.237	0.1277	1.267	0.225	0.1292	1.253

Notes:
Models also controlled for region.
Relative hazards are estimated from a Cox proportional hazards model.
All models use sample weights and take into account the LSOA II complex survey design using the SUDAAN software program (9.0.1).
NHW is non-Hispanic white; NHB is non-Hispanic black. The values in parentheses are reference categories.
* p <.05; ** p <.01; *** p <.001.

Table 4.1. Relative hazard for heart disease mortality: Comparative analyses of public-use and restricted-use LSOA II Linked Mortality File, non-Hispanic whites only (n=7,586)

	Public-use			Restricted-use		
	Coefficient	SE	Relative hazard	Coefficient	SE	Relative hazard
Age in years (70-79)						
80-89	0.905 ***	0.0718	2.471	0.909 ***	0.0727	2.482
90y+	1.618 ***	0.1342	5.044	1.622 ***	0.1346	5.063
Sex (Female)						
Male	0.497 ***	0.0746	1.644	0.489 ***	0.0746	1.631
Education (More than high school)						
Less than high school	0.234 **	0.0724	1.264	0.225 **	0.0720	1.252
High school	0.150	0.0776	1.162	0.156 *	0.0779	1.169
Marital status (Married)						
Widowed	0.405 ***	0.0865	1.499	0.404 ***	0.0872	1.497
Divorced/Separated	0.459 **	0.1539	1.582	0.420 **	0.1569	1.522
Never married	0.373 *	0.1562	1.452	0.324 *	0.1564	1.382

Notes:
Models also control for region of the country.
Relative hazards are estimated from a Cox proportional hazards model.
All models use sample weights and take into account the LSOA II complex survey design using the SUDAAN software program (9.0.1).
The values in parentheses are reference categories.
* p <.05; ** p<.01; *** p <.001.

Table 4.2. Relative hazard for ischemic heart disease mortality: Comparative analyses of public-use and restricted-use LSOA II Linked Mortality File, non-Hispanic whites only (n=7,586)

	Public-use			Restricted-use		
	Coefficient	SE	Relative hazard	Coefficient	SE	Relative hazard
Age in years (70-79)						
80-89	0.531 ***	0.1445	1.700	0.534 ***	0.1448	1.706
90y+	0.930 ***	0.2675	2.533	0.943 ***	0.2649	2.568
Sex (Female)						
Male	0.555 ***	0.1486	1.743	0.548 ***	0.1484	1.729
Education (More than high school)						
Less than high school	0.116	0.1577	1.123	0.124	0.1564	1.132
High school	0.041	0.1553	1.042	0.054	0.1529	1.055
Marital status (Married)						
Widowed	0.533 **	0.1741	1.704	0.540 **	0.1747	1.715
Divorced/Separated	0.530 *	0.2583	1.699	0.534 *	0.2595	1.706
Never married	0.412	0.3802	1.510	0.420	0.3826	1.522

Notes:
Models also control for region of the country.
Relative hazards are estimated from a Cox proportional hazards model.
All models use sample weights and take into account the LSOA II complex survey design using the SUDAAN software program (9.0.1).
The values in parentheses are reference categories.
* p <.05; ** p<.01; *** p <.001.

Table 4.3. Relative hazard for all cancer mortality: Comparative analyses of public-use and restricted-use LSOA II Linked Mortality File, non-Hispanic whites only (n=7,586)

	Public-use			Restricted-use		
	Coefficient	SE	Relative hazard	Coefficient	SE	Relative hazard
Age in years (70-79)						
80-89	0.253 **	0.0921	1.288	0.260 **	0.0939	1.297
90y+	-0.475	0.2931	0.622	-0.419	0.2866	0.658
Sex (Female)						
Male	0.571 ***	0.0847	1.770	0.559 ***	0.0855	1.748
Education (More than high school)						
Less than high school	0.146	0.1044	1.157	0.129	0.1054	1.138
High school	0.254 *	0.1096	1.289	0.246 *	0.1098	1.279
Marital status (Married)						
Widowed	0.047	0.0965	1.048	0.035	0.0958	1.036
Divorced/Separated	0.062	0.2149	1.064	0.075	0.2076	1.078
Never married	0.128	0.1822	1.136	0.108	0.1829	1.114

Notes:
Models also control for region of the country.
Relative hazards are estimated from a Cox proportional hazards model.
All models use sample weights and take into account the LSOA II complex survey design using the SUDAAN software program (9.0.1).
The values in parentheses are reference categories.
* p <.05; ** p<.01; *** p <.001.

Table 4.4. Relative hazard for lung cancer mortality: Comparative analyses of public-use and restricted-use LSOA II Linked Mortality File, non-Hispanic whites only (n=7,586)

	Public-use			Restricted-use		
	Coefficient	SE	Relative hazard	Coefficient	SE	Relative hazard
Age in years (70-79)						
80-89	-0.017	0.2061	0.983	-0.011	0.2064	0.989
90y+	-1.359	0.7915	0.257	-1.335	0.7908	0.263
Sex (Female)						
Male	0.620 ***	0.1551	1.858	0.598 ***	0.1549	1.818
Education (More than high school)						
Less than high school	0.522 *	0.2204	1.686	0.511 *	0.2180	1.666
High school	0.648 **	0.2146	1.912	0.633 **	0.2102	1.883
Marital status (Married)						
Widowed	-0.144	0.1793	0.866	-0.153	0.1800	0.858
Divorced/Separated	0.403	0.3421	1.496	0.334	0.3540	1.397
Never married	-0.167	0.4291	0.846	-0.177	0.4291	0.838

Notes:
Models also control for region of the country.
Relative hazards are estimated from a Cox proportional hazards model.
All models use sample weights and take into account the LSOA II complex survey design using the SUDAAN software program (9.0.1).
The values in parentheses are reference categories.
* p <.05; ** p<.01; *** p <.001.

Table 4.5. Relative hazard for cerebrovascular diseases mortality: Comparative analyses of public-use and restricted-use LSOA II Linked Mortality File, non-Hispanic whites only (n=7,586)

	Public-use			Restricted-use		
	Coefficient	SE	Relative hazard	Coefficient	SE	Relative hazard
Age in years (70-79)						
80-89	0.936 ***	0.1422	2.550	0.947 ***	0.1418	2.579
90y+	1.446 ***	0.2494	4.248	1.440 ***	0.2493	4.221
Sex (Female)						
Male	0.107	0.1536	1.112	0.096	0.1542	1.101
Education (More than high school)						
Less than high school	-0.011	0.1748	0.989	-0.030	0.1748	0.971
High school	0.005	0.1641	1.005	0.003	0.1632	1.003
Marital status (Married)						
Widowed	-0.162	0.1571	0.850	-0.161	0.1579	0.852
Divorced/Separated	0.368	0.2334	1.445	0.362	0.2328	1.436
Never married	0.220	0.3579	1.246	0.219	0.3569	1.244

Notes:
Models also control for region of the country.
Relative hazards are estimated from a Cox proportional hazards model.
All models use sample weights and take into account the LSOA II complex survey design using the SUDAAN software program (9.0.1).
The values in parentheses are reference categories.
* p <.05; ** p<.01; *** p <.001.