Supplementary Text

Overview of supplementary analyses

As supplementary analyses, we examined two additional issues to further explore the social and geographic inequalities in premature mortality; (i) the patterns of geographic inequalities in mortality by occupations, and (ii) the presence of contextual effects of prefecture-level socioeconomic status on mortality risk.

Geographic inequalities in all-cause premature mortality by occupations

Background and aims

Although we examined the patterns of geographic inequalities in premature mortality for all occupations in the main analysis, the patterns may vary (substantially) according to occupations. Therefore, we examined the occupation-specific geographic inequality in premature mortality for the overall study period. This analysis may further facilitate understanding of the possible pathways of emerging geographic inequalities in Japan.

Methods

Following the previous report of the Population Census,[1] we summarized the 11 occupations into six groups to increase the statistical power as follows: I. clerical, technical and managerial occupations (i.e., (1) specialist and technical workers, (2) administrative and managerial workers, and (3) clerical workers), II. sales and service occupations (i.e., (4) sales workers, (5) service workers, and (6) security workers), III. agriculture, forestry and fishery occupations (i.e., (7) agriculture, forestry and fishery workers), IV. production and transport occupations (i.e., (8) transport and communication workers and (9) production process and related workers), V. unclassifiable occupations (i.e., (10) workers not classifiable by occupation), and VI. non-employed (i.e., (11) non-employed) (Supplementary Table 1).

In this supplementary analysis, we specified six prefecture-level error terms (at level 3) corresponding to the six occupational groups, conditional on individual age, 11 occupations, and years as fixed terms. We calculated the variance and covariance of these error terms, and we also derived their correlation coefficients to explore the possible differential geographic patterns of mortality by the six occupational groups. Finally, we created maps showing prefecture-level residuals in the same methods as the main analysis.

Results

We show the results of variance and covariance of prefecture-level residuals among the six occupational groups (Supplementary Table 8). Men and women revealed a similar pattern except for the covariance between sales and service occupations and non-employed (-0.003 and 0.005 in men and women, respectively) and the covariance between agriculture, forestry and fishery occupations

and unclassifiable occupations (0.006 and -0.019 in men and women, respectively). In both sexes, the variances among unclassifiable occupations were much higher than those of other occupational groups (0.317 and 0.331 in men and women, respectively). Further, excluding unclassifiable occupations and non-employed, the signs of correlation coefficients were all positive, indicating that the patterns of geographic inequalities were similar across the remaining four occupational groups. We show these geographic patterns in both sexes (Supplementary Figures 4 and 5).

Contextual effect of prefecture-level socioeconomic status

Background and aims

Previous studies in Japan have examined possible contextual effects of area-level socioeconomic status (e.g., income inequality, per-capita income) on self-rated health and health-related behaviors by using multilevel analysis.[2-4] The relationship between area-level socioeconomic status and mortality has been also investigated in ecological studies,[5-12] most of which indicated higher mortality in areas of lower socioeconomic position. Indeed, recent international comparative studies have confirmed an association between income inequality and health, which included Japan.[13-15] However, no studies have examined the association between area-level socioeconomic status and premature adult mortality in Japan, by considering both individual- and area-level socioeconomic indicators. Further, we note the possibility that contextual effects by area-level disadvantage may have changed after the collapse of asset bubble in the early 1990s. Therefore, we examined the trends of contextual effects of prefecture-level socioeconomic status on premature adult mortality.

Methods

We derived prefecture-level socioeconomic status variables from the *National Survey of Family Income and Expenditure*,[16] which has been implemented every five years since the first survey in 1959. We derived the following three variables for each prefecture and divided them into tertiles; Gini's coefficient of yearly income, average yearly income, and average savings (Supplementary Table 9). These variables were calculated among two-or-more-person households. Gini's coefficient of yearly income was available since 1979, and we imputed the values of 1979 forwardly to 1969 and 1974. Although household income and savings may follow the skewed distributions, median income or savings were not available throughout the study period. Note that a previous review article suggested that the studies in income inequality are more supportive in large areas, e.g., states, regions, and metropolitan areas, because in that context income inequality serves as a measure of the scale of social stratification.[17] As Shibuya et al.[2] noted, a prefecture is similar to a state in the United States in terms of its population size and variations in income inequality.

We linked the data set of prefecture-level variables to the data set of the Population Census and the Vital Statistics one year out, e.g., National Survey of Family Income and Expenditure in 2004 was linked with the Population Census in 2005 and the Vital Statistics in 2005 fiscal year.

In the analysis, we conducted three-level analyses as an overall model, with cells at level 1, years

at level 2, and prefectures at level 3. The prefecture-level socioeconomic status variable was entered into the model as a level-2 variable separately. Furthermore, to examine the joint effects of income inequality and average income/savings, we also entered Gini's coefficient and average yearly income/savings into the model simultaneously. In like manner, to examine the temporal patterns of contextual effects, we also conducted two-level analysis, with cells at level 1 and prefectures at level 2 separately for each year.

Results

Overall, we found little evidence of the association between prefecture-level socioeconomic status and the risk of mortality in both sexes, conditional on individual age and occupation (Supplementary Table 10). Likewise, in year-specific analyses, no clear associations were found although lower average savings were associated with higher risk of mortality in some years. When we examined the joint effects of income inequality and average income/savings, no substantial differences were observed (data not shown).

Conclusions of supplementary analyses

Excluding unclassifiable occupations and non-employed, the patterns of geographic inequalities were similar across occupational groups. We found no clear associations between prefecture-level socioeconomic status and premature mortality risk throughout the period although there is suggestion of inverse association between average savings and mortality in some years.

References

1. Ministry of Internal Affairs and Communications. Population Census: Explanation of Terms. http://www.stat.go.jp/english/data/kokusei/2000/terms.htm#Occupation.
2. Shibuya K, Hashimoto H, Yano E. Individual income, income distribution, and self rated health in Japan: cross sectional analysis of nationally representative sample. *BMJ* 2002;324:16-9.
3. Fukuda Y, Nakamura K, Takano T. Accumulation of health risk behaviours is associated with lower socioeconomic status and women's urban residence: a multilevel analysis in Japan. *BMC Public Health* 2005;5:53. doi:10.1186/1471-2458-5-53.
4. Ichida Y, Kondo K, Hirai H, Hanibuchi T, Yoshikawa G, Murata C. Social capital, income inequality and self-rated health in Chita peninsula, Japan: a multilevel analysis of older people in 25 communities. *Soc Sci Med* 2009;69:489-99.
5. Fukuda Y, Nakao H, Yahata Y, Imai H. Are health inequalities increasing in Japan? The trends of 1955 to 2000. *Biosci Trends* 2007;1:38-42.
6. Fukuda Y, Nakamura K, Takano T. Higher mortality in areas of lower socioeconomic position measured by a single index of deprivation in Japan. *Public Health* 2007;121:163-73.
7. Nakaya T, Dorling D. Geographical inequalities of mortality by income in two developed island countries: a cross-national comparison of Britain and Japan. *Soc Sci Med* 2005;60:2865-75.

8. Fukuda Y, Nakamura K, Takano T. Cause-specific mortality differences across socioeconomic position of municipalities in Japan, 1973-1977 and 1993-1998: Increased importance of injury and suicide in inequality for ages under 75. *Int J Epidemiol* 2005;34:100-9.
9. Fukuda Y, Umezaki M, Nakamura K, Takano T. Variations in societal characteristics of spatial disease clusters: examples of colon, lung and breast cancer in Japan. *Int J Health Geogr* 2005;4:16. doi:10.1186/1476-072X-4-16.
10. Fukuda Y, Nakamura K, Takano T. Municipal health expectancy in Japan: decreased healthy longevity of older people in socioeconomically disadvantaged areas. *BMC Public Health* 2005;5:65. doi:10.1186/1471-2458-5-65.
11. Fukuda Y, Nakamura K, Takano T. Municipal socioeconomic status and mortality in Japan: sex and age differences, and trends in 1973-1998. *Soc Sci Med* 2004;59:2435-45.
12. Fukuda Y, Nakamura K, Takano T. Wide range of socioeconomic factors associated with mortality among cities in Japan. *Health Promot Int* 2004;19:177-87.
13. Kim D, Kawachi I, Hoorn SV, Ezzati M. Is inequality at the heart of it? Cross-country associations of income inequality with cardiovascular diseases and risk factors. *Soc Sci Med* 2008;66:1719-32.
14. Elgar FJ. Income inequality, trust, and population health in 33 countries. *Am J Public Health* 2010;100:2311-5.
15. Karlsson M, Nilsson T, Lyttkens CH, Leeson G. Income inequality and health: importance of a cross-country perspective. *Soc Sci Med* 2010;70:875-85.
16. Ministry of Internal Affairs and Communications. National Survey of Family Income and Expenditure. http://www.stat.go.jp/english/data/zensho/index.htm.
17. Wilkinson RG, Pickett KE. Income inequality and population health: A review and explanation of the evidence. *Soc Sci Med* 2006;62:1768-84.

Supplementary Table 1. The history of the Japan Standard Occupational Classification [a]

1st revision, 1970			2nd revision, 1979			3rd revision, 1986			4th revision, 1997		
No.		Occupation (major group)	No.		Occupation (major group)	No.		Occupation (major group)	No.		Occupation (major group) [b]
(1)	[1]	Professional and technical workers	(1)	[1]	Professional and technical workers	(1)	[1]	Professional and technical workers	(1)	[1]	Specialist and technical workers
(2)	[2]	Managers and officials	(2)	[2]	Managers and officials	(2)	[2]	Managers and officials	(2)	[2]	Administrative and managerial workers
(3)	[3]	Clerical and related workers	(3)	[3]	Clerical and related workers	(3)	[3]	Clerical and related workers	(3)	[3]	Clerical workers
(4)	[4]	Sales workers	(4)	[4]	Sales workers	(4)	[4]	Sales workers	(4)	[4]	Sales workers
(5)	[7]	Farmers, Lumbermen and fishermen	(5)	[7]	Agricultural, forestry and fisheries workers	(5)	[5]	Service workers	(5)	[5]	Service workers
(6)	[9]	Workers in mining and quarrying occupations	(6)	[9]	Mining workers	(6)	[6]	Protective service workers	(6)	[6]	Security workers
(7)	[8]	Workers in transport and communications occupations	(7)	[8]	Workers in transport and communications occupations	(7)	[7]	Agricultural, forestry and fisheries workers	(7)	[7]	Agriculture, forestry and fishery workers
(8)	[9]	Craftsmen, production process workers and labourers	(8)	[9]	Craftsmen, production process workers and labours	(8)	[8]	Workers in transport and communications occupations	(8)	[8]	Transport and communication workers
(9)	[6]	Protective service workers	(9)	[6]	Protective service workers	(9)	[9]	Craftsmen, mining, production process and construction workers and laborers	(9)	[9]	Production process and related workers
(10)	[5]	Service workers	(10)	[5]	Service workers	(10)	[10]	Workers not classifiable by occupation	(10)	[10]	Workers not classifiable by occupation
(11)	[10]	Unclassifiable	(11)	[10]	Workers not classifiable by occupation	(11)	[11]	Non-employed [c]	(11)	[11]	Non-employed [c]
(12)	[11]	Non-employed [c]	(11)	[11]	Non-employed [c]						

[a] We consistently used occupation (major group) of the 4th revision. The number in square brackets is the classification used in ths present study.

[b] When showing geographic inequality by occupation, we summarized these 11 occupation into six groups as follows:

I. Clerical, technical and managerial occupations: (1) specialist and technical workers, (2) administrative and managerial workers, and (3) clerical workers
II. Sales and service occupations: (4) sales workers, (5) service workers, and (6) security workers
III. Agriculture, forestry and fishery occupations: (7) agriculture, forestry and fishery workers
IV. Production and transport occupations: (8) transport and communication workers and (9) production process and related workers
V. Unclassifiable occupations: (10) workers not classifiable by occupation
VI. Non-employed: (11) non-employed

[c] Non-employed refers to the sum of unemployed and non-labor force in line with the *Report of Vital Statistics: Occupational and Industrial Aspects* .

Supplementary Table 2. Description of data in 47 prefectures, Japan, 1970-2005

	Men				Women			
	No. of deaths	Total population	Mortality rate per 100,000 [a]	(SD)	No. of deaths	Total population	Mortality rate per 100,000 [a]	(SD)
Overall	984,022	251,576,351	1,569	(6,718)	532,223	259,688,353	758	(3,914)
Prefectures								
1 Hokkaido	49,247	11,489,095	1,870	(7,692)	26,436	12,394,724	886	(4,366)
2 Aomori	15,202	2,959,355	1,531	(6,760)	7,282	3,248,812	471	(2,143)
3 Iwate	13,258	2,856,175	2,187	(9,429)	6,959	3,067,651	864	(4,827)
4 Miyagi	17,042	4,448,360	1,412	(5,469)	9,137	4,625,004	728	(3,064)
5 Akita	12,371	2,512,525	1,410	(5,569)	6,168	2,740,415	561	(3,178)
6 Yamagata	10,748	2,553,156	1,863	(8,426)	5,824	2,679,130	978	(4,649)
7 Fukushima	18,520	4,200,931	1,368	(4,958)	9,601	4,341,831	454	(1,655)
8 Ibaraki	23,125	5,779,563	1,101	(3,644)	12,135	5,665,132	511	(2,853)
9 Tochigi	16,375	3,976,411	1,643	(6,942)	8,590	3,941,144	876	(3,381)
10 Gunma	15,506	4,036,944	1,704	(6,946)	8,651	4,069,213	532	(2,058)
11 Saitama	43,148	13,129,693	1,436	(5,956)	23,114	12,774,631	519	(1,419)
12 Chiba	39,273	11,279,717	1,247	(4,401)	19,925	11,073,425	652	(3,696)
13 Tokyo	91,194	25,686,395	1,374	(5,119)	49,601	25,677,746	598	(1,754)
14 Kanagawa	54,947	16,940,375	1,330	(5,569)	28,202	16,194,532	1,053	(5,584)
15 Niigata	21,083	5,083,511	1,945	(7,533)	10,861	5,245,859	714	(3,398)
16 Toyama	9,238	2,300,243	1,606	(7,190)	5,250	2,429,822	980	(5,406)
17 Ishikawa	8,670	2,301,490	1,655	(7,956)	5,013	2,447,439	953	(6,194)
18 Fukui	5,611	1,643,881	1,677	(7,209)	3,556	1,721,279	1,391	(7,473)
19 Yamanashi	7,183	1,720,587	1,436	(5,625)	3,727	1,754,097	719	(3,804)
20 Nagano	15,876	4,393,794	2,175	(8,828)	9,505	4,551,945	853	(4,017)
21 Gifu	14,957	4,139,225	1,515	(6,609)	9,222	4,333,798	913	(4,421)
22 Shizuoka	28,057	7,639,953	1,962	(8,756)	14,720	7,674,935	565	(1,736)
23 Aichi	46,925	14,066,571	1,626	(7,368)	26,699	13,817,272	764	(2,784)
24 Mie	14,118	3,624,980	1,408	(5,186)	7,828	3,794,338	583	(2,379)
25 Shiga	8,125	2,428,751	1,453	(5,976)	4,883	2,465,170	782	(3,805)
26 Kyoto	18,723	5,109,042	1,166	(3,889)	11,146	5,465,224	464	(2,094)
27 Osaka	73,055	18,232,091	1,964	(7,462)	38,671	18,808,092	1,109	(4,676)
28 Hyogo	44,110	10,970,009	1,940	(7,967)	23,963	11,550,437	798	(3,145)
29 Nara	9,755	2,621,500	1,730	(7,403)	5,598	2,813,039	971	(4,423)
30 Wakayama	10,006	2,169,994	1,276	(6,597)	5,596	2,358,333	573	(2,872)
31 Tottori	5,687	1,212,157	2,055	(8,746)	2,862	1,295,687	695	(3,717)
32 Shimane	7,103	1,546,077	2,051	(8,981)	3,829	1,651,580	891	(4,704)
33 Okayama	15,296	3,828,579	1,991	(8,329)	8,127	4,043,112	720	(3,298)
34 Hiroshima	23,074	5,750,006	1,708	(6,593)	12,338	6,008,967	852	(3,726)
35 Yamaguchi	14,671	3,127,157	2,051	(8,498)	7,883	3,435,624	582	(2,276)
36 Tokushima	7,871	1,661,674	711	(1,797)	4,406	1,786,025	454	(1,935)
37 Kagawa	8,494	2,052,654	999	(3,529)	4,743	2,182,213	551	(3,159)
38 Ehime	13,813	2,961,350	2,209	(8,794)	7,631	3,279,967	781	(3,189)
39 Kochi	8,686	1,627,246	1,004	(3,355)	4,403	1,792,884	353	(1,777)
40 Fukuoka	41,386	9,316,985	1,349	(5,374)	22,159	10,313,913	790	(3,359)
41 Saga	7,618	1,664,620	1,458	(7,446)	4,307	1,844,827	1,057	(6,718)
42 Nagasaki	14,563	2,995,173	1,398	(5,680)	8,010	3,346,375	813	(4,295)
43 Kumamoto	15,029	3,485,422	780	(2,080)	8,554	3,916,400	623	(2,600)
44 Oita	10,691	2,389,418	1,658	(6,904)	6,345	2,691,272	834	(3,893)
45 Miyazaki	10,422	2,240,503	1,866	(8,416)	5,606	2,496,028	1,239	(7,251)
46 Kagoshima	16,626	3,369,654	1,329	(5,321)	9,565	3,795,497	859	(3,649)
47 Okinawa [b]	7,544	2,053,359	1,046	(5,404)	3,592	2,083,513	722	(4,594)

SD; standard deviation

[a] Mortality rate was calculated on the basis of the means of the proportion of deaths for each prefecture across all cell types.

[b] The data for Okinawa prefecture were not available in 1970.

Supplementary Table 3. The number (percentage) of total population in each occupation, Japan, 1970-2005

	1970		1975		1980		1985		1990		1995		2000		2005	
Men																
Specialist and technical workers	1,835,895	(7.32)	2,080,025	(7.25)	2,306,830	(7.51)	3,143,412	(9.76)	3,637,515	(10.95)	3,991,077	(11.72)	4,221,683	(12.27)	3,950,815	(11.90)
Administrative and managerial workers	1,797,390	(7.17)	1,972,340	(6.88)	2,210,783	(7.19)	1,868,101	(5.80)	1,998,511	(6.01)	2,066,172	(6.07)	1,305,093	(3.79)	1,031,316	(3.11)
Clerical workers	2,914,350	(11.62)	3,674,725	(12.81)	3,637,048	(11.83)	3,857,022	(11.98)	3,895,784	(11.72)	3,906,006	(11.47)	4,077,310	(11.85)	4,093,124	(12.33)
Sales workers	2,681,490	(10.69)	3,508,340	(12.23)	4,132,015	(13.44)	4,509,884	(14.00)	4,794,455	(14.43)	5,044,836	(14.82)	5,159,661	(15.00)	4,716,064	(14.21)
Service workers	738,725	(2.95)	984,940	(3.43)	1,027,910	(3.34)	1,123,385	(3.49)	1,202,319	(3.62)	1,270,668	(3.73)	1,381,504	(4.02)	1,441,522	(4.34)
Security workers	438,955	(1.75)	520,720	(1.82)	567,438	(1.85)	615,053	(1.91)	660,161	(1.99)	706,462	(2.08)	787,325	(2.29)	832,148	(2.51)
Agriculture, forestry and fishery workers	3,531,500	(14.08)	2,849,180	(9.94)	2,379,666	(7.74)	2,112,513	(6.56)	1,615,756	(4.86)	1,199,620	(3.52)	899,881	(2.62)	823,066	(2.48)
Transport and communication workers	1,682,400	(6.71)	1,972,390	(6.88)	2,072,133	(6.74)	1,997,137	(6.2)	1,984,890	(5.97)	2,020,393	(5.93)	1,957,847	(5.69)	1,794,551	(5.41)
Production process and related workers	8,428,675	(33.61)	9,645,620	(33.63)	10,682,007	(34.76)	10,644,436	(33.05)	10,985,461	(33.06)	10,945,330	(32.15)	10,762,241	(31.28)	10,451,026	(31.48)
Workers not classifiable by occupation	6,725	(0.03)	13,870	(0.05)	22,474	(0.07)	50,391	(0.16)	115,015	(0.35)	151,362	(0.44)	294,663	(0.86)	502,667	(1.51)
Non-employed [a]	1,024,357	(4.08)	1,456,032	(5.08)	1,696,114	(5.52)	2,283,403	(7.09)	2,339,703	(7.04)	2,744,327	(8.06)	3,559,611	(10.35)	3,559,611	(10.72)
Total	25,080,462	(100.00)	28,678,182	(100.00)	30,734,418	(100.00)	32,204,737	(100.00)	33,229,570	(100.00)	34,046,253	(100.00)	34,406,819	(100.00)	33,195,910	(100.00)
Women																
Specialist and technical workers	800,245	(3.00)	1,121,045	(3.73)	1,507,610	(4.72)	1,891,400	(5.73)	2,250,231	(6.69)	2,684,971	(7.83)	3,094,599	(8.87)	3,459,894	(9.83)
Administrative and managerial workers	86,615	(0.32)	105,985	(0.35)	155,251	(0.49)	171,782	(0.52)	184,219	(0.55)	199,894	(0.58)	142,983	(0.41)	123,283	(0.35)
Clerical workers	1,694,870	(6.36)	2,753,760	(9.16)	3,369,822	(10.56)	4,248,922	(12.86)	5,155,485	(15.32)	5,748,954	(16.76)	6,289,031	(18.03)	6,422,961	(18.25)
Sales workers	1,885,440	(7.07)	2,152,320	(7.16)	2,586,857	(8.11)	2,447,212	(7.41)	2,534,197	(7.53)	2,702,863	(7.88)	2,618,387	(7.51)	2,561,132	(7.28)
Service workers	1,634,865	(6.13)	1,974,925	(6.57)	2,106,305	(6.60)	2,173,931	(6.58)	2,263,285	(6.73)	2,516,848	(7.34)	2,825,178	(8.10)	3,207,147	(9.11)
Security workers	5,830	(0.02)	8,010	(0.03)	9,876	(0.03)	12,390	(0.04)	16,562	(0.05)	24,289	(0.07)	37,414	(0.11)	43,158	(0.12)
Agriculture, forestry and fishery workers	4,558,975	(17.10)	3,154,040	(10.49)	2,471,427	(7.75)	2,029,368	(6.14)	1,478,304	(4.39)	1,055,672	(3.08)	755,524	(2.17)	600,419	(1.71)
Transport and communication workers	99,570	(0.37)	108,500	(0.36)	108,205	(0.34)	96,205	(0.29)	84,717	(0.25)	93,936	(0.27)	92,226	(0.26)	85,394	(0.24)
Production process and related workers	3,546,495	(13.30)	3,691,205	(12.28)	4,456,927	(13.97)	4,911,261	(14.87)	5,158,278	(15.33)	4,862,147	(14.17)	4,664,292	(13.37)	4,228,532	(12.01)
Workers not classifiable by occupation	5,285	(0.02)	34,995	(0.12)	24,186	(0.08)	66,917	(0.20)	89,544	(0.27)	121,135	(0.35)	223,913	(0.64)	327,266	(0.93)
Non-employed [a]	12,339,091	(46.29)	14,949,973	(49.74)	15,110,843	(47.36)	14,978,370	(45.35)	14,434,745	(42.90)	14,296,062	(41.67)	14,141,088	(40.54)	14,141,088	(40.17)
Total	26,657,281	(100.00)	30,054,758	(100.00)	31,907,309	(100.00)	33,027,758	(100.00)	33,649,567	(100.00)	34,306,771	(100.00)	34,884,635	(100.00)	35,200,274	(100.00)

[a] Non-employed is the sum of unemployed and non-labor force.

Supplementary Table 4. Description of data used for multilevel models analyzing all-cause mortality in 47 prefectures, Japan, 1970-2005

Characteristics	Men					Women				
	No. of cells [a]	No. of deaths	Total population	Mortality rate per 100,000 [b]	(SD)	No. of cells [a]	No. of deaths	Total population	Mortality rate per 100,000 [b]	(SD)
Overall	32,590	984,022	251,576,351	1,569	(6,718)	32,542	532,223	259,688,353	758	(3,914)
Level 1: cell										
Specialist and technical workers										
25-29 y	375	2,044	4,259,474	59	(38)	375	837	3,750,173	28	(32)
30-34 y	375	2,374	4,400,316	63	(39)	375	815	2,781,512	37	(37)
35-39 y	375	3,122	4,078,554	90	(51)	375	938	2,546,667	43	(43)
40-44 y	375	4,655	3,665,610	152	(69)	375	1,419	2,449,918	69	(55)
45-49 y	375	7,054	3,095,990	257	(108)	375	1,983	2,137,592	114	(82)
50-54 y	375	9,922	2,511,813	423	(144)	375	2,422	1,628,069	180	(136)
55-59 y	375	12,688	1,990,836	676	(202)	375	2,516	1,044,184	298	(216)
60-64 y	375	11,086	1,164,659	1,055	(354)	375	1,949	471,880	519	(390)
Administrative and managerial workers										
25-29 y	375	212	296,615	85	(206)	372	49	25,359	168	(751)
30-34 y	375	496	810,953	71	(124)	375	99	56,477	211	(742)
35-39 y	375	1,053	1,489,214	83	(84)	375	174	103,320	171	(587)
40-44 y	375	2,387	2,162,030	118	(71)	375	403	157,876	251	(413)
45-49 y	375	4,655	2,604,260	194	(95)	375	684	204,826	286	(326)
50-54 y	375	8,292	2,759,166	320	(119)	375	1,007	227,213	434	(529)
55-59 y	375	11,466	2,487,389	481	(151)	375	1,237	219,669	604	(646)
60-64 y	375	10,619	1,640,079	670	(235)	375	1,274	175,272	756	(966)
Clerical workers										
25-29 y	375	3,143	4,619,902	68	(41)	375	1,546	7,377,454	25	(24)
30-34 y	375	3,486	4,720,850	75	(42)	375	1,372	5,423,988	31	(33)
35-39 y	375	4,860	4,579,329	109	(61)	375	1,741	5,266,613	38	(33)
40-44 y	375	6,935	4,381,766	163	(86)	375	2,456	5,389,811	54	(48)
45-49 y	375	9,969	3,996,273	261	(127)	375	3,259	4,834,832	87	(75)
50-54 y	375	13,048	3,507,037	414	(193)	375	3,603	3,768,147	141	(121)
55-59 y	375	14,258	2,778,285	586	(292)	375	3,026	2,474,248	196	(227)
60-64 y	375	8,500	1,471,927	642	(394)	375	1,939	1,148,712	285	(359)
Sales workers										
25-29 y	375	2,773	5,895,959	55	(40)	375	684	2,326,951	32	(37)
30-34 y	375	3,330	5,923,651	67	(50)	375	910	2,218,018	40	(39)
35-39 y	375	4,582	5,414,612	106	(73)	375	1,291	2,572,122	50	(39)
40-44 y	375	6,726	4,806,468	176	(122)	375	2,131	2,931,404	74	(50)
45-49 y	375	9,791	4,194,561	299	(184)	375	3,193	3,034,544	111	(65)
50-54 y	375	12,994	3,567,706	474	(240)	375	4,432	2,762,345	174	(93)
55-59 y	375	16,386	2,882,844	727	(348)	375	4,995	2,200,556	252	(127)
60-64 y	375	16,493	1,860,944	1,025	(459)	375	4,938	1,442,468	358	(175)
Service workers										
25-29 y	375	1,612	1,659,142	112	(82)	375	762	1,935,466	45	(46)
30-34 y	375	1,667	1,453,561	127	(88)	375	856	1,964,185	44	(40)
35-39 y	375	2,258	1,284,982	209	(254)	375	1,181	2,353,506	54	(42)
40-44 y	375	3,101	1,153,463	298	(158)	375	1,890	2,741,991	75	(48)
45-49 y	375	4,630	1,041,635	475	(214)	375	2,968	2,943,583	109	(59)
50-54 y	375	6,508	956,705	729	(291)	375	3,910	2,880,236	150	(76)
55-59 y	375	8,453	888,084	1,005	(351)	375	4,557	2,432,373	218	(108)
60-64 y	375	8,185	733,401	1,261	(487)	375	3,882	1,451,144	309	(181)
Security workers										
25-29 y	375	420	826,908	56	(82)	362	40	38,591	239	(1,631)
30-34 y	375	433	746,077	66	(87)	348	41	23,805	332	(2,068)
35-39 y	375	563	694,425	86	(108)	352	58	18,416	568	(3,220)
40-44 y	375	875	692,317	126	(115)	363	87	19,017	896	(4,439)
45-49 y	375	1,380	678,802	224	(172)	360	133	18,789	869	(2,725)
50-54 y	375	1,905	621,010	340	(243)	354	151	17,878	1,208	(3,259)
55-59 y	375	2,404	517,883	492	(335)	336	189	14,007	2,138	(5,218)
60-64 y	375	2,015	350,840	636	(503)	317	137	7,026	3,053	(8,385)
Agriculture, forestry and fishery workers										
25-29 y	375	1,425	911,736	141	(121)	375	544	768,146	55	(114)
30-34 y	375	2,047	1,147,060	174	(128)	375	874	1,212,740	63	(96)
35-39 y	375	3,667	1,510,949	222	(132)	375	1,515	1,691,530	74	(100)
40-44 y	375	6,154	1,895,195	297	(142)	375	2,664	2,125,301	99	(74)
45-49 y	375	9,650	2,139,287	418	(158)	375	4,360	2,465,129	152	(96)
50-54 y	375	14,455	2,319,644	592	(176)	375	6,912	2,636,924	228	(112)
55-59 y	375	22,542	2,568,440	827	(218)	375	9,481	2,702,501	315	(151)
60-64 y	375	33,473	2,918,871	1,086	(346)	375	11,993	2,501,458	442	(241)
Transport and communication workers										
25-29 y	375	2,051	2,124,064	93	(66)	375	125	161,108	75	(249)
30-34 y	375	2,384	2,384,161	95	(58)	375	141	124,668	85	(209)
35-39 y	375	3,236	2,427,773	135	(72)	375	205	124,084	149	(274)
40-44 y	375	4,418	2,353,707	192	(147)	375	294	121,923	209	(327)
45-49 y	375	5,599	2,158,825	271	(108)	375	416	105,735	334	(486)
50-54 y	375	7,057	1,908,570	406	(187)	374	431	75,568	547	(837)
55-59 y	375	7,057	1,453,565	570	(293)	373	411	41,887	1,156	(2,098)
60-64 y	375	3,796	671,076	783	(580)	343	301	13,780	3,095	(6,452)
Production process and related workers										
25-29 y	375	7,322	12,387,917	64	(43)	375	740	2,765,852	25	(29)
30-34 y	375	8,657	12,289,511	76	(52)	375	985	3,610,544	25	(23)
35-39 y	375	12,143	11,861,114	110	(75)	375	1,748	4,939,585	34	(29)
40-44 y	375	17,256	11,459,170	164	(100)	375	2,700	5,872,068	46	(35)
45-49 y	375	23,730	10,858,257	241	(123)	375	3,933	6,045,010	68	(44)
50-54 y	375	29,381	10,014,409	339	(159)	375	4,928	5,497,531	102	(65)
55-59 y	375	33,010	8,491,654	472	(231)	375	4,742	4,297,010	135	(97)
60-64 y	375	26,151	5,182,764	608	(323)	375	3,780	2,491,537	188	(151)
Workers not classifiable by occupation										
25-29 y	345	1,513	207,647	4,422	(9,574)	354	581	150,990	1,492	(4,303)
30-34 y	346	1,796	181,239	5,530	(11,417)	361	697	122,540	1,792	(4,764)
35-39 y	336	2,399	150,763	9,618	(16,824)	355	914	111,790	2,392	(6,226)
40-44 y	323	3,544	136,098	12,160	(18,001)	351	1,360	116,798	3,402	(7,472)
45-49 y	327	5,911	128,506	16,372	(21,250)	346	2,247	116,946	4,342	(8,124)
50-54 y	310	8,721	131,754	19,824	(22,022)	347	3,360	111,753	7,301	(13,362)
55-59 y	308	10,718	125,633	23,038	(23,707)	343	3,681	96,322	8,706	(13,246)
60-64 y	295	10,281	95,527	23,592	(22,601)	331	3,800	66,102	14,147	(19,001)
Non-employed										
25-29 y	375	7,981	2,366,593	448	(245)	375	9,868	16,328,017	66	(32)
30-34 y	375	9,093	1,572,710	696	(323)	375	13,641	17,975,450	89	(39)
35-39 y	375	12,570	1,351,088	1,026	(428)	375	18,225	15,037,080	142	(61)
40-44 y	375	19,268	1,314,727	1,521	(514)	375	26,086	12,159,904	253	(92)
45-49 y	375	30,255	1,456,804	2,223	(723)	375	38,502	11,501,582	384	(118)
50-54 y	375	48,346	1,689,190	3,024	(823)	375	57,256	12,364,455	522	(161)
55-59 y	375	84,286	2,517,232	3,330	(762)	375	82,857	13,455,956	674	(210)
60-64 y	375	164,871	6,394,814	2,972	(1,194)	375	124,761	15,568,816	890	(351)

SD; standard deviation

[a] These cells are cross-clasified by sex, age (five year categories), and 11 occupations.

[b] Mortality rate was calculated on the basis of the means of the proportion of deaths for each cell type across all prefectures.

Supplementary Table 5. Age-adjusted mortality rate per 100,000 in each occupation, Japan, 1970-2005 [a]

	1970	1975	1980	1985	1990	1995	2000	2005
Men								
Specialist and technical workers	340	282	319	257	234	223	312	231
Administrative and managerial workers	233	223	192	215	193	170	248	241
Clerical workers	460	366	298	267	253	207	146	95
Sales workers	547	444	370	322	246	187	146	113
Service workers	515	389	488	426	476	442	401	348
Security workers	295	259	238	226	228	189	161	159
Agriculture, forestry and fishery workers	571	489	442	425	384	365	346	287
Transport and communication workers	449	339	328	276	253	230	200	180
Production process and related workers	415	327	250	216	181	156	105	89
Workers not classifiable by occupation	14,668	15,038	20,796	9,141	5,935	7,231	4,900	768
Non-employed [b]	2,669	2,226	1,891	1,648	1,774	1,533	1,289	1,313
Women								
Specialist and technical workers	246	181	146	126	115	90	97	66
Administrative and managerial workers	548	452	239	268	337	263	345	306
Clerical workers	234	153	105	83	68	54	39	29
Sales workers	197	164	137	135	111	81	68	55
Service workers	160	117	130	111	111	92	78	60
Security workers	1,615	1,027	822	1,335	991	508	398	390
Agriculture, forestry and fishery workers	256	224	172	148	133	114	103	85
Transport and communication workers	899	585	844	712	808	440	324	278
Production process and related workers	145	114	73	67	60	43	32	25
Workers not classifiable by occupation	4,769	1,533	6,995	3,024	2,967	3,382	2,296	325
Non-employed [b]	489	387	324	286	256	254	242	222

[a] Age-adjusted mortality rates were calculated by the direct method, using the model population of 1985 in Japan as a reference.

[b] Non-employed is the sum of unemployed and non-labor force.

Supplementary Table 6. Adjusted prefecture-level residuals for all-cause premature mortality among men, Japan, 1970-2005

	Overall			1970			1975			1980			1985			1990			1995			2000			2005		
Prefectures	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank
1 Hokkaido	1.02	(0.98 to 1.06)	31	1.02	(0.99 to 1.05)	28	1.05	(1.02 to 1.08)	37	1.05	(1.02 to 1.09)	40	1.01	(0.98 to 1.04)	26	0.97	(0.94 to 0.99)	10	1.01	(0.98 to 1.04)	26	1.05	(1.01 to 1.08)	33	1.06	(1.02 to 1.11)	36
2 Aomori	1.13	(1.09 to 1.18)	47	1.07	(1.03 to 1.12)	42	1.06	(1.01 to 1.10)	44	1.10	(1.05 to 1.15)	45	1.09	(1.05 to 1.14)	45	1.09	(1.04 to 1.14)	44	1.17	(1.11 to 1.23)	46	1.25	(1.19 to 1.31)	47	1.27	(1.20 to 1.34)	47
3 Iwate	1.07	(1.03 to 1.12)	45	1.09	(1.04 to 1.13)	44	1.04	(0.99 to 1.08)	35	1.04	(0.99 to 1.09)	37	1.02	(0.98 to 1.07)	36	1.06	(1.01 to 1.11)	43	1.05	(0.99 to 1.11)	34	1.08	(1.03 to 1.15)	40	1.22	(1.15 to 1.29)	46
4 Miyagi	0.97	(0.93 to 1.01)	14	0.94	(0.90 to 0.98)	5	0.97	(0.93 to 1.01)	11	0.96	(0.92 to 1.00)	8	0.94	(0.91 to 0.98)	4	0.98	(0.94 to 1.02)	14	0.97	(0.92 to 1.01)	14	0.99	(0.94 to 1.04)	20	1.04	(0.99 to 1.10)	31
5 Akita	1.07	(1.02 to 1.11)	44	1.12	(1.07 to 1.17)	46	1.06	(1.01 to 1.10)	43	1.04	(0.99 to 1.09)	36	1.01	(0.97 to 1.06)	29	1.01	(0.96 to 1.06)	28	1.10	(1.04 to 1.16)	44	1.09	(1.03 to 1.15)	43	1.17	(1.10 to 1.24)	45
6 Yamagata	0.99	(0.95 to 1.03)	20	1.02	(0.97 to 1.07)	27	1.00	(0.95 to 1.05)	22	1.00	(0.95 to 1.05)	20	0.94	(0.90 to 0.99)	3	0.97	(0.92 to 1.02)	13	0.97	(0.92 to 1.03)	17	1.00	(0.94 to 1.07)	23	1.06	(0.99 to 1.13)	34
7 Fukushima	1.04	(1.00 to 1.08)	37	1.02	(0.98 to 1.07)	29	1.02	(0.98 to 1.06)	31	1.00	(0.96 to 1.05)	25	1.01	(0.97 to 1.05)	31	1.01	(0.97 to 1.06)	29	1.06	(1.01 to 1.11)	37	1.09	(1.03 to 1.14)	41	1.14	(1.08 to 1.20)	44
8 Ibaraki	1.02	(0.98 to 1.07)	34	1.03	(0.99 to 1.07)	32	1.01	(0.98 to 1.05)	27	1.01	(0.97 to 1.05)	30	1.02	(0.98 to 1.06)	34	1.03	(0.99 to 1.07)	36	1.07	(1.03 to 1.12)	40	1.03	(0.99 to 1.07)	30	1.03	(0.98 to 1.08)	24
9 Tochigi	1.07	(1.03 to 1.11)	43	1.09	(1.04 to 1.14)	45	1.05	(1.01 to 1.10)	41	1.06	(1.02 to 1.11)	42	1.09	(1.05 to 1.14)	46	1.11	(1.07 to 1.16)	47	1.09	(1.04 to 1.14)	43	1.06	(1.01 to 1.11)	35	1.04	(0.98 to 1.09)	28
10 Gunma	1.01	(0.97 to 1.06)	28	1.02	(0.97 to 1.06)	26	0.97	(0.93 to 1.02)	12	0.97	(0.93 to 1.02)	11	1.04	(0.99 to 1.08)	39	1.00	(0.96 to 1.05)	24	1.06	(1.01 to 1.11)	38	1.02	(0.97 to 1.07)	26	1.04	(0.99 to 1.10)	29
11 Saitama	0.96	(0.92 to 1.00)	9	1.00	(0.97 to 1.04)	22	0.98	(0.94 to 1.01)	14	0.98	(0.94 to 1.01)	15	0.99	(0.96 to 1.02)	19	1.00	(0.97 to 1.03)	26	0.93	(0.90 to 0.97)	10	0.91	(0.88 to 0.94)	8	0.86	(0.83 to 0.90)	6
12 Chiba	0.96	(0.92 to 1.00)	8	0.98	(0.95 to 1.01)	18	0.94	(0.91 to 0.97)	5	0.95	(0.92 to 0.98)	6	0.99	(0.95 to 1.02)	17	0.99	(0.96 to 1.02)	19	0.93	(0.90 to 0.96)	7	0.91	(0.88 to 0.94)	7	0.93	(0.89 to 0.97)	12
13 Tokyo	0.99	(0.95 to 1.03)	19	0.96	(0.93 to 0.98)	16	0.97	(0.95 to 1.00)	13	1.00	(0.97 to 1.02)	21	1.01	(0.99 to 1.03)	28	1.06	(1.03 to 1.08)	41	0.93	(0.90 to 0.96)	8	0.91	(0.88 to 0.94)	6	0.97	(0.94 to 1.01)	16
14 Kanagawa	0.94	(0.90 to 0.98)	5	0.95	(0.92 to 0.98)	11	0.89	(0.86 to 0.92)	2	0.89	(0.86 to 0.91)	2	0.99	(0.96 to 1.02)	18	1.02	(0.99 to 1.05)	31	0.93	(0.90 to 0.96)	6	0.89	(0.86 to 0.92)	5	0.83	(0.80 to 0.87)	2
15 Niigata	1.02	(0.98 to 1.07)	33	1.00	(0.96 to 1.04)	21	1.01	(0.98 to 1.05)	28	1.00	(0.96 to 1.04)	22	1.02	(0.98 to 1.06)	33	0.98	(0.95 to 1.02)	16	1.07	(1.02 to 1.12)	39	1.10	(1.05 to 1.15)	45	1.06	(1.01 to 1.11)	35
16 Toyama	1.05	(1.00 to 1.09)	40	1.03	(0.98 to 1.08)	31	1.04	(0.99 to 1.09)	36	1.04	(0.98 to 1.09)	35	1.09	(1.04 to 1.15)	47	1.05	(1.00 to 1.11)	39	0.94	(0.88 to 1.00)	11	1.10	(1.03 to 1.17)	44	1.13	(1.06 to 1.21)	42
17 Ishikawa	1.00	(0.96 to 1.04)	23	0.99	(0.94 to 1.04)	19	1.01	(0.96 to 1.07)	26	1.03	(0.97 to 1.09)	34	0.97	(0.92 to 1.02)	9	0.97	(0.91 to 1.02)	11	0.94	(0.88 to 1.00)	12	1.03	(0.97 to 1.10)	31	1.10	(1.03 to 1.18)	41
18 Fukui	0.93	(0.89 to 0.98)	4	0.91	(0.86 to 0.97)	2	0.96	(0.91 to 1.02)	9	0.89	(0.84 to 0.95)	3	0.97	(0.92 to 1.03)	11	0.93	(0.87 to 0.99)	4	0.87	(0.81 to 0.94)	2	0.99	(0.92 to 1.07)	21	1.03	(0.95 to 1.12)	25
19 Yamanashi	1.07	(1.02 to 1.11)	42	1.04	(0.98 to 1.10)	34	1.00	(0.95 to 1.06)	23	1.07	(1.01 to 1.14)	43	1.06	(1.00 to 1.12)	43	1.09	(1.03 to 1.16)	45	1.11	(1.04 to 1.18)	45	1.06	(0.99 to 1.13)	36	1.09	(1.02 to 1.18)	40
20 Nagano	0.97	(0.93 to 1.01)	11	0.93	(0.90 to 0.97)	4	0.98	(0.94 to 1.02)	15	0.95	(0.90 to 0.99)	5	0.98	(0.94 to 1.02)	13	0.94	(0.89 to 0.98)	6	0.98	(0.93 to 1.03)	18	1.00	(0.95 to 1.05)	22	1.03	(0.98 to 1.09)	26
21 Gifu	1.01	(0.97 to 1.05)	26	0.89	(0.85 to 0.93)	1	1.01	(0.97 to 1.06)	25	0.97	(0.93 to 1.02)	13	1.05	(1.01 to 1.10)	42	1.02	(0.98 to 1.07)	33	1.01	(0.96 to 1.06)	27	1.07	(1.02 to 1.12)	37	1.07	(1.02 to 1.13)	37
22 Shizuoka	1.01	(0.97 to 1.05)	27	0.97	(0.94 to 1.01)	17	0.99	(0.95 to 1.02)	19	1.03	(0.99 to 1.07)	33	1.04	(1.00 to 1.08)	40	1.04	(1.00 to 1.07)	37	1.05	(1.01 to 1.09)	32	1.01	(0.97 to 1.05)	24	0.99	(0.94 to 1.03)	18
23 Aichi	0.99	(0.95 to 1.03)	18	0.95	(0.92 to 0.98)	13	0.94	(0.91 to 0.97)	4	0.95	(0.92 to 0.98)	7	0.98	(0.95 to 1.01)	15	1.00	(0.97 to 1.03)	21	1.03	(1.00 to 1.07)	31	1.02	(0.99 to 1.06)	27	1.04	(1.00 to 1.08)	30
24 Mie	0.97	(0.93 to 1.01)	15	0.94	(0.90 to 0.98)	6	0.96	(0.92 to 1.01)	7	0.96	(0.92 to 1.01)	9	0.98	(0.93 to 1.02)	12	1.00	(0.96 to 1.05)	25	1.02	(0.97 to 1.07)	29	0.99	(0.94 to 1.04)	19	0.99	(0.94 to 1.05)	19
25 Shiga	0.93	(0.89 to 0.97)	3	0.95	(0.90 to 1.01)	12	0.96	(0.91 to 1.02)	10	1.00	(0.94 to 1.06)	19	0.96	(0.91 to 1.01)	7	0.97	(0.92 to 1.02)	12	0.94	(0.88 to 1.00)	13	0.84	(0.79 to 0.90)	1	0.88	(0.82 to 0.94)	8
26 Kyoto	0.95	(0.91 to 0.99)	7	0.94	(0.91 to 0.98)	8	0.96	(0.93 to 1.00)	8	0.97	(0.93 to 1.01)	12	0.95	(0.92 to 0.99)	5	0.93	(0.90 to 0.97)	5	0.87	(0.84 to 0.91)	3	0.94	(0.90 to 0.98)	12	0.94	(0.89 to 0.99)	15
27 Osaka	1.02	(0.98 to 1.06)	32	1.04	(1.01 to 1.07)	36	1.02	(0.99 to 1.05)	30	1.05	(1.02 to 1.08)	39	1.07	(1.04 to 1.09)	44	1.09	(1.07 to 1.12)	46	1.02	(0.99 to 1.05)	28	0.97	(0.94 to 1.00)	14	0.84	(0.81 to 0.88)	4
28 Hyogo	1.00	(0.96 to 1.04)	22	1.01	(0.98 to 1.04)	24	1.02	(0.99 to 1.05)	32	1.02	(0.99 to 1.06)	32	1.01	(0.98 to 1.04)	30	1.03	(1.00 to 1.06)	35	0.99	(0.96 to 1.02)	20	0.92	(0.89 to 0.95)	11	0.90	(0.86 to 0.93)	10
29 Nara	0.94	(0.90 to 0.98)	6	0.93	(0.88 to 0.98)	3	0.98	(0.93 to 1.03)	16	0.96	(0.91 to 1.02)	10	1.00	(0.95 to 1.05)	21	1.01	(0.96 to 1.06)	27	0.91	(0.86 to 0.96)	5	0.85	(0.80 to 0.89)	2	0.81	(0.76 to 0.86)	1
30 Wakayama	0.99	(0.95 to 1.04)	21	0.95	(0.91 to 1.00)	14	0.96	(0.92 to 1.01)	6	1.01	(0.95 to 1.06)	27	0.98	(0.93 to 1.03)	14	1.00	(0.95 to 1.05)	22	0.98	(0.93 to 1.04)	19	1.01	(0.96 to 1.08)	25	1.02	(0.96 to 1.09)	22
31 Tottori	1.08	(1.03 to 1.12)	46	1.06	(0.99 to 1.12)	39	1.00	(0.94 to 1.06)	20	1.09	(1.02 to 1.16)	44	1.00	(0.95 to 1.07)	25	1.05	(0.99 to 1.12)	38	1.22	(1.13 to 1.30)	47	1.08	(1.00 to 1.16)	38	1.14	(1.05 to 1.23)	43
32 Shimane	1.05	(1.00 to 1.09)	39	1.01	(0.96 to 1.07)	23	1.05	(1.00 to 1.11)	39	1.10	(1.04 to 1.17)	46	1.00	(0.94 to 1.05)	20	1.00	(0.94 to 1.06)	23	1.08	(1.01 to 1.15)	41	1.13	(1.06 to 1.21)	46	1.03	(0.95 to 1.11)	23
33 Okayama	0.97	(0.93 to 1.01)	10	0.94	(0.90 to 0.98)	7	1.00	(0.96 to 1.04)	21	0.99	(0.94 to 1.03)	16	1.00	(0.96 to 1.04)	24	1.02	(0.98 to 1.06)	32	1.00	(0.95 to 1.04)	23	0.98	(0.93 to 1.03)	16	0.84	(0.79 to 0.89)	3
34 Hiroshima	1.00	(0.96 to 1.05)	25	1.04	(1.00 to 1.08)	35	1.05	(1.01 to 1.09)	38	1.00	(0.96 to 1.04)	24	1.05	(1.01 to 1.09)	41	1.02	(0.98 to 1.05)	30	1.05	(1.01 to 1.10)	36	0.97	(0.93 to 1.02)	15	0.87	(0.82 to 0.91)	7
35 Yamaguchi	1.06	(1.02 to 1.10)	41	1.06	(1.02 to 1.11)	40	1.05	(1.01 to 1.10)	40	1.11	(1.06 to 1.16)	47	1.03	(0.99 to 1.07)	37	1.06	(1.01 to 1.10)	40	1.09	(1.03 to 1.14)	42	1.04	(0.99 to 1.10)	32	1.05	(0.99 to 1.12)	33
36 Tokushima	0.97	(0.93 to 1.01)	12	1.03	(0.98 to 1.09)	33	1.01	(0.96 to 1.06)	24	1.01	(0.96 to 1.07)	31	0.97	(0.92 to 1.02)	10	0.92	(0.87 to 0.97)	3	0.93	(0.87 to 0.99)	9	0.89	(0.83 to 0.95)	4	0.99	(0.92 to 1.07)	20
37 Kagawa	0.98	(0.94 to 1.03)	17	1.01	(0.96 to 1.07)	25	0.98	(0.93 to 1.04)	18	0.98	(0.92 to 1.03)	14	0.96	(0.91 to 1.01)	6	0.99	(0.94 to 1.05)	20	1.00	(0.94 to 1.06)	24	0.98	(0.92 to 1.04)	17	0.99	(0.93 to 1.06)	21
38 Ehime	1.02	(0.97 to 1.06)	30	1.03	(0.98 to 1.07)	30	1.03	(0.99 to 1.08)	34	1.01	(0.96 to 1.05)	28	1.00	(0.96 to 1.04)	22	0.99	(0.94 to 1.03)	18	1.05	(0.99 to 1.10)	33	1.08	(1.03 to 1.14)	39	0.97	(0.92 to 1.03)	17
39 Kochi	1.03	(0.98 to 1.07)	35	1.07	(1.02 to 1.13)	41	1.06	(1.00 to 1.11)	46	1.05	(1.00 to 1.11)	41	0.98	(0.93 to 1.04)	16	0.94	(0.89 to 0.99)	8	0.99	(0.93 to 1.06)	22	1.03	(0.96 to 1.09)	28	1.08	(1.00 to 1.15)	39
40 Fukuoka	0.98	(0.94 to 1.02)	16	0.95	(0.92 to 0.97)	9	0.98	(0.95 to 1.01)	17	0.99	(0.96 to 1.02)	17	1.00	(0.97 to 1.03)	23	1.02	(0.99 to 1.06)	34	0.99	(0.96 to 1.03)	21	0.96	(0.92 to 0.99)	13	0.94	(0.90 to 0.98)	13
41 Saga	1.04	(1.00 to 1.09)	38	0.96	(0.90 to 1.01)	15	1.09	(1.03 to 1.15)	47	1.00	(0.95 to 1.06)	26	1.02	(0.96 to 1.08)	32	1.06	(1.00 to 1.12)	42	1.05	(0.98 to 1.12)	35	1.09	(1.02 to 1.16)	42	1.05	(0.97 to 1.13)	32
42 Nagasaki	1.01	(0.97 to 1.06)	29	1.04	(1.00 to 1.09)	37	1.02	(0.98 to 1.07)	33	0.99	(0.95 to 1.04)	18	1.02	(0.98 to 1.07)	35	0.95	(0.91 to 0.99)	9	1.02	(0.97 to 1.08)	30	0.98	(0.93 to 1.04)	18	1.07	(1.01 to 1.14)	38
43 Kumamoto	0.91	(0.87 to 0.94)	2	0.95	(0.91 to 0.99)	10	0.90	(0.86 to 0.94)	3	0.94	(0.90 to 0.98)	4	0.92	(0.88 to 0.96)	2	0.89	(0.85 to 0.93)	1	0.89	(0.85 to 0.94)	4	0.87	(0.82 to 0.91)	3	0.89	(0.84 to 0.95)	9
44 Oita	0.97	(0.93 to 1.01)	13	0.99	(0.95 to 1.04)	20	1.06	(1.01 to 1.11)	42	1.05	(1.00 to 1.10)	38	0.96	(0.92 to 1.01)	8	0.94	(0.89 to 0.98)	7	0.97	(0.91 to 1.02)	15	0.92	(0.86 to 0.97)	10	0.91	(0.85 to 0.97)	11
45 Miyazaki	1.00	(0.96 to 1.04)	24	1.05	(1.00 to 1.11)	38	1.02	(0.97 to 1.07)	29	1.00	(0.95 to 1.05)	23	1.01	(0.96 to 1.06)	27	0.99	(0.94 to 1.04)	17	0.97	(0.92 to 1.03)	16	1.03	(0.97 to 1.09)	29	0.94	(0.88 to 1.00)	14
46 Kagoshima	1.03	(0.99 to 1.08)	36	1.08	(1.04 to 1.13)	43	1.06	(1.02 to 1.10)	45	1.01	(0.97 to 1.05)	29	1.03	(0.99 to 1.08)	38	0.98	(0.94 to 1.02)	15	1.00	(0.96 to 1.05)	25	1.05	(1.00 to 1.11)	34	1.04	(0.98 to 1.10)	27
47 Okinawa	0.87	(0.83 to 0.91)	1	NA	NA	NA	0.88	(0.83 to 0.93)	1	0.82	(0.77 to 0.87)	1	0.85	(0.80 to 0.89)	1	0.91	(0.87 to 0.96)	2	0.85	(0.80 to 0.90)	1	0.91	(0.86 to 0.97)	9	0.86	(0.80 to 0.91)	5

CI; confidence interval, NA; not available, OR; odds ratio

Prefectures with a lower estimate of odds for all-cause premature mortality are ranked higher. The reference is the grand mean of all the prefectures.

Supplementary Table 7. Adjusted prefecture-level residuals for all-cause premature mortality among women, Japan, 1970-2005

	Overall			1970			1975			1980			1985			1990			1995			2000			2005		
Prefectures	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank	OR	(95% CI)	Rank
1 Hokkaido	0.97	(0.93 to 1.00)	14	0.95	(0.92 to 0.99)	10	0.96	(0.92 to 1.00)	17	0.97	(0.94 to 1.01)	13	0.99	(0.95 to 1.02)	18	0.97	(0.93 to 1.01)	14	0.97	(0.93 to 1.02)	14	0.97	(0.93 to 1.01)	16	1.01	(0.96 to 1.06)	20
2 Aomori	1.04	(1.00 to 1.08)	31	0.98	(0.93 to 1.04)	15	0.99	(0.93 to 1.05)	20	1.00	(0.95 to 1.07)	23	1.05	(0.99 to 1.11)	40	1.01	(0.95 to 1.08)	23	1.07	(1.00 to 1.15)	38	1.11	(1.03 to 1.19)	42	1.13	(1.05 to 1.22)	43
3 Iwate	1.07	(1.02 to 1.11)	40	1.05	(0.99 to 1.12)	35	1.04	(0.98 to 1.10)	34	1.03	(0.97 to 1.09)	33	1.02	(0.96 to 1.09)	25	1.03	(0.97 to 1.10)	31	1.09	(1.02 to 1.17)	43	1.13	(1.05 to 1.22)	46	1.17	(1.08 to 1.27)	45
4 Miyagi	0.91	(0.88 to 0.95)	6	0.89	(0.85 to 0.94)	4	0.87	(0.82 to 0.92)	3	0.88	(0.83 to 0.93)	3	0.93	(0.88 to 0.98)	6	0.96	(0.91 to 1.02)	13	0.95	(0.90 to 1.02)	13	0.92	(0.86 to 0.98)	10	0.96	(0.90 to 1.03)	15
5 Akita	0.96	(0.92 to 1.00)	12	0.99	(0.94 to 1.05)	20	0.94	(0.89 to 1.00)	9	0.91	(0.86 to 0.97)	5	0.93	(0.88 to 1.00)	8	0.93	(0.87 to 1.00)	6	1.00	(0.93 to 1.07)	21	1.04	(0.96 to 1.13)	26	1.05	(0.96 to 1.14)	29
6 Yamagata	0.96	(0.92 to 1.00)	11	0.99	(0.93 to 1.05)	18	0.95	(0.89 to 1.01)	11	0.95	(0.89 to 1.01)	9	0.95	(0.89 to 1.01)	11	0.94	(0.88 to 1.00)	8	1.00	(0.92 to 1.08)	19	0.97	(0.89 to 1.05)	15	1.05	(0.96 to 1.14)	30
7 Fukushima	1.04	(1.00 to 1.08)	30	1.04	(0.98 to 1.09)	30	1.07	(1.01 to 1.13)	40	0.99	(0.94 to 1.05)	18	1.03	(0.98 to 1.09)	32	1.01	(0.95 to 1.06)	21	1.02	(0.95 to 1.08)	26	1.07	(1.00 to 1.14)	32	1.10	(1.02 to 1.18)	40
8 Ibaraki	1.04	(1.00 to 1.08)	33	1.08	(1.03 to 1.14)	42	1.02	(0.96 to 1.07)	28	1.01	(0.96 to 1.06)	27	1.04	(0.99 to 1.10)	36	1.06	(1.01 to 1.12)	43	1.07	(1.01 to 1.13)	37	0.99	(0.94 to 1.05)	19	1.05	(0.98 to 1.11)	31
9 Tochigi	1.09	(1.05 to 1.13)	44	1.09	(1.03 to 1.15)	43	1.05	(0.99 to 1.11)	38	1.06	(1.00 to 1.13)	40	1.13	(1.07 to 1.20)	47	1.09	(1.03 to 1.16)	46	1.04	(0.98 to 1.11)	29	1.11	(1.04 to 1.19)	43	1.09	(1.01 to 1.17)	38
10 Gunma	1.05	(1.01 to 1.09)	34	1.08	(1.02 to 1.14)	40	1.01	(0.95 to 1.07)	22	1.02	(0.96 to 1.08)	31	1.05	(0.99 to 1.11)	39	1.02	(0.97 to 1.09)	27	1.01	(0.94 to 1.08)	23	1.09	(1.02 to 1.17)	40	1.10	(1.03 to 1.18)	41
11 Saitama	0.92	(0.88 to 0.95)	7	0.94	(0.90 to 0.98)	9	0.92	(0.88 to 0.96)	6	0.91	(0.88 to 0.95)	6	0.95	(0.91 to 0.99)	10	0.96	(0.92 to 1.00)	12	0.92	(0.88 to 0.96)	9	0.89	(0.85 to 0.93)	7	0.84	(0.80 to 0.88)	4
12 Chiba	0.88	(0.85 to 0.91)	3	0.90	(0.86 to 0.95)	5	0.89	(0.85 to 0.93)	4	0.88	(0.84 to 0.92)	4	0.90	(0.86 to 0.94)	3	0.88	(0.85 to 0.92)	1	0.87	(0.83 to 0.91)	4	0.84	(0.80 to 0.88)	3	0.89	(0.85 to 0.94)	8
13 Tokyo	0.89	(0.86 to 0.92)	4	0.79	(0.76 to 0.81)	1	0.86	(0.83 to 0.89)	2	0.92	(0.89 to 0.95)	7	0.93	(0.90 to 0.96)	7	0.93	(0.90 to 0.96)	5	0.88	(0.85 to 0.91)	6	0.89	(0.86 to 0.93)	6	0.93	(0.89 to 0.97)	11
14 Kanagawa	0.84	(0.81 to 0.87)	1	0.79	(0.76 to 0.82)	2	0.82	(0.78 to 0.85)	1	0.85	(0.82 to 0.88)	1	0.87	(0.84 to 0.91)	2	0.89	(0.86 to 0.92)	3	0.86	(0.82 to 0.89)	3	0.83	(0.79 to 0.86)	2	0.80	(0.76 to 0.84)	2
15 Niigata	0.96	(0.93 to 1.00)	13	1.00	(0.96 to 1.05)	23	0.95	(0.90 to 0.99)	10	0.95	(0.90 to 1.00)	10	0.92	(0.87 to 0.97)	5	0.97	(0.92 to 1.03)	15	1.00	(0.94 to 1.06)	20	1.01	(0.95 to 1.08)	22	0.97	(0.90 to 1.04)	16
16 Toyama	1.06	(1.01 to 1.10)	38	1.08	(1.02 to 1.15)	41	1.04	(0.97 to 1.11)	35	1.02	(0.95 to 1.09)	29	1.03	(0.96 to 1.10)	29	1.01	(0.94 to 1.08)	22	1.01	(0.93 to 1.09)	24	1.15	(1.06 to 1.25)	47	1.13	(1.04 to 1.24)	44
17 Ishikawa	1.03	(0.99 to 1.07)	25	1.04	(0.97 to 1.11)	31	1.02	(0.96 to 1.10)	30	1.00	(0.93 to 1.07)	21	0.98	(0.91 to 1.05)	16	1.03	(0.96 to 1.11)	32	1.02	(0.94 to 1.11)	27	1.06	(0.98 to 1.15)	30	1.10	(1.00 to 1.20)	39
18 Fukui	1.05	(1.00 to 1.10)	35	1.07	(1.00 to 1.15)	38	1.01	(0.94 to 1.09)	25	1.06	(0.98 to 1.15)	41	1.02	(0.95 to 1.11)	27	1.04	(0.96 to 1.12)	35	0.91	(0.83 to 1.00)	8	1.07	(0.97 to 1.18)	33	1.18	(1.06 to 1.30)	46
19 Yamanashi	1.01	(0.97 to 1.06)	23	1.00	(0.93 to 1.07)	22	1.00	(0.93 to 1.08)	21	0.99	(0.92 to 1.07)	19	1.03	(0.96 to 1.12)	33	0.99	(0.91 to 1.07)	19	1.05	(0.96 to 1.15)	32	1.03	(0.94 to 1.13)	25	1.02	(0.92 to 1.13)	23
20 Nagano	1.04	(1.00 to 1.08)	32	1.05	(1.00 to 1.11)	36	1.01	(0.96 to 1.06)	24	1.05	(1.00 to 1.11)	38	1.05	(0.99 to 1.11)	41	1.06	(1.00 to 1.12)	40	1.07	(1.01 to 1.14)	39	1.01	(0.94 to 1.08)	20	1.04	(0.97 to 1.12)	28
21 Gifu	1.11	(1.07 to 1.16)	46	1.02	(0.97 to 1.08)	26	1.10	(1.04 to 1.17)	43	1.15	(1.09 to 1.22)	47	1.11	(1.05 to 1.17)	45	1.08	(1.02 to 1.15)	45	1.14	(1.08 to 1.22)	46	1.11	(1.04 to 1.18)	41	1.12	(1.04 to 1.20)	42
22 Shizuoka	1.01	(0.97 to 1.05)	22	0.94	(0.89 to 0.98)	7	0.96	(0.91 to 1.00)	15	1.00	(0.96 to 1.05)	22	1.00	(0.95 to 1.05)	21	1.06	(1.01 to 1.11)	39	1.06	(1.01 to 1.12)	35	1.05	(1.00 to 1.11)	29	1.05	(0.99 to 1.12)	33
23 Aichi	1.03	(0.99 to 1.07)	24	0.98	(0.94 to 1.02)	13	1.01	(0.97 to 1.05)	23	1.04	(1.00 to 1.08)	34	1.07	(1.03 to 1.11)	43	1.04	(1.00 to 1.08)	38	1.06	(1.02 to 1.11)	34	1.02	(0.98 to 1.07)	24	1.04	(0.99 to 1.09)	27
24 Mie	0.98	(0.94 to 1.02)	19	0.99	(0.93 to 1.04)	16	0.93	(0.88 to 0.99)	8	0.97	(0.92 to 1.03)	14	0.99	(0.93 to 1.05)	19	0.94	(0.89 to 1.00)	10	1.01	(0.95 to 1.08)	25	1.06	(0.99 to 1.14)	31	0.99	(0.92 to 1.06)	18
25 Shiga	0.98	(0.94 to 1.02)	18	1.07	(1.00 to 1.14)	37	1.02	(0.95 to 1.09)	27	1.01	(0.94 to 1.08)	28	0.94	(0.87 to 1.01)	9	0.98	(0.91 to 1.05)	17	1.01	(0.93 to 1.09)	22	0.90	(0.83 to 0.98)	8	0.90	(0.83 to 0.99)	10
26 Kyoto	0.93	(0.89 to 0.97)	9	0.89	(0.84 to 0.93)	3	0.96	(0.91 to 1.01)	16	0.99	(0.94 to 1.04)	17	0.97	(0.92 to 1.03)	15	0.94	(0.89 to 0.99)	9	0.85	(0.80 to 0.90)	2	0.88	(0.83 to 0.94)	5	0.95	(0.89 to 1.01)	13
27 Osaka	0.95	(0.91 to 0.98)	10	0.92	(0.89 to 0.95)	6	0.96	(0.92 to 0.99)	14	0.98	(0.95 to 1.02)	16	1.00	(0.97 to 1.04)	22	0.98	(0.95 to 1.02)	18	0.94	(0.91 to 0.98)	10	0.91	(0.87 to 0.95)	9	0.85	(0.81 to 0.89)	5
28 Hyogo	0.92	(0.89 to 0.96)	8	0.94	(0.90 to 0.97)	8	0.96	(0.92 to 1.00)	13	0.98	(0.94 to 1.02)	15	0.97	(0.93 to 1.01)	14	0.93	(0.89 to 0.96)	4	0.89	(0.85 to 0.93)	7	0.84	(0.80 to 0.88)	4	0.86	(0.81 to 0.90)	6
29 Nara	0.87	(0.83 to 0.90)	2	0.97	(0.91 to 1.04)	12	0.95	(0.89 to 1.02)	12	0.95	(0.88 to 1.01)	8	0.91	(0.85 to 0.97)	4	0.89	(0.83 to 0.95)	2	0.80	(0.75 to 0.86)	1	0.76	(0.71 to 0.82)	1	0.75	(0.69 to 0.82)	1
30 Wakayama	1.01	(0.96 to 1.05)	21	1.03	(0.97 to 1.09)	27	1.02	(0.95 to 1.08)	29	1.00	(0.94 to 1.07)	24	1.04	(0.98 to 1.12)	37	0.98	(0.91 to 1.05)	16	0.95	(0.87 to 1.02)	11	0.93	(0.86 to 1.02)	12	1.08	(0.99 to 1.18)	37
31 Tottori	1.07	(1.02 to 1.12)	41	1.07	(0.99 to 1.16)	39	1.04	(0.96 to 1.13)	37	1.05	(0.97 to 1.14)	37	1.04	(0.96 to 1.13)	35	1.03	(0.95 to 1.12)	33	1.08	(0.98 to 1.19)	41	1.11	(1.00 to 1.23)	44	1.01	(0.90 to 1.14)	21
32 Shimane	1.05	(1.01 to 1.10)	36	1.05	(0.98 to 1.13)	33	1.09	(1.01 to 1.17)	42	1.06	(0.98 to 1.14)	39	0.98	(0.91 to 1.06)	17	1.03	(0.95 to 1.11)	30	1.13	(1.03 to 1.23)	44	1.05	(0.95 to 1.15)	27	0.96	(0.86 to 1.07)	14
33 Okayama	0.97	(0.93 to 1.01)	16	0.98	(0.93 to 1.04)	14	0.98	(0.93 to 1.04)	18	0.97	(0.91 to 1.03)	12	1.04	(0.99 to 1.11)	38	1.03	(0.97 to 1.09)	29	0.98	(0.92 to 1.05)	17	0.92	(0.86 to 0.99)	11	0.84	(0.78 to 0.91)	3
34 Hiroshima	0.99	(0.96 to 1.03)	20	0.99	(0.94 to 1.04)	17	1.03	(0.98 to 1.08)	31	1.03	(0.98 to 1.08)	32	1.01	(0.96 to 1.06)	23	1.04	(0.99 to 1.10)	37	0.98	(0.93 to 1.04)	16	0.94	(0.88 to 0.99)	13	0.90	(0.85 to 0.96)	9
35 Yamaguchi	1.03	(0.99 to 1.07)	27	0.99	(0.94 to 1.05)	19	1.04	(0.98 to 1.10)	36	1.01	(0.95 to 1.07)	25	1.03	(0.97 to 1.09)	30	1.01	(0.96 to 1.08)	24	1.04	(0.98 to 1.12)	30	1.07	(1.00 to 1.15)	36	1.05	(0.97 to 1.13)	32
36 Tokushima	1.08	(1.04 to 1.13)	43	1.11	(1.03 to 1.18)	45	1.19	(1.11 to 1.27)	47	1.10	(1.03 to 1.18)	45	0.97	(0.90 to 1.04)	13	1.06	(0.98 to 1.14)	42	1.08	(1.00 to 1.18)	42	1.01	(0.93 to 1.11)	23	1.02	(0.92 to 1.12)	22
37 Kagawa	1.03	(0.99 to 1.08)	28	1.03	(0.96 to 1.10)	29	1.01	(0.95 to 1.09)	26	1.00	(0.93 to 1.07)	20	1.03	(0.96 to 1.11)	31	1.02	(0.95 to 1.09)	26	1.07	(0.98 to 1.16)	36	1.05	(0.96 to 1.15)	28	1.02	(0.93 to 1.12)	24
38 Ehime	1.06	(1.02 to 1.10)	37	1.02	(0.96 to 1.08)	24	1.13	(1.07 to 1.19)	44	1.02	(0.96 to 1.08)	30	1.03	(0.97 to 1.09)	28	1.08	(1.02 to 1.15)	44	1.03	(0.96 to 1.11)	28	1.07	(0.99 to 1.15)	34	1.07	(0.99 to 1.16)	35
39 Kochi	1.11	(1.06 to 1.16)	45	1.05	(0.98 to 1.13)	34	1.19	(1.11 to 1.27)	46	1.05	(0.98 to 1.13)	36	1.06	(0.99 to 1.15)	42	1.06	(0.98 to 1.14)	41	1.07	(0.99 to 1.17)	40	1.08	(0.98 to 1.18)	37	1.18	(1.07 to 1.30)	47
40 Fukuoka	0.97	(0.94 to 1.01)	17	0.96	(0.92 to 1.00)	11	0.93	(0.89 to 0.97)	7	0.97	(0.93 to 1.01)	11	1.04	(1.00 to 1.08)	34	0.99	(0.95 to 1.03)	20	0.98	(0.93 to 1.02)	15	0.97	(0.92 to 1.02)	17	0.94	(0.89 to 0.99)	12
41 Saga	1.08	(1.04 to 1.13)	42	1.03	(0.96 to 1.10)	28	1.09	(1.01 to 1.17)	41	1.09	(1.01 to 1.17)	43	0.99	(0.92 to 1.07)	20	1.10	(1.03 to 1.19)	47	1.13	(1.04 to 1.23)	45	1.11	(1.02 to 1.22)	45	1.06	(0.96 to 1.17)	34
42 Nagasaki	1.03	(0.99 to 1.07)	26	1.02	(0.97 to 1.08)	25	1.03	(0.97 to 1.09)	32	1.04	(0.98 to 1.10)	35	1.01	(0.96 to 1.08)	24	1.02	(0.96 to 1.08)	25	1.05	(0.98 to 1.12)	31	1.07	(1.00 to 1.15)	35	1.02	(0.95 to 1.11)	25
43 Kumamoto	0.97	(0.93 to 1.01)	15	1.00	(0.95 to 1.05)	21	0.98	(0.93 to 1.04)	19	1.01	(0.95 to 1.06)	26	0.96	(0.90 to 1.01)	12	0.95	(0.90 to 1.01)	11	0.95	(0.89 to 1.02)	12	0.97	(0.91 to 1.05)	18	0.99	(0.91 to 1.06)	17
44 Oita	1.03	(0.99 to 1.08)	29	1.10	(1.04 to 1.17)	44	1.03	(0.97 to 1.10)	33	1.08	(1.01 to 1.15)	42	1.08	(1.02 to 1.15)	44	1.03	(0.96 to 1.09)	28	0.99	(0.92 to 1.06)	18	1.01	(0.93 to 1.09)	21	0.89	(0.82 to 0.98)	7
45 Miyazaki	1.06	(1.02 to 1.10)	39	1.04	(0.98 to 1.11)	32	1.06	(0.99 to 1.13)	39	1.10	(1.03 to 1.17)	44	1.02	(0.95 to 1.09)	26	1.04	(0.97 to 1.11)	36	1.05	(0.97 to 1.14)	33	1.08	(1.00 to 1.17)	38	1.08	(0.99 to 1.18)	36
46 Kagoshima	1.11	(1.07 to 1.16)	47	1.14	(1.08 to 1.20)	46	1.15	(1.09 to 1.21)	45	1.13	(1.07 to 1.19)	46	1.13	(1.07 to 1.19)	46	1.04	(0.98 to 1.10)	34	1.15	(1.08 to 1.22)	47	1.09	(1.01 to 1.17)	39	1.00	(0.92 to 1.08)	19
47 Okinawa	0.89	(0.85 to 0.94)	5	NA	NA	NA	0.92	(0.85 to 0.99)	5	0.87	(0.80 to 0.93)	2	0.86	(0.80 to 0.92)	1	0.93	(0.87 to 1.00)	7	0.87	(0.80 to 0.94)	5	0.94	(0.86 to 1.02)	14	1.03	(0.95 to 1.13)	26

CI; confidence interval, NA; not available, OR; odds ratio

Prefectures with a lower estimate of odds for all-cause premature mortality are ranked higher. The reference is the grand mean of all the prefectures.

Supplementary Table 8. Variance and covariance matrices of prefecture-level variances of each occupation group, Japan, 1970-2005 [a]

	Men						Women					
	Clerical, technical and managerial occupations	Sales and service occupations	Agriculture, forestry and fishery occupations	Production and transport occupations	Unclassifiable occupations	Non-employed [b]	Clerical, technical and managerial occupations	Sales and service occupations	Agriculture, forestry and fishery occupations	Production and transport occupations	Unclassifiable occupations	Non-employed [b]
Clerical, technical and managerial occupations	0.005						0.008					
	(0.001)						(0.002)					
	1.000						*1.000*					
Sales and service occupations	0.006	0.014					0.003	0.010				
	(0.002)	(0.003)					(0.002)	(0.002)				
	0.716	*1.000*					*0.345*	*1.000*				
Agriculture, forestry and fishery occupations	0.002	0.005	0.006				0.002	0.004	0.013			
	(0.001)	(0.002)	(0.001)				(0.002)	(0.002)	(0.003)			
	0.303	*0.506*	*1.000*				*0.176*	*0.393*	*1.000*			
Production and transport occupations	0.006	0.012	0.004	0.013			0.004	0.006	0.004	0.011		
	(0.002)	(0.003)	(0.002)	(0.003)			(0.002)	(0.002)	(0.002)	(0.003)		
	0.731	*0.920*	*0.484*	*1.000*			*0.472*	*0.544*	*0.308*	*1.000*		
Unclassifiable occupations	-0.007	-0.003	0.006	-0.005	0.317		-0.022	-0.014	-0.019	-0.014	0.331	
	(0.007)	(0.010)	(0.007)	(0.010)	(0.066)		(0.009)	(0.009)	(0.011)	(0.010)	(0.070)	
	-0.168	*-0.051*	*0.139*	*-0.078*	*1.000*		*-0.440*	*-0.247*	*-0.297*	*-0.244*	*1.000*	
Non-employed [b]	-0.001	-0.003	-0.0002	-0.003	0.006	0.006	-0.002	0.005	-0.002	-0.001	0.014	0.008
	(0.001)	(0.001)	(0.001)	(0.001)	(0.007)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.008)	(0.002)
	-0.226	*-0.387*	*-0.030*	*-0.358*	*0.144*	*1.000*	*-0.198*	*0.508*	*-0.203*	*-0.112*	*0.262*	*1.000*

[a] The number in parentheses is a standard error of the corresponding variances and covariances. The italicized numbers are correlation coefficients.

[b] Non-employed is the sum of unemployed and non-labor force.

Supplementary Table 9. Gini's coefficient of yearly income, average yearly income, and average savings in 47 prefectures, Japan, 1969-2004 [a]

	1969 [b c]			1974 [c]			1979			1984			1989			1994			1999			2004		
Prefectures	Gini	Income	Savings	Gini	Income	Savings	Gini	Income	Savings	Gini	Income	Savings	Gini	Income	Savings	Gini	Income	Savings	Gini	Income	Savings	Gini	Income	Savings
1 Hokkaido	NA	1,154	966	NA	2,366	1,686	0.268	3,969	3,998	0.265	4,851	5,097	0.267	5,407	7,276	0.273	6,506	10,241	0.292	6,588	11,616	0.294	5,928	12,062
2 Aomori	NA	1,157	1,014	NA	2,056	1,626	0.253	3,951	3,570	0.266	4,738	4,573	0.289	5,405	6,440	0.298	5,974	7,707	0.294	6,239	9,270	0.291	5,896	11,267
3 Iwate	NA	1,012	786	NA	2,426	1,954	0.263	3,502	3,023	0.294	4,448	4,629	0.283	5,307	6,901	0.272	6,674	10,540	0.283	7,351	12,767	0.298	6,455	12,363
4 Miyagi	NA	1,105	1,021	NA	2,788	2,301	0.251	4,223	4,470	0.260	5,158	4,947	0.271	6,307	8,006	0.279	7,486	10,666	0.275	7,167	12,261	0.307	6,764	11,894
5 Akita	NA	1,336	864	NA	2,616	1,810	0.268	4,129	3,814	0.262	4,821	4,266	0.274	5,872	7,364	0.274	7,284	9,642	0.279	7,254	9,966	0.300	6,235	11,512
6 Yamagata	NA	1,053	877	NA	2,341	1,803	0.256	4,151	3,761	0.266	5,088	4,688	0.272	6,748	7,695	0.273	8,045	10,705	0.277	7,926	13,045	0.306	7,070	12,675
7 Fukushima	NA	1,027	864	NA	2,407	1,963	0.279	3,893	3,798	0.278	5,182	5,290	0.273	6,127	7,660	0.299	7,294	11,202	0.301	7,578	12,405	0.312	6,536	13,216
8 Ibaraki	NA	1,130	1,266	NA	2,573	2,376	0.264	4,369	4,751	0.278	5,437	6,813	0.272	7,140	10,569	0.276	8,516	14,506	0.295	8,261	15,136	0.295	7,339	16,224
9 Tochigi	NA	1,291	1,306	NA	2,617	2,577	0.276	4,461	4,981	0.262	5,819	6,365	0.262	6,884	11,496	0.296	8,146	16,105	0.290	7,630	15,077	0.310	7,527	15,793
10 Gunma	NA	1,203	1,135	NA	2,586	2,361	0.251	4,216	4,627	0.267	5,475	6,571	0.289	6,312	9,731	0.287	8,001	15,031	0.302	7,415	16,836	0.293	6,704	15,878
11 Saitama	NA	1,347	1,322	NA	2,758	2,462	0.244	4,473	4,314	0.253	5,803	6,431	0.268	7,322	11,731	0.274	8,565	13,811	0.281	7,994	14,871	0.295	7,165	14,919
12 Chiba	NA	1,355	1,319	NA	2,765	2,511	0.254	4,593	5,108	0.266	5,898	7,036	0.272	7,439	11,391	0.283	8,683	13,165	0.294	8,330	16,243	0.302	7,230	16,646
13 Tokyo	NA	1,572	1,700	NA	3,067	3,137	0.287	4,843	6,287	0.282	6,165	8,236	0.315	7,691	14,720	0.301	8,494	16,210	0.314	8,082	18,408	0.314	7,799	19,961
14 Kanagawa	NA	1,443	1,481	NA	2,885	2,788	0.260	4,500	4,970	0.272	6,281	7,832	0.280	7,785	13,434	0.291	8,948	16,366	0.285	8,340	17,587	0.299	7,566	17,916
15 Niigata	NA	1,227	1,259	NA	2,432	1,963	0.263	4,177	4,116	0.259	5,631	6,296	0.271	6,515	9,215	0.279	8,086	12,637	0.292	7,904	14,513	0.312	7,406	16,220
16 Toyama	NA	1,178	1,150	NA	2,815	2,506	0.268	4,460	5,176	0.259	5,959	7,286	0.259	7,481	10,780	0.294	8,947	15,490	0.276	8,915	15,676	0.303	8,001	16,814
17 Ishikawa	NA	1,235	1,384	NA	2,773	2,857	0.247	4,486	5,005	0.261	5,875	7,285	0.272	7,144	14,108	0.281	9,152	16,794	0.285	8,728	17,861	0.286	7,409	16,219
18 Fukui	NA	1,213	1,541	NA	2,735	3,181	0.286	5,025	5,759	0.269	6,089	7,819	0.316	7,823	13,122	0.273	8,639	16,529	0.291	8,841	19,639	0.304	8,297	19,330
19 Yamanashi	NA	1,114	927	NA	2,580	2,368	0.267	4,178	4,796	0.257	5,550	6,703	0.258	6,370	9,703	0.278	7,967	12,968	0.287	7,591	13,453	0.280	6,380	13,253
20 Nagano	NA	1,165	1,203	NA	2,463	2,314	0.254	4,347	4,939	0.260	5,525	6,656	0.270	6,547	10,632	0.280	8,041	13,811	0.284	7,970	15,089	0.275	6,807	15,597
21 Gifu	NA	1,160	1,272	NA	2,813	3,074	0.237	4,602	5,033	0.285	5,840	7,173	0.271	6,895	10,957	0.273	8,300	15,472	0.302	8,593	18,079	0.293	7,345	17,212
22 Shizuoka	NA	1,315	1,321	NA	2,615	2,420	0.276	4,380	5,196	0.267	5,666	7,009	0.282	7,156	10,970	0.288	8,183	13,564	0.287	8,057	16,410	0.298	7,361	17,622
23 Aichi	NA	1,279	1,540	NA	2,836	2,892	0.277	4,456	5,716	0.271	6,098	8,468	0.280	7,223	12,592	0.296	8,574	15,924	0.301	8,081	16,767	0.306	7,636	19,433
24 Mie	NA	1,269	1,597	NA	2,736	3,058	0.247	4,137	5,033	0.251	5,541	6,694	0.283	7,161	11,692	0.289	8,224	15,492	0.286	8,159	15,888	0.287	7,346	19,677
25 Shiga	NA	1,286	1,497	NA	2,930	3,361	0.232	4,753	5,470	0.262	6,027	7,817	0.266	7,407	12,852	0.266	8,745	15,929	0.286	7,994	16,220	0.280	7,231	17,098
26 Kyoto	NA	1,593	1,646	NA	3,004	3,105	0.260	4,439	5,632	0.270	5,485	8,077	0.272	6,678	11,127	0.294	7,458	13,633	0.303	7,434	16,289	0.295	6,565	16,383
27 Osaka	NA	1,481	1,736	NA	2,844	2,975	0.276	4,275	5,378	0.271	5,304	7,208	0.291	6,725	12,716	0.308	7,742	14,578	0.296	7,223	15,175	0.323	6,443	15,079
28 Hyogo	NA	1,367	1,779	NA	2,746	2,827	0.272	4,384	5,839	0.281	5,771	7,835	0.293	6,709	13,310	0.287	7,955	15,221	0.296	7,552	15,521	0.314	6,857	16,826
29 Nara	NA	1,220	1,733	NA	2,639	2,927	0.248	4,659	6,405	0.255	5,664	7,923	0.252	6,882	12,601	0.292	8,066	15,819	0.292	8,019	16,010	0.290	7,019	19,270
30 Wakayama	NA	1,180	1,693	NA	2,574	3,311	0.255	4,038	5,210	0.303	5,511	8,111	0.303	5,916	10,795	0.309	7,009	12,886	0.295	6,959	14,747	0.304	6,209	16,929
31 Tottori	NA	1,112	1,134	NA	2,574	2,223	0.259	4,100	4,752	0.278	5,208	6,922	0.276	6,599	9,898	0.289	7,698	13,798	0.296	7,400	14,908	0.297	6,875	16,442
32 Shimane	NA	999	777	NA	2,343	1,890	0.269	4,021	4,191	0.284	5,444	5,958	0.271	6,032	9,969	0.292	7,395	12,366	0.322	7,707	13,343	0.298	6,789	15,128
33 Okayama	NA	1,164	1,330	NA	2,594	2,696	0.267	4,478	5,659	0.280	5,329	7,799	0.292	6,162	11,342	0.282	7,206	14,636	0.291	7,756	16,356	0.303	6,493	17,909
34 Hiroshima	NA	1,187	1,326	NA	2,641	2,444	0.264	4,136	4,935	0.276	5,351	6,620	0.275	6,225	10,185	0.286	7,659	13,471	0.311	7,240	15,763	0.301	6,778	15,478
35 Yamaguchi	NA	1,069	1,168	NA	2,639	2,391	0.252	4,122	5,025	0.267	4,990	6,585	0.283	6,135	10,064	0.282	7,410	13,813	0.294	6,530	13,216	0.293	6,388	14,772
36 Tokushima	NA	1,101	1,292	NA	2,330	2,156	0.298	4,128	5,444	0.287	5,384	6,979	0.284	6,065	9,934	0.294	7,235	13,253	0.321	7,361	15,291	0.345	6,607	16,186
37 Kagawa	NA	1,165	1,259	NA	2,762	2,886	0.266	4,429	5,768	0.288	5,257	7,573	0.266	6,347	13,286	0.294	7,438	15,379	0.285	7,530	17,431	0.292	6,805	18,858
38 Ehime	NA	1,144	1,084	NA	2,272	2,126	0.265	3,876	4,516	0.291	4,834	6,734	0.299	5,627	10,117	0.300	6,833	12,740	0.288	6,355	12,883	0.295	6,157	15,770
39 Kochi	NA	1,074	1,058	NA	2,496	2,325	0.271	3,749	4,267	0.310	4,613	5,482	0.299	5,613	9,695	0.330	6,612	12,490	0.326	6,726	13,279	0.313	6,331	16,847
40 Fukuoka	NA	1,175	1,079	NA	2,404	1,788	0.267	4,008	4,112	0.296	5,024	5,324	0.290	5,579	8,374	0.311	7,159	11,540	0.317	6,797	11,946	0.302	6,464	13,414
41 Saga	NA	1,073	1,064	NA	2,293	2,065	0.261	3,799	3,610	0.286	4,923	5,248	0.301	6,147	8,612	0.296	7,159	11,607	0.284	7,440	12,538	0.296	6,832	13,363
42 Nagasaki	NA	1,113	942	NA	2,184	1,473	0.249	3,659	3,511	0.287	4,273	5,116	0.259	5,249	6,941	0.289	6,129	8,777	0.301	6,646	10,999	0.309	5,855	11,355
43 Kumamoto	NA	1,116	804	NA	2,233	1,750	0.276	3,713	3,716	0.286	4,791	5,155	0.308	5,721	7,603	0.313	6,874	10,354	0.310	6,640	10,824	0.316	6,388	11,657
44 Oita	NA	1,178	1,072	NA	2,281	1,969	0.275	3,666	3,944	0.274	4,470	4,539	0.299	5,560	7,827	0.291	6,406	10,268	0.283	6,764	12,249	0.299	5,811	12,271
45 Miyazaki	NA	1,037	906	NA	2,408	1,677	0.301	3,520	3,125	0.319	4,104	3,876	0.298	4,781	6,044	0.294	5,797	8,779	0.312	6,216	10,263	0.311	5,934	10,030
46 Kagoshima	NA	887	644	NA	2,037	1,423	0.272	3,236	2,854	0.291	3,730	4,031	0.310	4,583	6,318	0.302	5,831	8,461	0.282	5,885	10,217	0.293	5,827	10,410
47 Okinawa	NA	NA	NA	NA	2,128	990	0.299	3,261	2,345	0.337	3,648	2,656	0.332	4,505	4,728	0.380	5,491	5,238	0.353	5,298	5,918	0.344	4,516	5,484
Mean	NA	1,197	1,220	NA	2,562	2,357	0.265	4,170	4,637	0.276	5,278	6,335	0.282	6,368	10,054	0.291	7,575	12,971	0.296	7,457	14,261	0.302	6,753	15,120
Standard deviation	NA	144	293	NA	248	557	0.015	391	919	0.018	617	1,375	0.017	833	2,386	0.018	915	2,680	0.015	792	2,754	0.013	688	3,007
Lowest	NA	887	644	NA	2,037	990	0.232	3,236	2,345	0.251	3,648	2,656	0.252	4,505	4,728	0.266	5,491	5,238	0.275	5,298	5,918	0.275	4,516	5,484
Highest	NA	1,593	1,779	NA	3,067	3,361	0.301	5,025	6,405	0.337	6,281	8,468	0.332	7,823	14,720	0.380	9,152	16,794	0.353	8,915	19,639	0.345	8,297	19,961

NA; not available

[a] These data were obtained from the *National Survey of Family Income and Expenditure* . All variables were calculated among two-or-more-person households. Average yearly income and average savings are shown in thousand yen.

[b] The data for Okinawa prefecture were not available in 1969.

[c] Gini's coefficients of yearly income were not available in these years, and we imputed the values of 1979 forwardly in the analysis.

Supplementary Table 10. Odds ratios for all-cause premature mortality of prefecture-level socioeconomic status variables, Japan, 1970-2005 [a]

	Overall		1970 [b]		1975 [b]		1980		1985		1990		1995		2000		2005	
	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)	OR	(95% CI)
Men																		
Gini's coefficient of yearly income [c]																		
Low	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference
Middle	1.01	(0.99 to 1.03)	1.03	(0.98 to 1.07)	1.03	(0.99 to 1.07)	1.01	(0.97 to 1.06)	1.00	(0.97 to 1.04)	1.03	(0.99 to 1.07)	0.99	(0.93 to 1.04)	1.02	(0.96 to 1.08)	0.99	(0.92 to 1.07)
High	1.01	(0.98 to 1.03)	1.03	(0.99 to 1.07)	1.01	(0.97 to 1.05)	0.99	(0.95 to 1.04)	0.98	(0.94 to 1.01)	0.99	(0.95 to 1.03)	1.00	(0.94 to 1.06)	0.98	(0.93 to 1.05)	0.98	(0.91 to 1.06)
Average yearly income [c]																		
High	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference
Middle	0.99	(0.97 to 1.02)	0.99	(0.95 to 1.03)	1.04	(1.00 to 1.08)	1.05	(1.00 to 1.09)	0.99	(0.95 to 1.03)	1.00	(0.96 to 1.04)	1.05	(0.99 to 1.11)	1.07	(1.01 to 1.13)	0.99	(0.91 to 1.07)
Low	0.99	(0.96 to 1.02)	1.04	(1.00 to 1.08)	1.05	(1.01 to 1.08)	1.04	(0.99 to 1.09)	0.98	(0.94 to 1.02)	0.96	(0.92 to 1.00)	1.01	(0.96 to 1.07)	1.04	(0.98 to 1.10)	1.03	(0.96 to 1.11)
Average savings [c]																		
High	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference
Middle	1.00	(0.97 to 1.02)	1.04	(1.00 to 1.08)	1.04	(1.00 to 1.08)	1.02	(0.97 to 1.07)	1.02	(0.98 to 1.06)	0.99	(0.95 to 1.03)	1.05	(0.99 to 1.11)	1.07	(1.01 to 1.13)	1.03	(0.95 to 1.11)
Low	1.01	(0.98 to 1.05)	1.07	(1.03 to 1.12)	1.05	(1.01 to 1.09)	1.02	(0.98 to 1.07)	0.99	(0.95 to 1.03)	0.97	(0.93 to 1.01)	1.04	(0.98 to 1.10)	1.07	(1.01 to 1.14)	1.08	(1.00 to 1.16)
Women																		
Gini's coefficient of yearly income [c]																		
Low	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference
Middle	1.00	(0.97 to 1.02)	0.98	(0.93 to 1.05)	1.01	(0.95 to 1.08)	1.00	(0.95 to 1.05)	1.04	(0.99 to 1.09)	1.02	(0.97 to 1.07)	0.97	(0.90 to 1.03)	0.96	(0.89 to 1.03)	0.99	(0.91 to 1.07)
High	1.01	(0.98 to 1.04)	1.01	(0.95 to 1.07)	1.04	(0.98 to 1.11)	1.04	(0.98 to 1.10)	1.05	(1.00 to 1.10)	1.02	(0.97 to 1.07)	0.99	(0.93 to 1.06)	0.99	(0.92 to 1.07)	1.00	(0.93 to 1.09)
Average yearly income [c]																		
High	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference
Middle	1.01	(0.98 to 1.04)	1.09	(1.03 to 1.15)	1.07	(1.01 to 1.13)	1.01	(0.96 to 1.06)	1.04	(0.99 to 1.10)	1.01	(0.97 to 1.07)	1.00	(0.94 to 1.07)	1.06	(0.99 to 1.14)	0.96	(0.89 to 1.04)
Low	1.02	(0.99 to 1.06)	1.10	(1.05 to 1.16)	1.09	(1.04 to 1.16)	1.05	(0.99 to 1.11)	1.04	(0.98 to 1.09)	1.02	(0.97 to 1.08)	1.04	(0.98 to 1.12)	1.04	(0.97 to 1.12)	1.04	(0.96 to 1.13)
Average savings [c]																		
High	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference	1.00	Reference
Middle	1.00	(0.97 to 1.03)	1.09	(1.03 to 1.15)	1.05	(0.99 to 1.12)	1.01	(0.96 to 1.07)	1.02	(0.96 to 1.07)	1.08	(1.03 to 1.13)	1.03	(0.96 to 1.10)	1.05	(0.98 to 1.13)	1.01	(0.93 to 1.09)
Low	1.02	(0.98 to 1.06)	1.08	(1.02 to 1.14)	1.04	(0.98 to 1.11)	1.02	(0.96 to 1.07)	1.01	(0.96 to 1.07)	1.03	(0.98 to 1.07)	1.06	(0.99 to 1.13)	1.08	(1.00 to 1.16)	1.05	(0.97 to 1.14)

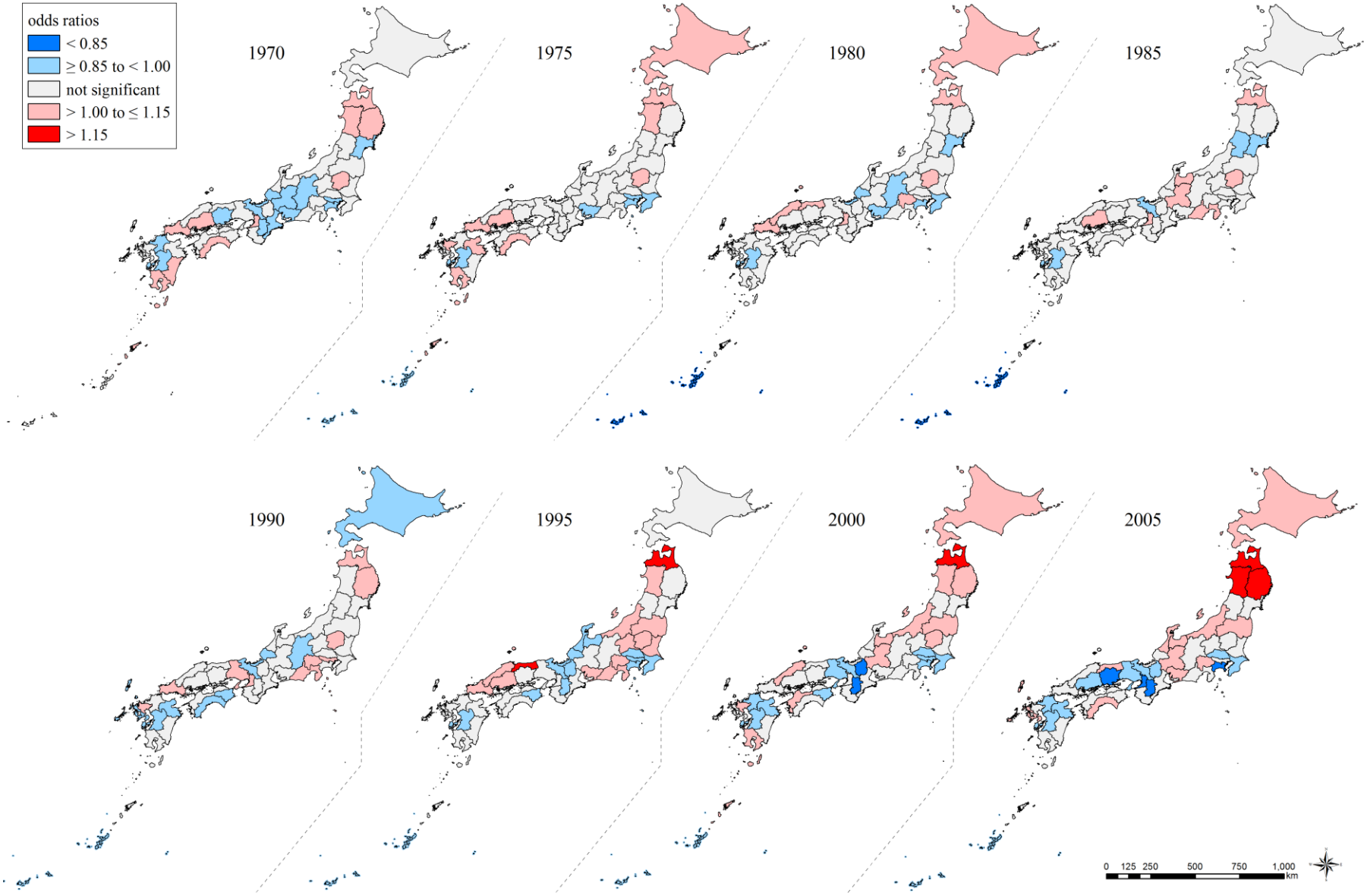
CI; confidence interval, OR; odds ratio

[a] These odds ratios were adjusted for age, occupations, and year (only in the overall model). Prefecture-level variables were adjusted for separately.

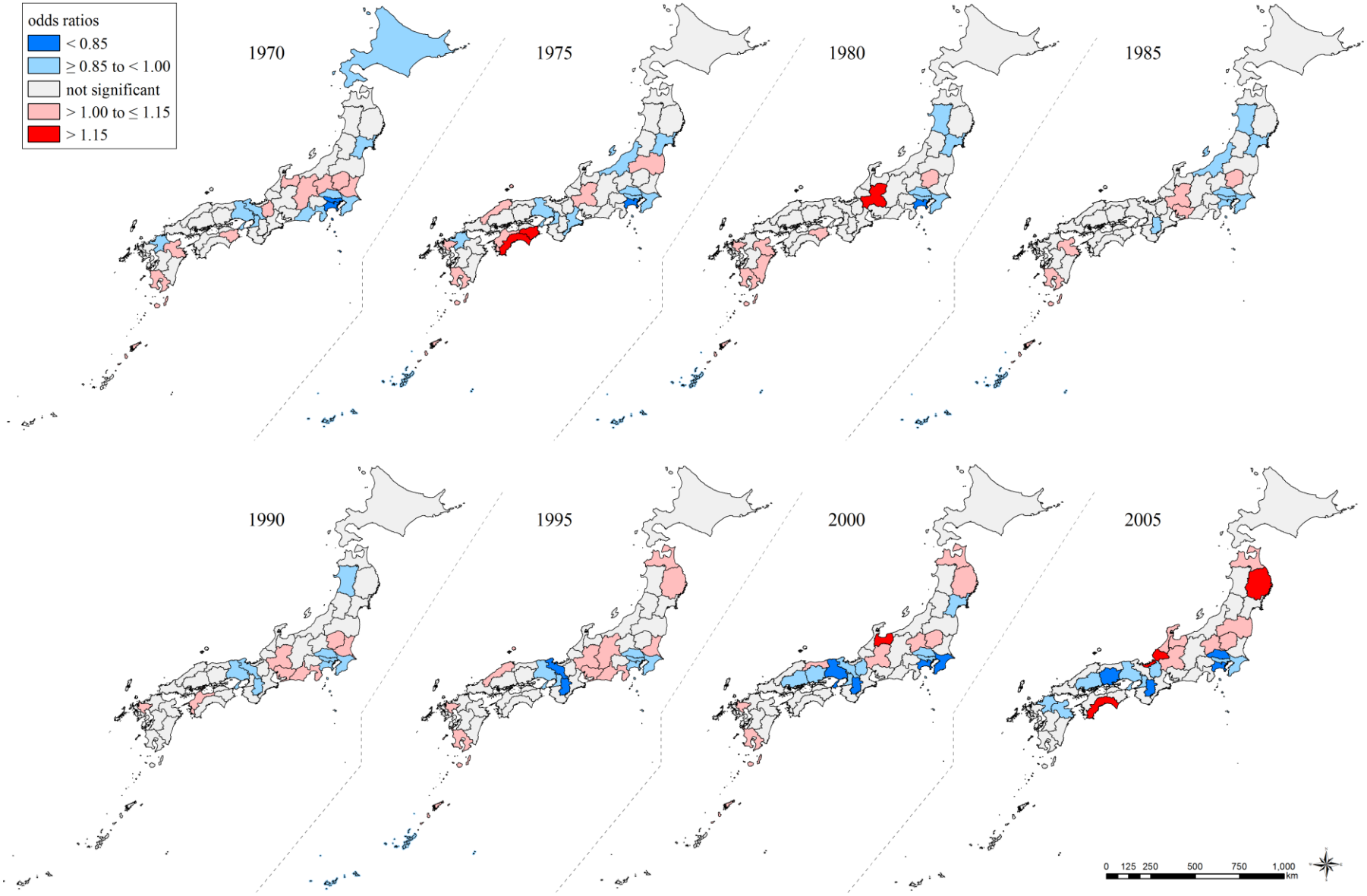
[b] Gini's coefficients of yearly income were not available in these models, and we imputed the vlaues of the 1980 model to them.

[c] These variables were calculated among two-or-more-person households.

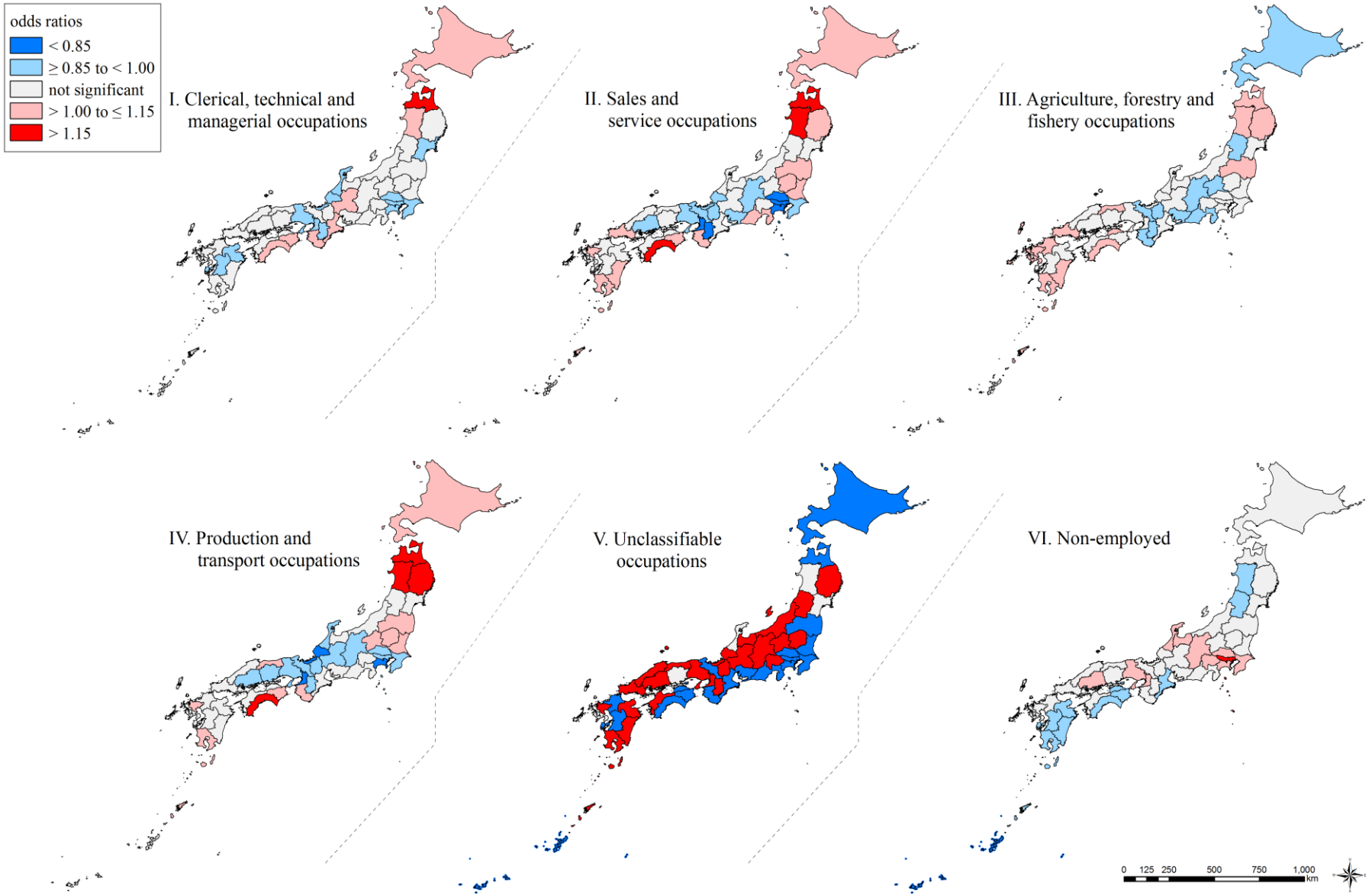
Supplementary Figure 1. A blank map of Japan.



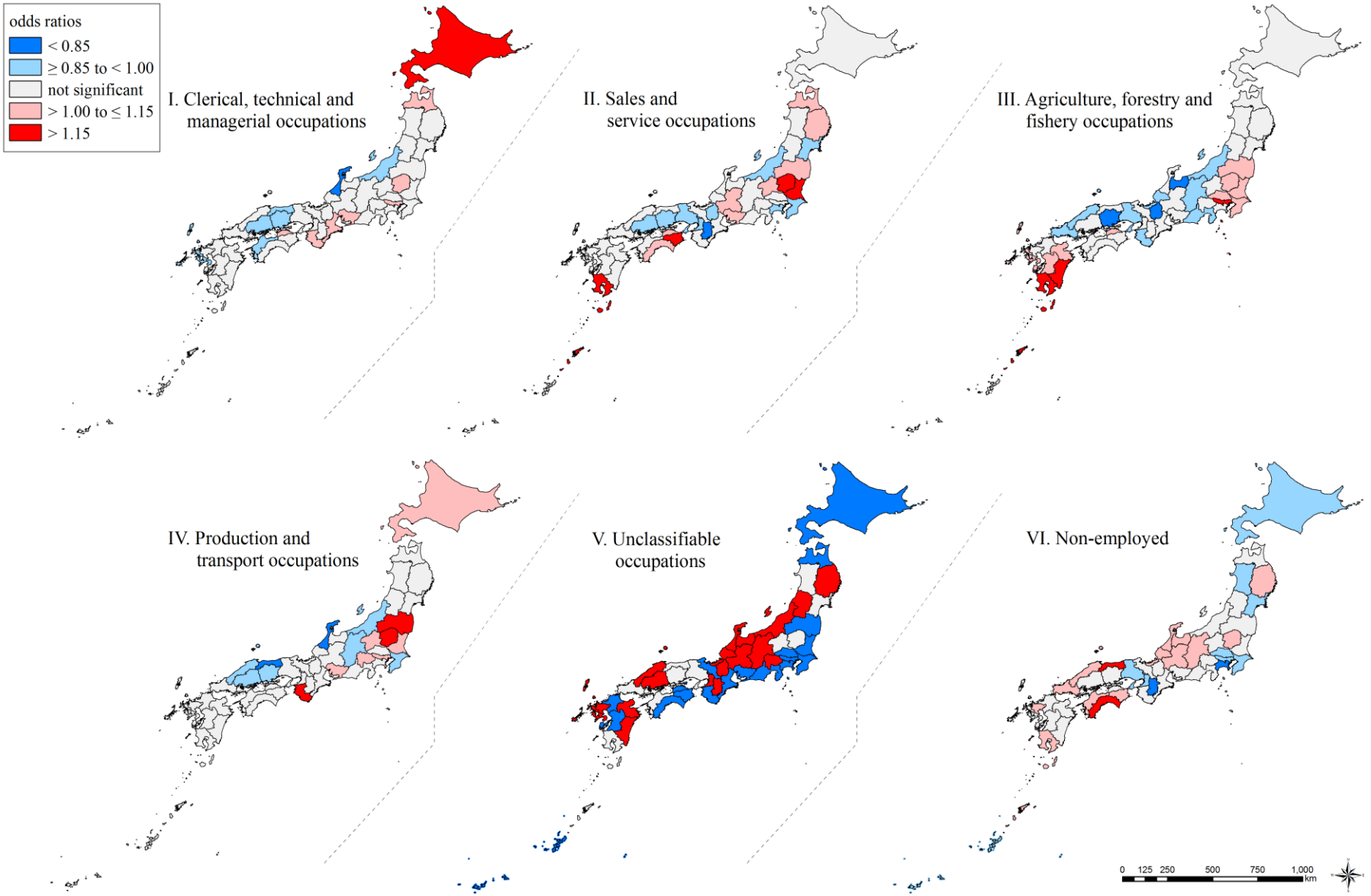
Supplementary Figure 2. Geographic and temporal variation in all-cause premature mortality among men, Japan.



Supplementary Figure 3. Geographic and temporal variation in all-cause premature mortality among women, Japan.



Supplementary Figure 4. Geographic inequality of all-cause premature mortality by occupational groups among men, Japan, 1970-2005.



Supplementary Figure 5. Geographic inequality of all-cause premature mortality by occupational groups among women, Japan, 1970-2005.

Legends of Supplementary Figures

Supplementary Figure 1. A blank map of Japan.
We show the locations of 47 prefectures in Japan.

Supplementary Figure 2. Geographic and temporal variation in all-cause premature mortality among men, Japan.
We show year-specific geographic inequality of all-cause mortality across 47 prefectures, conditional on individual age and occupation. (The data for Okinawa prefecture were not available in 1970.) Prefecture-level residuals are described in odds ratios with the reference being the grand mean of all the prefectures. Prefectures with a lower and a higher estimate of odds for mortality are filled with blue and red, respectively. Regarding areas filled with gray, prefecture-level residuals were not statistically significant.

Supplementary Figure 3. Geographic and temporal variation in all-cause premature mortality among women, Japan.
We show year-specific geographic inequality of all-cause mortality across 47 prefectures, conditional on individual age and occupation. (The data for Okinawa prefecture were not available in 1970.) Prefecture-level residuals are described in odds ratios with the reference being the grand mean of all the prefectures. Prefectures with a lower and a higher estimate of odds for mortality are filled with blue and red, respectively. Regarding areas filled with gray, prefecture-level residuals were not statistically significant.

Supplementary Figure 4. Geographic inequality of all-cause premature mortality by occupational groups among men, Japan, 1970-2005.
We show the geographic inequality of all-cause mortality across 47 prefectures for the six collapsed occupational groups, conditional on individual age, occupation, and year. Prefecture-level residuals are described in odds ratios with the reference being the grand mean of all the prefectures. Prefectures with a lower and a higher estimate of odds for mortality are filled with blue and red, respectively. Regarding areas filled with gray, prefecture-level residuals were not statistically significant.

Supplementary Figure 5. Geographic inequality of all-cause premature mortality by occupational groups among women, Japan, 1970-2005.
We show the geographic inequality of all-cause mortality across 47 prefectures for the six collapsed occupational groups, conditional on individual age, occupation, and year. Prefecture-level residuals are described in odds ratios with the reference being the grand mean of all the prefectures. Prefectures with a lower and a higher estimate of odds for mortality are filled with blue and red, respectively. Regarding areas filled with gray, prefecture-level residuals were not statistically significant.