Links between unemployment and morbidity/mortality

Pierre Meneton, INSERM U1142, Paris

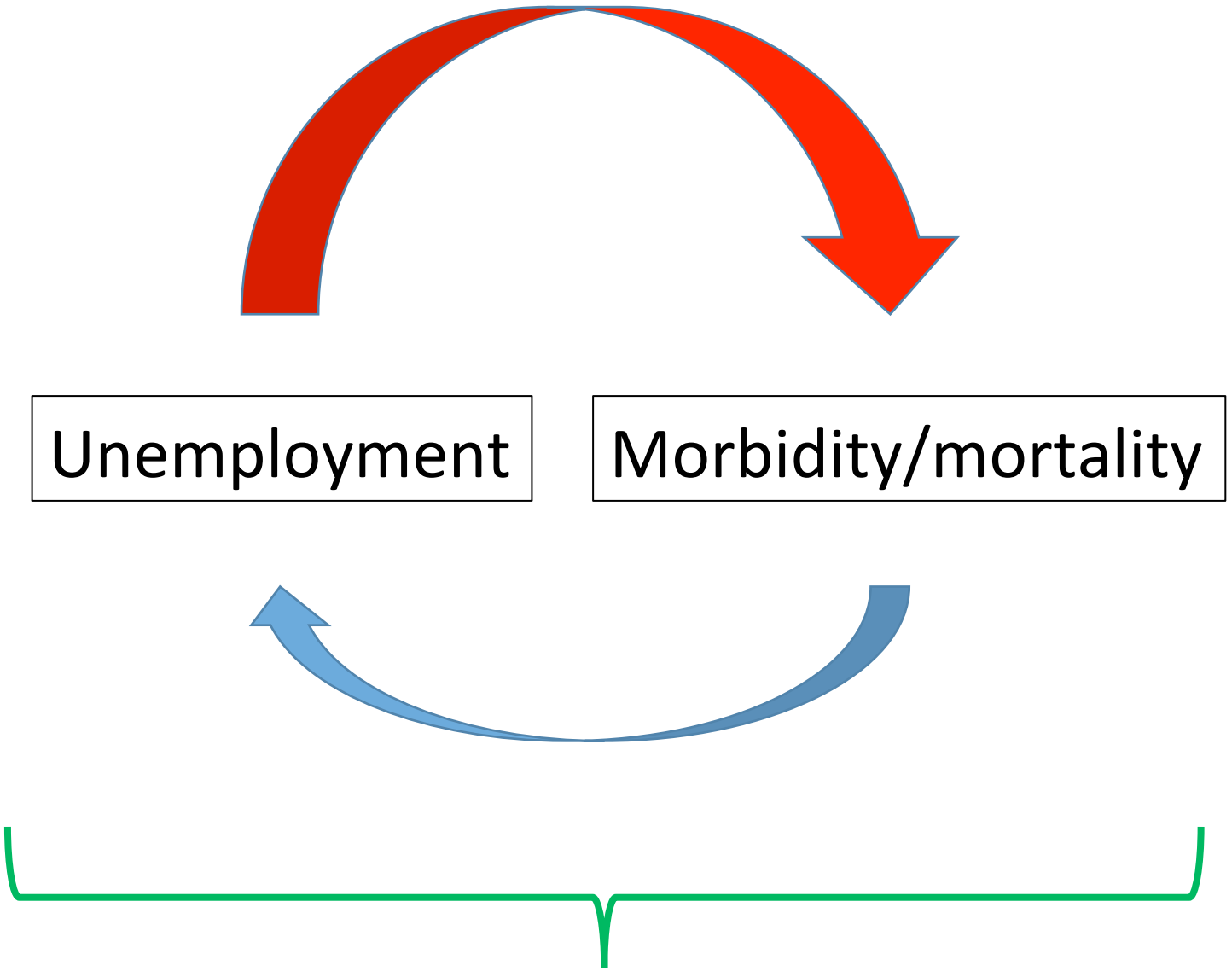
Cohorte CONSTANCES

Marie Zins, Marcel Goldberg, Guillaume Airagnes, INSERM UMS 011, Villejuif
Cédric Lemogne, AP-HP, Université Paris 5
Marie Plessz, INRA, Paris

Cohorte SUVIMAX

Serge Hercberg, Université Paris 13, Bobigny

Conflict of interest: none

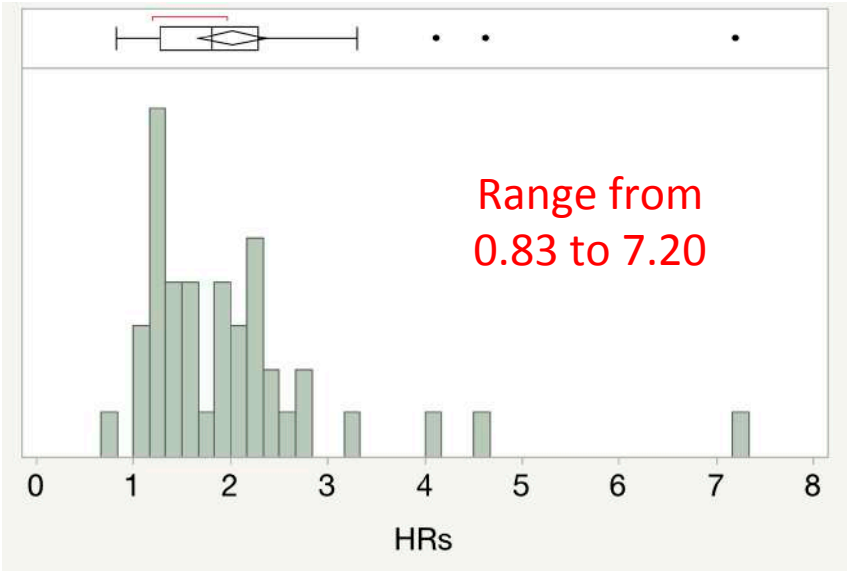


Unemployment/job loss
Gender, age
Family context
Education
Occupation
Working conditions
Local environment
Unemployment insurance
Welfare state regime
Health care access

Losing Life and Livelihood: A Systematic Review and Meta- Analysis of Unemployment and All-Cause Mortality

Soc Sci Med. 2011 72(6): 840–854

Hazard ratios comparing the unemployed with the employed from 42 studies in 15 countries, providing data on more than 20 million persons with a mean follow-up of 9 years



HRs (95% CI)		Unadjusted	Multi-adjusted
All		2.08 (1.77-2.43)	**1.63 (1.49-1.79)**
Sex	**Women**	1.62 (1.25-2.09)	1.37 (1.17-1.60)
	Men	2.38 (1.85-3.08)	1.78 (1.56-2.02)
Age (y)	**<40**	1.84 (1.37-2.48)	1.73 (1.41-2.11)
	40-50	2.25 (1.87-2.71)	1.77 (1.59-1.98)
	50-65	1.64 (0.97-2.76)	1.25 (1.03-1.52)
Mean follow-up (y)	**<5**	1.70 (1.15-2.52)	1.73 (1.44-2.06)
	5-10	2.65 (2.15-3.25)	1.76 (1.55-2.00)
	>10	1.58 (1.22-2.04)	1.42 (1.22-1.64)

Unemployment and Mortality: A Comparative Study of Germany and the United States
Am J Public Health 2012, 102(8): 1542-1550

TABLE 2—Relative Risk of Dying for Current Labor Force Status for the German and American Cohorts, Adjusted for Age and Gender and Other Potential Confounders: German Socio-Economic Panel and US Panel Study of Income Dynamics, 1984–2005

	German Cohort (n = 10 754)		American Cohort (n = 9523)	
Variables	Age and Gender, RR (95% CI)	Fully Adjusted, RR (95% CI)	Age and Gender, RR (95% CI)	Fully Adjusted, RR (95% CI)
Employment status (Ref = employed)				
Unemployed	2.15*** (1.50, 3.07)	1.42 (0.98, 2.04)	3.66*** (2.60, 5.16)	2.35*** (1.67, 3.34)
Not working	3.01*** (2.44, 3.70)	2.01*** (1.61, 2.51)	4.24*** (3.47, 5.15)	2.43*** (1.95, 3.01)

Welfare state regimes, unemployment and health: a comparative study of the relationship between unemployment and self-reported health in 23 European countries

J Epidemiol Community Health, 63:92–98, 2009

Table 1 Characteristics of unemployment protection in 23 European countries, ranked by welfare state regime (2004)[33 34]

Welfare regime (1–5, high–low)	Country	Funding system	Qualifying period*	Initial net replacement rate (% of net average wages)†	Unemployment insurance benefit duration (months)‡	Waiting period (days)§
1. Scandinavian	Denmark	Subsidised voluntary insurance	12 months in last 3 years	70	48	0
	Finland	Voluntary subsidised insurance and social assistance system	43 weeks in last 2 years	70	23	7
	Norway	Social insurance	Annual earnings in last year equal to 75% of base amount	68	36	5
	Sweden	Subsidised programme of basic insurance and voluntary income-related insurance	6 months in last 12 months	75	28	5
2. Bismarckian	Austria	Social insurance	28 weeks in last 12 months	63	9	0
	Belgium	Social insurance	468 days in last 27 months	61	No limit	0
	France	Social insurance and social assistance	6 months in last 22 months	75	23	8
	Germany	Social insurance and social assistance	12 months in last 2 years	69	12	0
	Luxembourg	Social insurance	26 weeks in last 12 months	80	12	0
	Netherlands	Social insurance and social assistance	26 weeks in last 39 weeks	74	24	0
	Switzerland	Social insurance	12 months in last 2 years	77	24	5
3. Anglo-Saxon	Ireland	Social insurance and social assistance	39 weeks in last 12 months	49	15	3
	United Kingdom	Social insurance and social assistance	Contributions equivalent to 25 and 50 times the lower earnings limit must have been paid in the last 2 years	54	6	3
4. Southern Europe	Greece	Social insurance	125 days in last 14 months	55	12	6
	Italy	Social insurance	2 years of insurance contributions with 52 weeks contributions in last 2 years	54	6	7
	Portugal	Social insurance and social assistance	540 days in last 24 months	83	24	0
	Spain	Social insurance	12 months in last 6 years	67	21	0
5. Eastern Europe	Czech Republic	Social insurance	12 months in last 3 years	56	5	–
	Hungary	Social insurance	12 months in last 4 years	49	9	0
	Poland	Social insurance	Earnings in 18 months prior to claim must be at least equivalent to the minimum wage	59	12	7
	Slovenia	Social insurance	12 months in last 18 months	56	8	–

Social inequalities in mortality by cause among men and women in France

J Epidemiol Community Health 2009;63:197–202

Table 2 Age-adjusted relative risk of all-cause mortality by level of education and occupational group, among men and women

	Men	Women
	RR (95% CI)	**RR (95% CI)**
Educational level		
No diploma	2.83 (2.56 to 3.12)	2.02 (1.74 to 2.36)
Primary	2.14 (1.93 to 2.37)	1.39 (1.19 to 1.63)
Technical	1.73 (1.57 to 1.92)	1.20 (1.02 to 1.40)
Secondary	1.42 (1.26 to 1.61)	0.95 (0.78 to 1.15)
University	1	1
RII	2.96 (2.72 to 3.23)	2.62 (2.29 to 2.99)
Occupational groups		
Farmers	1.42 (1.22 to 1.66)	1.30 (0.97 to 1.74)
Shop keepers, craftsmen	1.56 (1.36 to 1.78)	1.19 (0.89 to 1.60)
Professionals, managers	1	1
Intermediate white collars	1.36 (1.20 to 1.54)	0.95 (0.73 to 1.23)
Office, sales employees	1.96 (1.70 to 2.25)	1.08 (0.86 to 1.37)
Skilled manual workers	1.85 (1.64 to 2.08)	1.00 (0.67 to 1.50)
Unskilled manual workers	2.50 (2.19 to 2.85)	1.32 (0.99 to 1.76)
Retired	3.82 (3.41 to 4.28)	2.36 (1.86 to 2.99)
Other inactive	5.43 (4.83 to 6.11)	2.16 (1.73 to 2.71)
Unemployed jobseekers	4.63 (4.08 to 5.26)	1.97 (1.53 to 2.55)
RII	6.08 (5.54 to 6.68)	3.42 (2.96 to 3.96)

Aged 30–64 years at the beginning of the census year.
RII, relative inequality index; RR, relative risk; CI, confidence interval.

Unemployment is associated with high cardiovascular event rate and increased all-cause mortality in middle-aged socially privileged individuals

Int Arch Occup Environ Health, 88(6): 707-716, 2015

Table 3 12-year cardiovascular event risk and all-cause mortality according to occupational groups of volunteers at baseline

Occupation	Unadjusted		Model 1		Model 4	
	HR (95 % CI)	*p*	HR (95 % CI)	*p*	HR (95 % CI)	*p*
Cardiovascular events						
Worker	1.00		1.00		1.00	
Unemployed	2.25 (1.41–3.42)	0.001	1.84 (1.15–2.83)	0.01	1.74 (1.07–2.72)	0.03
Retired	3.41 (2.49–4.60)	<0.0001	1.44 (1.00–2.07)	0.05	1.34 (0.92–1.93)	0.13
All-cause mortality						
Worker	1.00		1.00		1.00	
Unemployed	3.27 (1.96–5.19)	<0.0001	2.79 (1.66–4.47)	0.0002	2.89 (1.70–4.69)	0.0002
Retired	2.99 (1.96–4.43)	<0.0001	1.63 (1.00–2.59)	0.05	1.57 (0.96–2.52)	0.07

14000 deaths per year?

The impact of late career job loss on myocardial infarction and stroke: a 10 year follow up using the health and retirement survey

Occup Environ Med 2006;63:683–687

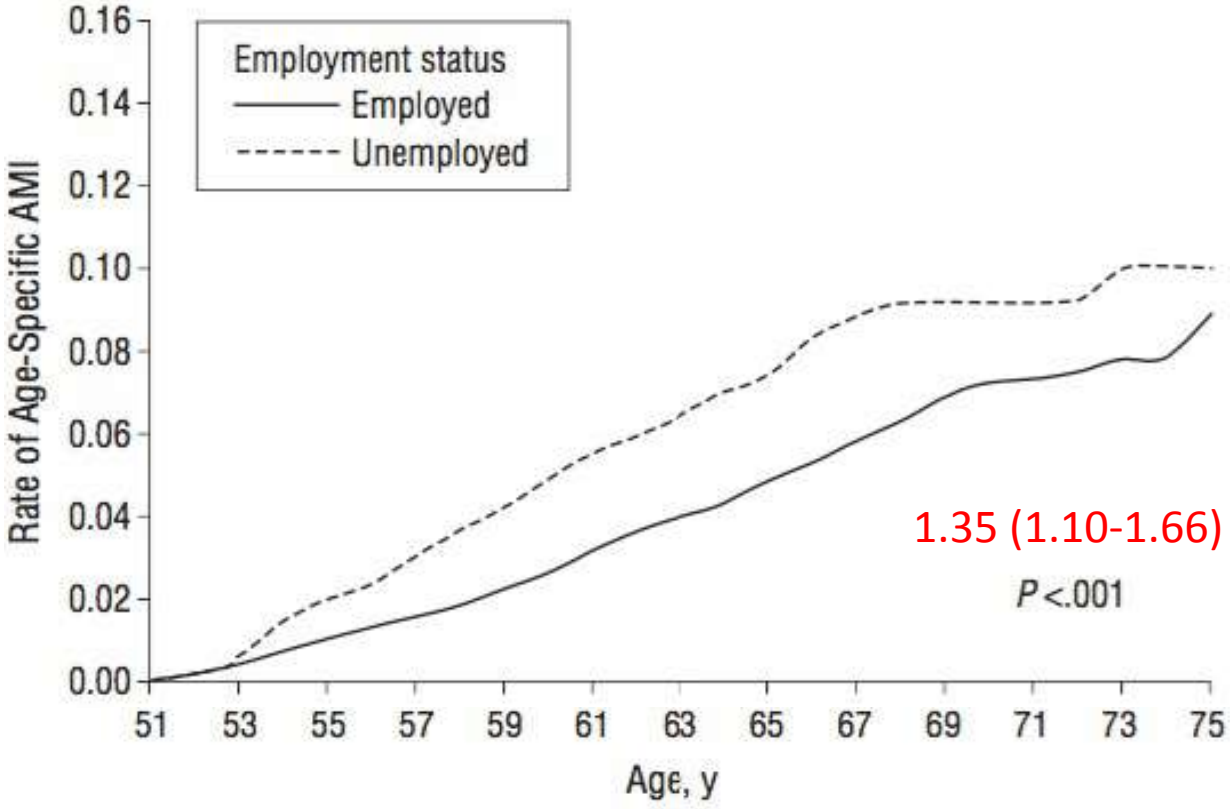
Table 2 Unadjusted and adjusted risk of MI and stroke associated with involuntary job loss

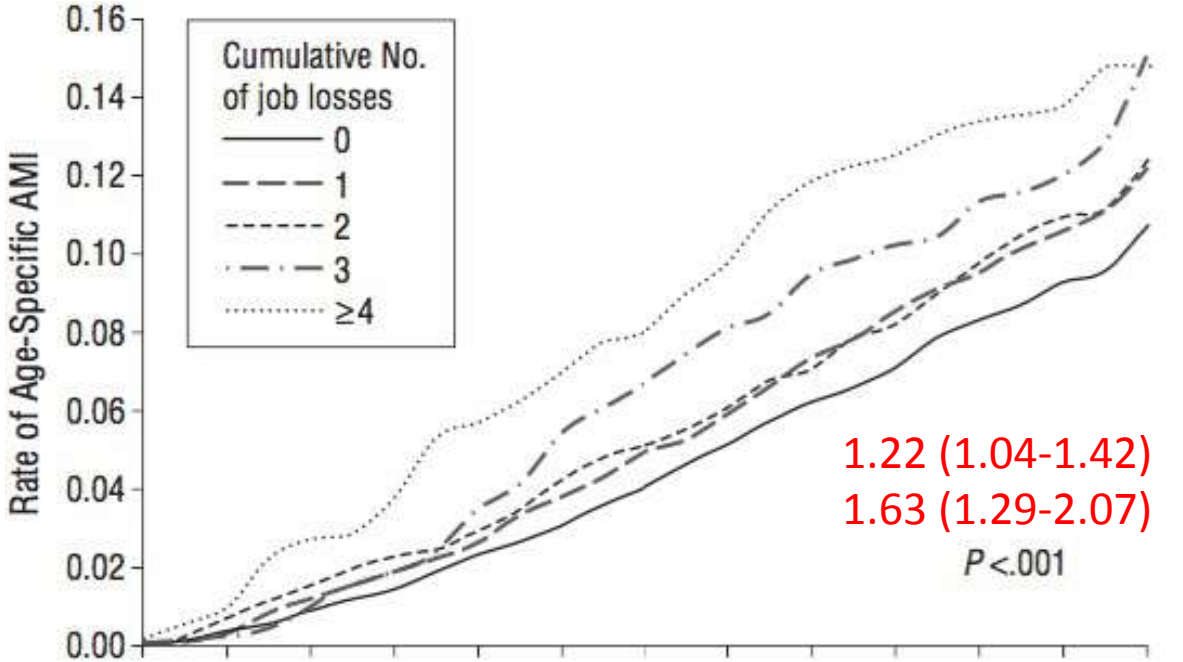
	MI model (n = 4301)			Stroke model (n = 4301)		
Variable	Unadjusted model HR (95% CI)	Adjusted model HR (95% CI)	Reduced form model HR (95% CI)	Unadjusted model HR (95% CI)	Adjusted model HR (95% CI)	Reduced form model HR (95% CI)
Primary independent variable						
Involuntary job loss	2.51 (1.52–4.17)	2.48 (1.49–4.14)	2.68 (1.61–4.48)	2.39 (1.16–4.95)	2.43 (1.18–4.98)	2.38 (1.15–4.92)
Adjustment variables						
Age	–	1.03 (0.95–1.12)	–	–	1.06 (0.97–1.16)	–
Female	–	0.57 (0.34–0.93)	0.63 (0.38–1.05)	–	0.54 (0.29–1.01)	–
White	–	3.18 (1.36–7.41)	3.07 (1.35–6.98)	–	1.61 (0.70–3.70)	–
Blue collar occupation	–	–	–	–	0.51 (0.23–1.15)	–
Labour income	–	1.07 (1.00–1.15)	1.06 (0.99–1.14)	–	–	–
Current smoker	–	2.55 (1.62–4.02)	2.55 (1.62–4.02)	–	–	–
Prevalence of hypertension	–	2.19 (1.37–3.50)	2.53 (1.62–3.95)	–	1.77 (0.96–3.27)	–
Prevalence of diabetes	–	–	–	–	2.68 (1.15–6.23)	2.95 (1.27–6.88)
Obese (BMI ⩾30)	–	1.53 (0.91–2.57)	–	–	–	–
Mental health score	–	1.12 (0.98–1.29)	–	–	–	–
Physical functional score	–	1.08 (0.99–1.18)	–	–	–	–

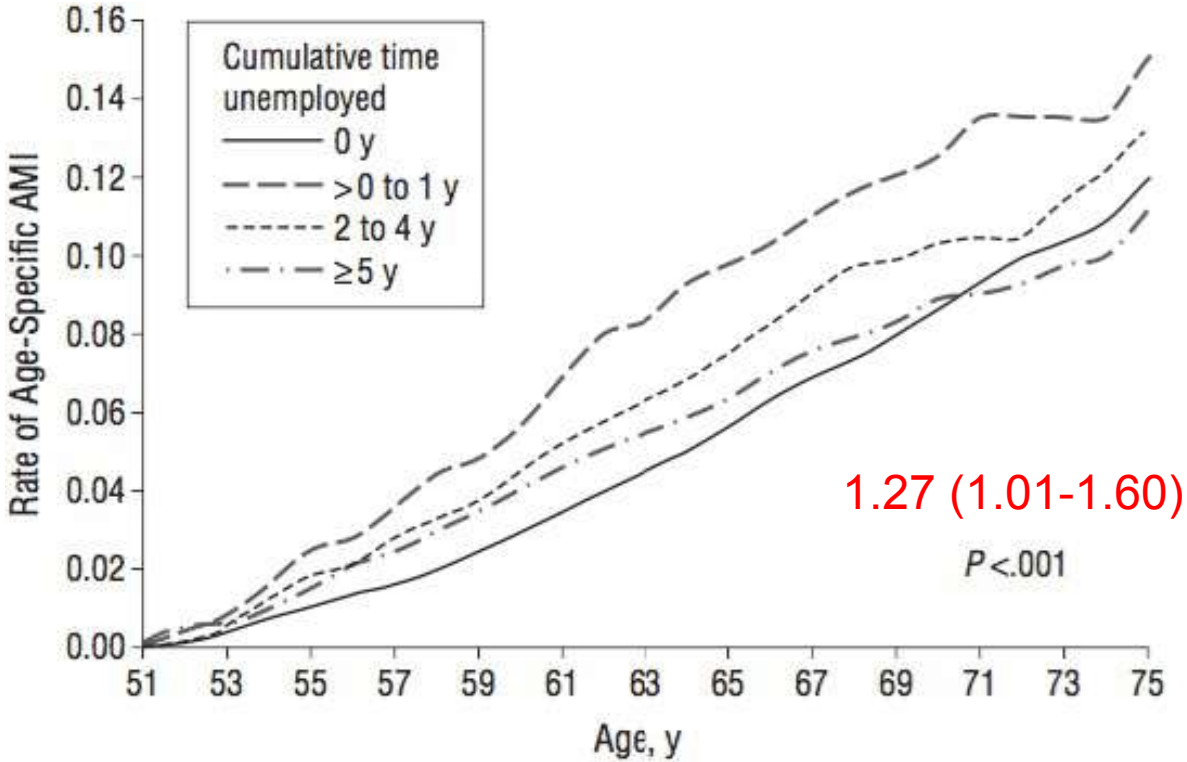
HR, hazard ratio; CI, confidence interval.

The Cumulative Effect of Unemployment on Risks for Acute Myocardial Infarction

Arch Intern Med. 2012;172(22):1731-1737







Social inequalities in mortality by cause among men and women in France

J Epidemiol Community Health 2009;63:197–202

Table 3 Age-adjusted relative risks of mortality by cancer, cardiovascular diseases

	Cancer mortality		Cardiovascular mortality	
	Men	Women	Men	Women
	RR (95% CI)	RR (95% CI)	RR (95% CI)	RR (95% CI)
Educational level				
No diploma	2.78 (2.37 to 3.26)	1.38 (1.12 to 1.70)	2.72 (2.17 to 3.41)	4.31 (2.51 to 7.42)
Primary	2.25 (1.92 to 2.64)	1.15 (0.94 to 1.42)	2.14 (1.70 to 2.68)	2.71 (1.57 to 4.67)
Technical	2.01 (1.71 to 2.36)	1.06 (0.86 to 1.31)	1.59 (1.26 to 2.00)	2.13 (1.22 to 3.73)
Secondary	1.64 (1.36 to 1.97)	0.88 (0.68 to 1.14)	1.32 (1.00 to 1.74)	1.44 (0.75 to 2.76)
University	1	1	1	1
RII	2.47 (2.17 to 2.81)	1.63 (1.35 to 1.96)	3.08 (2.54 to 3.74)	4.63 (3.26 to 6.56)
Occupational groups				
Farmers	1.11 (0.87 to 1.41)	1.02 (0.71 to 1.46)	1.80 (1.28 to 2.53)	1.98 (0.70 to 5.64)
Shop keepers, craftsmen	1.43 (1.17 to 1.75)	0.88 (0.61 to 1.28)	1.86 (1.37 to 2.54)	2.91 (1.06 to 7.94)
Professionals, managers	1	1	1	1
Intermediate white collars	1.37 (1.14 to 1.65)	0.76 (0.55 to 1.04)	1.59 (1.19 to 2.14)	0.89 (0.31 to 2.61)
Office, sales employees	1.85 (1.50 to 2.29)	0.82 (0.62 to 1.09)	2.18 (1.56 to 3.04)	1.98 (0.79 to 4.96)
Skilled manual workers	1.92 (1.61 to 2.28)	0.70 (0.41 to 1.20)	2.00 (1.51 to 2.65)	3.38 (1.07 to 10.7)
Unskilled manual workers	2.43 (1.99 to 2.96)	0.85 (0.58 to 1.23)	2.07 (1.47 to 2.89)	2.40 (0.84 to 6.80)
Retired	3.20 (2.71 to 3.78)	1.36 (1.02 to 1.82)	3.65 (2.80 to 4.75)	5.25 (2.13 to 12.9)
Other inactive	3.89 (3.25 to 4.64)	1.28 (0.98 to 1.68)	5.47 (4.16 to 7.20)	5.31 (2.18 to 12.9)
Unemployed jobseekers	3.71 (3.05 to 4.51)	1.15 (0.83 to 1.59)	3.29 (2.37 to 4.56)	3.94 (1.51 to 10.2)
RII	4.53 (3.94 to 5.21)	2.09 (1.71 to 2.56)	4.50 (3.65 to 5.54)	5.84 (3.94 to 8.65)

Aged 30–64 years at the beginning of the census year.
RII, relative inequality index; RR, relative risk; CI, confidence interval.

Unemployment and cancer: a literature review *IARC Scientific Publications No. 138 International Agency for Research on Cancer, Lyon, 1997*

Country and population	Follow-up period	Age group	All cancer Obs.	All cancer SMR/RR	All cancer Adj. SMR/RR	Lung cancer Obs.	Lung cancer SMR/RR	Lung cancer Adj. SMR/RR	Reference
United Kingdom	1971–1981	15–64	102	1.44	1.28[a]	56	1.89	1.62[a]	Moser *et al.*, 1990
1971 census, mortality	1971–1975		52	1.42	NA	33	2.06	1.74[a]	
	1976–1981		50	1.48	NA	23	1.70	1.45[a]	
1971 census, incidence	1971–1981	15–64	267	1.29	NA	96	1.50	NA	Kogevinas, 1990
	1971–1975		103	1.18	NA	43	1.56	NA	
	1976–1981		164	1.37	NA	53	1.46	NA	
1981 census, mortality	1983	16–64	25	1.38	NA	14	2.09	NA	Moser *et al.*, 1987
1978–1980 British Regional Heart Study, mortality	1978/80–1989	40–59	27	1.74	1.59[b]	NA	NA	NA	Morris *et al.*, 1994
Finland 1980 census, mortality	1981–1985	30–54	NA	1.39	1.17[c]	NA	2.05	1.43[c]	Martikainen, 1990
Denmark	1970–1980	20–64	NA	1.33	NA	NA	NA	NA	Iversen *et al.*, 1987
1970 census, mortality	1970–1975		163	1.24	NA	70[d]	1.54[d]	NA	Lynge & Andersen, 1996
	1976–1980		NA	1.40	NA	NA	NA	NA	Iversen *et al.*, 1987
1970 census, incidence	1970–1975		291	1.25	NA	97[d]	1.64[d]	NA	Lynge & Andersen, 1996
1986 census, mortality	1986–1990	20–64	1204	1.23	NA	464[d]	1.44[d]	NA	Lynge & Andersen, 1996
Italy 1981 census, mortality	1981–1985	15–59	78	1.75	NA	NA	NA	NA	Costa & Segnan, 1987

Unemployment and cause-specific mortality among the Belgian working-age population: The role of social context and gender.
PLoS ONE 14(5): e0216145, 2019

Table 4. Age-adjusted all-cause and cause-specific mortality rate ratios (MRR) with 95% confidence intervals (CI) of being unemployed but looking for a job versus being unemployed, 2001–2011, Belgian men and women aged 25–59 years.

	Men	Women
Reference category is employed	**MRR (95% CI)**	**MRR (95% CI)**
All deaths	2.32 (2.24–2.40)	1.64 (1.57–1.72)
Infectious diseases	3.50 (2.73–4.50)	2.10 (1.46–3.01)
Cancers	1.86 (1.75–1.98)	1.30 (1.21–1.39)
Endocrine diseases	3.60 (2.75–4.70)	2.77 (1.83–4.19)
Diabetes	3.12 (2.12–4.59)	3.56 (1.96–6.45)
Mental disorders	6.90 (5.74–8.29)	3.53 (2.50–4.99)
Mental disorder due to alcohol	7.60 (6.17–9.37)	4.26 (2.84–6.38)
Diseases of the nervous system	2.59 (2.02–3.33)	1.14 (0.77–1.68)
Diseases of the circulatory system	2.20 (2.03–2.37)	1.78 (1.58–2.02)
Hypertensive diseases	1.86 (1.01–3.43)	2.37 (1.10–5.12)
Ischaemic Heart Disease	1.99 (1.77–2.24)	1.81 (1.43–2.28)
Pulmonary Heart Disease	2.09 (1.35–3.24)	2.47 (1.54–3.95)
Diseases of the respiratory system	3.14 (2.62–3.76)	2.75 (2.11–3.57)
Pneumonia	3.44 (2.46–4.81)	3.15 (1.96–5.08)
Chronic lower respiratory infections	3.43 (2.64–4.45)	3.13 (2.18–4.51)
Diseases of the digestive system	3.83 (3.40–4.32)	3.15 (2.66–3.72)
Alcoholic liver disease	4.20 (3.54–4.97)	3.44 (2.72–4.35)
Fibrosis and cirrhosis of the liver	3.78 (2.89–4.95)	3.20 (2.19–4.69)
Injury, poisoning and other consequences of external causes	1.55 (1.40–1.71)	1.58 (1.37–1.82)
External causes of morbidity and mortality	3.06 (2.78–3.37)	2.64 (2.26–3.08)
Transport accidents	2.29 (1.88–2.79)	2.13 (1.54–2.94)
Falls	4.77 (3.50–6.49)	3.68 (2.24–6.06)
Intentional self-harm	2.83 (2.46–3.27)	2.61 (2.09–3.27)

Association between unemployment and the co-occurrence and clustering of common risky health behaviors: Findings from the Constances cohort.
Int Arch Occup Environ Health

Alcohol abuse (>2/3 drinks per day) 1.88 (1.62-2.18)
Smoking 2.16 (1.93-2.42)
Physical inactivity (leisure-time) 1.20 (1.03-1.31)
Unhealthy food intake (<3 servings of F&V per day) 1.38 (1.20-1.60)

Two factors 1.56 (1.39-1.75)
Three factors 2.23 (1.87-2.66)
Four factors 2.75 (1.70-4.44)