Socio-economic inequalities in suicide: a European comparative study

VINCENT LORANT, ANTON E. KUNST, MARTIJN HUISMAN, GIUSEPPE COSTA and JOHAN MACKENBACH
on behalf of the EU Working Group on Socio-Economic Inequalities in Health

Background Social factors have been shown to be predictors of suicide. It is not known whether these factors vary between countries.

Aims To present a first European overview of socio-economic inequalities in suicide mortality among men and women.

Method We used a prospective follow-up of censuses matched with vital statistics in ten European populations. Directly standardised rates of suicide were computed for each country.

Results In men, a low level of educational attainment was a risk factor for suicide in eight out of ten countries. Suicide inequalities were smaller and less consistent in women. In most countries, the greater the socio-economic disadvantage, the higher is the risk of suicide. The population of Turin evidenced no socio-economic inequalities.

Conclusions Socio-economic inequalities in suicide are a generalised phenomenon in western Europe, but the pattern and magnitude of these inequalities vary between countries. These inequalities call for improved access to psychiatric care for lower socio-economic groups.

Declaration of interest None.

Social factors have been shown to be predictors of suicide in some studies using individual-level data (Lewis & Sloggett, 1998; Kposowa, 2001; Qin *et al*, 2003). The results were, however, not consistent for education, which was found to be a significant risk factor in the USA (Kposowa, 2000) but not in the UK (Lewis & Sloggett, 1998) or Denmark (Qin *et al*, 2000). Because previous studies focused on specific settings and had different designs, it is unknown whether their results can be generalised to other geographical settings. Moreover, it is important to identify cross-national variations in socio-economic inequalities in suicide, because this would help to foster a better understanding of the contextual factors such as mental care systems.

The aim of this study is to present a European overview of socio-economic inequalities in suicide mortality among men and women. Using a common method and data source, our purposes were first, to assess whether socio-economic inequalities in suicide are a generalised phenomenon in Europe, and second, to compare the extent of educational and housing socio-economic inequalities in suicide in different European populations, among men and women.

METHOD

Data from national, regional and urban longitudinal mortality studies were used. The data were taken from population censuses linked to mortality registries throughout an average follow-up period of 4 years (1 year for Austria and Madrid) in the early 1990s. Data were gathered on the number of deaths and the number of person-years at risk, by gender, 5-year age group (age specified at the start of the follow-up, with 30–34 years as the youngest age group and 90 years and over as the oldest group), level of education and housing tenure. The populations included in the study are listed in Table 1. Most studies covered the entire national, regional or urban population. Studies from Austria, Belgium, Denmark, Finland and Norway comprised the total national population. Other data included were longitudinal data from Madrid (region), Barcelona (city), Turin (city) and Switzerland (individuals living in predominantly German-speaking regions; 70% of the total population). The data for England and Wales concern a representative 1% sample of the national population.

Variables

The codes used to identify death by suicide in the ICD–8, ICD–9 or ICD–10 classifications (World Health Organization, 1974, 1978, 1992) were E950–E959 (ICD–8 and ICD–9) and X60–X84 (ICD–10).

Educational status and housing tenure were registered. The level of education was first classified according to the national categories of education in each country. The number of educational categories ranged from four (in most countries) to 13 in Belgium. On the basis of the description given by each representative of the data collected in each country, the national categories were converted into International Standard Classification of Education (ISCED) categories (UNESCO, 1997). As several countries provided no information on the group with primary education only (ISCED 1), the ISCED levels 1 and 2 (lower secondary school) were grouped together in the analysis. Education data were not available for Danish people older than 70 years. Education is mostly achieved by early adulthood and is not necessarily consistent with later economic achievement and wealth accumulation over the life cycle. Housing tenure was included to cover such wealth effects and was grouped in two categories: owner and tenant. This variable, however, was available for only six populations, namely those of Norway, Finland, Denmark, England and Wales, Belgium and Turin.

Analysis

Age-standardised mortality rates by educational level and housing tenure were computed for each gender and country. Direct standardisation was applied, using the population of the European Union and Norway of 1995. On the basis of these standardised rates, we computed rate ratios

https://doi.org/10.1192/bjp.187.1.49 Published online by Cambridge University Press

comparing those with a low educational level (ISCED 1 and 2) with those more highly educated (ISCED 3 and above), and tenants with house owners. The formula for the standard error of a relative risk was used to compute standard error (Dawson & Trapp, 2001). Because differences in suicide inequalities between countries could arise from methodological or sample variations, we tested the homogeneity of inequalities using Cochran's Q statistic, which has a χ^2 distribution with a degree of freedom equal to the number of studies minus 1 (Petitti, 1994).

We also looked at the cumulative effect of different types of socio-economic disadvantages on suicide levels. We combined education and housing tenure into a single index ranging from 0 (low educational level and tenant) to 4 (high educational level and house owner). The effect of increasing socio-economic disadvantages was assessed for each country through logistic regression, controlling for age.

RESULTS

For all male populations, the suicide mortality rate is higher in the group with a lower educational level (Table 2). Moreover, the risk of suicide decreased unimodally with the educational level, everywhere but in Denmark. The results from all populations except those of Denmark and Turin consistently showed that the male suicide risk was significantly higher in the low educational level group, as compared with the highly educated group. In most populations the increase in risk was moderate, with a relatively narrow confidence interval. Madrid and England/Wales evidenced a stronger inequality, although the confidence interval in the latter was wide.

The pattern of educational inequalities was very different in women. A lower educational attainment level was shown to be a significant, positive but weak risk factor for suicide only in Belgium and Finland. A lower educational level proved to be a protective risk factor for women from Norway, Denmark and Switzerland.

In four out of five countries, the risk of suicide was greater in tenants than in house owners (Table 3), for both men and women. Once again, Turin evidenced small and non-significant inequalities in suicide. The overall risk associated with ownership

Table 1 Characteristics of the ten European populations studied

	Follow-up period	Number of person-years	Suicides	
			n	Standardised mortality rate[1]
Men				
Norway	1990–1995	10 911 951	2845	2.63
Finland	1991–1995	6 715 485	4100	6.07
England/Wales[2]	1991–1996	736 648	81	1.10
Denmark	1991–1995	5 420 695	2028	3.34
Belgium	1991–1995	11 844 482	4724	4.10
Switzerland[3]	1991–1995	5 586 898	2338	4.22
Austria	1991–1992	2 092 644	913	4.45
Turin	1991–1996	1 269 655	246	1.98
Barcelona	1992–1996	2 229 996	266	1.15
Madrid	1996–1997	1 976 860	105	0.55
All populations		48 785 314	17 646	
Women				
Norway	1990–1995	11 855 334	1130	0.99
Finland	1991–1995	7 615 433	1210	1.63
England/Wales[2]	1991–1996	817 798	41	0.46
Denmark	1991–1995	5 531 645	1091	1.78
Belgium	1991–1995	13 133 290	2023	1.53
Switzerland[3]	1991–1995	6 580 829	983	1.47
Austria	1991–1992	2 459 619	386	1.46
Turin	1991–1996	1 512 732	147	0.92
Barcelona	1992–1996	2 753 341	143	0.47
Madrid	1996–1997	2 321 451	30	0.13
All populations		54 581 472	7184	

1. Suicide rate per 10 000 person-years, standardised for age.
2. Sample of the population.
3. German-speaking regions only.

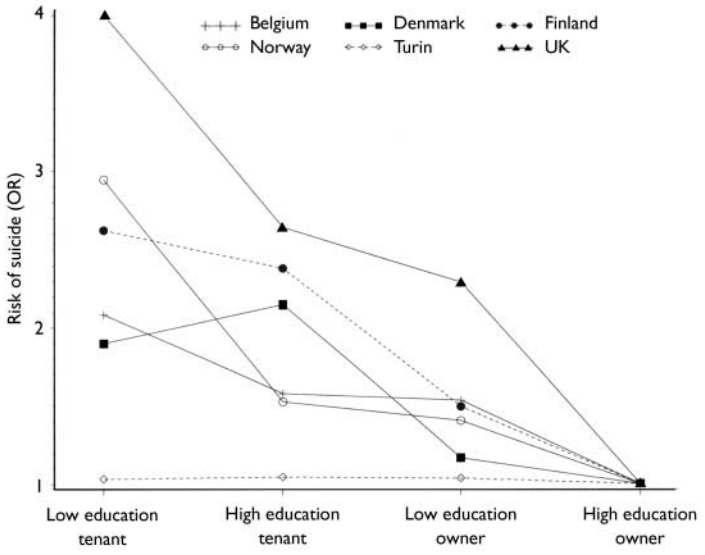

Fig. 1 Suicide risk in men: effect of educational level and house ownership status (OR, odds ratio).

https://doi.org/10.1192/bjp.187.1.49 Published online by Cambridge University Press

Table 2 Suicide rates and educational status

	Lower secondary group (% of person-years)	Age-standardised suicide rate per 10 000 person-years			Rate ratio[1]	(95% CI)
		Low secondary (ISCED 1 and 2)	Upper secondary (ISCED 3 and 4)	Superior (ISCED 5+)		
Men						
Norway	31	3.43	2.31	2.13	1.52	(1.41–1.63)***
Finland	50	7.18	5.69	3.14	1.42	(1.33–1.51)***
England/Wales	85	1.22	0.86	0.20	2.67	(1.10–6.53)*
Denmark	57	3.96	3.98	3.44	1.06	(0.97–1.16)
Belgium	62	4.63	3.15	2.51	1.61	(1.51–1.72)***
Switzerland	18	5.72	4.11	3.70	1.44	(1.31–1.58)***
Austria	29	5.80	4.04	2.58	1.53	(1.34–1.75)***
Turin	68	2.03	1.92	1.84	1.04	(0.80–1.36)
Madrid	63	0.68	0.28	0.19	2.72	(1.65–4.47)***
Barcelona	61	1.25	1.11	0.80	1.33	(1.02–1.74)*
Overall	52	3.54	2.70	2.01	1.43	(1.38–1.47)***
Women						
Norway	40	0.88	1.06	1.47	0.79	(0.70–0.89)***
Finland	54	1.86	1.59	1.87	1.12	(1.01–1.25)*
England/Wales	92	0.45	0.55	1.15	0.57	(0.22–1.45)
Denmark	54	1.96	2.40	2.39	0.81	(0.73–0.91)***
Belgium	69	1.60	1.30	1.66	1.10	(1.00–1.21)*
Switzerland	40	1.37	1.55	1.98	0.86	(0.76–0.98)*
Austria	54	1.49	1.46	1.13	1.05	(0.85–1.29)
Turin	78	0.84	1.00	1.25	0.77	(0.53–1.12)
Madrid	75	0.13	0.11	0.10	1.19	(0.51–2.77)
Barcelona	72	0.47	0.52	0.24	1.24	(0.80–1.91)
Overall	63	1.08	1.15	1.30	0.92	(0.88–0.97)**

1. Rate ratio=standard suicide rate for those with lower secondary education (ISCED 1 and 2)/standard suicide rate for those with upper secondary education or above (ISCED 3+).
*$P<0.05$, **$P<0.01$, ***$P<0.001$.

was slightly greater than the risk associated with education, particularly for women.

The homogeneity of educational and housing risk factors of suicide was rejected for both men and women (for men, Cochran $Q>73$, $P<0.001$; for women, Cochran $Q>38$, $P<0.001$). A rejection of the homogeneity assumption implies that there are country-specific effects in inequalities, which could not be explained by random variation. Inequalities in suicide according to housing tenure were slightly less heterogeneous (standard deviation of relative risk 0.38) than inequalities according to education (standard deviation of RR=0.54).

The risk of suicide for men in all the populations, except for Danish men, was shown to decrease unimodally with increasing socio-economic advantage (Fig. 1). The intermediate socio-economic groups (high level of education and tenant; low level of education and house owner) were at less risk of suicide than the lowest group. These intermediate groups were, however, at more risk than the upper group. In all countries, house owners with a low educational level had a smaller risk than highly educated tenants. For Finland, England/Wales and Belgium, the risk of suicide decreased linearly with socio-economic status, whereas in Denmark and Norway a less regular trend was observed.

In women, the risk of suicide did not decrease unimodally with increasing socio-economic status (Fig. 2). The highest risk was found in the intermediate group of women with higher levels of educational attainment who were tenants. As among men, a lower educational status and house ownership led to a smaller risk than a higher educational level and being a tenant. In most countries, the lowest risk was found in the low-educated house owners. In Turin, socio-economic status was associated only slightly with suicide risk.

DISCUSSION

Main findings

We examined socio-economic risk factors for suicide mortality in ten European populations. Four main findings stand out. Socio-economic inequalities in suicide are pervasive in all male populations, except for that of Turin. Second, inequalities were far less pronounced in women and in some cases even reversed, particularly when educational status was considered. Third, housing tenure seems to be a more important risk factor than education and yields more consistent results between genders. Fourth, our study shows that in most settings, suicide level increases with increasing socio-economic disadvantage.

Limitations

The study has a few limitations which could affect the reliability and comparability of estimates of suicide inequalities.

https://doi.org/10.1192/bjp.187.1.49 Published online by Cambridge University Press

Table 3 Suicide rates and housing tenure

	Tenant group (% of person-years)	Age-standardised suicide rate per 10 000 person-years		Rate ratio[1]	(95% CI)
		Tenant	Owner		
Men					
Norway	14	4.66	2.42	1.92	(1.71–2.16)***
Finland	17	10.40	5.08	2.05	(1.91–2.19)***
England/Wales	22	2.09	0.95	2.19	(1.37–3.51)***
Denmark	29	4.62	2.71	1.71	(1.57–1.86)***
Belgium	25	5.18	3.67	1.41	(1.33–1.50)***
Turin	40	1.97	1.89	1.04	(0.80–1.36)
Overall	26	4.82	2.79	1.73	(1.65–1.81)***
Women					
Norway	15	1.54	0.86	1.79	(1.46–2.20)***
Finland	18	2.82	1.35	2.09	(1.85–2.36)***
England/Wales	26	0.81	0.36	2.25	(1.19–4.27)**
Denmark	33	2.58	1.28	2.02	(1.80–2.26)***
Belgium	27	1.94	1.38	1.41	(1.28–1.54)***
Turin	40	0.98	0.89	1.09	(0.78–1.53)
Overall	27	1.78	1.02	1.74	(1.63–1.86)***

1. Rate ratio of tenants compared with house owners.
*$P<0.05$, **$P<0.01$, ***$P<0.001$.

Misclassification could affect the suicide registration. Indeed, there is some evidence that official suicide rates are underestimated (Joseph *et al*, 2003) because of suicide misclassification. Such misclassification could affect our estimates if countries apply different coding procedures (Jougla *et al*, 1998) and, hence, have different reliability (Rockett & Thomas, 1999). We assessed such risk by combining suicide and injuries of undetermined intent (E980–E989, Y10–Y23). The results were relatively robust. When injuries and suicide were added up, the risk of suicide among men of low education compared with men of high education increased from 1.4 to 1.48. This change was more dramatic for the male populations in England and Wales (from 2.67 to 4.10) and in Belgium (from 1.61 to 2.2). The country rankings in educational inequalities among men changed very little, except for Barcelona, which was pushed from eighth position into fourth.

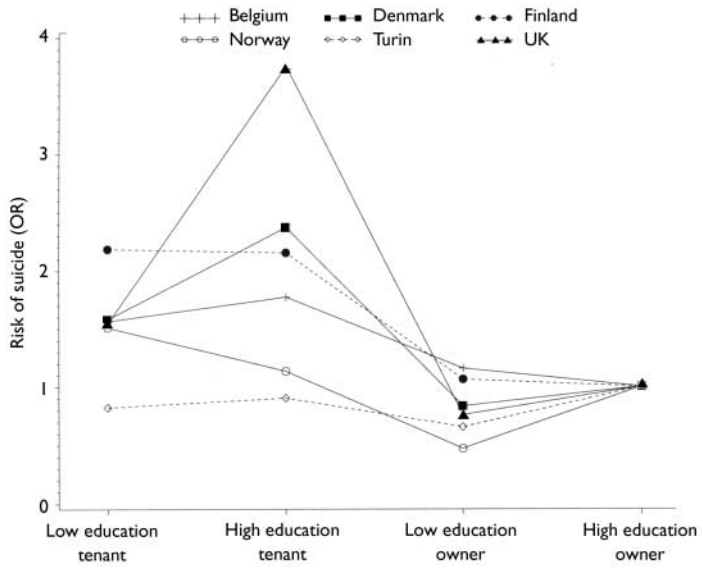

Fig. 2 Suicide risk in women: effect of educational level and house ownership status (OR, odds ratio).

A second group of limitations arises from the differences in the educational system in the countries compared. We devoted considerable effort to obtaining internationally comparable educational categories using the ISCED system. However, the ISCED distribution is not homogeneous and some countries have a low percentage of individuals in the lower secondary educational attainment category (such as Switzerland) or in the categories with upper secondary education and above (England/Wales and Turin). Sensitivity analysis was performed to assess the impact of the heterogeneity in education distribution. The cross-country analysis was carried out by computing a relative index of inequality on the relative rank of educational status (Mackenbach & Kunst, 1997), which takes into account each educational level individually, with a distinction of about four educational levels in most countries. Inequalities increased and became significant in all male populations but that of Turin. On average, the ranking of countries changed by 1 point. Barcelona became a high-inequality population. The highest inequality level was still seen in Madrid. Turin and Denmark had the smallest inequalities.

The inequalities in England and Wales were higher than those found in a study based on the 1981 population census (Lewis & Sloggett, 1998). They are also higher than the figures reported in a psychiatric epidemiological survey (Lewis *et al*, 1998). Discrepancies in source (we used the 1991 population census), in statistical power (we counted 130 suicides for England and Wales *v.* 581 in the study of Lewis & Sloggett) and follow-up (5 years *v.* 10 years) may explain such differences in the observed size of inequalities.

Previous studies and interpretation

On three aspects our results are consistent with a previous worldwide meta-analysis of socio-economic risk factors for common mental disorders, a main risk factor for suicide (Lorant *et al*, 2003). First, in that study low socio-economic status was found to be

https://doi.org/10.1192/bjp.187.1.49 Published online by Cambridge University Press

a significant and positive risk factor of depression in 35 out of 56 studies. Second, as in our study, the association with socio-economic status was unimodal and stronger for economic variable than for educational status. Finally, it was also geographically heterogeneous: greater in the USA than in Europe.

The greater inequality between educational groups found in men as compared with women is consistent with previous individual-level studies (Kposowa, 2000; Blakely *et al*, 2003). It can be explained by gender differences in health-related and life-threatening behaviours, such as alcohol or drug misuse, which are known risk factors of suicide and are more prevalent among men and among lower socio-economic groups (Kessler *et al*, 1994; Cavelaars *et al*, 1997; McDonough *et al*, 1999), although alcohol was not particularly related to socio-economic status in the British survey of psychiatric morbidity. On the other hand, suicide inequalities in women resemble those in men more closely where house ownership is concerned than education: this may be because house ownership is mostly an attribute of the household and thus shared by both spouses, whereas education is an individual attribute, hence more sensitive to gender differences. It could be also that low wealth or income tends to have a similar association with men's and women's overall mortality risk (Duncan *et al*, 2002).

Suicide was more strongly associated with home ownership than with education. This is consistent with previous studies using housing tenure, wealth or car ownership (Lewis & Sloggett, 1998; Qin *et al*, 2000; Blakely *et al*, 2003). Several elements may explain such a difference. Housing tenure is an indicator of wealth accumulation and has shown to yield stronger inequality than education (Lorant *et al*, 2003), presumably because the material pathway (captured by housing tenure) has the edge over the behavioural pathway (captured by educational status). Moreover, psychiatric illness is more likely to affect house ownership than education, because reverse causation is less likely in the latter case. The fact that housing inequalities are greater than educational inequalities indicates that selection factors must not be overlooked and that the roots of inequalities are grasped in the whole life cycle (Power *et al*, 1998). Finally, housing tenure may also be associated with marital status, which has a clear protective effect on suicide (Kposowa, 2000).

Why is there no suicide inequality in Turin, while the largest inequalities were found in Madrid? We can speculate that the outstanding Italian mental care system might play some part. Mental illness is a major risk factor for suicide (Qin *et al*, 2003) and is more prevalent among lower socio-economic groups (Lorant *et al*, 2003). Individuals of lower socio-economic status favour primary mental care over psychiatric specialty care (Alegria *et al*, 2000). Italy has pioneered an integrated and community-based mental health system, introduced after the reforms of 1978 and the 1994 National Mental Health Plan (Burti, 2001; Becker & Vázquez-Barquero, 2001). As a consequence, Italy might well be able to tackle suicide inequalities more effectively. A recent assessment of time trends of suicide inequalities in Turin showed that the suicide risk was reduced most in the less educated population groups between the 1970s and the 1990s (Costa *et al*, personal communication). The link with the reform undergone by the Italian psychiatric system requires further study, however.

The large educational inequalities observed in Madrid (and in some analyses also in Barcelona) might be due to the higher prevalence of drug misuse in these Spanish cities compared with other countries of the European Union (Kraus *et al*, 2003). Suicide is a frequent cause of death among drug users in southern Europe (Orti *et al*, 1996), and there is a strong relationship between parenteral drug use and educational level. The small inequalities in women from Madrid are consistent with the lower prevalence of injecting drug use in women compared with men. Societal inequalities, including inequalities in income, may provide another explanation for the greater inequalities in suicide in Madrid. Spain ranks among the countries with the highest income inquality in Europe. Moreover, large inequalities among Madrid men may also be explained by the low level of suicide prevalence, as rare events tend to concentrate among lower socio-economic groups.

Clinical implications

The pervasive association between socio-economic status and suicide calls for an improvement of access to psychiatric care for lower socio-economic groups. This is relevant because psychiatric disorders seem to be an important pathway in the relationship between socio-economic status and suicide (Qin *et al*, 2003) and because of the under-utilisation of speciality mental care among lower socio-economic groups (Alegria *et al*, 2000). Individuals of lower socio-economic status with a DSM–IV disorder (American Psychiatric Association, 1994) are more likely to receive that care in countries (such as The Netherlands) that have succeeded in integrating mental health within the primary and community care sectors (Alegria *et al*, 2000). The shift to primary care and community care may thus contribute to reducing socio-economic inequalities in suicide.

ACKNOWLEDGEMENTS

Members of the EU Working Group on Socio-Economic Inequalities in Health who contributed to this paper are Otto Andersen (Statistics Denmark, Copenhagen, Denmark), Matthias Bopp (Institute for Social and Preventive Medicine, Zurich, Switzerland), Carme Borrell (Municipal Health Service, Barcelona, Spain), Jens-Kristian Borgan (Statistics Norway, Oslo, Norway), Giuseppe Costa (Department of Public Health and Microbiology, Turin, Italy), Patrick Deboosere (Interface Demography, Brussels, Belgium), Myer Glickman (Health and Care Division, Office for National Statistics, London, UK), Sylvie Gadeyne (Interface Demography, Brussels, Belgium), Christoph Minder (Institute for Social and Preventive Medicine, Bern, Switzerland), Enrique Regidor (Department of Preventive Medicine and Public Health, Madrid, Spain), Teresa Spadea (Department of Public Health and Microbiology, Turin, Italy) and Tapani Valkonen (Department of Sociology, Helsinki, Finland).

REFERENCES

Alegria, M., Bijl, R.V., Lin, E., *et al* (2000) Income differences in persons seeking outpatient treatment for mental disorders: a comparison of the United States with Ontario and The Netherlands. *Archives of General Psychiatry*, **57**, 383–391.

American Psychiatric Association (1994) *Diagnostic and Statistical Manual of Mental Disorders* (4th edn) (DSM–IV). Washington, DC: APA.

Becker, L. & Vázquez-Barquero, J. L. (2001) The European perspective of psychiatric reform. *Acta Psychiatrica Scandinavica Supplement*, **410**, 8–14.

Blakely, T. A., Collings, S. C. D. & Atkinson, J. (2003) Unemployment and suicide. Evidence for a causal association? *Journal of Epidemiology and Community Health*, **57**, 594–600.

Burti, L. (2001) Italian psychiatric reform 20 plus years after. *Acta Psychiatrica Scandinavica Supplement*, **410**, 41–46

Cavelaars, A. E., Kunst, A. E. & Mackenbach, J. P. (1997) Socio-economic differences in risk factors for

https://doi.org/10.1192/bjp.187.1.49 Published online by Cambridge University Press

morbidity and mortality in the European Community: an international comparison. *Journal of Health and Psychology*, **24**, 253–372.

Dawson, B. & Trapp, R. (2001) *Basic and Clinical Biostatistics*. New York: McGraw-Hill.

Duncan, G. J., Daly, M. C., McDonough, P., *et al* (2002) Optimal indicators of socioeconomic status for health research. *American Journal of Public Health*, **92**, 1151–1157.

Joseph, A., Abraham, S., Muliyil, J. P., *et al* (2003) Evaluation of suicide rates in rural India using verbal autopsies, 1994–9. *BMJ*, **326**, 1121.

Jougla, E., Pavillon, G., Rossollin, F., *et al* (1998) Improvement of the quality and comparability of causes-of-death statistics inside the European Community. *Revue d'Épidémiologie et Santé Publiques*, **46**, 447–456.

Kessler, R. C., McGonagle, K. A., Zhao, S. Y., *et al* (1994) Lifetime and 12-month prevalence of DSM–III–R psychiatric disorders in the United States. Results from the National Comorbidity Survey. *Archives of General Psychiatry*, **51**, 8–19.

Kposowa, A. J. (2000) Marital status and suicide in the National Longitudinal Mortality Study. *Journal of Epidemiology and Community Health*, **54**, 254–261.

Kposowa, A. J. (2001) Unemployment and suicide: a cohort analysis of social factors predicting suicide in the US National Longitudinal Mortality Study. *Psychological Medicine*, **31**, 127–138.

Kraus, L., Augustin, R., Frischer, M., *et al* (2003) Estimating prevalence of problem drug use at national level in countries of the European Union and Norway. *Addiction*, **98**, 471–485.

Lewis, G. & Sloggett, A. (1998) Suicide, deprivation, and unemployment: record linkage study. *BMJ*, **317**, 1283–1286.

Lewis, G., Bebbington, P., Brugha, T., *et al* (1998) Socioeconomic status, standard of living, and neurotic disorder. *Lancet*, **352**, 605–609.

Lorant, V., Deliege, D., Eaton, W., *et al* (2003) Socioeconomic inequalities in depression: a meta-analysis. *American Journal of Epidemiology*, **157**, 98–112.

Mackenbach, J. P. & Kunst, A. E. (1997) Measuring the magnitude of socio-economic inequalities in health: an overview of available measures. *Social Science and Medicine*, **44**, 757–771.

McDonough, P., Williams, D. R., House, J. S., *et al* (1999) Gender and the socioeconomic gradient in mortality. *Journal of Health and Social Behavior*, **40**, 17–31.

Orti, R. M., Domingo-Salvany, A., Muñoz, A., *et al* (1996) Mortality trends in a cohort of opiate addicts, Catalonia, Spain. *International Journal of Epidemiology*, **25**, 545–553.

Petitti, D. B. (1994) *Meta-analysis, Decision Analysis, and Cost-effectiveness Analysis. Methods for Quantitative Synthesis in Medicine*. New York: Oxford University Press.

CLINICAL IMPLICATIONS

- In most settings, men of low socio-economic status are at greater risk of suicide than higher-status groups.
- Socio-economic inequalities are smaller and less consistent among women.
- In most settings, the more socio-economic disadvantages a person suffers, the higher the risk of suicide.

LIMITATIONS

- Misclassification results in an underestimation of national suicide rates, but the bias may not strongly differ by socio-economic status.
- Differences in educational systems affect to some extent the national rankings in suicide inequalities.
- Low statistical power for some countries challenges comparisons of these countries with others.

VINCENT LORANT, Health Sociology and Economics, Catholic University of Louvain, Brussels, Belgium and Department of Public Health, Erasmus Medical Centre, Rotterdam, The Netherlands; ANTON E. KUNST, MARTIJN HUISMAN, Department of Public Health, Erasmus Medical Centre, Rotterdam, The Netherlands; GIUSEPPE COSTA, Department of Public Health and Microbiology, Turin, Italy; JOHAN MACKENBACH, Department of Public Health, Erasmus Medical Centre, Rotterdam, The Netherlands

Correspondence: Vincent Lorant, Health Sociology and Economics, Catholic University of Louvain, Clos chapelle aux champs 30.41, 1200 Bruxelles, Belgium. Tel: +32 2 764 3263; fax: +32 2 764 3031; e-mail: lorant@sesa.ucl.ac.be

(First received 24 November 2003, accepted 22 June 2004)

Power, C., Matthews, S. & Manor, O. (1998) Inequalities in self-rated health: explanations from different stages of life. *Lancet*, **351**, 1009–1014.

Qin, P., Mortensen, P., Agerbo, E., *et al* (2000) Gender differences in risk factors for suicide in Denmark. *British Journal of Psychiatry*, **177**, 546–550.

Qin, P., Agerbo, E. & Mortensen, P. B. (2003) Suicide risk in relation to socioeconomic, demographic, psychiatric, and familial factors: a national register-based study of all suicides in Denmark, 1981–1997. *American Journal of Psychiatry*, **160**, 765.

Rockett, I. R. & Thomas, B. M. (1999) Reliability and sensitivity of suicide certification in higher-income countries. *Suicide and Life-Threatening Behavior*, **29**, 141–149.

UNESCO (1997) *International Standard Classification of Education: ISCED 1997*. Paris: UNESCO.

World Health Organization (1974) *International Statistical Classification of Diseases and Related Health Problems* (ICD–8). Geneva: WHO.

World Health Organization (1978) *International Statistical Classification of Diseases and Related Health Problems* (ICD–9). Geneva: WHO.

World Health Organization (1992) *International Statistical Classification of Diseases and Related Health Problems* (ICD–10). Geneva: WHO.

https://doi.org/10.1192/bjp.187.1.49 Published online by Cambridge University Press