

**Socioeconomic differences in suicide mortality by sex in Finland in 1971–2001:  
A register-based study of trends, levels and years of life expectancy lost**

Netta Mäki MSocSc<sup>1</sup>, Pekka Martikainen PhD<sup>1,2</sup>

1. Population Research Unit  
Department of Sociology  
P.O. Box 18  
FIN-00014, University of Helsinki,  
Finland  
Tel. 358 9 191 23886  
Fax. 358 9 191 23967  
E-mail. [netta.maki@helsinki.fi](mailto:netta.maki@helsinki.fi)

2. International Centre for Health and Society  
Department of Epidemiology and Public Health  
University College London Medical School

**Abstract**

Suicide is a common cause of death worldwide and its significance is predicted to increase. Considerable variation between genders and socio-economic groups exists in suicide mortality. We used census records linked with death records to analyse socioeconomic differences and trends in suicide mortality of men and women aged 25+ in 1971–2000. Among men suicide mortality of manual workers was 2.3-fold compared with that of upper non-manual workers whereas among women the difference was about 1.3-fold. Socioeconomic differences were largest among those in their thirties. Because of decline in suicide mortality among upper non-manual workers and stagnant mortality among other socioeconomic groups, the relative mortality differences have increased rapidly. In 1991–2000 years-of-life-expectancy-lost due to suicide made up 7.5% of total years-of-life-expectancy-lost among manual men, but only 2.6% among manual women. Reducing gender and socio-economic differences in suicide can significantly improve equity in health and reduce the burden of excess mortality.

## 1 Introduction

### *General background*

Suicide is a common cause of death in many European and North-American countries (WHO 1995). Among both men and women of working age suicide was the fourth most common cause of death in Finland in 2002, hence among men every tenth and among women every fourteenth death was caused by suicide (Statistics Finland 2003).

In many regions suicide mortality has increased during the last decades and furthermore suicide has been predicted to become an even more common cause of death worldwide in the next two decades (Lopez & Murray 1998). Considerable variation, however, exists in suicide mortality rates as well as in trends between nations (Schmidtke et al 1999; Fernquist & Cutright 1998; La Vecchia et al 1994), and also within a country (Bunting & Kelly 1998; Kelleher et al 1997; MMWR 1997; Lönnqvist 1989). Suicide also shows a specific mortality pattern according to, *inter alia*, sex and age (La Vecchia et al 1986; Surtees & Duffy 1989; Granizo et al 1996; Morrel et al 2002).

Both morbidity and mortality have been found to relate inversely to socioeconomic status. Results of better health and lower mortality among those in higher socioeconomic status have been uniform regardless of the physical health outcome measure used (Fuhrer et al. 2002; Dahl & Elstad 2001; Lissau et al 2001), the indicator used for socioeconomic status (Lundberg et al. 2001; Manderbacka et al 2001) and for most causes of death studied (Mackenbach et al 1999).

But even though the socioeconomic differences in total and some cause-specific mortality are extensively studied, little is known about the extent and burden of socioeconomic differences in suicide mortality according to age and sex. Furthermore, socioeconomic differences in suicide mortality trends in Finland as well as in many other countries after the middle of 1990s have remained unknown.

### *Size and gradient of socioeconomic differences in suicide mortality*

Socioeconomic status has been found to relate inversely to both total (Mackenbach et al 1999) and most specific causes of death (Pensola 2003; Martikainen et al. 2001; Mackenbach et al. 2000; Valkonen et al. 2000; Marang-van de Mheen et al 1998). Cross-sectional individual-level studies have shown that socioeconomic status is associated also with suicide mortality in the same, inverse way as it is with total mortality – only the association seems to be stronger. This distinct association is consistent with results concerning external causes of death (accidents, suicide, and violence) as a whole. In a study related to eleven western European countries the mortality rate ratio comparing manual class to non-manual one was higher in external causes than in deaths caused by diseases in all but one country (Kunst et al 1998).

The association between socioeconomic status and suicide mortality can be seen with different socioeconomic indicators. Those with basic education (Valkonen & Martelin 1988), those employed in blue-collar occupations (Fitzpatrick & Dallamore 1999; Drever & Bunting 1997; Burnley 1995; Kreitman et al 1991), and those with low income (Martikainen 2001; Mortensen et al 2000) have been found to have elevated suicide risk.

While income tends to be fairly linearly associated to suicide mortality (Qin et al 2003; Agerbo et al 2001; Mortensen et al 2000), occupation based social class is less systematically associated with suicide. Lower white collar workers and skilled workers do have higher suicide mortality rate than those in upper white collar occupations, but the difference in rates is especially large between unskilled workers and all other groups. Suicide mortality of unskilled workers compared to upper white collar workers varies between two- and four-fold in different studies. (Drever & Bunting 1997; Valkonen & Martelin 1988).

In addition to socioeconomic status many other sociodemographic factors have been found to relate to suicide mortality. As mentioned above suicide mortality differs substantially by sex and age.

Unlike total and most cause-specific mortality which are directly related to age (i.e. mortality increases monotonically with age), suicide mortality is associated with age in a more complicated way. However, only few studies exist on interaction effects of socioeconomic and demographic factors on suicide mortality risk. According to British studies interaction between occupation-based socioeconomic status and age exists among men. While in higher social classes suicide mortality increases as age increases, in lower social classes the pattern is convex. Socioeconomic difference in suicide mortality is thus much larger (even seven-fold) in younger and middle age-groups, but it diminishes so that it is some two-fold in older age-groups (Fitzpatrick & Dollamore 1999; Drever & Bunting 1997; Kreitman et al 1991). There are, however, no studies concerning women as well as few comparable results from other countries.

### *Trends in socioeconomic suicide mortality differences*

Studies on trends in socioeconomic differentials in mortality have shown that the inequality gap has widened over time (Mackenbach et al 2003; Turrell & Mathers 2001; Marang-van de Mheen et al 1998). Changes in cardiovascular disease mortality have contributed most to the widening gap in total mortality, but in Finland and some other countries also external causes of death have had an important contribution (Valkonen 1999; Kunst et al 1998; Drever & Bunting 1997).

According to Martikainen et al (2001), over the period from 1971–75 to 1991–95 mortality of Finnish men and women increased for some causes of death including suicide. This has slowed down the otherwise increasing trend in life expectancy. For suicide mortality the increase in death rate was found only among manual men and women. The same trend has been observed in England and Wales (Drever & Bunting 1997). Suicide mortality of professional class has decreased over the period from 1970–72 to 1991–93. However, within manual classes suicide mortality has increased, and this increase is faster the lower the social class. While the risk ratio of suicide mortality in the lowest social class compared to the professional class was two fold during the first period, it was four-fold during the latter period.

However, socio-economic differences in suicide mortality trends in Finland as well as in other countries continue to be poorly documented from the middle of the 1990s onwards.

### *Socioeconomic differences in years of life lost due to suicide mortality*

Standardised mortality rates, although commonly used, are not always the most useful tool to describe the magnitude of mortality from specific causes. As the age pattern of different causes of death varies, the years of life lost can vary as well. Even if mortality rates declined, the burden of mortality could increase. In Hong Kong, for example, the suicide rate increased by 57 per cent from 1981 to 2001, whereas the years of life lost due to suicide increased by 96 per cent during the same period (Yip et al 2003).

Mortality rates may thus underestimate the magnitude of mortality differences between, for instance, socioeconomic groups and the in actual public health importance, because they do not weight the deaths taking place at younger ages (O’Shea 2003; Blane & Drever 1998). However, as far as we know, few analyses have studied years of life lost due to suicide by socioeconomic status and sex even though, as stated above, age-specific suicide mortality rates can vary considerably by socioeconomic status.

### *Aims of the study*

The purpose of this study is thus to report the size and structure of socioeconomic differences in suicide mortality of men and women aged 25 years and over in Finland in 1971-2000. The aims are:

- i To study the sex- and age-specific socioeconomic differences in suicide mortality
- ii To document the socioeconomic-specific suicide mortality rates by sex during the years 1971–2001 and thus update knowledge of suicide mortality trends after the middle of the 1990s.
- iii To illustrate the public health importance by estimating years of life expectancy lost due to excess deaths associated with socioeconomic differences in suicide mortality during the three decades

## 2 Data and methods

### *Data*

Register data that will be used in this study comprise of the Finnish census records for years 1970, 1975, 1980, 1985, 1990, and 1995 of all men and women over the age of 15 years linked with cause of death records for the periods 1971–1975, 1976–1980, ..., 1996–2000 respectively. All together the data consists of 56 million (men) and 61 million (women) person years and 37 000 suicides, of which 79 per cent among men.

The outcome measure in this study is suicide mortality. Suicide deaths are those that have suicide or some other condition brought about by intentional self-harm as the underlying cause in the death certificate (in 1971–86 ICD8 codes E950–E959, in 1987–95 ICD9 codes E950–E959B and 959X, in 1996–2001 ICD10 codes X60–X84 and Y870). Suicide attempts and deliberate self-harm greatly outnumber suicide deaths. According to Maris (2002) the concept of suicide can be perceived as a continuum that ranges from ideas to gestures, to risky lifestyles, suicide plans, suicide attempts, and, finally, suicide completions. In this study, however, only completed suicides are included. Reliable data describing prevalence and trends in different socioeconomic groups exists on completed suicides but not on suicidal behaviour or suicide attempts.

All analyses will be carried out on men and women separately. Because socioeconomic status is not yet established at very young ages, most analyses will include only those who are 25 years of age or older.

### *Methods*

Statistical methods that were applied to the analyses of the data included age-adjusted death rates and poisson regression models. Mortality rates were directly standardised using total population as a reference group. The burden of mortality was estimated by calculating the years of life expectancy lost due to total and suicide mortality under the assumption that the age-specific mortality probabilities of those in lower socioeconomic statuses were the same as those in the highest socioeconomic status. Life expectancy of upper non-manual men/women during the period 1991–2000 was used as a standard. (Bonneux 2002.)

SAS statistical software was used for carrying out the analyses.

## 3 Results

In the period 1971–2000 men's suicide mortality rate was 52 per 100 000 person years and women's 13 per 100 000 person years. However, rates varied substantially between socioeconomic groups and by sex. Among men suicide mortality was significantly larger in all socioeconomic groups compared with upper non-manual group whereas among women the corresponding differences were much more minor. For example, suicide mortality of manual men was 2.3-fold compared with that of upper non-

manual men, but the difference was only 1.3-fold among women. Besides, among women suicide mortality of farmers was lower than that of upper non-manuals.

Suicide mortality was extremely high among manual men in age groups from 30–34 to 50–55 and relatively high among manual women from 40–44 to 50–54. In higher social classes among men suicide mortality increased as age increased up to the oldest-old groups, but among women suicide mortality started to decrease after the age-group 55–59 as it did in all other socioeconomic classes. Thus socioeconomic differences were largest among both men and women in their thirties and, further, among men differences remained considerable until 55–59 years. After this socioeconomic differences diminished with age among both men and women.

On the whole, suicide mortality of upper non-manuals decreased among both men and women during the period 1971–2000 whereas among other socioeconomic groups it remained constant or somewhat increased. Among upper non-manual women suicide mortality was in fact higher than among manual women at the beginning of the 1970s, but suicide mortality of the former group started to decrease rapidly and halved during the period. Among both manual men and women suicide mortality increased substantially from the middle of 1980 onwards and peaked in 1990 among manual women and in 1991 among manual men, but declined thereafter first among manual men and a few years later among manual women. As a consequence socioeconomic differences in suicide were larger at the turn of the century than during the beginning of the 1970s.

Analyses of the burden of mortality showed that the proportion of suicide to total mortality is about two-fold larger in all socioeconomic groups when years of life expectancy lost was used instead of mortality rates. Among the group comprised of lower non-manuals, farmers and manual workers years of life expectancy lost due to suicide make up 7.5 per cent of total years of life lost in 1991–2000, but only 2.6 per cent among the equivalent group of women.

While the years of life expectancy lost due to total mortality diminished by 22 per cent among the upper non-manual men and by 15 per cent among the other socioeconomic group over the period from 1971–80 to 1991–2000, the years of life expectancy lost due to suicide diminished only by 13 per cent among the upper non-manual men and actually increased by 5 per cent in the other socioeconomic group. Among women life expectancy lost due to suicide decreased by as much as 38 per cent among the upper non-manuals during the period, but increased by 13 per cent among the other socioeconomic group.

## 4 Discussion

In this study register data that comprise of census records linked with cause of death records were used to analyse socioeconomic differences in suicide mortality of both men and women aged 25 and over in Finland during the years 1971–2000. The data is internationally unique in that it contains reliable information on socioeconomic status and suicide mortality for a national population.

These analyses showed that, in accordance with previous studies, among men socioeconomic differences in suicide mortality are larger than in total mortality. Among women, however, there were no such differences. Furthermore occupation based socioeconomic class is not linearly associated with suicide mortality: among both men and women differences were especially large between manual workers and all other socioeconomic groups.

So far few studies have considered the interaction effect between age and socioeconomic status and even fewer have included women in such analyses. In Finland the age-specific socioeconomic differences in suicide mortality patterns of men and women were very different. Men's patterns resembled those observed in Britain (Fitzpatrick & Dollamore 1999; Drever & Bunting 1997; Kreitman et al 1991). Differences were largest among those in their thirties being three-to-four-fold, but in Finland differences were considerable also among older men. Among women socioeconomic differences were largest in younger ages. After 65–69 years socioeconomic differences started to decrease and were negligible in the oldest-old groups.

Socioeconomic patterns of suicide mortality were remarkably different between men and women in this study. It is possible that differences in the structure of the socioeconomic groups explain some of these differences. Marital status and family type is associated with suicide risk: those with elevated suicide risk include divorced or separated (Kposowa 2000; Burnley 1995; Kposowa et al 1995) and widowed (Martikainen & Valkonen 1996; Burnley 1995). These effects are gender-specific. Previous evidence shows that there are more single and separated persons among manual men than among manual women. Further, an interaction effect between socioeconomic status and sociodemographic factors on suicide could be assumed to exist so that individuals who are vulnerable according to both socioeconomic status and sociodemographic situation – for example divorced or separated with low income - could be expected to have an elevated suicide risk compared to individuals having tribulation on only one of these aspects.

Another important factor explaining associations between socioeconomic status and suicide mortality can be labour market status. According to Gunnell (2001) explanations for the observed differences include higher levels of unemployment and job insecurity in people of lower socioeconomic position as well as differences in social support in relation to social class. These effects, again, are likely to be gender-specific. Our intention is to examine the contribution of these compositional explanations in a later version of this paper.

Socioeconomic mortality trends have been poorly documented in many countries after the middle of 1990s. According to the results at this study socioeconomic differences, that had been remarkably large at the beginning of the 1990s, decreased somewhat during the latter part of 1990s. Suicide mortality decreased in all socioeconomic groups, but most rapidly among manual workers whose suicide rate was extremely high during the first years of 1990s. Nevertheless, differences were still larger at the turn of the century than during the beginning of the 1970s. The causes of increasing socioeconomic differences in suicide are likely to result from changes in the factors that contribute to socioeconomic differences at any one point in time.

Mortality rates may underestimate the magnitude of mortality differences between socioeconomic groups and their actual public health importance, because they give equal weight to deaths at all ages (O'Shea 2003; Blane & Drever 1998). Few analyses have studied years of life lost due to suicide by socioeconomic group. In this study the proportion of suicide to total mortality was much larger when years of life lost was used instead of mortality rates. Among lower non-manuals, farmers and manual workers years of life lost due to suicide increased from 3.4 per cent to 7.5 per cent of total years of life lost during the 1990s among men, and, at a much lower level, from 1.6 to 2.6 per cent among the equivalent group of women.

Reducing health inequalities remains one of the salient goals in health policies in many countries. In Finland Ministry of Social Affairs and Health declared a new public health program in 2001 (Terveys 2015). One of the main goals is to reduce inequality in welfare between population groups. The aim is to bring down educational and occupation based social class differences in mortality by a fifth by the year 2015. In addition, accidental mortality and deaths from violence in young adult men's group ought to be reduced by a third from the level prevailed at the end of the 1990s. (Ministry of Social Affairs and Health 2001). As suicide is an important cause of death at younger ages, reduction of suicide mortality of young adult men and in low socioeconomic group to the level that those in high socioeconomic status have would advance the attainment of the goal.

## References

- Agerbo E., Mortensen P. B., Eriksson T., Qin P. & Westergaard-Nielsen (2001): Risk of suicide in relation to income level in people admitted to hospital with mental illness: nested case-control study. *BMJ*, 322: 334–335.
- Blane D & Drever F (1998): Inequality among men in standardised years of potential life lost, 1970–93. *BMJ* 317(25 July): 255.
- Bonneux, L (2002): How to measure the burden of mortality. *Journal of Epidemiology & Community Health* 56:128–131.
- Bunting J. & Kelly S. (1998): Geographical variations in suicide mortality, 1982–96. *Population Trends*, 93 (Autumn): 7–18.
- Burnley I. H. (1995): Socioeconomic and spatial differences in mortality and means of committing suicide in New South Wales, Australia, 1985–91. *Social Science & Medicine*, 41 (5): 687–698.
- Dahl E. & Elstad J. I. (2001): Recent changes in social structure and health inequalities in Norway. *Scandinavian Journal of Public Health*, 29 (suppl 55): 8–17.
- Drever F. & Bunting J. (1997): Patterns and trends in male mortality. In Drever F. & Whitehead M. (eds): *Health Inequalities. Decennial Suolement*. London: The Stationery Office.
- Fernquist R. M. & Cutright P. (1998): Societal Integration and Age-Standardized Suicide Rates in 21 Developed Countries, 1955–1989. *Social Science Research*, 27: 109–127.
- Fitzpatrick J. & Dollamore G. (1999): Examining adult mortality rates using the National Statistics Socio-economic Classification. *Health Statistics Quarterly* 2(summer): 33–40.
- Fuhrer R., Shipley M. J., Chastang J. F., Schmaus A., Niedhammer I., Stansfeld S. A., Goldberg M. & Marmot M. G. (2002): Socioeconomic Position, Health, and Possible Explanations: A Tale of Two Cohorts. *American Journal of Public Health*, 92 (8): 1290–1294.
- Granizo J. J., Guallar E. & Rodriguez-Artalejo F. (1996): Age-Period-cohort Analysis of Suicide Mortality Rates in Spain, 1959–1991. *International Journal of Epidemiology*, 25(4): 814–820.
- Gunnel D. (2001): Commentary: Suicide and income – is the risk greater in rich people who develop serious mental illness? *BMJ*, 322: 355.
- Kelleher M. J., Corcoran P. & Keeley H. S. (1997): The Service Implications of Regional Differences in Suicide Rates in the Republic of Ireland. *Irish Medical Journal*, 90 (7).
- Kposowa A. J. (2000): Marital status and suicide in the National Longitudinal Mortality Study. *Journal of Epidemiology & Community Health*, 54: 254–261.
- Kposowa A. J., Breault K. D. & Singh G. K. (1995): White Male Suicide in the United States: A Multivariate Individual-Level Analysis. *Social Forces*, 74 (1): 315–323.
- Kreitman N, Carstairs V. & Duffy J. (1991): Association of age and social class with suicide among men in Great Britain. *Journal of Epidemiology and Community Health*, 45: 195–202.
- Kunst A. E., Groenhouf F., Mackenbach J. P. & the EU Working Group on Socioeconomic Inequalities in Health (1998): Occupational class and cause specific mortality in middle aged men in 11 European countries: comparison of population based studies. *BMJ*, 316: 1636–1641.

- La Vecchia, C., Bollini P., Imazio C. & Decarli A. (1986): Age, period of death and birth cohort effects on suicide mortality in Italy, 1955–1979.
- La Vecchia, C., Lucchini, F. and Levi, F., 1994. Worldwide trends in suicide mortality, 1955-1989. *Acta Psychiatrica Scandinavica* 90, 53–64.
- Lissau I., Rasmussen N. K., Hesse N. M. & Hesse U. (2001): Social differences in illness and health-related exclusion from labour market in Denmark from 1987 to 1994. *Scandinavian Journal of Public Health*, 29 (suppl 55): 19–30.
- Lopez A. D. & Murray C. C. L. (1998): The global burden of disease, 1990–2020. *Nature Medicine*, 4 (11): 1241–1243.
- Lundberg O., Diderichsen F. & Åberg Yngwe M. (2001): Changing health inequalities in a changing society? Sweden in the mid-1980s and mid-1990s. *Scandinavian Journal of Public Health*, 29 (suppl 55): 31–39.
- Lönnqvist J. (1989): Itsemurhat Suomessa 1976–1985. Itsemurhakuolleisuus lääneittäin ja kunnittain 1976–80 ja 1981–85. Helsinki: Lääkintöhallituksen tutkimuksia 51.
- Mackenbach J. P., Kunst A. E., Groenhouf F., Borgan J.-K., Costa G., Faggiano F., Józán P., Leinsalu M., Martikainen P., Rychtarikova J. & Valkonen T. (1999): Socioeconomic Inequalities in Mortality Among Women and Among Men: An International Study. *American Journal of Public Health*, 89 (12): 1800–1806.
- Mackenbach J. P., Cavelaars A. E. M. J., Kunst A. E., Groenhouf F. and the EU Working Group on Socioeconomic Inequalities in Health (2000): Socioeconomic inequalities in cardiovascular disease mortality. An international study. *European Heart*, 21: 1141–1151.
- Mackenbach J. P., Bos, V., Andersen O., Cardano M., Costa G., Harding S., Reid A., Hemström Ö., Valkonen T. & Kunst A. E. (2003): Widening socioeconomic inequalities in mortality in six Western European countries. *International Journal of Epidemiology*, 32: 830–837.
- Manderbacka K., Lahelma E. & Rahkonen O. (2001): Structural changes and social inequalities in health in Finland, 1986–1994. *Scandinavian Journal of Public Health*, 29 (suppl 55): 41–54.
- Marang-van de Mheen P. J., Davey Smith G., Hart, C. L. & Gunning-Schepers L. (1998): Socioeconomic differentials in mortality among men within Great Britain: time trends and contributory causes. *Journal of Epidemiology & Community Health*, 52: 214–218.
- Maris R. W. (2002): Suicide. *The Lancet*, 360 (July 27): 319–326.
- Martikainen P. & Valkonen T. (1996): Mortality after the Death of a Spouse: Rates and Causes of Death in a Large Finnish Cohort.
- Martikainen P., Mäkelä P., Koskinen S. & Valkonen, T. (2001): Income differences in mortality: a register-based follow-up study of three million men and women. *International Journal of Epidemiology*, 30: 1397–1405.
- Ministry of Social Affairs and Health (2001): Valtioneuvoston periaatepäätös Terveysterveys 2015 – kansanterveysohjelmasta. Julkaisuja 2001:4. Helsinki: Sosiaali- ja terveysministeriö.
- MMWR (1997): Regional Variations in Suicide Rates – United States, 1990–1994. *Morbidity and Mortality Weekly Report*, 46 (34): 789–793.
- Morrel S., Page A. & Taylor R. (2002): Birth cohort effects in New South Wales suicide, 1865–1998. *Acta Psychiatrica Scandinavica*, 106: 365–372.

- Mortensen P. B., Agerbo E., Erikson T., Qin P. & Westergaard-Nielsen (2000): Psychiatric illness and risk factors for suicide in Denmark. *The Lancet*, 355: 9–12.
- O'Shea E. (2003): Social gradients in years of potential life lost in Ireland. *European Journal of Public Health*, 13: 327–333.
- Pensola T. H. & Martikainen P. (2003): Cumulative social class and mortality from various causes of adult men. *Journal of Epidemiology & Community Health*, 57: 745–751.
- 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 (4): 765–772.
- Schmidtke A., Weinacker B., Apter A., Batt A., Berman A., Bille-Brahe U., Botsis A., De Leo D., Doneux A., Goldney R., Grad O., Haring C., Hawton K., Hjelmeland H., Kelleher M., Kerkhof A., Leenaars A., Lonnqvist J., Michel K., Ostamo A., Salander-Renberg E., Sayil I., Takahashi Y., Van Heeringen C., Varnik A. & Wasserman D. (1999): Suicide rates in the world: Update. *Archives of Suicide Research*, 5(1): 81–89.
- Statistics Finland (2003): *Kuolemansyyt 2002 (Cause of death 2002). Terveystilasto 2003:2*. Helsinki: Tilastokeskus.
- Surtees, P. G. & Duffy J. C. (1989): Suicide in England Wales 1946–1985: an age-period-cohort analysis. *Acta Psychiatrica Scandinavica*, 79: 216–223.
- Turrell G. & Mathers C. (2001): Socioeconomic inequalities in all-cause and specific-cause mortality in Australia: 1985-1987 and 1995-1997. *International Journal of Epidemiology*, 30(2): 231–239.
- Valkonen T. & Martelin T. (1988): *Occupational Class and Suicide: An Example of the Elaboration of a Relationship*. Research Reports No. 222, Department of Sociology. Helsinki: University of Helsinki.
- Valkonen T. (1999): Sosioekonomiset kuolleisuuserot Suomessa. In Koskinen S. & Teperi J.: *Väestöryhmien välisten terveyserojen supistaminen*. Raportteja 243. Jyväskylä: Stakes.
- Valkonen T., Martikainen P., Jalovaara M., Koskinen S., Martelin T. & Mäkelä, P. (2000): Changes in socioeconomic inequalities in mortality during an economic boom and recession among middle-aged men and women in Finland. *European Journal of Public Health*, 10: 274–280.
- WHO (1995): *World Health Statistics Annual, 1995*. Geneva: World Health Organization.
- Yip P.S.F., Law C.K. & Law Y.W (2003): Suicide in Hong Kong: epidemiological profile and burden analysis, 1981 to 2001. *Hong Kong Medical Journal* 9(6): 419–426.