

Socioeconomic disadvantage and suicidal behaviour: a rapid review

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Introduction

This review was conducted to inform the scoping and development of the full report. It considers the empirical relationship between socioeconomic disadvantage and suicidal behaviour, highlighting (wherever possible) the evidence relating to the UK (as a whole or its constituent nations) and the Republic of Ireland. Socioeconomic disadvantage will be considered at both individual and aggregate levels. Common indicators that have been explored in primary research studies include unemployment, economic recession and socioeconomic deprivation, at the aggregate level; and occupational social class, education, income/debt, housing tenure and labour market position (economic position/employment status), at the individual level.

Unemployment and economic recession

Two systematic reviews on the labour market and suicidal behaviour have been published (Platt, 1984; Platt and Hawton, 2000; see, also, Platt, 1986a; Platt et al., 1992). When reporting findings these reviews distinguish between four major types of research design, based on two independent dimensions: individual vs. aggregate measures; and cross-sectional vs. longitudinal collection of measures. Individual-level studies measure the relationship between labour market status and suicidal behaviour of individuals, while aggregate-level studies consider the relationship between the unemployment rate and suicidal behaviour over time or over geographical areas. The temporal design of the research can be either cross-sectional, measuring the relationship between unemployment data and suicidal behaviour data (individual- or aggregate-level) at one point in time; or longitudinal, where unemployment in individuals or aggregates is associated with subsequent suicidal behaviour over two or more points in time. The intersection of these two

dimensions results in four types of study: individual cross-sectional, aggregate cross-sectional, individual longitudinal and aggregate longitudinal.

In the earlier review (Platt, 1984), evidence from cross-sectional individual studies conducted in a range of countries, including the USA, UK, India and Hong Kong, revealed that significantly more hospital-treated self-harm patients were unemployed than would be expected among general population samples. Likewise, rates of suicide or self-harm among unemployed people were always considerably higher than among employed people. Increasing duration of unemployment was associated with increasing risk of self-harm. Aggregate cross-sectional studies provided no evidence of a consistent relationship between unemployment and suicide, but a significant geographical association between unemployment and self-harm rates was found. Results from all but one of the individual longitudinal studies pointed to significantly more unemployment, job instability and occupational problems among suicides compared to non-suicides. The England and Wales Longitudinal Study (Fox and Goldblatt, 1982) also found a high suicide rate among unemployed people in the general population. The aggregate longitudinal analyses pointed to a significant positive association between unemployment and suicide in the USA. The negative relationship in Great Britain in the 1960s has been shown to result from a unique decline in the suicide rate due to the unavailability of the most common method of suicide (i.e., domestic gas poisoning) (Kreitman, 1976; Krietman and Platt, 1984).

The later review (Platt and Hawton, 2000) updated and extended the earlier review by concentrating on publications during the period 1984-1999. The range of countries included in this review was extremely wide, including USA, Canada, Australia, New Zealand, Japan, Taiwan and several European nations. The strongest evidence about the relationship between suicide and unemployment was derived from individual-level longitudinal studies. Significantly higher odds ratios (ORs), relative risks (RRs) or standardised mortality ratios (SMRs)¹ for suicide among unemployed people were consistently reported, even after the introduction of control variables

¹ The **odds ratio (OR)** is a measure of association between an exposure (e.g., unemployment) and an outcome (e.g., suicide). The OR represents the odds that an outcome will occur given a particular exposure, compared to the **odds** of the outcome occurring in the absence of that exposure. The **relative risk or rate ratio (RR)** is the ratio of the probability of an event occurring (for example, completing suicide) in an exposed group (e.g., those who are unemployed) to the probability of the event occurring in a comparison, non-exposed group (e.g., those who are employed). The **standardised mortality ratio (SMR)** is the ratio of observed deaths in the study group (e.g. those unemployed at some particular time) to expected deaths in the general population.

(such as age, sex, civil state, social class and education level). The most rigorous analyses were those based on the England and Wales Longitudinal Study. Lewis and Sloggett (1998), for example, calculated an OR of 2.6 for suicide over a 20-year follow-up period among those unemployed at baseline, after controlling for a range of socio-demographic variables. Based on the findings reported in nine different studies, the OR or RR for suicide among unemployed people over the medium-long term appeared to be in the region of 2-3. In other words, those who are unemployed are two to three times more likely to die by suicide than those who are in work. The interpretation of this finding is, however, not obvious. On the one hand, the experience of unemployment might have led, directly or indirectly (e.g., via increased psychological distress or even psychiatric illness), to an increased vulnerability to suicide. On the other hand, individuals who become unemployed (especially long-term) might also be more likely to be psychologically vulnerable (indeed their unemployment may have come about as a result of their psychological ill-health) and therefore also at greater risk of suicidal behaviour. The weight of evidence supports the conclusion reached in earlier studies, based on a shorter follow-up period and controlling only for social class, but also demonstrating a significant effect on the partners of unemployed men, that there is indeed a direct causal effect of unemployment on suicide. However, it is not possible to exclude the possibility that personal characteristics increase the risk of both unemployment and suicidal behaviour.

A systematic search of the international literature in four major bibliographic databases (Medline, Science Citation Index, Social Science Citation Index and PsycINFO), published since the earlier review, identified over 80 studies using an aggregate longitudinal design to explore the relationship between the suicide rate and the unemployment rate over time, within a single country or in several countries. Overall, the weight of evidence points to a significant positive association (e.g., Andres and Halicioglu 2010 [Denmark]; Kolves et al., 2013 [13 ex-Soviet countries]; Ceccherini-Nelli and Priebe, 2011 [US, UK France, Italy]. However, some studies find no association (e.g., Reneflot and Evensen, 2014 [review of several Nordic studies]; Gusmao et al., 2013 [29 European countries]); and a few report a significant negative association (e.g., Barstad, 2008 [Norway]).

The strength and direction of association between suicide and unemployment have also been found to vary by gender, with more positive associations among men than among women (e.g., Ying and Chang, 2009 [G7 countries]; Chen et al., 2010 [Taiwan]; Inoue et al., 2007 [Japan]); and by age group (e.g., Luo et al., 2011 [USA]; Taylor 2003 [20 countries]). When considering findings

based on the aggregate longitudinal design, however, it is important to look out for methodological limitations. For example, many studies explore simple bivariate relationships and fail to use more sophisticated multivariate modelling with controls for potential confounders (particularly those measuring major socio-demographic change, e.g., divorce rate). When appropriate controls are introduced, the association between suicide and unemployment may be attenuated or even disappear (e.g., Leenaars and Lester, 1995). An even more extreme example (namely, a change of direction in the relationship between suicide and unemployment) is reported by Chen et al. (2012) in their meta-regression analysis of 189 results from 24 academic articles. They show that an initial *negative* association between unemployment and suicide (i.e., high unemployment is associated with a low suicide rate) becomes a *positive* relationship (i.e., high unemployment is associated with a high suicide rate) after ‘using more sophisticated methods.’ Additionally, the authors report ‘a strong publication bias towards larger positive impact of unemployment on suicide rate’ (p. 291), a finding which should also be taken into account when weighing the empirical evidence.

A subset of studies using the aggregate longitudinal design addresses the impact of economic recession (typically defined as a sustained decline in economic output [GDP] and/or a sudden, sharp increase in unemployment) on suicide. While there is empirical support for a ‘procyclical’ association between economic conditions and all-cause mortality, i.e., mortality decreases when the economy contracts, the same evidence base suggests that suicide is one of the few causes of death that behaves in an opposite (‘counter-cyclical’) manner, increasing when the economy contracts (Ruhm 2000; Neumayer 2004; Gerdtham and Ruhm 2006). A review by Haw et al. (2014) concludes that there is ‘substantial’ evidence of a positive association between economic recession and suicide, particularly from studies carried out in middle- and high-income countries. The extensive literature covers a period of over 80 years, from the Great Depression of 1929-32 (e.g., Swinscow, 1951; Tapia Granados and Diez Roux, 2009), via the Asian economic crisis of 1997-98 (e.g., Chang et al., 2009) to the global 2008–2010 economic recession (e.g., Chang et al., 2013; Stuckler et al., 2011; Barr et al., 2012). As is the case with unemployment more generally, economic recession appears to have a greater impact on suicide risk among males than among females (Barr et al., 2012; Barth et al., 2011). Findings from a study by Chan et al., (2014) suggest that the association between macroeconomic conditions and suicide vary according to occupational roles: compared with workers in elementary (i.e., unskilled manual) occupations, the relative risk of suicide for managers in South Korea increased threefold during the recession. In the

most recent overview of the key epidemiological literature, Gunnell and Chang (2016) conclude: “Although increases in job loss contribute to ... [the adverse] effect [of economic recession on suicide and other mental health outcomes], a range of other stressors such as austerity measures, loss of home, debt, strains on relationships, and reductions in mental health services may also contribute. Those who are already vulnerable, such as individuals who are supported by social welfare or who have preexisting mental health problems are at greatest risk.”

With respect to unemployment and hospital-treated self-harm, findings from Great Britain point to instability in the temporal association, with a positive relationship in the 1970s followed by a negative or non-significant relationship in the 1980s. At the individual level Platt et al. (1988) reported relative risks (self-harm among the unemployed *versus* the employed) in excess of 12 (men) and 9 (women) in two UK cities. Long-term unemployment carried the greatest risk, with RRs of 19 (women) and 36 (men). While these high risk estimates suggest a strong association between unemployment and self-harm, a causal relationship cannot necessarily be inferred: findings from several studies suggest once again that it would be inadvisable to rule out the possibility of self-selection (i.e., non-causal) processes. For example, a UK-based cross-sectional study reported considerably higher levels of chronic psychopathology and personality disorder among unemployed self-harm patients, compared to their employed counterparts (e.g., Platt, 1986b); and a New Zealand birth cohort study found that a significant association between unemployment and suicide attempts became non-significant after adjustment for covariates, including previous mental ill-health (Fergusson et al., 2007).

Occupational status, occupation and suicidal behaviour

Findings relating to the association between occupational social class and suicidal behaviour were also presented in the review by Platt and Hawton (2000). The strongest evidence can be found in research using an individual-level cross-sectional design. Two studies provide data on variation in suicide by social class in Great Britain (Kreitman et al., 1991; Drever et al., 1997), using the UK Registrar General’s Social Class (SC) as the measure of socioeconomic classification (see box 1).

Box 1: Registrar General's Social Class (SC)

SCI:	professional occupations
SCII:	managerial and technical occupations
SCIIIN:	skilled non-manual occupations
SCIIIM:	skilled manual occupations
SCIV:	partly-skilled occupations
SCV:	unskilled occupations

Both studies reported lower suicide SMRs among men in the non-manual social classes and among skilled manual workers and significantly elevated suicide SMRs in the semi- and (especially) unskilled manual classes. Kreitman et al. (1991) confirmed the finding of higher SMRs for men in SCIV and SCV in England and Wales around 1981, for Scotland at about the same time, and for all three countries around 1971. In a subsequent analysis, Drever et al. (1997) reported the same inverse relationship between social class and suicide (including undetermined deaths) among men aged 20-64 years in England and Wales for the period 1991-93. SMRs (England and Wales=100) were 55 in SCI, 63 in SCII, 87 in SCIIIN, 96 in SCIIIM, 107 in SCIV and 215 in SCV. Drever and Bunting (1997) noted that the two-fold difference in suicide between SCI and SCV in 1970-72 had increased to a four-fold difference by 1991-93. Uren, Fitzpatrick, Reid and Goldblatt (2001) extended this analysis to explore differences in the social gradient of suicide in the UK as a whole and in each of its four constituent countries (England, Wales, Scotland, Northern Ireland). The evidence of a steep increase ('step change') in suicide risk in SCV is notable in all countries. Scotland had the worst level of suicide mortality, with higher rates in each social class than all other countries. One other important finding reported by Kreitman *et al.* (1991) is that of a significant interaction between age and social class, with particularly high suicide rates among those aged 25-44 years in SCV.

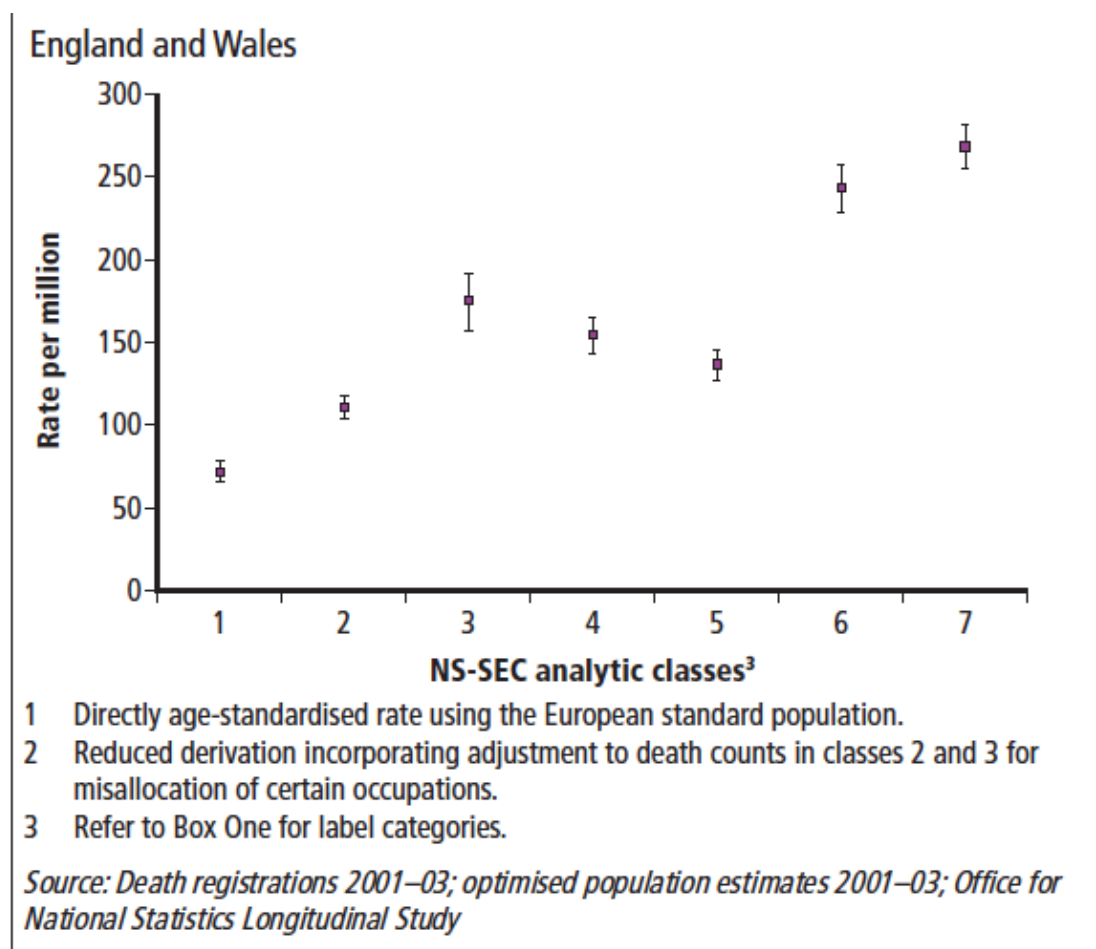
More recently reported findings based on a range of study designs provide overwhelming evidence of an *inverse* relationship between occupational social class and suicide risk (the higher the social class position, the lower the suicide rate) (e.g., Milner et al., 2014 [Australia]; Maki and Martikainen, 2007 [Finland]; Kim et al, 2006 [South Korea]).

The latest data relating to the UK cover the period around the 2001 census. In England and Wales there was an inverse (non-linear) relationship between suicide (using the ONS definition, comprising deaths from suicide and events of undetermined intent) and socioeconomic status (as measured by the National Statistics Socio-economic Classification (NS-SEC) (box 2)). Routine workers had a suicide rate of 26.8/100,000, which was 45% higher than the rate for all men of this age, while the rate among men working in higher managerial and professional occupations was only 7.4/100,000, 60 per cent lower than the rate for all men of this age (figure 1) (White et al., 2008).

Box 2: National Statistics Socio-economic Classification (NS-SEC) analytic classes

Condensed analytic class	Analytic class	Examples of occupations included
1 Managerial and professional occupations	1 Higher managerial and professional occupations	
	1.1 Large employers, higher managers	Senior officials in national and local government; directors and chief executives of major organisations; officers in the armed forces
	1.2 Higher professionals	Civil engineers, medical practitioners, physicists, geologists, IT strategy and planning professionals, legal professionals, architects
2 Intermediate occupations	2 Lower managerial, professional	Teachers in primary and secondary schools, quantity surveyors, public service administrative professionals, social workers, nurses, IT technicians
	3 Intermediate	NCOs and other ranks in the Armed Forces, graphic designers, medical and dental technicians, Civil Service administrative officers and local government clerical officers, counter clerks, school and company secretaries
	4 Small employers and own account workers	Hairdressing and beauty salon proprietors, shopkeepers, dispensing opticians in private practice, farmers, self-employed taxi drivers
3 Routine and manual	5 Lower supervisory and technical occupations	Bakers and flour confectioners, screen-printers, plumbers, electricians and motor mechanics employed by others, gardeners, rail transport operatives, supervisors of van, bus and coach drivers, labourers, scaffolders
	6 Semi-routine occupations	Pest control officers, clothing cutters, traffic wardens, scaffolders, assemblers of vehicles, farm workers, veterinary nurses and assistants, shelf fillers
	7 Routine occupations	Hairdressing employees, floral arrangers, roundsmen and women, sewing machinists, van, bus and coach drivers, labourers, hotel porters, bar staff, cleaners and domestics, road sweepers, car park attendants

Figure 1: Age-standardised mortality rate from suicide and events of undetermined intent by NS-SEC, England and Wales, men aged 25-64, 2001-2003



Source: White et al. (2008)

A systematic review and meta-analysis of individual-level case-control and cohort studies of suicide (n=14 studies, covering Canada, Denmark, Finland, Hong Kong, Norway, Sweden and USA) found pooled RRs for the lowest socioeconomic status groups (compared to the highest) of 2.67 (95% CI 1.53-4.68) in males (the RR was non-significant in females) (Li et al., 2011).

The evidence base on the association between occupational social class and SELF-HARM is far less extensive than that relating to suicide. In a study using an individual-level cross-sectional research design Platt et al. (1988) demonstrated a marked social class gradient in the incidence of hospital-treated self-harm among men in two UK cities in the early 1980s: the higher the social class, the lower the rate of self-harm. In Edinburgh, for example, the mean annual incidence of self-harm (1980-82) per 100,000 economically active males aged 16+ years was 72 in SCI and SCII combined, 236 in SCIIINM and SCIIIM combined, 526 in SCIV and 879 in SCV. A review of studies published

during the period 1990-2008, using both individual- and aggregate-level designs, concluded that 'low SES is associated with a higher risk of attempted suicide, although the strength of the association varies across countries, the demographic groups examined, the SES measures used and the data source' (Burrows and Laflamme, 2010, p. 37).

Analysis of variation in suicide risk by occupational group is reported in three publications relating to England and Wales (Charlton et al., 1992; Kelly et al., 1995; Kelly & Bunting, 1998). The statistic used in these studies is the proportional mortality ratio (PMR), which is the number of observed suicide deaths divided by the total number of deaths, expressed as a percentage. This statistic is used where the number of individuals in an occupational group and their age distribution is not known, so that the SMR cannot be computed. It should be noted, however, that the PMR for suicide in a particular group can be misleading since it depends not only on the number of deaths from suicide in the group but also on the number of deaths from other causes. Thus, an elevated suicide PMR may reflect a relative deficit of deaths from other causes.

Occupational groups in England and Wales which, on the basis of PMRs, appear to have had a high risk of suicide during the 1980s and 1990s were medical and allied occupations and farming among males, while among females additional groups with elevated PMRs were nurses, professionals in education, health and welfare and those in personal service employment. Kelly and Bunting (1998) drew attention to the discrepancy between the *PMR-based* findings, with high suicide risk occupations coming predominantly from SCI and SCII, and *SMR-based* findings, which show much lower suicide rates in the same social classes. They speculated that 'the high PMRs found for doctors, vets and dentists reflect the fact that their overall mortality is low and therefore the proportion of deaths from suicide is high relative to other causes.' Empirical support for this suggestion can be found in Charlton et al. (1992). Nevertheless, there is also evidence from other data (e.g., Stark et al., 2006) and other countries that some occupational groups, particularly medical doctors, nurses and farmers, are generally at increased risk of suicide.

In an investigation of changing suicide risk among occupational groups in England and Wales over the period 1979-2005, Roberts et al. (2013) found that veterinarians, pharmacists, dentists, doctors and farmers were among the occupations with the highest risk circa 1981. By circa 2001 none of these were ranked in the top 30 occupations; instead, the highest suicide rates were found among coal miners, merchant seafarers, labourers in building trades and window cleaners.

Occupations with significant increases in suicide over time in suicide rates were all manual, while occupations with significant decreases were mainly professional or non-manual.

Milner et al. (2013) sought to synthesise findings from the empirical literature through a systematic review and meta-analysis (N=34 studies) in which a pooled risk of suicide across occupational skill-level groups was calculated. Compared with the risk of suicide in the working age population, the most elevated risk was found among those in elementary occupations (e.g., construction workers) (RR = 1.84, 95% CI 1.46-2.33), plant machine operators and ship's deck crew (RR = 1.78, 95% CI 1.22-2.60), skilled agricultural, forestry and fishery workers (RR = 1.64, 95% CI 1.19-2.28) and service and sales workers such as the police (RR=1.52, 95% CI 1.28-1.80). Managers (RR = 0.68, 95% CI 0.50-0.93) and clerical support workers (RR=0.77, 95% CI 0.64-0.92) had the lowest risk. There was evidence of a decreasing gradient of risk from the lowest skilled occupations (e.g., construction workers) to the second most skilled occupations (e.g., technicians).

Education and housing tenure

A study by Lorant et al. (2005) explored socioeconomic inequalities in suicide mortality among men and women. They used a prospective follow-up of censuses matched with vital statistics in 10 European populations (Austria, Belgium, Denmark, England and Wales, Finland, Italy (Torino), Norway, Switzerland, Spain (Barcelona, Madrid)). Directly standardised rates of suicide were computed for each country. Inequalities were measured by educational level (low secondary vs. upper secondary vs. superior) and housing tenure (owner vs. tenant). In most countries, the greater the socioeconomic disadvantage, the higher the risk of suicide. Among men a low level of educational attainment was a risk factor for suicide in eight out of 10 countries. Among women, however, the pattern of educational inequalities was very different. Overall, lower educational attainment was protective against suicide, with only two countries showing the same association as found among men, while a reverse association was evident in three countries. In five out of six countries for which data were available, the risk of suicide was greater among tenants than among house owners, for both men and women. Housing tenure was a more important risk factor than education, and yielded more consistent results between men and women.

In a systematic review and meta-analysis of findings from 44 studies using a variety of research designs, Li et al. (2012) explored risk factors for suicidal behaviour in mainland China. Those with

lower education had a higher risk of suicide (pooled OR = 2.33) but not of suicide attempt. A regression analysis of data from 75 countries by Shah and Bhandarkar (2009) found the highest suicide rates among those with the highest and lowest levels of educational attainment, and the lowest suicide rates among those with a mid-level of educational attainment. The authors believe that this finding 'is consistent with previously reported relationships between ... high and low levels of ... educational attainment and suicide rates in individual-level and aggregate-level studies' (p. 465).

Socioeconomic characteristics of geographical areas

Rehkopf and Buka (2005) conducted a systematic review of the literature exploring the association between area socioeconomic characteristics and area suicide rates. Among the 221 analyses (covering North America, Europe, Australia, New Zealand, Australia and Asia) reported in 86 retrieved papers, more than half (55%) found no significant association between the socioeconomic characteristics of a region and suicide, while 32% reported a significant and inverse relationship (i.e., areas of lower socioeconomic position tended to have higher suicide incidence) and 14% a significant and direct relationship (i.e., areas of lower socioeconomic position tended to have lower suicide incidence). Among significant analyses, 70% showed an inverse relationship and 30% showed a direct relationship. The strength of association varied according to the size of the geographical unit (from city neighbourhoods, at one extreme, to countries, at the other) that was analysed: studies based on smaller geographical units were significantly more likely to report higher rates of suicide in lower socioeconomic areas than studies based on larger areas of aggregation. Measures of area poverty and deprivation were most likely to be inversely associated, and median income least likely to be inversely associated, with suicide rates. Analyses using measures of unemployment, education and occupation were equally likely to demonstrate inverse associations.

The authors drew attention to the well-known risk of committing the 'ecological fallacy', i.e., making causal inferences about individuals from aggregate-level data (Robinson, 1950; Morgenstern, 1995; Greenland, 2001). They note that area-level effects comprise both compositional effects and contextual effects (see box 3); given the nature of the studies included in the review, these components of area rates could not be unpacked. Nevertheless, they argue

that area correlates should be examined in order to avoid the 'atomistic fallacy' (Diez-Roux, 1998) of exclusively focusing on individual-level risk factors.

Box 3: Compositional versus contextual effects

Compositional: variation in (health) outcome (e.g., suicide) between areas can be explained in terms of the characteristics (e.g., social, psychological, genetic) of residents of those areas

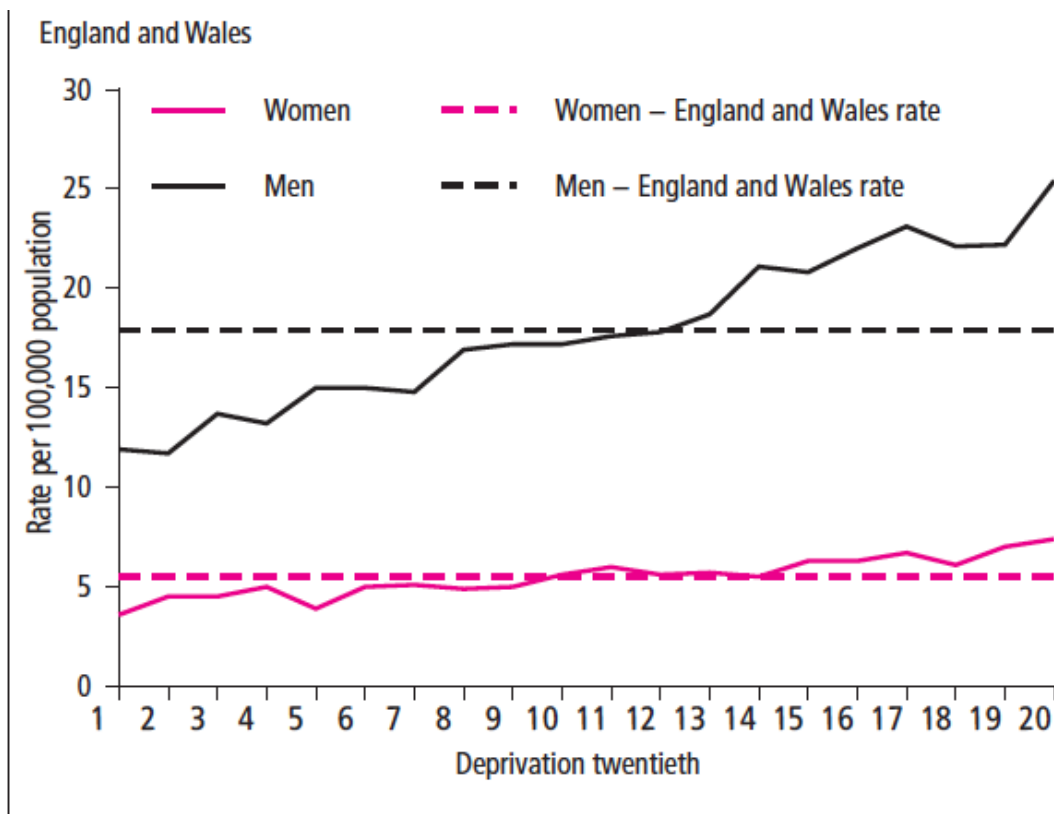
Contextual: variation in (health) outcome (e.g., suicide) between areas can be explained in terms of the characteristics (e.g., physical, cultural, economic, social) of the areas

Area-level studies published since the review by Rehkopf and Buka (2005) continue to produce mixed findings. While the majority describe a significant inverse association between socioeconomic position and suicide, i.e., more socioeconomically deprived areas have higher suicide rates (e.g., Hong and Knapp, 2013 [South Korea]; Qi et al., 2012 [Australia]), some find a direct association, i.e., more affluent areas have higher suicide rates (e.g., Panczak et al, 2012 [Switzerland]), while yet other studies report contrary findings (both inverse and direct associations) depending on the geographical areas under investigation (e.g., Bando et al., 2012 [Brazil]; Law et al., 2014 [Australia]).

The latest relevant data from England and Wales suggest a (reasonably linear) inverse association between suicide rates and socioeconomic deprivation (as measured by the Carstairs-Morris index) (Figure 2). During the period 1999-2003, suicide rates among those living in the most deprived areas (males: 25.4/100,000; females: 7.4/100,000) were double the rates among those living in the least deprived areas (males: 11.9/100,000; females: 3.6/100,000) (Brock et al., 2006). In Scotland, an even more marked linear gradient between suicide rates and socioeconomic deprivation (as measured by the Scottish Index of Multiple Deprivation) was evident in both 2001-2005 and 2010-2014, although there was a small decline in measures of inequality over time. In the more recent period the age-standardised suicide rates among those in the most deprived areas (males:

35.8/100,000; females: 13.3/100,000) were over three times higher than the rates among those living in the least deprived areas (males 11.6/100,000; females: 3.4/100,000)².

Figure 2: Age-standardised suicide rates by deprivation twentieth, England and Wales, population 15+ years, 1999-2003



Source:

Brock et al (2006)

Relative importance of individual- and area-level inequalities on suicide risk

Using linked population registers, Agerbo et al. (2007) investigated whether an individual's risk of suicide in relation to marital status, employment status or income differs depending on levels of single person households, employment and income in their area of residence. Relevant data were obtained for all suicides in Denmark during 1982-1997 (n=9,011) and age-sex matched controls

² <http://www.scotpho.org.uk/health-wellbeing-and-disease/suicide/data/deprivation>

(n=180,220). Individual-level associations between suicide and the selected risk factors were as expected (e.g., higher rate of suicide among the unmarried, unemployed/non-employed, lowest income) and rate ratios were only marginally lower after adjusting for area-level factors. On the other hand, controlling for individual-level (compositional) effects markedly reduced the area-level (ecological) associations of increased risk for suicide with declining area levels of socioeconomic disadvantage. Additionally, the association between area-level risk factors and suicide was much weaker than the association between individual-level risk factors and suicide. The authors concluded that ecological associations between indicators of socioeconomic disadvantage and suicide could be attributed primarily to characteristics of residents (compositional effects) rather than to contextual effects *per se*. Support for this conclusion is provided by findings from two studies which explore the relationship between deprivation and suicide at both individual and area levels. Burrows et al. (2011 [Canada]) and O'Reilly et al. (2008 [Ireland]) found that a significant inverse relationship between socioeconomic position and suicide at area level mostly disappeared after controlling for individual-level characteristics.

Platt et al. (2007) conducted an empirical investigation of the association between social class, socioeconomic deprivation and suicide in Scotland over the period 1989-2002. The study was intended to assess whether findings from Scotland complemented those reported for other countries, in particular the emerging evidence that individual-level social class has greater power in explaining suicide-related inequality than area-level socioeconomic affluence/deprivation. National suicide rates by social class (at death) were computed for males during two time periods (separately): 1989-1995 (based on 1991 census) and 1996-2002 (based on 2001 census). (This analysis was not undertaken for women due to the high proportion of female suicide deaths that were not assigned a substantive social class category. The main reason appears to be non-involvement in the labour market.) The Registrar General's Social Class (SC) was used as the measure of socioeconomic classification (see box 1).

At the individual level there was a marked variation in male suicide rates by social class in 1989-95 and 1996-2002 (Figure 3). Differences between rates in the non-manual groups were not statistically significant. However, there were significant differences between rates in the non-manual groups and SCIIIM, between SCIIIM and SCIV, and between SCIV and SCV. At the area level there was a clear social gradient during both periods, whereby suicide increased with increasing levels of area deprivation (see Figure 4). This gradient was steeper in the later period, indicating that the association between suicide and deprivation became more pronounced over time.

Figure 3: Suicide rates by social class, males, Scotland, 1989-95 and 1996-2002

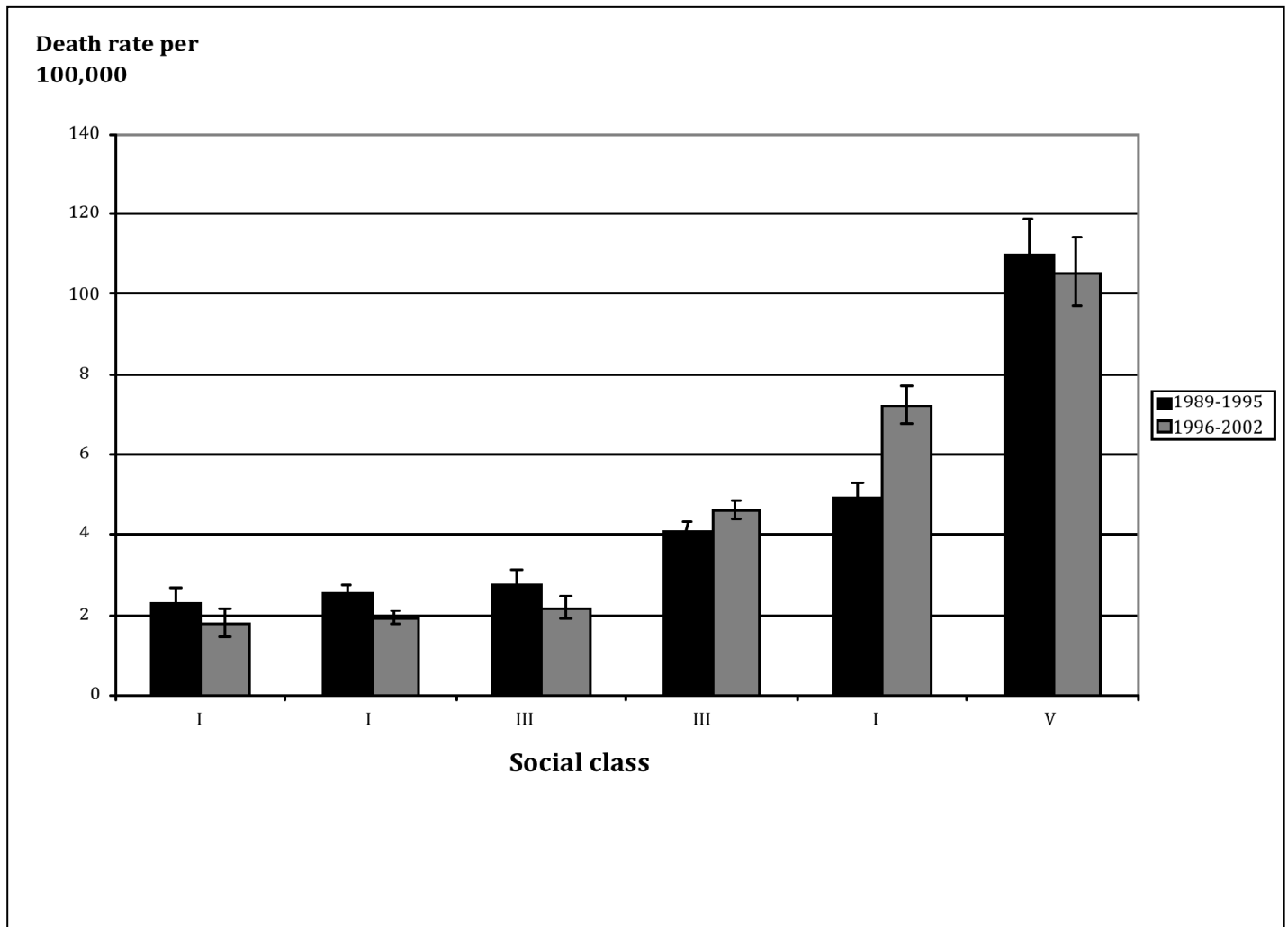
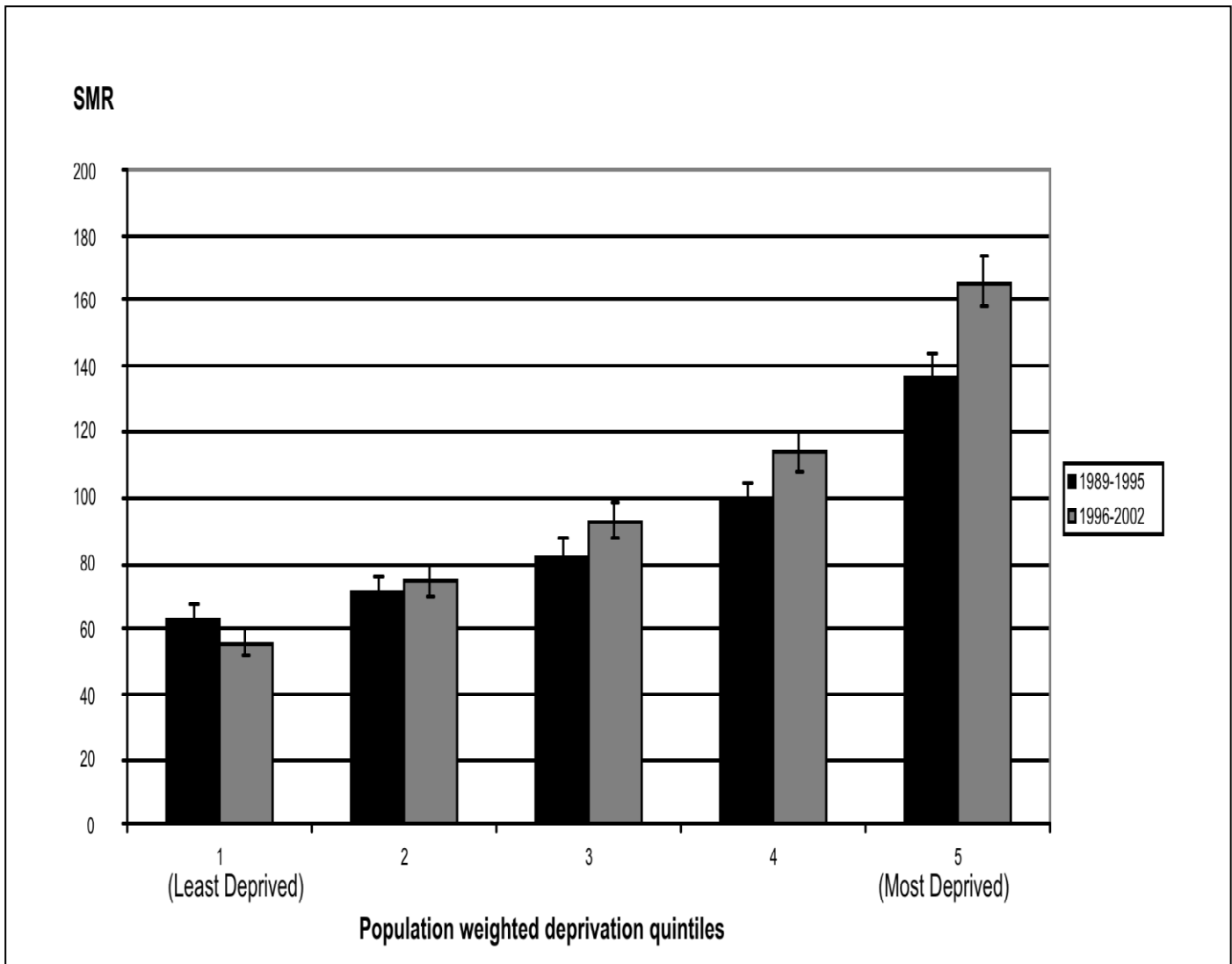
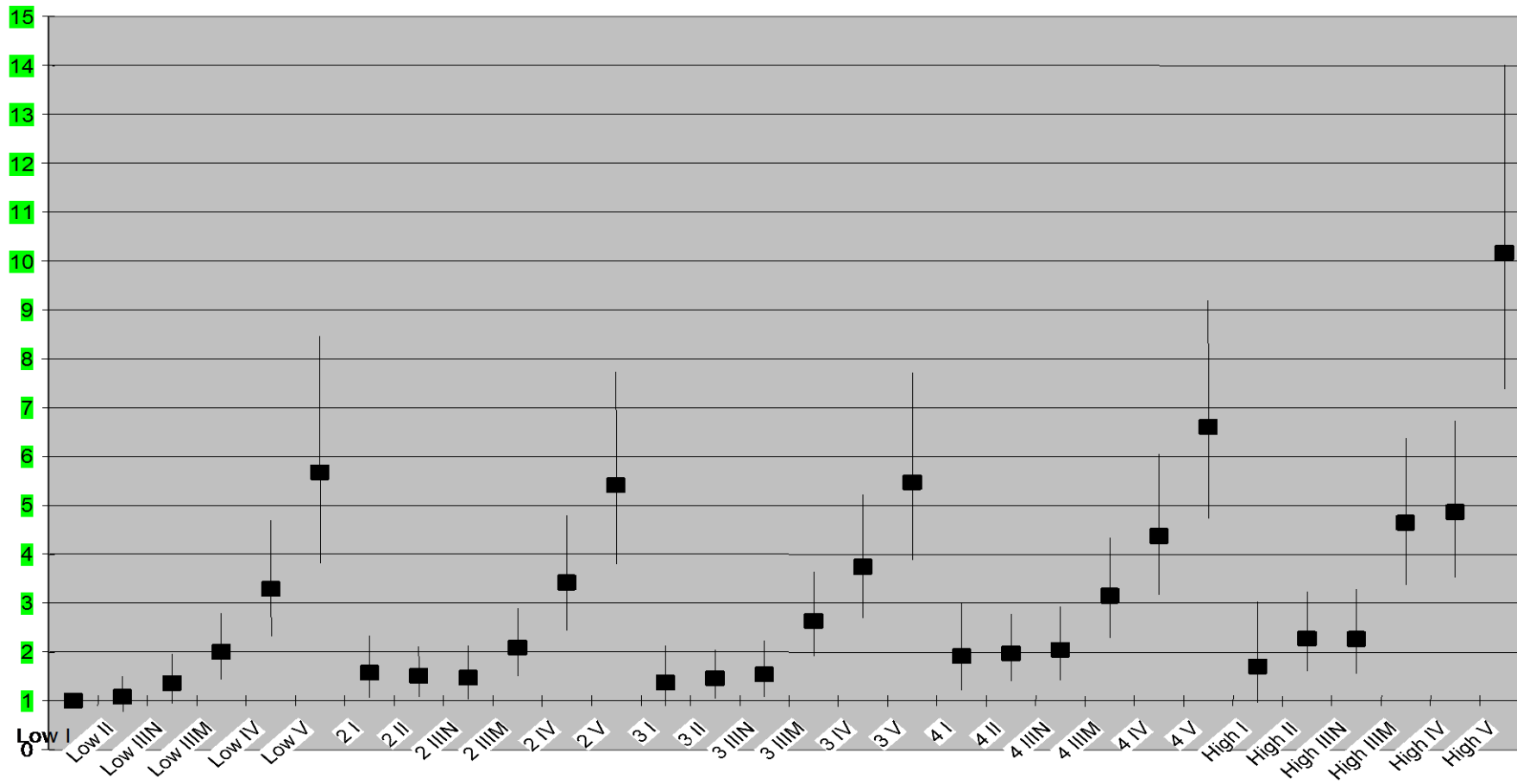


Figure 4: Standardised mortality ratios (SMRs) by population weighted deprivation quintile, all persons, Scotland, 1989-95 and 1996-2002



Further analysis of the relationship between area-level socioeconomic deprivation, individual-level social class position and suicide (see figure 5, which presents RRs for 1989-2002) demonstrated that the compositional effect (the influence of individual social class on suicide rates) was undoubtedly far stronger than the area effect (the influence of the level of socioeconomic deprivation in the locality). An exceptionally high relative risk of suicide among those in the lowest social class living in the most deprived areas was also found: it was approximately 10 times higher than the risk of suicide among those in the highest social class in the most affluent areas. (This finding is suggestive rather than definitive because of the large confidence interval surrounding the central estimate. There is in fact an overlap in confidence intervals between risk ratios for all social class V groups across the deprivation quintiles).

Figure 5: Male suicide rates by deprivation quintile and social class, 1989 - 2002, Scotland: relative risks (multilevel analysis)



Explaining the relationship between socioeconomic disadvantage and suicidal behaviour

The weight of evidence summarised above points to a significant association between socioeconomic disadvantage (across a range of indicators at both individual and area levels), on the one hand, and suicidal behaviour (suicide and self-harm), on the other. How might this association be explained? What is it about low socioeconomic status or residence in an area of socioeconomic deprivation (or, especially, the apparently multiplicative interaction of individual-level and area-level socioeconomic disadvantage) that increases the risk of suicidal behaviour? Boxes 4 and 5 set out some of the possible attributes of low socioeconomic status (individual or composition level) and the local socioeconomically deprived environment (aggregate or contextual level)³, respectively, that might contribute to a raised level of risk.

All these attributes appear to have some plausibility as suicidogenic pathways or mechanisms, acting directly or via a negative impact on mental health and well-being. Crucially, their prevalence is likely to be associated negatively with socioeconomic status: compared to more socioeconomically advantaged individuals, those who are socioeconomically disadvantaged will be more likely to have accumulated adverse experiences through their lifecourse; to feel powerless, stigmatised and disrespected; to be socially excluded; to live in deprived localities; to suffer from mental ill-health; and to have unhealthy lifestyles (box 4). At the area level, localities which are more socioeconomically disadvantaged will be more likely to be disadvantaged in many other domains (see box 5) than localities which are more socioeconomically advantaged. We hypothesise that the increased risk of suicidal behaviour associated with socioeconomic disadvantage arises from the presence and impact of one or more of these mechanisms, and possibly interacting with one another. In order to increase the effectiveness (and cost-effectiveness) of interventions to reduce or prevent suicidal behaviour associated with socioeconomic disadvantage, we need to improve our knowledge and understanding in two important areas: first, identify all possible causal pathways (those listed in boxes 4 and 5 are

³ It should be noted that there are two types of contextual factors: one is a proxy for unavailable or unreliable individual-level data (for example, when neighbourhood level of socioeconomic deprivation is used as a proxy for (unknown) individual-level socioeconomic position of individuals living in the neighbourhood); the other is an indicator of a genuinely group-level construct (for example, when socioeconomic deprivation is used as an indicator of neighbourhood characteristics that may be related to (for example) suicide independently of individual-level socioeconomic position) (Diez-Roux, 2002). It is the latter usage that is highlighted in box 5.

intended to be illustrative rather than exhaustive) and elaborate theoretically on the underlying suicidogenic processes; and, second, identify which mechanisms (at both individual and contextual levels) are most salient in the specific context (geographic and historic) in which suicide prevention strategy and action are being implemented.

**Box 4: Low socioeconomic status: possible pathways to increased risk of suicidal behaviour
(individual level)**

- Accumulated adverse lifecourse experiences (e.g., health, employment, living conditions)
- Powerlessness, stigma and disrespect
- Experiencing other features of social exclusion (e.g., poverty, poor educational attainment)
- Living in socioeconomically deprived area
- Poor physical and mental health
- Unhealthy lifestyles, i.e. smoking
- Social disconnectedness (e.g., loneliness, isolation, poor social support, negative relationships)

Box 5: Socioeconomically deprived localities: possible pathways to increased risk of suicidal behaviour (aggregate/contextual level)

- Physical (e.g., poor housing conditions)
- Cultural (e.g., tolerant attitudes to suicide)
- Political (e.g., adverse local public policy)
- Economic (e.g., lack of job opportunities)
- Social (e.g., weak social capital)
- History (e.g., high incidence of suicidal behaviour)
- Infrastructure (e.g., poor quality, accessibility, acceptability of services)
- Health and well-being (e.g., high prevalence of poor physical and mental health)

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