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Area factors and suicide: 5-year follow-up of the Northern Ireland population

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Background
Suicide rates vary markedly between areas but it is unclear whether this is due to differences in population composition or to contextual factors operating at an area level.

Aims
To determine if area factors are independently related to suicide risk after adjustment for individual and family characteristics.

Method
A 5-year record linkage study was conducted of 1 116 748 non-institutionalised individuals aged 16–74 years, enumerated at the 2001 Northern Ireland census.

Results
The cohort experienced 566 suicides during follow-up. Suicide risks were lowest for women and for those who were married or cohabiting. Indicators of individual and household disadvantage and economic and health status at the time of the census were also strongly related to risk of suicide. The higher rates of suicide in the more deprived and socially fragmented areas disappeared after adjustment for individual and household factors. There was no significant relationship between population density and risk of suicide.

Conclusions
Differences in rates of suicide between areas are predominantly due to population characteristics rather than to area-level factors, which suggests that policies targeted at area-level factors are unlikely to significantly influence suicides rates.

Declaration of interest
None.

Research shows that suicide risk is related to both individual and household characteristics such as age, gender, marital status and socio-economic circumstances: it is less clear whether area of residence constitutes an additional, independent risk. Previous work has demonstrated higher prevalence of social problems, mental disorder and suicidal behaviour in inner cities[1,2] and higher suicide rates in deprived or socially fragmented areas.[3] Whitley *et al* also showed that suicide rates increased most in areas that recorded the largest increases in deprivation or social fragmentation over time.[4] However, such studies cannot determine whether these are area effects (context) or due to the characteristics of the people living in these areas (composition). Such findings need to be confirmed using longitudinal data that include both individual and area characteristics. We report on such a study, based on a 5-year follow-up of the entire Northern Ireland population enumerated in the 2001 census.

Method

In 2006 the Northern Ireland Statistics and Research Agency (NISRA) undertook an exercise to link all those enumerated at the Northern Ireland 2001 census to deaths to residents in the subsequent 5 years. This formed a 5-year longitudinal study of the whole enumerated population, linking 94% of all deaths occurring over this period. Details of the linkage process are described elsewhere.[5] These data were anonymised, held in a safe setting by NISRA and made available to the research team for this study. In keeping with established practice both definite suicides and deaths of undetermined intent were combined to define suicide (ICD–10 codes X60–X84, Y10–Y34, Y87.0),[6] reducing the possible effects of misclassification. The analysis was limited to enumerated individuals aged 16–74 years at the time of the census: this allowed socio-economic factors, which in the 2001 UK census were coded only for those less than 75 years old, to be applied to the whole of the analysis population. A total of 12 055 individuals living in communal establishments (such as nursing or residential homes, hospitals and prisons) were also excluded from the analysis as they would be little influenced by area-level factors. Eight suicides (or 1.4% of all suicides occurring over the study period) were recorded for this excluded group. The resulting cohort available for analysis comprised 1 116 748 individuals.

Individual and household characteristics

All attributes of the cohort members were as described on the census record. Marital status (categorised as married or cohabiting; never married or single; separated or divorced; and widowed) and household size (the number of people of any age living at the address) were included as individual-level measures of social support. Because initial analysis showed excess risk of suicide in single-person households but no difference in risk between households with two or more residents, a binary household size indicator was generated (single-person households, households with two or more people). Socio-economic status was assessed using housing tenure (categorised as owner-occupied, private renting or social renting); car availability (two or more cars, one car or no car) and social class using the National Statistics Socio-economic Classification.[7] These were then combined to derive a single measure of relative material disadvantage comprising eight categories ranked from the least deprived group (professional owner-occupiers with access to at least two cars), to the most deprived (unemployed people living in socially rented accommodation with no car access). Economic activity, known to be independently associated with suicide, was also included.[8–11] The two census questions on self-reported health status were also included: one asked about the presence of a limiting long-term illness and required a 'yes/no' response; the other, on general health in the year preceding the census, offered three responses – 'good', 'fairly good' and 'not good'.

Area characteristics

Three indicators relating to area of residence were derived at census super-output area level (a standard government administrative area, with average population size 1894): material deprivation, population density and social fragmentation. Material deprivation was defined as the proportion in the super-output area in receipt of means-tested social security benefits.[12] Population density was measured as the census population divided by the area, in km^2; this was included as a proxy for the urban–rural character of the area of residence. Following seminal work by Congdon[3] and Whitley *et al*,[4] a measure of social fragmentation was constructed using four census variables: the percentage of people in private rented accommodation; the percentage of the adult population who were unmarried; the percentage of the population aged less than 65 years who were living alone; and the percentage population turnover in the year preceding the census. The fragmentation score was an unweighted sum of the standardised levels of these variables, giving a mean of 0.00 (s.d.=3.27). These areas were then ranked (separately) for each set of area characteristics and split into quintiles containing approximately equal proportions of the population.

Statistical methods

The relationship between cohort characteristics and death due to suicide was investigated using Cox proportional hazards modelling. Likelihood ratio statistics were used to test for differences in hazard rates between categories and trends across categories. Analysis was undertaken in two stages: the first to build a model that best described the individual and household factors associated with increased suicide risk, and the second to determine whether or not the area characteristics contributed to suicide risk independent of these. The Cox proportional hazard model assumes the independence of individual responses, an assumption that might not hold if responses within an area were correlated. Any such clustering within areas could exaggerate the precision with which associations are estimated. Sensitivity analyses were conducted using generalised estimating equation models to account for any within-area clustering.[13] Generalised estimating equation logistic regression population average models were used to make inferences concerning area characteristics.[14] Logistic regression models were used to conduct these sensitivity analyses, both for simplicity and because the estimates from the final Cox proportional hazard model were similar to estimates from a corresponding logistic regression model.

Results

In the 5 years of follow-up 566 deaths were registered as either suicide or of 'undetermined intent': 425 (75.1%) deaths were of men and 75.3% were of people aged less than 55 years at the time of census.

Individual and household-level indicators of suicide risk

Female suicide risk was about a third that of males (hazard ratio (HR)=0.30, 95% CI 0.24–0.37). Table 1 shows the relationship between suicide and individual and household factors. After adjustment for age and gender, those currently married or cohabiting at the time of census showed the lowest risks compared with all other marital status categories, with the excess risk associated with the single/never married and separated/divorced categories being maintained even after inclusion of the other demographic and socio-economic factors. Those living alone were associated with higher suicide risk even after adjustment for age, gender and marital status (HR=1.53, 95% CI 1.18–1.99), although further adjustment for socio-economic and general health status weakened this association considerably (HR=1.28, 95% CI 0.98–1.67; P=0.073).

There was a strong correlation between economic activity and deprivation, so mutual adjustment generally attenuated the effects of each. Among the economic activity categories those who were permanently ill had the highest suicide risks, with a four-fold excess after adjustment for age, gender, marital status and household size (despite constituting only 9.0% of the cohort they accounted for 25.3% of suicides). However, about half of this excess risk was explained by adjustment for disadvantage and health status. People defined as either 'homemakers' (90.6% of whom were female) or 'other economically inactive' had a 60% excess suicide risk when compared with those in employment. After adjustment for age, gender, marital status and household composition, unemployed people had a 68% excess suicide risk when compared with employed people (HR=1.68, 95% CI 1.20–2.35). However, further adjustment for measures of deprivation and baseline health status reduced this to a 28% excess (HR=1.28, 95% CI 0.89–1.84). There was a strong and graded relationship between individual and household deprivation and risk of suicide, although this was somewhat attenuated by the addition of health factors in the modelling. Poorer health status at the time of census, whether measured in terms of long-term illness or general health, was also strongly associated with higher suicide risk. However, when both self-reported health measures were simultaneously included in a model 'general health' remained significant whereas 'limiting long-term illness' became non-significant (likelihood ratio test P<0.05). For reasons of parsimony, therefore, long-term illness was not included in the final presented analysis.

Area-level indicators of suicide risk

Despite the equal distribution of population across quintiles, the more fragmented and deprived areas contributed a disproportionate number of suicides (Table 2). This is reflected in the increasing gradient of HRs in the age- and gender-adjusted models. (Note: when using the logistic regression generalised estimating equation models that allowed adjustment for individual-level covariates and clustering within areas, the area-level estimates of association and corresponding significance levels were little altered from those presented in Table 2 and have not been shown.) After further adjustment for the individual and household factors (marital status, household composition, socio-economic and employment status, and baseline health status) the association between suicide risk and area deprivation and levels of social fragmentation disappeared. Patterns associated with population density appeared slightly more complex: although the model adjusted for age and gender showed some indication of higher risk for those in the least and most densely populated quintiles when compared with the central quintiles, this disappeared in the fully adjusted model, which showed only weak evidence of an effect associated with the least densely populated quintile.

Discussion

With a cohort of more than 1 million community residents, this is one of the largest longitudinal studies of suicide risk undertaken in the UK. It has generally confirmed the known associations between suicide and indicators of isolation and socio-economic disadvantage at both individual and household level. Married or

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cohabiting individuals had the lowest risk, compared with both single/never married and the separated/divorced categories. The analysis suggests that at least some of this excess is due to socio-economic disadvantage. Household composition is a factor that is not usually examined as separate from marital status, and although the increased risk associated with single-person households was non-significant in the fully adjusted model, its importance as an indication of a developing social trend suggests that it should be included in future studies. The non-significant excess risk of suicide among the unemployed requires some explanation: until fairly recently Northern Ireland consistently had the highest rates of unemployment, long-term unemployment and proportions of the working-age population defined as economically inactive of any region of the UK, and in such circumstances, where future employment chances are slim, it is thought that many of those who might otherwise register as unemployed choose to register as economically inactive owing to chronic ill health.[8] This therefore may displace some of the effect of unemployment to those defined as permanently ill. Of the two self-reported morbidity measures, only general health in the previous year was significantly related to suicide risk; limiting long-term illness was not. This may be because long-term illness primarily reflects physical aspects of health status, whereas general health, being a less specific measure, may be more sensitive to psychiatric morbidity.

Area characteristics and comparison with other studies

The study showed that, after controlling for individual and household characteristics, area of residence did not exert an independent influence on suicide risk, suggesting that variation in suicide rates between areas is explained by differences between the types of people living in these areas. This can be seen as contrasting with some findings from recent ecological studies in Great Britain and other high-income countries, and can imply that some shift of emphasis in policy may be appropriate. For example, Congdon, Whitley *et al* and Gunnell *et al* have shown strong associations between rates of suicide and self-harm and levels of deprivation or social fragmentation,[3,4,15] factors that have also

Table 1 Individual and household factors associated with suicide risk in people aged 16–74 years: Cox proportional hazards analysis

Individual and household factors	Proportion of population (number of suicides) % (*n*)	Adjusted for age and gender		Fully adjusted[a]	
		HR (95% CI)	*P*	HR (95% CI)	*P*
Age, years					
16–24	17.2 (97)	1.00 (Reference)	<0.001	1.00 (Reference)	<0.001
25–34	20.0 (119)	1.08 (0.83–1.41)	(<0.019)[b]	0.90 (0.66–1.23)	(<0.001)[b]
35–44	21.0 (144)	1.24 (0.96–1.60)		0.97 (0.70–1.35)	
45–54	17.2 (114)	1.19 (0.91–1.56)		0.82 (0.57–1.17)	
55–64	14.1 (65)	0.85 (0.62–1.16)		0.46 (0.31–0.70)	
65–74	10.6 (27)	0.51 (0.33–0.78)		0.29 (0.16–0.53)	
Gender					
Male	48.5 (425)	1.00 (Reference)	<0.001	1.00 (Reference)	<0.001
Female	51.5 (141)	0.31 (0.26–0.38)		0.30 (0.24–0.37)	
Marital status					
Married/cohabiting	58.8 (254)	1.00 (Reference)	<0.001	1.00 (Reference)	0.006
Single	30.2 (222)	1.96 (1.57–2.44)		1.41 (1.10–1.80)	
Separated/divorced	6.9 (77)	2.89 (2.24–3.74)		1.67 (1.22–2.26)	
Widowed	4.1 (13)	1.52 (0.85–2.72)		1.07 (0.59–1.95)	
Household size					
Two or more persons	89.5 (453)	1.00 (Reference)	<0.001	1.00 (Reference)	0.08
One person	10.5 (113)	2.38 (1.93–2.94)		1.28 (0.98–1.67)	
Economic activity					
Employed	56.2 (254)	1.00 (Reference)	<0.001	1.00 (Reference)	<0.001
Unemployed	4.0 (41)	1.95 (1.40–2.72)		1.28 (0.89–1.84)	
Student	7.8 (25)	0.65 (0.41–1.02)		1.19 (0.17–8.59)	
Retired	11.3 (30)	1.91 (1.16–3.14)		1.38 (0.82–2.33)	
Homemaker	7.5 (36)	2.11 (1.46–3.04)		1.65 (1.12–2.41)	
Permanently ill	9.0 (143)	4.80 (3.88–5.95)		2.44 (1.81–3.29)	
Other economically inactive	4.2 (37)	2.65 (1.89–3.74)		1.63 (1.12–2.38)	
Deprivation category					
Least deprived	14.6 (39)	1.00 (Reference)	<0.001	1.00 (Reference)	<0.001
Second	20.4 (83)	1.57 (1.07–2.29)	(<0.001)[b]	1.31 (0.89–1.92)	(<0.001)[b]
Third	21.6 (94)	1.71 (1.17–2.49)		1.30 (0.89–1.90)	
Fourth	19.6 (117)	2.46 (1.71–3.53)		1.67 (1.15–2.43)	
Fifth	8.4 (55)	2.92 (1.93–4.41)		1.50 (0.97–2.32)	
Sixth	6.8 (62)	3.98 (2.66–5.95)		1.81 (1.17–2.78)	
Seventh	6.7 (67)	4.62 (3.11–6.89)		1.85 (1.19–2.86)	
Most deprived	1.9 (25)	5.68 (3.43–9.40)		1.92 (1.08–3.39)	
General health					
Good	66.9 (272)	1.00 (Reference)	<0.001	1.00 (Reference)	<0.001
Fair	21.3 (144)	2.17 (1.77–2.66)	(<0.001)[b]	1.62 (1.30–2.07)	(<0.001)[b]
Not good	11.8 (140)	3.98 (3.21–4.93)		1.86 (1.39–2.49)	

HR, hazard ratio.
a. Adjusted for other variables in table.
b. Value for test of linear trend across categories.

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Table 2 Area measures and risk of suicide

Area measures (in fifths)	Proportion of population (number of suicides) % (*n*)	Adjusted for age and gender		Fully adjusted[a]	
		HR (95% CI)	*P*	HR (95% CI)	*P*
Area deprivation					
Least deprived	20.5 (86)	1.00 (Reference)	<0.001	1.00 (Reference)	0.40
Second	20.5 (92)	1.08 (0.81–1.48)		0.88 (0.65–1.19)	
Third	20.0 (118)	1.45 (1.09–1.90)		1.01 (0.76–1.36)	
Fourth	19.9 (132)	1.63 (1.25–2.14)		0.97 (0.72–1.29)	
Most deprived	19.1 (138)	1.79 (1.37–2.34)		0.80 (0.59–1.09)	
Probability for trend			<0.001		0.29
Social fragmentation					
Least fragmented	20.6 (99)	1.00 (Reference)	0.021	1.00 (Reference)	0.54
Second	20.3 (99)	1.06 (0.80–1.39)		0.86 (0.65–1.15)	
Third	20.0 (120)	1.27 (0.97–1.65)		0.97 (0.73–1.28)	
Fourth	19.8 (116)	1.26 (0.97–1.65)		0.81 (0.61–1.08)	
Most fragmented	19.3 (132)	1.49 (1.17–1.93)		0.85 (0.64–1.13)	
Probability for trend			<0.001		0.26
Population density					
Least dense	19.9 (124)	1.00 (Reference)	0.25	1.00 (Reference)	0.49
Second	20.2 (97)	0.82 (0.63–1.06)		0.81 (0.62–1.07)	
Third	20.1 (104)	0.86 (0.66–1.12)		0.84 (0.65–1.10)	
Fourth	20.1 (120)	1.01 (0.78–1.29)		0.92 (0.72–1.20)	
Most dense	19.7 (121)	1.05 (0.82–1.35)		0.83 (0.64–1.08)	
Probability for trend			0.31		0.07

HR, hazard ratio.
a. Deprivation and social fragmentation adjusted for age, gender, marital status, economic position, household size, and deprivation and health status. Population density adjusted for age, gender, marital status, economic position, social class, health status and household size; household tenure and car availability not included as these have been shown to have different relationships to disadvantage in urban and rural areas.[39]

been associated by Allardyce *et al* with increased rates of admission for first episodes of psychosis in Scotland.[16] In the USA, Almog *et al* and Curtis *et al* have demonstrated higher rates of admission to psychiatric hospitals in New York from areas that were more deprived or that had higher levels of social fragmentation,[17,18] and Hempstead showed that suicides in New Jersey tended to be higher in areas characterised by low population density and a higher proportion of single-person families, whereas non-fatal injuries were more closely related to indicators of deprivation.[19] Fernquist & Cutright showed that rates of suicide in 21 high-income countries throughout the world were strongly associated with a range of indicators of societal integration.[20] However, ecological studies cannot determine if the variation between areas is due to concentrations of at-risk individuals in these areas. To do this requires studies that can examine the influence of area-level factors while simultaneously adjusting for individual-level factors. There have been relatively few such studies to date and none in the UK that has examined suicide. Reijneveld & Schene in a secondary analysis of Amsterdam residents showed that the higher prevalence of mental disorders (as assessed by the 12-item General Health Questionnaire) in deprived areas was explained by the higher concentration of deprived people in these areas,[21] and an analysis of the British Household Panel Study reported only a weak association between aggregate measures of deprivation and measures of mental health (also assessed using the General Health Questionnaire) after adjustment for individual measures.[22] On the other hand, an analysis of Welsh Health Survey data by Skapinakis *et al* found a significant, if small, regional effect on mental health (measured using the mental health index of the 36-item Short Form Health Survey), explaining less than 1% of the total variance.[24]

To date there has been no other longitudinal study in the UK that has included both individual and area characteristics and that has had suicide as the end point. Hawton *et al* followed up patients in an ecological study relating rates of self-harm with deprivation and social fragmentation in Oxford to show that their characteristics were generally in keeping with those of the areas in which they lived,[24] and Johnston *et al*, in a prospective analysis of self-harm in Manchester, showed that there was no association between area-level indicators of deprivation or social fragmentation and the risk of repetition of self-harm after adjustment for individual factors.[25] It is difficult, however, to extrapolate from these studies, because it is recognised that the epidemiologies of self-harm and suicide are quite distinct.[19] There have been two nested case–control studies based on the Danish longitudinal registries that looked at variations in suicide risk between areas while adjusting for individual factors. The first showed a higher suicide risk in urban areas among women but a lower risk for men, i.e. that the area characteristics had different effects on different subgroups of the population.[26] The second study showed that the increased risk of suicide in poorer areas was greatly attenuated by controlling for differences in the people within these areas, and the study's authors concluded that the ecological associations were primarily due to the proportions of high-risk individuals living in particular areas.[27] Martikainen *et al*, in a large study of 13 589 suicides in Finland between 1991 and 2002, found that although the area effects were greatly reduced by adjustment for individual factors, they remained significant and were more important for men than for women and for alcohol-related rather than for non-alcohol-related suicides.[28]

Methodological issues

This study has some methodological considerations that require comment. The initial cohort was large enough to allow sufficient events to accrue in a relatively short time, reducing the likelihood that the attributes of cohort members would change over the follow-up period. Other studies have had to aggregate up to 10 or more years of data to obtain numbers of events sufficient to analyse.[29] Excluding people resident in communal establishments from the analysis would also have increased the chances of demonstrating a significant area-level effect if one truly existed. On the other hand, our study was not sufficiently large to confidently examine variation by age and gender, and although we

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formally tested and found no significant interaction between these and the area factors, the study lacked sufficient power for us to be confident that none truly existed.

Although the study was based on data from the 2001 census and the General Registrar's mortality records, 6.0% of all deaths could not be linked to a census record. This can arise if either the dead person was not enumerated or difficulties arise in matching death records to corresponding census forms. Although not often reported, this is a limitation on all record linkage studies, with the notable exception of those in Scandinavian countries where universal population registration systems are the norm and an almost 100% linkage is regularly achieved. It is not clear whether the non-linkage of this small proportion of deaths leads to bias (or its directionality), as separate analysis has shown the phenomenon to be more common in young adults (especially males), the unmarried and those living in the most deprived areas.[5] Weich & Lewis have suggested that this might explain the generally weaker relationship between poverty and mental ill health found in longitudinal studies compared with cross-sectional studies.[30] The area-level unit of analysis can be another significant source of variation and it is recognised that there can be difficulty in choosing an appropriate geographical unit to define community or neighbourhood, neither of which are likely to equate to routine administrative areas such as electoral wards.[22] Additionally, in studies in which a significant area effect has been demonstrated, the effect sizes have been small,[23] and may vary according to the size of the selected area unit. Kunce & Anderson, discussing the 'contrariness' in the findings of ecological studies related to suicides, suggest that studies employing large aggregates of the population tend to bolster contextual influences on suicide,[31] whereas data gathered on smaller aggregates yield little or weakened support for Durkheim's societal factors.[32] The area-level indicators included in our study were derived from census super-output areas, smaller than either the London electoral wards used by Congdon or the 633 parliamentary constituents across Britain used by Whitley *et al*.[3,4] This was considered appropriate, on the assumption that the smaller the population encompassed by an area the more homogeneous it is likely to be.

Finally, research related to area-level effects on health is dependent on the measures of deprivation and fragmentation. As Congdon has stated,[33] deprivation measures should ideally include income and indicators of fragmentation should include measures of community ties, but in practice we are generally limited to data available from the census. It is possible that the measures of social fragmentation or deprivation, which worked so well in the ecological studies in Great Britain, are not so applicable in Northern Ireland, which contains only one city of note (Belfast) and is more rural in comparison with the rest of the UK. However, a comparison of the constituent elements of the fragmentation measure at the time of the census showed a significant difference only for population turnover (Northern Ireland 9.3%, England & Wales 12.2%),[34,35] and ecological studies in Northern Ireland[36] have replicated the associations between deprivation and health found in equivalent studies in the rest of the UK.[37,38]

Policy implications

Most ecological studies have found a strong link between area factors and mental health and risk of suicide, and have concluded that appropriate health-promoting and protection measures should be directed towards areas at risk as well as towards individuals at risk. However, the conclusions from studies such as this, which control for both individual and area-level factors, are that most – if not all – of the variation between areas arises because of differences between the populations within these areas. This suggests that policies targeted at area-level factors are unlikely to have a material impact on suicide rates.

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Word pictures of depression: tearfulness

Sharon McConville

Shortly after my admission to hospital, I wrote:

'Today, tears came. They poured out of me, not like little wavelets brimming over the edge of an overfilled swimming pool, but in a great gush, as if the reservoir of emotion and despair which is my soul had swelled to burst its dams. Deep, guttural sobs racked my body. I was in the foyer of the cancer centre when it happened. It was the sight of [. . .] walking towards me with open arms, ready to enfold me in a warm embrace, which precipitated the flow. As I buried my head in her soft coat collar, her lips kissed my hair. She supported me as we walked towards two adjacent chairs, where we sat down, wrapped in one another's arms, me crying uncontrollably; she stroking my head. I was aware of seemingly hundreds of pairs of eyes fixed upon me. In a sense, it was heartening to know that such a sight is not uncommon in the cancer centre. I have seen many people crying there before myself. However as people around me whispered; ''That poor girl. She must have lost somebody,'' or ''She must be ill. Look how thin she is. Maybe she's had bad news,'' I felt a pang of guilt. After all, I was only depressed. Then I realised – dare I say it – that I honestly believed that a death or diagnosis of cancer would actually have been easier to deal with.

I continued to cry all afternoon. I cried in the nurses' station, surrounded by staff, including a rather bemused-looking dietitian who had come to see me and whom I later realised had actually been at school with me, albeit a couple of years ahead. I cried in the interview room, as I waited to speak to this dietitian, who ultimately decided to defer the discussion until a later date. I cried in the dormitory, where I desperately tried to collect myself by sipping at a cup of herbal tea which one of the nurses had prepared for me. I cried in the day room as soon as [. . .] appeared to visit me. I cried in the office belonging to [my lead nurse] when he decided that we needed to have a chat later in the afternoon. I cried in my bed. I cried in the corridor. I cried in the toilet. I finished up exhausted and suffering from frightening palpitations. My eyes were burning, the lids rasping against them like sandpaper, and my head was pounding. At the same time, I felt some measure of relief: a relief akin to that experienced by a gentleman with prostatism whose bladder has just been catheterised, or that felt when a swollen, engorged boil is lanced and the pus can drain freely from it.

Aside from relief, however, I felt something else. It was as if something momentous had happened to me. I felt as I had been suddenly stripped, my vulnerability laid bare. I imagined myself as one of those plasticated bodies in the anatomy exhibition which has recently caused such controversy in the media, my skin peeled back to expose my raw flesh and sinews. It was a scary, dizzying sort of a feeling. I was unsure quite what it meant.'

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