Comparing the Impact of Early and Later Life Exposure to Disadvantage on Self-Assessed Health in Ireland

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Abstract

In this paper, we use data from a representative sample of Irish people to investigate inequalities in self-assessed health and examine, for the first time in Ireland, the degree to which these inequalities can be accounted for by processes occurring over the life-course. Research in a number of countries has now shown that early life exposure to socio-economic disadvantage and deprivation can impact on adult health, although the exact process through which this effect occurs is disputed. In this paper we use detailed information on socio-economic circumstances during childhood, current material circumstances, levels of social support and differential health behaviours to investigate whether socio-economic disadvantage in childhood or adverse circumstances in adulthood are better predictors of adult health status. We find that disadvantage in childhood is the best predictor of adult health status and that there is a direct effect from childhood circumstances to adult health controlling for educational attainment and adult position and circumstances. Overall we find that around 14% of class inequality in health status stems from childhood exposure, but also that using a different model estimation method from previous papers, that past results in other countries may actually have over-estimated the role of childhood circumstances in social class differentials in adult health status. Evidence from the paper also suggests that childhood disadvantage plays a larger role in forming adult inequalities in health in Ireland than it does in other countries.

1. *Introduction*

There is now ample evidence that Ireland, like other European nations has substantial socio-economic inequalities in both mortality and morbidity[1 2 3 4]. Evidence shows that in both Northern Ireland and the Republic, those in an unskilled manual social class have a standardised mortality rate over 130% higher than those in professional or managerial positions[2] and that the unskilled have a 275% greater risk of having a chronic illness than those in professional and managerial positions[4]. Almost no research in Ireland has sought to explain these variations in current health status and the little that has been published[4 5] has been confined to analyses of adult socio-economic position and the impact of current material and psycho-social circumstances. In contrast, research in Britain and elsewhere has increasingly adopted a life course approach to the explanation of adult inequalities in health and mortality with research examining causal paths to adult health beginning in the womb[6 7] or even earlier[8]. This research has utilised sophisticated data sources such as cohort studies [9 10] which have allowed researchers to control for exposures at different points in the life-course when assessing their impact on adult inequalities in health. However, even in this research there has been little attempt to decompose the impact of exposures at different points in the life course and quantify their relative importance.

In this paper we use recent data for Ireland to explore the effects of different groups of determinants on health outcomes in adulthood as measured by self-assessed health (SAH). We evaluate the impact of different types of explanations by developing groups of variables to measure different 'domains' of health determinants including disadvantage in early life, current material circumstances, social support and health behaviours. We then use these to test the relative impact of different domains on inequalities in SAH between social class groups and also quantify which domains explain the greatest variance in SAH. Using these findings we can then establish which domains are most important in determining present health and draw implications from this as to the most effective areas in which intervention should take place.

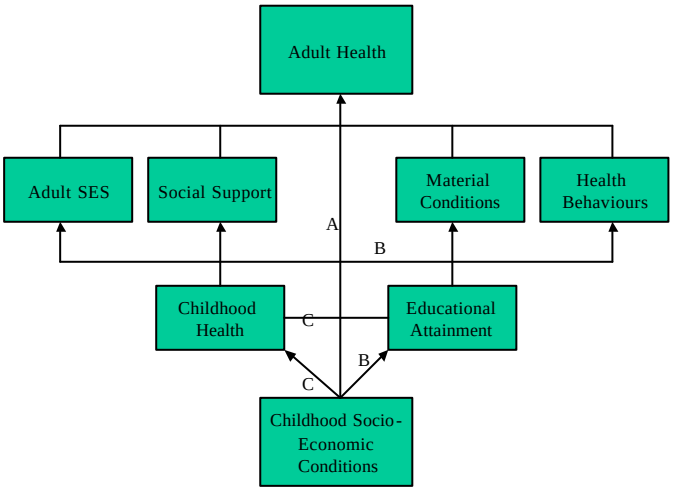
2. *The Transmission of Social and Biological Risk Across the Life Course*

Substantial differentials in premature mortality have been documented for centuries, but the social, economic and medical developments of the second half of the twentieth century led many to move away from social policy as the primary instrument of improving population health. Instead, the focus increasingly fell on how health could be improved through health promotion and the prevention of degenerative diseases [11]. Research duly investigated the extent of behavioural differences between social groups, but research found that differences in behaviour actually only accounted for a small proportion of the differences between social groups in health outcomes and mortality. For example, in what is now a classic study among British civil servants [12] health damaging behaviours did indeed vary inversely to grade, but results showed that differences in smoking, blood pressure, obesity and exercise accounted for only a minority of the differences in mortality from heart disease between those in different grades. By the late 1970s, the search for the other factors involved in disease aetiology and the inequality between social groups turned increasingly toward the

social and economic environment. Perhaps the defining moment in this change in focus was the publication of the Black report [13] which showed substantial inequalities in mortality between social class groups and moreover, directly attributed these inequalities to differences in material living standards, discounting the impact of behaviour and lifestyle or the impact of selection and statistical artefacts.

Since the Black Report was published almost a quarter of a century ago now, there has been a vast amount of research confirming, critiquing, and developing the original finding that there were substantial inequalities in health between social class groups. Research has shown that inequalities in health and mortality can be found across a number of socio-economic indicators and that the effect is very subtly graduated with differences in outcomes even between those near the top of the distribution [14 15 16]. Yet, even after two decades of research the mechanisms through which exposures to disadvantage lead to disease are still not fully understood [17]. Perhaps the most important development in understanding health inequalities has been the adoption of a life-course perspective which studies the importance of exposure to different determinants of ill health and mortality at different points in life [17 18 19]. Figure 1 gives a graphical representation of the life-course approach and the causal paths that have been suggested. This shows several paths through which adult health is determined, with the main determinants divided between childhood and adulthood. However, as Figure 1 shows, it is difficult to attribute a casual role to childhood factors in the aetiology of later disease as initial conditions can be linked to later socio-economic and environmental exposure through complex selection mechanisms that may well confound the relationship. This makes it difficult to establish whether neo-natal and childhood conditions contribute independently to adult socio-economic inequalities.

Figure 1: Life Course Pathways to Adult Health



It could be that the relationship between childhood conditions and adult health is fairly direct (path A in Figure 1) with both adult illness and adult socio-economic status directly influenced by the socio-economic status of the family of origin and childhood illness [20]. Children from lower socio-economic positions are more likely to have ill health and reach less privileged positions in later life, and as adult health is

correlated with childhood health, the route of transmission may be fairly direct. For example, social mobility research [21] [22] has shown that social origins are highly correlated with adult social class and Barker and colleagues [23] [6] [7] have investigated the possible 'programming' of later adult health in the intra-uterine period or during early infancy and Forsdahl [24] has suggested an interaction between poverty and adolescence and later affluence.

On the other hand, the link between adult health and social position may be less direct with childhood conditions resulting in what Lundberg [25] has referred to as 'unhealthy life careers'. From this perspective, childhood disadvantage can be described in terms of 'social programming' (path B in Figure 1) with childhood environment influencing educational achievement, this impacting on occupational attainment, social class and thus causing other disadvantages and these factors then related to inequality in health in adulthood. This indirect link may act through a number of mechanisms such as learned health behaviours, adult material circumstances, or lack of social support.

Of course there could be a process which is intermediate between the two just mentioned (path C in Figure 1) whereby child hood conditions make child hood ill health more likely and this ill health then impacts on educational and occupational attainment (say by missing crucial examinations and transitions). Lower educational attainment may impact on health behaviours and preferences and lower occupational attainment may impact on income in adulthood and levels of deprivation and poverty[1].

In adulthood a number of different domains have been shown to impact on SAH and particularly inequalities in SAH, although it should be said that the exact mechanism through which these effects occur is often unclear. The Black report stated a preference for materialist explanations of inequalities in mortality between social classes and it has been shown repeatedly that a large number of disadvantages cluster around less advantaged social class positions which are related to their material experience such as occupational hazards 26, poor housing [27] [28], unemployment [29] [30], poor diet [31] [32] and insecurity [33] [34].

Social support has been identified across a number of different national contexts as being an important influence on health status. This influence may come directly via the generalised effect that supportive social relationships have on well-being [35] [36], but may also come indirectly either through the ameliorating effect of support and assistance during difficult events or via the influence that social networks have on material circumstances. For example, social networks may influence the occupational status that an individual achieves [37] and also their probability of unemployment [38].

It is clear then that there are a number of domains which are said to impact on health outcomes. In this paper we will be selecting four of the main domains and examining the extent to which current health status and inequalities in this status between social class groups can be said to stem from this domain. The four domains we select are: heath behaviours, disadvantage in early life, current material circumstances and their

[1] So far I have not mentioned selection in adulthood as a mechanism, i.e. where ill health in adulthood leads to lower socio-economic position, but this relationship has been studied in depth and shown to not account for the difference in health status and mortality risk of different social classes [65].

psycho-social impact and social support. From the discussion above we can discern three main questions:

- The first is the important question of the relative importance of different domains, and particularly the impact of early life as opposed to later disadvantage on health status. Is early life exposure to disadvantage and deprivation more important than later exposure?

- Second, are the adverse health affects of this early life exposure independent of later exposures?

- Thirdly, can exposures at different points in the life-course be seen as cumulative? Although without true longitudinal data we cannot assess the full independent effect of earlier rather than later disadvantages, if after controlling for later effects earlier disadvantage remains significant, this will be evidence of the importance of this domain.

As in a number of other papers [39] [10] [9] we will be measuring the impact of different domains on social class inequalities in self-assessed health (SAH) in Ireland by estimating log odds ratios for each class both before and after controlling for the domain of interest whilst also controlling for factors that may confound the relationship. This will be the first time that such analyses have been carried out for Ireland and we will be able to compare results to similar analyses carried out in Great Britain and the Netherlands. However, unlike previous analyses in other countries, here we will also be decomposing the impact of different domains on total SAH using nested models which allow us to quantify the independent affect of each domain, plus the amount of explained variance that it shares with other domains.

3. Data

The data used for this paper come from the 2000 wave of the Living in Ireland Panel Survey (LII), the survey upon which the European Community Household Panel Survey is based in Ireland. The 2000 wave of the LII survey was the seventh wave of a panel survey which began in 1994 (the LII survey is the Irish component of the European Community Household Panel Survey although in LII form it contains a greater range of variables, some of which are extremely important to this paper). From the outset the LII survey was designed to yield information on a large range of socio-economic variables including very detailed information on all household income sources and the labour market status of all adult individuals. Importantly for this paper it also included a range of other information on the social background of individuals, their educational level, household deprivation and individual health status.

The original sample of 9905 individuals in 4048 households in 1994 was achieved using a two-stage clustered sample drawn from the Register of Electors using the ESRI's RANSAM software (for more details see [40]. Over time this sample was reduced due to attrition thus in 2000 the original sample was supplemented with 1500 new households giving a total sample of 8055 individuals in 3467 households with a response rate of 69%. Sample weights were applied to the sample of households and individuals for all analyses to compensate for sample error stemming from the sampling frame, differential response and attrition. A complex weighting

procedure based upon a large number of variables was used to construct weights for individuals and households based on the patterns found in external sources.

4. Variables and Measures

As already suggested the 2000 LII survey contains a large range of variables, a number of which are important for our analyses here. First and foremost we require a measure of health status and in this paper we use a measure of self-assessed health based on the question: "In general, how good would you say your health is?" with the response categories very good, good, fair, bad and very bad. Although a very simple measure, this question is a useful proxy measure for morbidity and has been shown to have a high degree of construct validity and test-retest reliability [41] as well as having strong correlations with more extensive measures such as the SF-36 [42] and the Sickness Impact Profile [43]. In previous research with this type of measure, the outcome categories tend to be dichotomised so, for instance, a model can estimate the odds ratio of having 'less than good health' or 'less than fair health'. Unfortunately, choosing different thresholds for this dichotomisation can alter the extent of inequalities found [44] and so offers a shifting platform upon which to compare the impact of other factors, particularly in cross-national research. Instead we use an ordered logit model which allows us to estimate the impact of each variable on the odds of being at or above each outcome level of SAH from very good to very bad. This model assumes that the slope of the effect is common across each level of the dependent variable but this is not a difficult assumption in this instance. Unfortunately however, using the ordered logit model does make comparisons with results outside of Ireland more difficult, although we can get an approximate idea of the extent of difference.

As well as a health outcome measure, we also require a measure of social class. For social class we use the LII data to construct a 12 category Erikson/Goldthorpe (EG or EGP) social class schema. There is still considerable debate about the appropriate social class measure, but research shows that theoretically informed measures such as the EG schema have a stronger underlying conceptual basis [45]. The EG schema we use is that used in the CASMIN social mobility project [22] which differentiates between a higher and lower service class, higher and lower Routine Non-Manual classes, self-employed with and without employees, Technical and Supervisory workers, Skilled Manual Workers, Semi-Skilled Manual Workers, Unskilled Manual Workers, Agricultural labourers and lastly, Farmers.

Before we can assess the impact of different sets of factors, we will first need to control for other influences that may confound the relationship. We use a number of variables within a 'base' model to control for these influences including age, sex., urban/rural location, employment status, months unemployed in the last two years, presence of chronic illness and degree of disablement and lastly, the highest educational qualification of the person. Age is strongly related to self-assessed health and is represented here with ten five year age groups. Rural/urban location is represented by a three level variable ranging from rural area or village to larger town or city. Employment status and particularly unemployment are strongly related to health [46] and this is represented in the base model by four categories: employed, self-employed, unemployed and inactive. Since the length of unemployment is itself related to health outcomes [47] [48] we also control for the number of months unemployed

in the last two years. The presence of a chronic illness will have a substantial impact on self-assessed health and although the probability of a chronic illness is itself correlated with social class, we still need to separate the impact of this variable from other factors. For example, chronic illness and particularly the degree to which it impacts on mobility will impact on extent of social participation, risk of unemployment or inactivity and level of occupation. For education measure we use a four level variable representing the highest qualification at the time of interview ranging from having no qualifications to tertiary education via lower and higher secondary education.

To measure different dimensions of disadvantage and disadvantage at different points in the life course we adopt a number of measures:

Early Life

To measure early life disadvantage we combine a number of different measures. First we construct a measure of the social class position of 'the main breadwinner' in the respondent's household 'when they were growing up'. For consistency we once again adopt the EG classification in a six category format. In addition we also use a four category measure of the educational status of the 'main breadwinner' when the respondent was growing up. These two measures allow us to assess the relative socio-economic disadvantage of the origin household, but we also use two other measures of hardship during childhood – one direct and the other indirect. The direct measure is a question asking 'would you say that your family was unable to manage financially compared to other families…when you were growing up?' with six response categories from 'with great difficulty' to 'very easily'. The indirect measure is a measure of the respondent's current height in metres. This has been shown to be a marker of child health and development [32] and of childhood socio-economic conditions [49] and here is dichotomised between those who are more than one standard deviation below sex specific average height and all others (1.69m for men and 1.57m for women).

Present Material Conditions

Our measure of current material living standards combines a number of variables chosen to measure both the current resources available to the individual (as part of a household) and the extent of lifestyle deprivation. To measure current resources we use current weekly disposable household income. Choosing household income assumes that individuals within households are pooling their resources and that individuals share a given standard of living and evidence suggests that, in general, this is the case [50]. Since a given household income may support a different number of individuals that may differ in their level of need, we 'equivalise' the income measure using the 'modified' OECD equivalence scale which weights the first adult (aged over thirteen) by 1 and all remaining adults by 0.5 and all children by 0.3. The natural log of equivalised household weekly disposable income is than allocated to all household members.

We measure current lifestyle deprivation using three measures. The first is an index of 'basic' deprivation and the second an index of 'secondary' deprivation. These indices measure whether a household has a particular item or service and if not, whether this

is because they could not afford them. They are thus measures of 'enforced' deprivation where the influence of preference and choice have been removed and where designed to be used as two distinct indices of underlying 'generalised lifestyle deprivation' [51 2 53 54]. Although a priori one would expect that current lifestyle deprivation would be highly correlated with current income, research shows [55] that the overlap between the two is rather modest and that deprivation measures are far more strongly related to longer-term structural disadvantage. 'Basic deprivation is an eight item scale which measures enforced lack of items including 'a substantial meal' or 'adequate heating' in the last week or items such as a 'warm, waterproof overcoat'. 'Secondary' deprivation is an eight item scale that refers to the absence of more lifestyle items such as being able to afford an evening or meal out in the last two weeks, or 'presents for friends or family once a year'.

The last measure of deprivation that we use is a six item scale that refers to the quality of housing that the person lives in and whether there are problems with this such as there not being enough space, inadequate heating, a leaking roof or damp and rot as well as there being pollution in the local area. Research has shown that damp housing is related to frequent respiratory tract infections, particularly in childhood [56 57], but poorly built and insulated housing has also been implicated in acute morbidity and mortality from ischaemic heart disease [58 59].

Social Support

To measure social support we use four variables relating to patterns of association or attendance at religious services. Of the measures of association, the first asks whether the person is a member of a club or organisation, the second the frequency with which they talk to neighbours and the third how often they meet others outside of their household face-to-face. The fourth variable measures how often the person attends religious services (apart from weddings, funerals and Christenings) with responses ranging from 'more than once a week' to 'never or practically never' along a seven-point scale.

Health Behaviours

Health behaviours are a very important influence of health status. Here we use two variables as proxies of the respondent's health behaviours: a measure of the extent of cigarette smoking in the present or past and a grouped Body-Mass index (BMI – kg/m^2). Smoking is obviously a strong negative influence on health and the risk to health increases with regular smoking, thus here we measure smoking using a five category variable: current regular smoke, current occasional smoker, past regular smoker, past occasional smoker, never smoked. The BMI index is a useful indicator of general diet and level of exercise with being overweight and particularly being obese correlated with a range of health problems such as diabetes, ischaemic heart disease and stroke. Our BMI measure is divided into underweight (BMI<20 for men and 18.7 for women), normal (BMI 20-25 for men and 18.7-23.8 for women), overweight (BMI 25-30 for men and 23.8-28.6 for women) and obese (BMI 30+ for men and >28.6 for women).

5. *Results*

Descriptive Analyses

As discussed in the first section, there is now ample evidence from a large number of studies that Ireland, in common with all other OECD countries has substantial inequalities in both morbidity and mortality between different social and economic groups. Inequalities in health have emerged when using a wide range of socio-economic measures, thus before we focus solely on explaining inequalities in self-assessed health using social class we should first get a descriptive picture of the extent of inequalities using different measures and confirm this relationship.

Table 1: Distribution of Self-Assessed Health by Education, Social Class and Equivalised Income Quintile

	V.Bad	Bad	Fair	Good	V.Good
Highest Education					
No Qualifications	1.3	7.0	31.8	37.5	22.4
Lower Secondary	0.5	1.9	13.7	38.7	45.2
Leaving Level	0.2	1.3	8.4	36.6	53.5
Tertiary	0.1	.8	7.4	31.8	60.0
Household Social Class					
Service	0.1	1.2	9.5	32.3	56.9
Routine Non-Manual	0.9	2.6	14.4	38.2	44.0
Petty-Bourg	0.2	2.1	13.0	38.4	46.3
Farmers	0.9	3.1	23.9	42.2	29.8
Technical/Sup/Skilled Manual	0.8	2.5	16.6	37.8	42.4
Semi & Unskilled Manual	0.6	5.1	20.8	38.0	35.4
Equivalised Income Decile					
Lowest	1.3	5.5	27.6	39.4	26.2
2nd	0.5	3.5	16.0	36.6	43.4
3rd	0.3	1.3	14.1	37.0	47.3
4th	0.3	1.6	8.1	35.4	54.6
Highest	0.1	1.4	9.1	32.8	56.6

Although health will vary systematically across a range of indicators of advantage and disadvantage, analytically we can think of most indicators as the 'downstream', or outcome of a range of processes related to a persons present and past socio-economic status, or that of the person in their household who determined their standard of living. Socio-economic status is commonly thought of as the confluence of one's education, social class position and income and this is exactly what underlies many of the scales of occupational prestige and socio-economic position [60]. We will be looking in more detail specifically at social class in a moment, but Table 1 shows the relationship between our self-assessed measure of health and education, social class and income. For these descriptive analyses we adopt a more aggregated social class measure which differentiates between six classes: service, routine non-manual, self-employed groups (petty-bourgeois), farmers, technical, supervisory and skilled manual, semi and unskilled manual (which also includes agricultural labourers.

Table 2: Mean and Standard Deviation of Self-Assessed Health by Education, Social Class and Equivalised Income Quintile Controlling for Sex and Age

	All		Men		Women		Age <35		Age 35-54		Age 55+	
Highest Education	mean	Std	mean	Std	mean	Std	mean	Std	mean	Std	mean	Std
No Qualifications	3.73	(.93)	3.75	(.94)	3.71	(.92)	4.29	(.87)	3.98	(.84)	3.55	(.92)
Lower Secondary	4.26	(.80)	4.31	(.78)	4.20	(.83)	4.46	(.71)	4.22	(.81)	3.95	(.84)
Leaving Level	4.42	(.72)	4.41	(.72)	4.42	(.71)	4.54	(.64)	4.41	(.69)	4.02	(.89)
Tertiary	4.51	(.67)	4.55	(.66)	4.48	(.68)	4.62	(.59)	4.46	(.69)	4.28	(.80)
Household Social Class												
Service	4.45	(.72)	4.47	(.69)	4.42	(.75)	4.60	(.62)	4.44	(.69)	4.13	(.87)
Routine Non-Manual	4.22	(.85)	4.21	(.88)	4.22	(.82)	4.49	(.67)	4.20	(.86)	3.78	(.92)
Petty-Bourg	4.29	(.78)	4.20	(.82)	4.40	(.72)	4.54	(.72)	4.36	(.66)	3.78	(.83)
Farmers	3.97	(.86)	3.98	(.84)	3.97	(.89)	4.51	(.71)	4.23	(.74)	3.71	(.85)
Technical/Sup/Skilled Manual	4.18	(.85)	4.22	(.86)	4.14	(.85)	4.48	(.70)	4.26	(.77)	3.70	(.93)
Semi & Unskilled Manual	4.03	(.90)	4.06	(.89)	3.98	(.92)	4.47	(.68)	4.14	(.78)	3.54	(.94)
Equivalised Income Decile												
Lowest	3.84	(.92)	3.85	(.98)	3.83	(.87)	4.46	(.71)	3.91	(.88)	3.50	(.88)
2nd	4.19	(.86)	4.21	(.84)	4.17	(.88)	4.50	(.68)	4.28	(.75)	3.74	(.96)
3rd	4.30	(.78)	4.27	(.79)	4.32	(.77)	4.47	(.69)	4.37	(.72)	3.83	(.86)
4th	4.42	(.73)	4.44	(.70)	4.41	(.77)	4.59	(.60)	4.42	(.72)	4.10	(.89)
Highest	4.45	(.72)	4.43	(.75)	4.47	(.69)	4.58	(.65)	4.42	(.69)	4.15	(.86)

Table 3: Mean Value of Health Related Variables by EG Social Class								
	Mean Basic Deprivation[1]		Great Difficulty while Growing Up		Smoke Regularly		Member of Club or Org.	
	Mean	Std	Mean	Std	Mean	Std	Mean	Std
Service	0.06	0.34	0.10	0.30	0.20	0.40	0.56	0.50
Routine Non-Manual	0.18	0.65	0.13	0.34	0.25	0.44	0.39	0.49
Petty-Bourg	0.17	0.40	0.21	0.41	0.24	0.42	0.48	0.50
Farmers	0.06	0.35	0.22	0.41	0.18	0.39	0.34	0.47
Technical/Sup/Skilled Manual	0.14	0.54	0.19	0.39	0.33	0.47	0.39	0.49
Semi & Unskilled Manual	0.27	0.76	0.29	0.45	0.31	0.46	0.33	0.47
All	0.14	0.54	0.16	0.36	0.25	0.43	0.44	0.50

1. Mean score on an eight item scale.

Looking across all three measures is it clear that there is a structured relationship with those in less advantaged positions having a lower probability of having very good health and a higher probability of having fair or worse health. If we assume for the moment that the difference between the levels of self-assessed health are uniform, we can look at whether there is a difference in the mean score for different groups in Table 2, this time controlling for age and sex. Table 2 shows that this difference between advantaged and disadvantaged groups in terms of SAH is true both across men, women and age groups with the difference between groups being particularly large in the oldest age group. This suggests that the inequality between education, social class and income groups grows larger with age.

As we would expect, the LII data confirms the inverse relationship between socio-economic position and health status with those in lower positions far more likely to have a worse SAH. Section 2 of this paper has already examined a number of hypotheses about the causes of this inequality an identified four specific domains in the life course which may influence current health status: social origins, current material conditions, health behaviours and social support. Before we go on to examine the relationship between SAH and these dimensions, can we identify a relationship between our primary measure of inequality – social class and variables in these dimensions? That is, if these dimensions are to explain the inequality that we see between different social class groups, are the different dimensions distributed in a structured fashion across social class groups? Moreover, can we say that this relationship is to the detriment of the health of those in the less advantaged classes?

Table 3 gives the means and standard deviations of four variables from these dimensions – an index of basic deprivation (material conditions), family of origin having great difficulty financially (social origins dimension), smoking regularly (health behaviours) and being a member of a club or organisation (social support). We would expect that all these variables could be related to health status and a glance across the columns confirms that there is at least a substantial bivariate relationship. Looking at the first column - levels of mean basic deprivation, the pattern across the classes is not straight forward, with farmers having very low levels of deprivation and the skilled manual group having lower levels than the white collar groups, but we still see a clear difference among the unskilled manual group, particularly from the service class.

The second column shows that the proportion whose households of origin experienced 'great difficulty making ends meet' rises almost steadily as we move down the social class groups with the rate for the unskilled manual class almost 300% higher than among the service class. For In the third column we can see that smoking is far more likely among manual groups and lowest among farmers and the service class. Lastly, in the fourth column we see that being a member of a club or society (social support), like the previous variables is distinctly structured by social class with those in the service class almost 70% more likely to answer positively to this question.

Although only a selection of the variables that we will be using shortly to model SAH, the four variables just examined show the manner in which factors which are likely to influence health status are distributed across social class groups with more

disadvantaged classes much more likely to experience health damaging circumstances.

Explaining Inequalities in SAH

Having established a descriptive picture of the extent of inequalities in social class and other measures and some of the possible ways in which these inequalities might be generated, we now adopt a more analytical approach and attempt to assess the impact that different domains in the life course have on the extent of inequality between social class groups and the overall contribution of each domain to the determination of SAH.

As explained in section two, to establish the impact of each domain on the inequality between social class groups we estimate ordered logit models of the SAH categories, first using only a 'base' model and then including each domain in turn. The extent to which the inequality between classes, as measured using each classes' log-odds, is tempered by the inclusion of the domain is taken as indicating the role of that domain. However, we can also get an overall picture of the contribution of each domain to the explanation of the variance in SAH by evaluating the decrease in the deviance from the base model brought about by the inclusion of each domain. By withdrawing each domain in turn from a full model including the base model and all the domains we will then also have a measure of the independent contribution of each domain to the total decrease in deviance provided by the full model.

Table 4: Estimates and Significance from an Ordered Logit Model of Self-Assessed Health

Variable		B	t-stat	Significance
	Small Stature	-0.18	-2.55	*
Parental Highest Education –	No Qualifications	*Ref.*		
	Lower Secondary	0.11	0.9	n.s
	Higher Secondary	0.08	0.62	n.s
	Tertiary	-0.15	-1.22	n.s
	Hardship in Childhood Index	0.08	3.35	**
Parental EG Social Class –	Higher Service	*Ref.*		
	Lower Service	-0.33	-2.2	*
	Routine Non-Manual Higher	0.03	0.17	n.s
	Routine Non-Manual Lower	-0.11	-0.66	n.s
	Self-Employed with Employees	0.38	1.08	n.s
	Self-Employed without Employees	-0.41	-2.68	**
	Technical and Supervisory	-0.29	-1.73	n.s
	Skilled Manual	-0.08	-0.57	n.s
	Semi-Skilled Manual	-0.48	-3.05	**
	Unskilled Manual	-0.37	-2.49	*
	Agricultural Labourers	0.06	0.28	n.s
	Farmers	-0.16	-1.1	n.s

Table 5: Log Odds from Ordered Logit Model of Self-Assessed Health Adjusted for Social Class, Confounding Variables and Social Origins (Men and Women aged 17 to 97)

	Base Model		95 CI		Controlling for Social origins		95 CI		Reduction
	B	Sig.	Lower	Higher	B	Sig.	Lower	Higher	
	Ref.				*Ref.*				
Lower Service	-0.26	**	-0.42	-0.09	-0.22	*	-0.39	-0.04	15.0%
Routine Non-Manual Higher	-0.31	***	-0.49	-0.14	-0.23	*	-0.42	-0.04	26.1%
Routine Non-Manual Lower	-0.60	***	-0.80	-0.41	-0.62	***	-0.83	-0.41	+2.5%
Self-Employed with Employees	-0.33	*	-0.63	-0.02	-0.28	n.s	-0.62	0.06	14.8%
Self-Employed without Employees	-0.39	**	-0.67	-0.12	-0.37	*	-0.67	-0.08	4.9%
Technical and Supervisory	-0.52	***	-0.74	-0.30	-0.44	***	-0.68	-0.20	15.8%
Skilled Manual	-0.45	***	-0.65	-0.25	-0.46	***	-0.68	-0.25	+2.5%
Semi-Skilled Manual	-0.49	***	-0.71	-0.28	-0.53	***	-0.77	-0.30	+8.1%
Unskilled Manual	-0.60	***	-0.88	-0.33	-0.57	***	-0.86	-0.27	6.3%
Agricultural Labourers	-0.36	n.s	-0.75	0.03	-0.43	*	-0.86	0.00	+19.8%
Farmers	-0.59	***	-0.86	-0.31	-0.62	***	-0.92	-0.32	+5.6%
G^2	13703.74				11905.30				13.1%
AIC	13779.74				12001.30				

We begin the analysis with the variables measuring disadvantage in social origins when the respondent was growing up. This domain includes a measure for parental education, parental social class, the respondent's own height in adulthood and the respondent's retrospective evaluation of how difficult the economic situation of the household of origin was. Table 4 shows that once we have controlled for the base model (including current social class and education), the variables for small stature and hardship in childhood remain significant, as do four of the groups for origin social class including lower service, self-employed without employees, semi-skilled manual and unskilled manual. All these effects are in the hypothesised direction. Table 5 shows that the impact of this domain on the inequality between classes varies a great deal by class and actually increases the inequality for some of the classes. The largest decrease in inequality is between higher routine non-manuals and the service class (26%) with the level of decrease growing smaller among manual employees.

If we look at the contribution of the social origin variables to the decrease in deviance in the base model we see a substantial reduction of over 13%. This suggests that, even controlling for current class, education and a number of other factors, early life experience has a substantial impact on current health status. However, comparing the reduction in G^2 can offer a misleading picture of the value of the domain overall since the simple addition of more variables could explain equal variance, even though the variables themselves were not particularly effective. To get round this problem we adopt the Akaike Information Criterion (AIC)[61] which provides a coefficient to test the overall fit of a model, but which penalises for the number of degrees of freedom used in providing this fit. We will be able to compare model AIC values to establish which model performed best.

Given that we are controlling for highest educational level and social class position in the model, the significance of early life factors and social origins in these models suggests not only that these factors have an independent affect on SAH, but also that hypotheses of the indirect effect of social background such as 'social programming'[25] are incorrect. The variables within the early life domain have strong independent affects and this suggests a more direct route of causation.

Table 6: Estimates and Significance from an Ordered Logit Model of Self-Assessed Health

Variable	B	t-stat	Significance
Log Equivalised Household Disposable Income	0.00	0.04	n.s
Basic Deprivation Index	-0.02	-0.34	n.s
Secondary Deprivation Index	-0.10	-4.37	***
Index of Household Problems	-0.08	-2.88	**

Table 6 gives the parameter estimates and significance of the variables representing current material conditions. Although both log-equivalent income and basic deprivation are significant before secondary deprivation is added into the model, afterward both are insignificant, although their effects remain in the expected direction. Secondary deprivation and housing problems remain significant with both having a negative relationship with health status.

Table 7: Log Odds from Ordered Logit Model of Self-Assessed Health Adjusted for Social Class, Confounding Variables and Material Circumstances (Men and Women aged 17 to 97)

	Base Model		95 CI		Controlling for Material Circ.		95 CI		Reduction
	B	Sig.	Lower	Higher	B	Sig.	Lower	Higher	
	Ref.						*Ref.*		
Lower Service	-0.26	**	-0.42	-0.09	-0.25	**	-0.42	-0.09	0.4%
Routine Non-Manual Higher	-0.31	***	-0.49	-0.14	-0.31	**	-0.49	-0.13	2.1%
Routine Non-Manual Lower	-0.60	***	-0.80	-0.41	-0.49	***	-0.70	-0.29	18.7%
Self-Employed with Employees	-0.33	*	-0.63	-0.02	-0.20	n.s	-0.51	0.11	39.0%
Self-Employed without Employees	-0.39	**	-0.67	-0.12	-0.38	**	-0.66	-0.10	4.4%
Technical and Supervisory	-0.52	***	-0.74	-0.30	-0.49	***	-0.71	-0.26	6.9%
Skilled Manual	-0.45	***	-0.65	-0.25	-0.41	***	-0.62	-0.21	8.7%
Semi-Skilled Manual	-0.49	***	-0.71	-0.28	-0.47	***	-0.69	-0.24	5.5%
Unskilled Manual	-0.60	***	-0.88	-0.33	-0.48	**	-0.77	-0.20	20.0%
Agricultural Labourers	-0.36	n.s	-0.75	0.03	-0.25	n.s	-0.67	0.16	29.7%
Farmers	-0.59	***	-0.86	-0.31	-0.54	***	-0.83	-0.26	7.4%
G^2	13703.74						13124.28		4.2%
AIC	13779.74						13208.28		

The greater significance of secondary deprivation compared to basic deprivation could suggest that the actual process through which deprivation acts on health is relative rather than absolute – i.e. based on the psychological impact and associated stress rather than material consequences. Whereas the basic index measures lack of essentials such as food and heat, the secondary index measures the lack of more 'lifestyle' or social items such as being able to afford an evening or meal out or being able to buy presents for friends or family once a year. Given that we are already controlling for basic deprivation the effect of this variable may suggest that we are seeing the impact of relative or comparative deprivation based on an inability to attain what is seen as a socially minimal lifestyle.

Table 7 shows that controlling for current material conditions decreases the parameter estimates for current class by between 0.4 and 39% with the effect for lower service class decreasing least and that for self-employed with employees decreasing most. This latter effect may have something to do with the fact that almost half of those in this category have farming origins with farming having a particularly negative impact on health. Overall however, the decrease in G^2 for this domain is around a third of that for the social origins domain and the model produces a larger AIC value[2], both suggesting that it is less successful at explaining variance in the SAH measure.

Table 8: Estimates and Significance from an Ordered Logit Model of Self-Assessed Health

Variable		B	t-stat	Significance
Smoking Behaviour –	Never Smoked	*Ref.*		
	Regularly	-0.61	-10.62	***
	Occasionally	-0.43	-4.22	***
	Regularly in the Past	-0.37	-4.99	***
	Occasionally in the past	-0.25	-1.8	n.s
BMI Index -	Normal	*Ref.*		
	Underweight	0.17	1.89	n.s
	Overwweight	0.01	0.26	n.s
	Obese	-0.37	-4.44	***

Table 8 gives the parameter effects for the impact of the health behaviour variables on SAH and shows, as expected that smoking behaviour and BMI are both significant predictors. The effect for smoking is negative and also graduated with smoking regularly currently having the largest negative impact on SAH, followed by occasionally currently and regularly in the past. This suggests a very structured relationship and a very sizeable effect for current smoking. Of the BMI categories, only being obese has a significant negative impact, but this is quite substantial. Table 9 shows that the impact of this domain on the inequality between social class groups is very large with the effects for agricultural decreasing by 41% and that for semi-skilled by 25%. Overall, the health behaviours domain decreases the deviance (G^2) of the base model by only 3.3%, lower than both social origins and material circumstances and this is also reflected in the AIC coefficient which is the highest of all the domains (with a low AIC being preferred).

[2] The AIC is defined as AIC=-2(LL)+2(c+p+1) where c is the number of model covariates and p is the number of model specific ancillary parameters. The preferred model is that with the lowest AIC value.

Table 9: Log Odds from Ordered Logit Model of Self-Assessed Health Adjusted for Social Class, Confounding Variables and Health Behaviours (Men and Women aged 17 to 97)

	Base Model		95 CI		Controlling for Health Behaviours		95 CI		Reduction
	B	Sig.	Lower	Higher	B	Sig.	Lower	Higher	
	Ref.				*Ref.*				
Lower Service	-0.26	**	-0.42	-0.09	-0.24	**	-0.41	-0.08	4.3%
Routine Non-Manual Higher	-0.31	***	-0.49	-0.14	-0.32	***	-0.50	-0.14	+3.1%
Routine Non-Manual Lower	-0.60	***	-0.80	-0.41	-0.52	***	-0.72	-0.33	13.1%
Self-Employed with Employees	-0.33	*	-0.63	-0.02	-0.29	n.s	-0.60	0.02	10.0%
Self-Employed without Employees	-0.39	**	-0.67	-0.12	-0.35	*	-0.63	-0.07	10.6%
Technical and Supervisory	-0.52	***	-0.74	-0.30	-0.46	***	-0.68	-0.23	12.1%
Skilled Manual	-0.45	***	-0.65	-0.25	-0.37	***	-0.57	-0.16	19.1%
Semi-Skilled Manual	-0.49	***	-0.71	-0.28	-0.37	**	-0.59	-0.15	25.0%
Unskilled Manual	-0.60	***	-0.88	-0.33	-0.55	***	-0.83	-0.28	8.4%
Agricultural Labourers	-0.36	n.s	-0.75	0.03	-0.21	n.s	-0.62	0.19	40.5%
Farmers	-0.59	***	-0.86	-0.31	-0.55	***	-0.83	-0.27	5.9%
G^2	13703.74				13257.27				3.3%
AIC	13779.74				13347.27				

Table 10: Estimates and Significance from an Ordered Logit Model of Self-Assessed Health

Variable		B	t-stat	Significance
Frequency of Attendance at Religious Services		-0.07	-4.06	***
Member of a Club or Organisation		0.14	2.69	**
Frequency See Neighbours –	Most Days	*Ref.*		
	Once or Twice a Week	-0.22	-4	***
	Once or Twice a Month	-0.34	-3.52	***
	Less than Once a Month	-0.54	-3.52	***
	Never	-0.67	-4.14	***
Frequency Meet People –	Most Days	*Ref.*		
	Once or Twice a Week	-0.01	-0.14	n.s
	Once or Twice a Month	-0.18	-1.45	n.s
	Less than Once a Month	0.07	0.23	n.s
	Never	-1.37	-2.75	**
Afternoon or Evening Out Last Two Weeks		0.38	6.01	***

Table 10 shows that all of the variables in the social support domain have a significant impact on SAH with frequency of church attendance having a particularly significant positive impact on self-assessed health. Being a member of a club or organisation likewise increases the probability of higher SAH, as does having an evening out in the last two weeks and seeing neighbours more frequently. The latter has a particularly structured and graduated relationship to SAH. Lastly, only the category of never meeting people outside one's household face-to-face has a significant negative association with SAH. To what extent does the inclusion of the social support variables impact on the inequality between social class groups? Table 11 shows that the effect ranges from a decrease of 2% among the self-employed with employees to a high of 22% among semi-skilled manuals. Overall however, the inclusion of this domain decreases the deviance of the model by only 3.5%, the third highest proportional change.

Tables 5 to 11 have shown that all of the domains which we have examined make a contribution to explaining overall SAH and a substantial contribution to explaining inequalities between social classes in SAH. The impact of each domain varies across social classes, but if we examine the impact on the unskilled manual social class we see that the early life and social origins domain explains around 6% of the differential, health behaviours 8%, social support 13% and current material conditions 20%. Therefore, although early life experience is the most important determinant of current SAH overall (in terms of explained deviance), it is actually the least important domain in the determination of the inequality between the service and unskilled manual classes. However, we are analysing the impact of these factors across the class categories and Tables 5 to 11 show that early life factors play a greater role among the more advantaged classes such as the higher routine non-manual class and the lower service class.

Table 12 shows that if we fit all of the domains to a model simultaneously we see decreases in the social class effects of between 6% and 38% with the effects for the manual class groups decreasing by between 25% and 35%. Thus, between a quarter and a third of the inequality between manual social class groups and the most advantaged, or service class group can be accounted for using the four domains and base models evaluated here.

Table 11: Log Odds from Ordered Logit Model of Self-Assessed Health Adjusted for Social Class, Confounding Variables and Social Support (Men and Women aged 17 to 97)

	Base Model		95 CI		Controlling for Social Support		95 CI		Reduction
	B	Sig.	Lower	Higher	B	Sig.	Lower	Higher	
	Ref.				*Ref.*				
Lower Service	-0.26	**	-0.42	-0.09	-0.23	**	-0.40	-0.07	8.7%
Routine Non-Manual Higher	-0.31	***	-0.49	-0.14	-0.26	**	-0.44	-0.08	17.2%
Routine Non-Manual Lower	-0.60	***	-0.80	-0.41	-0.56	***	-0.76	-0.36	7.0%
Self-Employed with Employees	-0.33	*	-0.63	-0.02	-0.32	*	-0.63	-0.01	2.0%
Self-Employed without Employees	-0.39	**	-0.67	-0.12	-0.38	**	-0.66	-0.11	2.5%
Technical and Supervisory	-0.52	***	-0.74	-0.30	-0.52	***	-0.75	-0.30	+0.4%
Skilled Manual	-0.45	***	-0.65	-0.25	-0.42	***	-0.62	-0.22	7.0%
Semi-Skilled Manual	-0.49	***	-0.71	-0.28	-0.39	**	-0.61	-0.16	21.9%
Unskilled Manual	-0.60	***	-0.88	-0.33	-0.53	***	-0.80	-0.25	12.9%
Agricultural Labourers	-0.36	n.s	-0.75	0.03	-0.43	*	-0.83	-0.03	+19.4%
Farmers	-0.59	***	-0.86	-0.31	-0.53	***	-0.81	-0.25	9.6%
G^2	13703.74				13229.66				3.5%
AIC	13779.74				13327.66				

Table 12: Log Odds from Ordered Logit Model of Self-Assessed Health Adjusted for Social Class, Confounding Variables and All Four Domains (Men and Women aged 17 to 97)

	Base Model		95 CI		Controlling for All Domains		95 CI		Reduction
	B	Sig.	Lower	Higher	B	Sig.	Lower	Higher	
	Ref.				*Ref.*				
Lower Service	-0.26	**	-0.42	-0.09	-0.19	*	-0.37	0.00	27.1%
Routine Non-Manual Higher	-0.31	***	-0.49	-0.14	-0.22	*	-0.42	-0.01	31.0%
Routine Non-Manual Lower	-0.60	***	-0.80	-0.41	-0.46	***	-0.69	-0.23	24.2%
Self-Employed with Employees	-0.33	*	-0.63	-0.02	-0.22	n.s	-0.58	0.13	31.0%
Self-Employed without Employees	-0.39	**	-0.67	-0.12	-0.37	*	-0.68	-0.06	6.2%
Technical and Supervisory	-0.52	***	-0.74	-0.30	-0.32	*	-0.58	-0.07	37.8%
Skilled Manual	-0.45	***	-0.65	-0.25	-0.38	**	-0.61	-0.14	16.8%
Semi-Skilled Manual	-0.49	***	-0.71	-0.28	-0.32	*	-0.58	-0.06	35.1%
Unskilled Manual	-0.60	***	-0.88	-0.33	-0.46	**	-0.78	-0.13	24.5%
Agricultural Labourers	-0.36	n.s	-0.75	0.03	-0.27	n.s	-0.74	0.20	25.3%
Farmers	-0.59	***	-0.86	-0.31	-0.48	**	-0.80	-0.16	18.6%
G^2	13703.74				10833.4				
AIC	13779.74				10979.4				

It should be born in mind that we have not attempted to fit any interaction terms between the elements of the domains or between the domains and the base model variables. Doing so would undoubtedly account for even more of the inequality between groups.

It would be very useful if we could decompose the contribution made by each of the domains to the overall decrease in deviance achieved by all of the domains when included simultaneously in a model. We can examine the independent and shared contributions made by each domain by specifying a series of nested models were the domain of interest is withdrawn and the increase in deviance between that model and the 'full' model, with all domains are compared. The results for just such a process are shown in Table 13 which also gives the G^2 and AIC values for the models. This shows, as expected that early life and social origins explain the largest proportion of the deviance explained in the total model (20%) followed by material conditions (6%), health behaviours (5%) and social support (3%). For the most part this ordering is reflected in the G^2 and AIC coefficients, except that social support actually achieves a lower AIC score than health behaviours suggesting this domain makes more efficient use of the degrees of freedom it uses.

Overall the four health domains explain 39% of the reduction in G^2 over the zero slopes model, which as Table 13 shows is roughly equal to that explained by the base model, although it is clear that much of the power of the base model comes from the inclusion of chronic illness. Since chronic illness is the outcome of these processes at least to some degree, the impact of this variable should be discounted. Social class accounts for roughly 4% of the deviance independently followed closely by age which explains around 3%.

Are the affects of the domains independent or do they work through other domains or the social class variable? Table 13 shows that 23% of the explained deviance in the model is shared between one or more of the domains and the base model and 5% is shared explanation between the domains. In terms of the shared deviance between the domains and the base model, only a minority could be accounted for with interaction terms between social class and the domain variables as Table 13 shows that only 1.2% of the model deviance was shared between social class and the early life domain. Moreover, less than 1% was shared between all the other domains and social class. Between the domains, around 2% of the total model deviance was explained by affects from early life acting through degree of social support in the present, 1% through current material circumstances and less than 1% through current health behaviours.

Table 13: G2, AIC Coefficients and % Reduction in Deviance of Different Groups of Variables

	G^2	AIC	Independent Contribution to Reduction in G^2 from Base Model	Independent Contribution to Reduction in G^2 from Zero Slopes Model
Health Domains				
Four Domains Combined	10833.4	10979.4	100%	38.9%
Early Life	11905.3	12001.3	52.5%	20.4%
Material Circumstances	13124.28	13208.28	14.4%	5.6%
Health Behaviours	13257.27	13347.27	11.6%	4.5%
Social Support	13229.66	13327.66	8.8%	3.4%
Base Model Variables				
Base Model Variables Combined	13703.74	13779.74	-	38.2%
Chronic Illness			-	21.9%
Social Class			-	4.1%
Age			-	2.7%
Employment Status			-	0.9%
Locality			-	0.2%
Unemployment Last 3 Years			-	<0.1%
Sex			-	<0.1%
Shared Variance				
Between Four Domains and Base Model			-	22.9%
Between Four Domains			12.8%	5.0%
Between Base Model Variables			-	8.3%
Social Class + Early Life			-	1.2%
Social Class + Material Circumstances			-	0.5%
Social Class + Health Behaviour			-	0.1%
Social Class + Social Support			-	<0.1%
Early Life + Social Support			4.1%	1.6%
Early Life + Material Circumstances			2.5%	1.0%
Early Life + Health Behaviour			1.8%	0.7%

Discussion and Conclusions

In this paper we have examined the life course perspective on inequalities in health for the first time using Irish data and have examined the extent to which adult self-assessed health (SAH) and inequalities in this are explained by different 'domains' which influence health. We were particularly interested in the role which early life exposure to disadvantage through social origins played in determining adult SAH and examined questions about the role of early life and childhood:

- The first is the important question of the relative importance of different domains, and particularly the impact of early life as opposed to later disadvantage on health status. Is early life exposure to disadvantage and deprivation more important than later exposure?

- Second, are the adverse health affects of this early life exposure independent of later exposures?

- Thirdly, can exposures at different points in the life-course be seen as cumulative?

The first part of the analysis showed clearly that SAH is distributed unequally across social class, education and income groups controlling for age and sex. This confirms for Ireland the pattern found elsewhere that those groups disadvantaged by a range of socio-economic indicators are more likely to have poorer health status. Examining the literature on SAH, we then conceptualised four domains which may influence adult health status and showed how these also tended to be unequally distributed across social class categories in a manner which we would expect would lead to inequalities in health outcomes.

Our prime interest however was in examining the contribution which these four domains made SAH and we pursued this using a series of nested models which controlled for current social class whilst estimating the impact of each domain. Going back to the first of our questions, these models showed that early life exposure to social disadvantage and deprivation was by far the best predictor of adult health status explaining over three times as much (20%) as the next largest domain, current material circumstances (6%). Current health behaviours explained only around 5% of the variance in SAH and differences in social support around 3%. These effects were net of current demographic characteristics, social class and education as these were controlled for in the model. This suggests that hypotheses about an indirect effect of social origins through education and labour market position are not correct and that the effect is rather direct.

This is a very important finding since it implies that if we wanted to intervene in the process to improve adult health we would need to do so fairly early in life, ameliorating childhood living conditions, rather than trying to improve educational performance, occupational attainment or material conditions or health behaviours in adulthood. The Independent Inquiry into Inequalities in Health undertaken in Great Britain, chaired by Donald Acheson (62), also came to a conclusion very similar to this after reviewing evidence from a number of sources both from the UK and more widely. Although exposure to adversity later in life clearly has a significant impact on

adult health, the results here show that the answer to our second question – "are the effects of early life exposure independent of later adverse experiences?", is yes. To answer our third question – "can exposure to adverse circumstance across the life course be cumulative?" also seems to be positive with later exposures independently impacting on health status.

If we compare the results found in this paper to those found in other countries[3] we find that the average impact of early life variables on current class inequalities is fairly large internationally with around 14% of the differential between classes being explained compared to around 10% found in the Netherlands[39], Britain[63] and Sweden[20]. Tests (not shown) using a dichotomous specification of SAH that could be directly compared to results in other countries showed that this estimate for Ireland is, if anything, very much an underestimate. Predicting 'less than good health' we found that early life factors reduced the class inequality by 46%, whereas present material circumstances reduced it by 36%, social support by 26% and health behaviours by 8%. This is the average across all classes, thus for the unskilled manual the differential was actually reduced by 55% using the early life domain, 45% by material circumstances, 25% by differential social support and 1% by varying health behaviours. The large difference in findings using the different methodologies is not surprising since using a measure of 'less-than-good health" produces a far more unequal measure than if one adopts an ordered measure. This result does however suggest that past analyses of health inequalities may have over estimated the inequality involved by using dichotomous measures rather than multiple ordered categories.

These findings suggest that health inequalities in Ireland may be far more strongly related to early life exposure than in the Netherlands, Britain and Sweden at least, although the impact from adult exposure to disadvantage should not be underestimated. Social class inequalities in Ireland have been shown to be rather larger than in other countries for both risk of income poverty[64] and intergenerational social class mobility[21] and so the results of this paper would be congruent with past research carried out in Ireland. The implications of this pattern of health inequality and its roots in early life are however are enormous for social welfare and health policy and serious research effort should be applied to investigating the mechanisms that influence health in childhood and the reasons why early exposure to disadvantage in Ireland seems to lead to such large inequalities when compared internationally.

[3] As stated earlier this is made difficult by the use of an ordered five category dependent variable here rather than a logit specification used in all other papers.

Reference List

1 Mackenbach JP, Bakker M. Reducing Inequalities in Health: A European Perspective. London: Routledge, 2002.

2 Balanda KP, Wilde J. Inequalities in Mortality 1989-1998: A Report on All-Ireland Mortality Data. 2001. Dublin, Institute of Public Health in Ireland.
Ref Type: Report

3 Barry J, Sinclair H, Kelly A, O'Loughlin R, Handy D, O'Dowd T. Inequalities in Health in Ireland - Hard Facts. 2001. Dublin, Department of Community Health and General Practice, Trinity College.
Ref Type: Report

4 Layte R. Explaining Material Inequalities in Health: the Importance of Theoretically Based Measures. ESRI Working Paper No. 124. 2000.
Ref Type: Generic

5 Kelleher C, Friel S, Nic Gabhainn S, Tay JB. Socio-Demographic Predictors of Self-Rated Health in the Republic of Ireland: Findings from the National Survey on Lifestyle, Attitudes and Nutrition, SLAN. Social Science and Medicine 2003; 57:477-486.

6 Barker DJP. Fetal and Infant Origins of Adult Disease. London: British Medical Joumal Publishing Group, 1992.

7 Barker DJP. Mothers, Babies and Disease in Later Life. London: British Medical Journal Publishing Group, 1994.

8 Emanuel I. Maternal Health During Childhood and Later Reproductive Performance. In: Wisnieski HM, Snider DA, editors. Mental Retardation: Research Education Technology Transfer. New York: New York Academy of Sciences, 1986.

9 Power C, Matthews S, Manor O. Inequalities in Self-Rated Health: Explanations from Different Stages in Life. Lancet 1998; 351:1009-1014.

10 Poulton R, Caspi A, Milne BJ, Thomson WM, Taylor A, Sears MR et al. Association Between Children's Experience of Socio-Economic Disadvantage and Adult Health: A Life-Course Study. Lancet 2002; 360:1640-1645.

11 Blane D, Brunner E, Wilkinson RG. The Evolution of Public Health Policy: An Anglocentric View of the Last Fifty Year. In: Blane D, Brunner E, Wilkinson RG, editors. Health and Social Organisation: Towards a Health Policy for the 21st Century. London: Routledge, 1996.

12 Marmot MG, Rose G, Shipley M, Hamilton PJS. Employment Grade and Coronary Heart Disease in British Civil Servants. Journal of Epidemiology and Community Health 1978; 32:244-249.

13 Townsend P, Davidson N. Inequalities in Health (The Black Report). Middlesex: Penguin, 1982.

14 Bartley M, Blane D, Montgomery S. Socio-Economic Determinants of Health: Health and the Life Course: Why Safety Nets Matter. British Medical Journal 1997; 314:1194-1196.

15 Blane D, Bartley M, Davey-Smith G. Disease Etiology and Materialist Explanations of Socio-Economic Mortality Differentials. European Journal of Public Health 1997; 7:385-391.

16 Davey-Smith G, Hart C, Blane D, Gillis C, Hawthorne V. Lifetime Socio-economic Position and Mortality: Prospective Observational Study. British Medical Journal 1997; 314:547-552.

17 Davey Smith G, Blane D, Bartley M. Explanations for Socio-Economic Differentials in Mortality: Evidence from Britain and Elsewhere. European Journal of Public Health 1994; 4:132-144.

18 Vågerô D, Illsley R. Explaining Health Inequalities: Beyond Black and Barker. European Sociological Review 1995; 11:1-23.

19 Kuh DJL, Ben Shlomo Y. Lifecourse Approach to Chronic Disease Epidemiology. Oxford: Oxford University Press, 1997.

20 Lundberg O. Childhood Living Conditions, Health Status and Social Mobility: A Contribution to the Health Selection Debate. European Sociological Review 1991; 7:149-162.

21 Whelan CT, Layte R. Late Industrialisation and the Increased Merit Selection Hypothesis: Ireland as a Test Case. European Sociological Review 2002.

22 Erikson R, Goldthorpe JH. The Constant Flux: A Study of Class Mobility in Industrial Societies. Oxford: Oxford University Press, 1992.

23 Barker DJP, Winter PD, Osmond C, Margetts B, Simmonds SJ. Weight in Infancy and Death from Ischaemic Heart Disease. Lancet 1989; ii:577-580.

24 Forsdahl A. Are Poor Living Conditions in Childhood and Adolescence an Important Risk Factor for Arteriosclerotic Heart Disease? British Journal of Preventative and Social Medicine 1977; 31:91-95.

25 Lundberg O. The Impact of Childhood Living Conditions on Illness and Mortality in Adulthood. Social Science and Medicine 1993; 36:1047-1052.

26 Hunter D. The Diseases of Occupations. London: Hodder and Stoughton, 1955.

27 Burridge R, Ormandy D. Unhealthy Housing: Research, Remedies and Reform. London: E and F.N, 1993.

28 Arblaster L, Hawtin M. Health, Housing and Social Policy. London: Socialist Health Association, 1993.

29 Scott A, Burchell B. 'And Never the Twain Shall Meet'? Gender Segregation and Work Histories'. In: Scott A, editor. *Gender Segregation and Social Change*. Oxford: Oxford University Press, 1994.

30 Bartley M. Unemployment and Ill Health: Understanding the Relationship. Journal of Epidemiology and Community Health 1994; 48(333):337.

31 Kushi LH, Lee RA, Stare FJ, Ellison CR, el Lozy M, Bourke G. Diet and 20 Year Mortality from Coronary Heart Disease. New England Journal of Medicine 1985; 312:811-817.

32 Floud R, Wachter K, Gregory A. Height, Health and History. Nutritional Status in the United Kingdom 1750-1980. Cambridge: Cambridge University Press, 1990.

33 Brunner EJ. Stress and the Biology of Inequality. British Medical Journal 1997; 314:1472-1476.

34 Karasek RA, Theorell T. Healthy Work: Stress, Productivity and the Reconstruction of Working Life. New York: Basic Books, 1990.

35 Kawachi I, Colditz GA, Ascherio A. Prospective Study of Social Networks in Relation to Total Mortality and Cardiovascular Disease in Men in the US. Journal of Epidemiology and Community Health 1976; 50:245-251.

36 Kaplan GA, Salonen JT, Cohen RD, Brand RJ. Social Connections and Mortality from all Causes and from Cardiovascular Disease: Prospective Evidence from Eastern Finland. American Journal of Epidemiology 1988; 2:370-380.

37 Granovetter M. Getting a Job: A Study of Contacts and Careers. 2nd ed. Chicago: University of Chicago Press, 1995.

38 de Graaf P, Ultee WC. United in Employment, United in Unemployment? Employment and Unemployment of Couples in the European Union in 1994. In: Gallie D, Paugam S, editors. Welfare regimes and the Experience of Unemployment in Europe. Oxford: Oxford University Press, 2000.

39 Dike van de Mheen H, Stronks K, Mackenbach JP. A Lifecourse Perspective on Socio-Economic Inequalities in Health: The Influence of Childhood Socio-Eocnomic Conditions and Selection Processes. In: Bartley M, Blane D, Davey Smith G, editors. The Sociology of Health and Illness. Oxford: Blackwells, 1998.

40 Callan T, Nolan B, Whelan BJ, Whelan CT, Williams J. Poverty in the 90s: Evidence from the 1994 Living in Ireland Survey. Dublin: Oak Tree Press, 1996.

41 Streiner DL, Norman GR. Health Measurement Scales: A Practical Guide to Their Development and Use. 2 ed. Oxford: Oxford Medical Publications, 1995.

42 Brazier JE, Harper R, Jones NMB. Validating the SF-36 Health Survey Questionnaire: A New Outcome Measure for Primary Care. British Medical Journal 1992; 305:160-164.

43 Bergner M, Bobitt RA, Pollard W.E. The Sickness Impact Profile: Validation of a Health Status Measurement. Medical Care 1976; 14:57-67.

44 Wagstaff A, van Doorslaer E. Measuring Inequalities in Health in the Presence of Multiple Category Morbidity Indicators. Health Economics 1994; 3:281-291.

45 Bartley M, Sacker A, Firth D, Fitzpatrick R. Understanding Social Variation in Cardiovascular Risk Factors in Women and Men: the Advantage of Theoretically Based Measures. Social Science and Medicine 1999; 49:831-845.

46 Bartley M. Unemployment and Health: Selection or Causation-A False Antithesis? Sociology of Health and Illness 1988; 10(1):41-67.

47 Whelan CT. The Role of Income, Life-Style Deprivation and Financial Strain in Meditating the Impact of Unemployment on Psychological Distress. Journal of Occupational and Organisational Psychology, 1992; 65:331-344.

48 Whelan CT. The Role of Social Support in Mediating the Psychological Consequences of Economic Stress. Sociology of Health and Illness 1993; Vol. 15(No. 1):86-101.

49 Fogel RW. Physical Growth as a Measure of the Economic Well-Being of Populations: the Eighteenth and Noneteenth Centuries. In: Falkner F, Tanner JM, editors. Human Growth: A Comprehensive Treatise, Volume 3. New York: Plenum Press, 1986: 263-305.

50 Nolan B, Cantilon S. Are Married Women More Deprived than Their Husbands? Journal of Social Policy 1998; 27:151-171.

51 Callan T, Nolan B, Whelan CT. Resources, Deprivation and the Measurement of Poverty. Journal of Social Policy 1993; 22(2):141-172.

52 Nolan B, Whelan CT. Resources, Deprivation and Poverty. 1996.

53 Layte R, Nolan B, Whelan CT. Poverty and Affluence in Ireland: A Comparison of Income and Deprivation Approaches tothe Measurement of Poverty. In: Gordon D, Townsend P, editors. Breadline Europe: The Measurement of Poverty. Bristol: Policy Press, 2001.

54 Whelan CT, Layte R, Maître B, Nolan B. Income, Deprivation and Economic Strain: An Analysis of the European Community Household Panel. European Sociological Review 2001; Vol. 17(No. 4):357-372.

55 Layte R, Maître B, Nolan B, Whelan CT. Persistent and Consistent Poverty in the 1994 and 1995 Waves of the European Community Household Panel. Review of Income and Wealth 2001; 47(4):427-449.

56 Martin CJ, Platt SD, Hunt S. Housing Conditions and Health. British Medical Journal 1987; 294:1125-1127.

57 Platt SD, Martin CJ, Hunt S, Lewis CW. Damp Housing, Mold Growth and Symptomatic Health State. British Medical Journal 1989; 298:1673-1678.

58 West RR, Lowe CR. Mortality from Ischaemic Heart Disease: Inter-Town Variation and its Association with Climate in England and Wales. International Journal of Epidemiology 1976; 5:195-201.

59 Crombie IK, Kenicer MB, Smith WCS, Tunstall-Pedoe HD. Unemployment, Socio-Environmental Factors and Coronary Heart Disease in Scotland. British Heart Journal 1989; 61:172-177.

60 Treiman D. Occupational Prestige in Comparative Perspective. New York: Academic Press, 1977.

61 AKAIKE H. A New Look at the Statistical Model Identification. IEEE Transaction and Automatic Control 1974; AC19:716-723.

62 Acheson D, Barker D, Chambers J, Graham H, Marmot MG, Whitehead M. Independent Inquiry into Inequalities in Health. 1998. London, The Stationary Office.
Ref Type: Report

63 Power C. Social and Economic Background and Class Inequalities in Health Among Young Adults. Social Science and Medicine 1991; 32:411-417.

64 Layte R, Whelan CT. Cumulative Disadvantage or Individualisation? A Comparative Analysis of Poverty Risk and Incidence. European Societies 2002; 4(2):209-233.

65 Bartley M, Plewis I. Does Health Selective Social Mobility Account for Socio-Economic Differences in Health? Evidence from England and Wales 1971 to 1991. Journal of Health and Social Behaviour 1997; 38:376-386.