Health Research Board Unit for Health Status and Health Gain: 1999-2007

Contents

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The Health Research Board Unit for Health Status and Health Gain 1999-2007: A Reflection on the Evidence and Future Directions for both Policy and Research

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The 5 year research unit for Health Status and Health Gain was established with Health Research Board funding at the end of 1999 and began its work programme in earnest in 2000. The original call for research proposals had indicated the need for a dedicated research unit that would explore how the health status of the disadvantaged might be improved in light of key strategy objectives in the policy document of the Department of Health and Children, Shaping A Healthier Future (1994). The unit was expected to provide information needed to measure health status and health gain, to monitor changes over time, to analyse the social determinants of health status in Ireland and to identify the policy measures necessary to increase equity in health status. The inter-disciplinary research group established in Dublin and Galway has produced a steady research and policy output since then[1-17] and the current publication is the most recent to draw together the collected research evidence.

In 1999 it was widely acknowledged by both academic researchers and health care providers that the Republic of Ireland lacked the information infrastructure to assess population need at an ecological, individual or a service level and to monitor changes in health expectancy. Despite the fact that life expectancy ranked at the lower end of the European spectrum of countries and Ireland has high rates of both heart disease and some cancers, we had little information on risk factor profiles and their inter-relationship and no means of tracking individuals' mortality and morbidity patterns directly. This deficiency has become particularly acute as trends towards audit and quality of care have become more explicit and economic constraints force properly reasoned choices in healthcare.

In formulating our work programme two considerations were key. First was the definition of disadvantage. In Shaping a Healthier Future the concept of health development sectors was introduced to pay specific attention both to high risk or vulnerable groups like Travellers or to specific areas such as inner cities or isolated rural pockets where conditions are generally adverse. Subsequent policy, as outlined in Quality and Fairness, a Health System for You in 2001 has continued to focus on social inclusion, with the establishment of specialist units in both the Department of Health and Children itself and the now newly established Health Service Executive. However, the International literature on health inequalities also stresses the graduated and relative nature of disadvantage across social groups and emphasises that the problem may be also a cumulative one over the life-course, suggesting the need for policy intervention at different time points [18,19]. Accordingly we decided to ensure both perspectives were met in our work programme.

A second key issue was whether traditional measures of social position would translate into the Irish context, in that Ireland was a country in major economic transition, moving from a mainly rural population to a profile more typical of other industrialised countries. Free secondary education only became possible after 1966 and this became a major feature of the newly developing Celtic Tiger economy. One robust proxy of disadvantage was General Medical Services (GMS) eligibility, as comprehensive entitlement to health care in the Republic of Ireland is means-tested and we already had evidence that GMS card-holders had poorer health. It was not, in our view, a given that patterns of inequality and disadvantage would be the same as for instance our neighbour the United Kingdom and accordingly we needed to take a triangulated approach to our work programme, incorporating both quantitative and qualitative methodologies in order to understand how health inequality might be patterned or determined in an Irish context.

The outline work-plan, was four-fold:
1. To establish a cross-generation cohort study to address the issues of disadvantage or not in contemporary Irish families, with special emphasis on general medical services eligibility
2. To conduct a detailed secondary data analysis of existing datasets to examine the relative importance to health and well-being of area, social position and lifestyle of respondents
3. To conduct a mainly qualitative consultative process with individuals and groups at both relative and absolute social disadvantage
4. To review public policy and consider the implications of our findings for policy in key areas such as infant and maternal health, health of older people, working conditions and health and the relationship between behaviour and equity in health.

In all of these areas we have produced important findings. The Health Research Board funded the original unit from 1999-2004 and subsequently in a number of further peer-reviewed grant applications. We also participated in a very similar work programme funded through the European Science Foundation, entitled Social Variations in Health Expectancy in Europe. Both at University College Dublin, in association with the Geary Institute and at NUI Galway, with the establishment of the Centre for Social Gerontology has the research agenda continued to consolidate and grow. Additionally, we have had significant policy input to statutory agencies such as Combat Poverty Agency, Women's Health Council and National Council for Ageing and Older People.

Some important conclusions of this work programme to date have emerged. First, the unit work has established beyond reasonable doubt, building also on the work of others, such as the Institute of Public Health[20] that health variations do exist in modern Ireland[1,2,5,6,12,13]. A series of secondary analyses in the present supplement show that proxy indicators of health status, such as self rated health, self reported mental health and quality of life are all influenced by measures of social position, including education, social class, and most consistently of all, general medical services eligibility. The graduated pattern seen in other countries is true in Ireland too, from richest to poorest. Nonetheless, and especially in urbanised areas, pockets of real area disadvantage can be seen, suggesting that special policy effort must be made to reach the most disadvantaged.

While the directionality of some of these inter-relationships can only be inferred as much of this evidence comes from cross sectional rather than longitudinal data, it appears clear that social position influences health and well-being. One of the more interesting aspects of the programme has been the relationship between measures of social capital, including networks, trust, social support, with health status. We found many of these characteristics to be well preserved in rural communities, but relatively less so in urban communities. There may be a secular effect at play, in that older people were more trusting than the young. This has lent context to International work on the Irish in the United States, showing that patterns of cardiovascular mortality persisted over several generations in the past. It appears that material disadvantage, and educational

trajectory are the driving factors in this pattern[3,7.] However in the future, unless we attend to it now with community development and social support policies, the decline in these characteristics will simply serve to compound any material disadvantage that exists.

The need for longitudinal evidence is increasingly critical in assessing the directionality of the relationship between health status, lifestyle and social position. The Lifeways cohort study is now established and in its fifth year of follow-up. This study of 1000 families confirms the longitudinal and cross-generational nature of health status. Expectant mothers-to-be rate their health in relation to their social position and their lifestyles also have a strong social pattern. Preliminary evidence suggests indeed that biological outcomes such as birth weight may be influenced by cross-generation transmission and asthma by the age of three may have both nutritional and social determinants. The future importance of this Lifeways dataset is a real research resource and the participating families are indeed helping to shape a healthier future. This study is one of several new cohorts to be established in recent years in Ireland. The investment made by the Government in 2006 to establish the National Longitudinal Cohort Studies of children will similarly yield information of the foremost importance to Irish life in the future.

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The Lifeways Cross-Generation Study: Design, Recruitment and Data Management Considerations

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Abstract

The Lifeways Cross-Generation Cohort Study was first established in 2001 and is a unique longitudinal database in Ireland, with currently over three and a half thousand family participants derived from 1124 mothers recruited initially during pregnancy, mainly during 2002. The database comprises a) baseline self-reported health data for all mothers, a third of fathers and at least one grandparent b) clinical hospital data at recruitment, c) three year follow-up data from the families' General Practitioners, and d) linkage to hospital and vaccination databases. Data collection for the five-year follow-up with parents is underway, continuing through 2007. Because there is at present no single national/regional health information system in Ireland, original data instruments were designed to capture data directly from family members and through their hospitals and healthcare providers. A system of relational databases was designed to coordinate data capture for a complex array of study instruments and to facilitate tracking of family members at different time points.

Introduction

There is renewed interest world-wide in birth and childhood longitudinal cohort studies as knowledge grows about the importance of early life influences on long-term health and well-being and the extent to which children may be influenced by the social and biological characteristics of their parents and grandparents. The Lifeways Cross-Generation Cohort Study is a longitudinal study established in 2001-2 as part of the Health Research Board-funded Unit for Health Status and Health Gain work programme. The study is part of an international network of longitudinal studies established around the Millennium period and was developed in the context of the European Science Foundation funded Social Variations in Health Expectancy in Europe international research programme (http://www.uni-duesseldorf.de/health/). The original design has expanded to implement 4 principal data collection phases in the timeframe 2000 to end of 2007. Though much is now known about such early life influences from evidence in other countries, very little was known about the impact of social variations on health status in Ireland, particularly important given the extent of economic transition in the country and virtually no longitudinal datasets exist. Few datasets anywhere include more than one generation of the same family. Accordingly, the overall objectives of the Lifeways Cross-Generation Study were:

1. To record the physical and psychological health status and socio-economic circumstances of individuals at birth, during early childhood, early adulthood and early middle age in Ireland, and
2. To follow them prospectively in order to measure their changing health status initially over a five year period and to assess the extent to which health status relates to social circumstances.

By collecting data at four phases over a six year period, the study provides multiple facets by which to assess the extent to which health status relates to social circumstances.

Methods

It was planned to recruit at least 1000 families over a one year period, that is the expectant mother at first maternity hospital booking visit, with a special focus on those general medical services eligible (medical card holders), her infant at birth (the proband), her partner if agreeable, and at least one living grandparent. Two representative regions were chosen, one urban, one rural, and within those regions two major hospitals providing maternity services were selected for sampling and agreed to participate. In the West of Ireland, University College Hospital Galway (UCHG), provides services for both urban and rural populations and in Dublin, on the East coast, the Coombe Women's Hospital is one of the busiest maternity hospitals in Ireland with over 7,000 babies born annually. Ethical approval was obtained prior to the study's commencement in both hospitals and from the ethical committee of the Irish College of General Practitioners. The full cooperation of the maternity units in both hospitals was secured with permission granted for research midwives to be present at ante-natal clinics to recruit expectant mothers for the study, and agreement to provide electronic data files related to the pregnancy, labour and birth records from the hospital information systems.

Sample size estimates were based on anticipated significant differences, according to medical services eligibility or not, of the following outcome measures: uptake of the 3 in 1 vaccine, option to breastfeed, smoking status of adult participants and annual rates of episodes of health care utilisation. While major outcomes such as inter-current illness, death and cause of death were also to be recorded it was not anticipated that any significant patterns would emerge by the end of the first five years, though it was an aspiration to continue the cohort for a 20 year period ultimately.

There are four time points for collection of data (see Figure 1): baseline questionnaire in 2001 (Phase 1) and birth records in 2002 (Phase 2), follow-up of the full cohort in 2005 (Phase 3) and a fourth time point will be added in 2007 (Phase 4). Phase 1 of the study began when consent was obtained from the expectant mothers who were 14 to 16 weeks pregnant and attending their first antenatal visit (booking visit) at the maternity hospital. The research nurses initially explained the study face-to-face with the women at the clinic, and answered questions as to what their participation would entail over the years. The expectant mothers were then given a leaflet to take home explaining the aims and objectives of the study and the self-completion questionnaire. If agreeable to participate they contacted the study team by telephone and returned the completed questionnaire, the written informed consent and contact details for follow-up at the birth of the baby. To enable the cross-generation recruitment, each mother was also asked to provide the names and contact details for the baby's father, and up to four of the grandparents. A total of 1124 women were recruited in Phase 1.

The objective of Lifeways was to recruit as many as possible of consecutively approached women. The cohort was never necessarily intended to be representative of the general obstetric population in Ireland at the time, since the focus was on longitudinal follow-up and within-cohort comparison and the commitment anticipated for the project was high given the number of family members involved. Nor was every pregnant woman approached during the calendar year as staffing levels, with one part-time nurse midwife in each hospital site, did not permit full coverage of every ante-natal clinic. It was decided at the outset to exclude mothers born outside Ireland as the study was unlikely to be powered to allow for meaningful sub-group analyses of this kind. Data from the annual reports of

the Coombe hospital (Dr S Daly, personal communication 2005) indicate for instance that in 2002, the calendar year of maximum recruitment, there were 7399 deliveries. At least 20% of these were non-National and around a third reported professional qualifications. Our recruitment rate was therefore about 10% of all mothers, and 19% of eligible mothers, with a skew towards higher educated women.

The fathers' and grandparents' consents were obtained by sending an information letter and a consent form. The grandparent consent forms were slightly amended to include a clinical examination during a home visit with the option of giving a blood sample. Before fieldwork began, a dedicated lo-call telephone number was set up to enable the families to contact the survey manager with any questions relating to the study. Additionally, a freepost address was provided. Later, a website http://www.ucd.ie/phps/research/ lifeways.htm was established, and an e-mail account Lifeways@ ucd.ie was set up. The ways to contact the study were routinely included in all correspondence.

Study instruments for Phase 1 and Phase 2: Mothers
Baseline data for mothers were collected using a comprehensive self-completed questionnaire. The process of variable selection and sources of instruments are available in a report at http://www. ucd.ie/phps/research/lifeways.htm, and all the survey instruments for each stage are also available online.
The questionnaire was a 50-page booklet, divided into sections relating to general health and exercise, current and past GMS eligibility (General Medical Card Services) and smoking status, consumption of alcohol and other substances, changes in diet during pregnancy including the taking of supplements. Those with GMS eligibility have a medical card, which entitles holders to free health care. General Medical Services eligibility is based on means testing and so is an important measure of economic status as well as a measure of health service utilisation.
An important design decision was to include a 158 item food frequency questionnaire - as used in the Irish national survey on lifestyle, attitudes and nutrition (SLÁN 98 and SLÁN 2002)[1]. This part of the questionnaire was designed to cover the whole diet and included 149 food items arranged into the main food groups consumed in the Irish diet. Respondents were asked to indicate their average use of each food item over the last year. Frequency of consumption of a medium serving or common household unit such as a slice or teaspoon was asked for each food and later converted to quantities using standard portion sizes. The frequency categories offered were 'never or less than once per month', '1-3 per month', 'once a week', '2-4 per week', '5-6 per week', 'once a day', '2-3 per day', '4-5 per day' and '6+ per day'. Questions were also asked relating to special diets, food labelling, frequency of consumption of fried food, butter, low-fat/polyunsaturated spread, vegetable oil and lard, methods used for cooking vegetables and whether people thought their diet could be healthier. Three psychometric instruments were included: GHQ12[2], CES-D[3] and the WHOQOL BREF[4]. In addition, there were questions on literacy and social circumstances taken from the British Millennium Cohort Study[5] and thirty-four questions on social capital as used in the West of Scotland Twenty-07 study[6]. Clinical data on mothers from the EuroKing[7] maternity information system's booking interview provided over forty variables such as family history for various diseases, personal gynaecological and reproductive history and eleven variables relating to the labour and delivery of the index baby.

Study instruments for Phase 1: Fathers
The fathers' baseline data were collected using the self-administered 50-page questionnaire described above, excluding the elements relating to pregnancy. A third of the fathers completed the baseline questionnaire.

Study instruments for Phase 1: Grandparents
Baseline data for grandparents comprised the 50-page baseline questionnaire described above, excluding the elements relating to pregnancy. In addition, a clinical examination was offered to the participating grandparents, conducted primarily by appointment at the grandparents' homes by a nurse. A small number of respondents attended a special clinic at the Coombe hospital for their examinations. The examination component was based on the European Health Risk Monitoring protocol (http://www.ktl.fi/ehrm) and included a cardio-vascular interview, standardised measure of blood pressure, height, waist and hip measurement to calculate Body Mass Index (BMI), and a blood sample. All bloods were sent to the same laboratory at University College Hospital Galway and analysed as part of routine laboratory batches for total serum cholesterol, HDL, LDL cholesterol and plasma fibrinogen. Results were sent subsequently both to the participant and their nominated GP for appropriate action with an explanation sheet, developed for the SLAN Survey of Lifestyles, Attitudes and Nutrition.

Study instruments for Phase 1 and Phase 2: Babies
The mother's pregnancy questionnaire and the baby's hospital birth record provide the baby's baseline and very early life factors. Gestational age at birth is calculated from the mother's expected delivery date recorded at the booking visit and the baby's actual date of birth. Twenty variables relating to the baby's birth, including weight, Apgar scores, delivery type, intra-partum problems, and need for resuscitation were captured from the Euro King system.

Study instruments for Phase 3: Mothers and Fathers
Follow-up data for 708 of the mothers and 188 of the fathers were collected from their GP at an average of three years post recruitment, whose name and address were captured at recruitment with prospective consent from participants. A one-page form, pre-printed with each individual's name, address and date of birth was posted to each GP with a cover letter and the GP was asked to complete the information and return it, so response rate was dependent on GP cooperation. Follow-up variables included vital status of participant, number of GP consultations since proband baby's birth, current and past medical card (GMS) eligibility, occurrence of myocardial infarction, stroke or cancer in the older adults, and date last seen by the GP.

Study instruments for Phase 3: Babies
Follow-up was provided by the GP on 703 babies. The variables were vital status, number of consultations since birth, date last seen by GP, hospital in-patient treatments and discharge diagnosis (if any), medical card (GMS) eligibility, and whether asthma was ever diagnosed in the child.

Study instruments for Phase 3: Grandparents
Follow-up data were reported by the nominated GP on 731 of participating grandparents. Variables captured include all of the variables listed for mothers' follow-up above, and in addition dates and values for the last recorded blood pressure and the lipid profile.

Additional study instruments for babies:
A sub-sample of the mothers opted to maintain an ongoing annual record of their baby's health and development. The parent-held child study record is an individual booklet for each child with two no-carbon required pre-perforated pages for each year of the child's life up to age 5. The relevant pages are posted back to the Study team annually at the time of the baby's birthday. Each visit to a healthcare provider is self-recorded by the mother, with the date and reason for visit, advice/treatment given, and by which type of healthcare provider. Additional variables relate to vaccinations, type of feeding, anthropometric measurements taken by a public health nurse, type of childcare, dental hygiene, and parents' assessment of whether the developmental milestones appropriate to the child's age (such as walking, talking, toilet training, ability to dress oneself) have been reached.

Phase 1:
1st ante-natal visit

1124 mothers consented

14 miscarriages
11 hospital record missing
9 stillbirths
1 maternal death
3 born at other hospitals
4 withdrawals before birth

Phase 2:
Baby's birth

1082 Lifeways families targeted at 3 year follow-up

42 = Cohort losses in Year 1-2

Phase 3:
3 yr GP follow-up

31 withdrawals for variety of reasons
10 lost to follow-up (post undelivered)
2 babies in foster care
1 infant death

Phase 4:
5 yr follow-up

Target is 1038 families at 5 year follow-up

44 = Cohort losses in Years 3-5

Figure 2   Lifeways Cohort recruitment and retention

703 babies & 708 mothers have 3 year follow-up

Phase 1- Ante-natal visit
Years: 2001-2

1124 pregnant mothers recruited

1003 fathers' names

2734 grandparents' names

Phase 2 - Baby's birth
Years: 2002-3

1094 babies (12 sets of twins)

330 fathers' questionnaires

707 grandparents' questionnaires+ 958 clinical exams

Phase 3 - GP follow-up
Year: 2005

703 babies & 708 mothers

188 fathers

729 grandparents

Phase 4 - 5 year follow-up
Year: 2007

Target is 75% of babies, parents, grandparents.

Figure 1   Phases of Data Collection in Lifeways

With the cooperation of the Health Services Executive in the two regions, access to the official immunisation records for children born in the study's timeframe has also been acquired. A probabilistic data matching strategy based on baby's name, date of birth, gender, and mother's name and maiden name was used to identify matching pairs of records. During 2007, an anonymized Geocoding exercise was initiated through the Health Service Executive's newly established Health Atlas in order to facilitate linkage to ecological level information such as census data and provision of health services.

Databases
During the recruitment phase, it was essential that a relational database design was adopted to assign a unique Study ID and to record contact details at the individual family member level, thus enabling tracking and correspondence. It was necessary to develop a second relational database (with identifiers removed to protect confidentiality) to link the results from questionnaires, clinical exams, hospital records, general practice follow-ups, immunization records, and blood tests to each of the participant's unique Study ID. The system now provides robust and reliable linkage between the different family members' data so that cross-generation analytic data sets can be derived (data dictionary available at http://www.ucd.ie/phps/research/lifeways.htm).

In all matters relating to capturing the families' information, the study team paid particular attention to balancing the needs of the study

for regular information and the rights of the families to not be over-burdened by requests for data. Recruitment of pregnant mothers during antenatal visits was an opportune time. Although hospital waiting areas are very busy, it seemed likely that mothers would have set this time aside to focus on their health and on the health of their expected babies. The baseline mother's questionnaire, although quite long at over 50 pages, was designed to be a practical booklet (with an A5 format, it can fit in a typical handbag). The baseline father's and grandparent's questionnaires were in a larger A4 format, to facilitate older people's eyesight, but equally comprehensive.

As this is a longitudinal study, it was vital to keep families feeling connected to and informed about the study over the period of 6 years. A variety of updates were sent: for example, birthday cards, a newsletter and a Halloween letter, and on the child's fourth birthday a birthday card with coloured stickers was dispatched plus a note to the mother notifying her of the fourth wave of data collection. The very fact of receiving one of these items often triggered a response from the participant. Telephone calls and e-mails were received to notify the research team of new family circumstances: a change of address, a birth in the family, or an update on the health of a grandparent. Directly contacting families via an e-mail address provided by mothers at recruitment was not found to be helpful, as 60-70% of the e-mail addresses were no longer valid in Phase 2. Moving home due to factors such as employment opportunities and family status changes in the parent cohort, and retirement or downsizing in the grandparent cohort means that is always challenging to keep track of the Lifeways participants. The single and younger mothers and non-home owners are found to be particularly mobile.

New wave
In spring 2007, the fieldwork for the fourth wave of the Lifeways Study is scheduled to commence. Data collection will be by postal questionnaire with the mother as principal respondent, and there will be new questions focussing on: mother's return to work status, changes in family status, child's relationship with biological father, vital status, and childcare/early schooling arrangements. The mothers will be asked to keep a record for one week of her own and her child's nutrition, and a researcher will make a home visit with prior consent to capture their physical measurements (height, weight, waist circumference). It is essential that data are captured on as many cohort members as possible at this time, with a response target set at 75%. The usefulness and importance of the Lifeways Cross-Generation Cohort Study longitudinal data to researchers across a wide range of disciplines including child development, demography, economics, epidemiology, family studies, social policy and sociology is self-evident and the data will continue to prove of great value to the research community.

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2. GHQ-12: The General Health Questionnaire is a widely used self-administered screening instrument and was included in the self-completion booklet for all of the Lifeways adults. It detects a wide range of psychological disorders, mainly the anxiety/depression spectrum, and has proved to be a valid and reliable instrument across cultures. The questionnaire comprises twelve questions, asking informants about their general level of happiness, experience of depressive and anxiety symptoms, and sleep disturbance over the last four weeks. http://www.nfer-nelson.
3. CES-D This scale was developed by the Center for Epidemiologic Studies of the National Institute of Mental Health; (Radloff, 1977). This is a short, self-reporting depression scale intended for the general population.
4. The WHOQOL-BREF instrument comprises 26 items, which measure the following broad domains: physical health, psychological health, social relationships, and environment.
5. Centre for Longitudinal Studies: Millennium Cohort Study http://www.cls.ioe.ac.uk/
6. The West of Scotland Twenty-07 Study: Health in the Community : http://www.msoc-mrc.gla.ac.uk/studies/2007study/
7. The Euro King Maternity Information System is widely used at Irish and UK maternity hospitals http://www.euroking.com/site/aboutus.cfm (accessed 12/02/2007).

Socio-Demographic, Lifestyle and Cross-Generation Predictors of Self-Rated Health in Mothers during Pregnancy

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Abstract
The Lifeways Cross-generation study was established to assess the influence of socio-economic and familial characteristics on the health status and early development of children. Between October 2001 and June 2002, 1124 women were recruited to the Lifeways study at booking or first visit to maternity hospital. Lifeways mothers were 29.4 (SD 5.9) years old at recruitment, two-thirds from greater Dublin area, 17.9% held a General Medical Services (GMS) card, 64.3% were married and 40.8% were third level educated. At uni-variate level, GMS eligibility, own and parents' education and marital status all predicted mother's self rated health during pregnancy, whilst in the final multivariate logistic regression model, GMS status, household-adjusted income, marital status and grand-maternal education were each independently predictors. The Lifeways cohort confirms the importance of social position in predicting health in pregnant Irish women.

Introduction
Pregnancy is a critical life experience, not just in terms of the obstetrical outcome but also the social and psychological adjustment it entails during the pregnancy itself and upon the birth of the baby. Whilst there are many direct measures of health status, self rated health by respondents has been shown to be a good proxy indicator for actual morbidity in a variety of situations and clinical conditions. However, there is relatively little available information on self-rated health and its determinants in pregnant women[1]. Socio-economic factors such as income, education and marital status are known to affect self-rated health. In recent years there has been renewed interest in life course influences on long-term health, including socio-economic status at different time-points. The Lifeways cohort is one of a number of longitudinal projects established around the millennium period to assess prospectively how early life factors might influence long-term outcomes for the mother herself and her baby. The Lifeways study includes three participating generations of Irish families, methodology for which is described elsewhere[2].

The objective of the present analysis was to assess the association between socio-economic and lifestyle factors in early and present life on self-rated health of currently pregnant Irish women at recruitment stage to the cohort. In particular we wished to assess how material and psycho-social factors influenced health status.

Methods
Participants
The present analysis is based on data for 1124 women recruited initially to the study.

Measures
As the health outcome measure we used self rated health based on the question: "In general, would you say your health is …" with 5 response alternatives ranging from excellent to poor – as a proxy of general health[3]. Measures identified as potential determinants of (excellent/very good) self-rated health included region (east/west), age, working status, means-tested General Medical Services (GMS) eligibility and household-adjusted income, marital status, maternal family education, father's education and mother's education. Region of origin was categorised in "West" (rural based Galway) and "East" (capital city Dublin). Age classes were built as follows: 14-23, 24-33 and 34-43. Working status variable was categorised as "working" (employee or self-employed) and "not working"(homemaker, unemployed, unable to work, retired, student, seeking work for the first time and other). The GMS status was defined by the response to the question "Do you have a medical card?" with two categories "No medical card" and "Medical card".

Finally, the household's total net income per week (income from any source, including salary, pension, benefits and allowances before deduction of tax) is adjusted to the differences in needs associated with differing size and composition using the following equivalence scale: the first adult in the household is given the value 1, each additional adult a value of 0.66 and each child (< 16 years of age) a value of 0.33. Thereafter, the total income (middle of the band) is divided by the weighted number of household members, giving a Household-adjusted income expressed across quintiles. In the analyses, the household-adjusted income was dichotomised as follows: "low income" corresponds to the lowest two quintiles and "high income" to the highest three quintiles.

Marital status was categorised as "Married", "Cohabiting", "Separated/Divorced" and "Single/Never married". The six levels of education proposed in the questionnaire were clustered into 4 categories as follows: "No school/1st level", "Some Secondary school", "Complete secondary education", "All 3rd level" (= Some third-level/Complete third-level education). These categories were used to describe mother-to-be and partner's level of education (respectively Mother and Father education). To construct the factor maternal family education, the levels of education of the maternal grandparents were combined as follows: if the response for both grandparents was "No school/1st level", the family category is "No school/1st level"; if the highest level of education achieved by at least one of the 2 grandparents was "Some Secondary school", the family category is "Some Secondary school". The category "Complete secondary education" was built in the same way. For the third-level of education, if the highest level of education achieved by one of the grandparents was "All 3rd level", the family education was "All 3rd level 1" and if both grandparents have achieved a third-level of education the category was "All 3rd level 2".

Statistical analysis
In a first step, we tested for associations between the independent variables using chi^2 tests. In the second step, to estimate health differences between groups, logistic regressions were performed. In order to assess the relative effects of the different chosen determinants, we built stepwise four successive models. In the first one, adjusting for region and age, we tested the effect of the working status and in the second one we added two economic factors: GMS status and household-adjusted income. Then, in order to study the causal pathway between these factors and SRH, marital status and education factors were successively added, respectively in a third and a fourth model. In the third step, having observed the variation of the effect of the factors in the three successive models, we built a last one with all the potential determinants entered following a
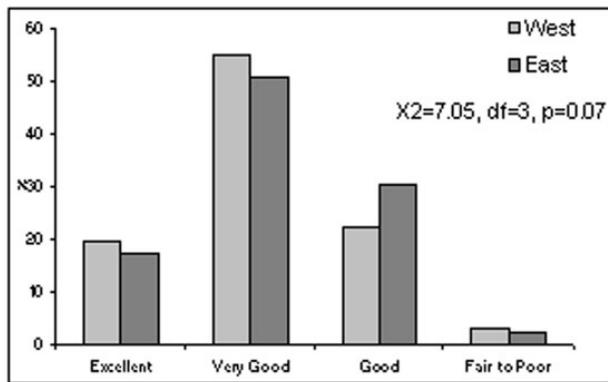
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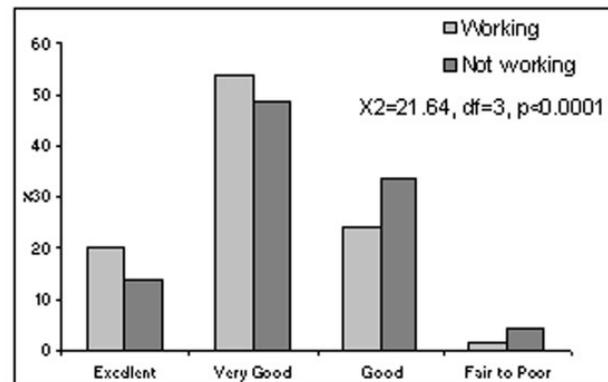
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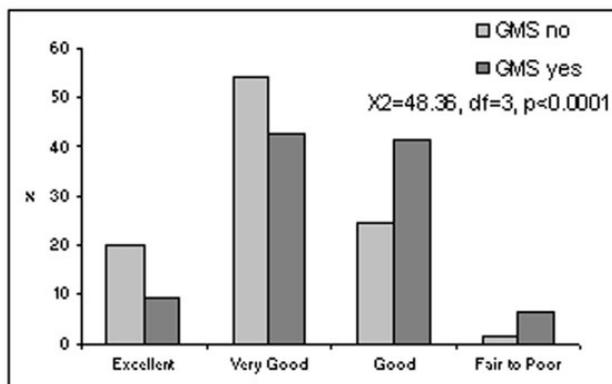
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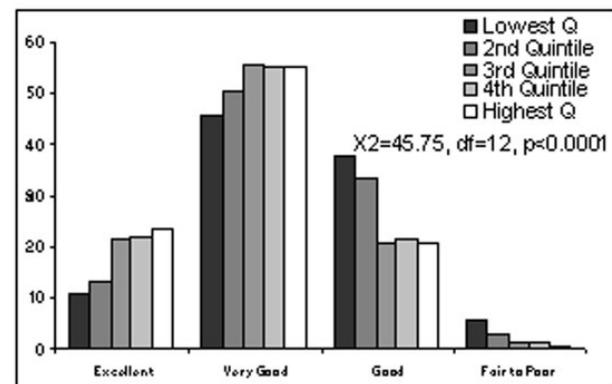
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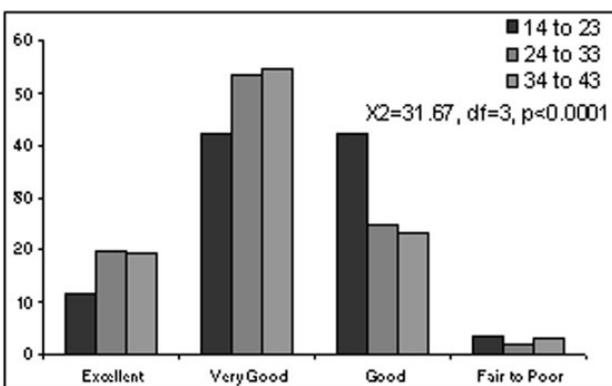
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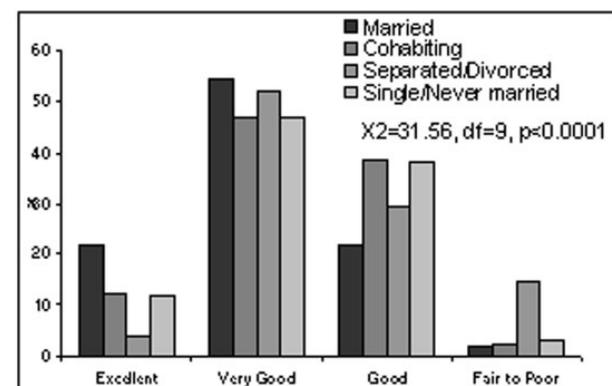
Figure 1f

Figures 1a-f   Relationship between mother's self rated health according to location, working status, general medical services eligibility, education status, age group and marital status

forward stepwise method. All the values are presented +/- the standard deviation (S.D.).

Results

Baseline socio-demographic characteristics of the participants in the Lifeways study are shown in Table 1.

The women were 29.4-years-old +/- 5.9 and none of them were widowed. The distribution of SRH overall and according to region, working status, GMS, income, age and marital status are presented in Figure 1 (a-g). Women were more likely to rate their health well if they lived in the West (Fig. 1a), were working outside home (Fig. 1b),

did not hold a GMS medical card (Fig. 1c), lived in a household with high income (highest 3 quintiles) (Fig. 1d), were over 24-years-old (Fig. 1e) and were married (Fig. 1f). The youngest mothers-to-be (14 to 23-years-old) were far more likely to be single (72.1%) than married (6.9%). Conversely, 90.2% aged 34 to 43 were married (Chi^2=31.666, df=3, p<0.0001).

The relationship between GMS and marital status was strong and significant (chi^2=167.414, df=3, p<0.0001), almost half of women holding a medical card were single (Separated/Divorced: 48.1% and Single/Never married: 41.7%) vs. 26.8% of cohabiting and 7.3% of married women. Women living with a partner (married:

No school/1st
Some 2nd
Complete 2nd
All 3rd

X2=35.57, df=9, p<0.0001

Excellent   Very Good   Good   Fair to Poor

Figure 2a

No school/1st
Some 2nd
Complete 2nd
All 3rd

X2=31.56, df=9, p<0.0001

Excellent   Very Good   Good   Fair to Poor

Figure 2b

No school/1st
Some 2nd
Complete 2nd
All 3rd 1 GP
All 3rd 2 GP

X2=27.94, df=12, p=0.006

Excellent   Very Good   Good   Fair to Poor
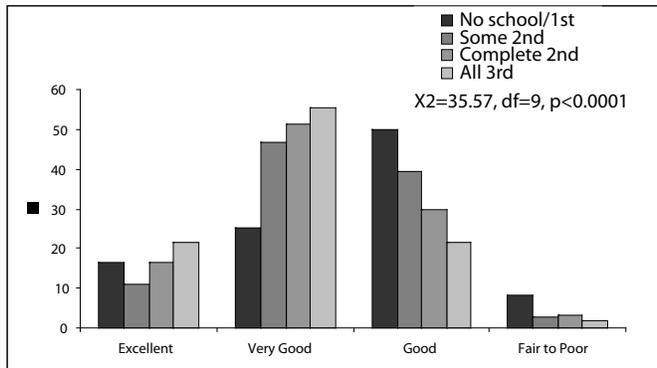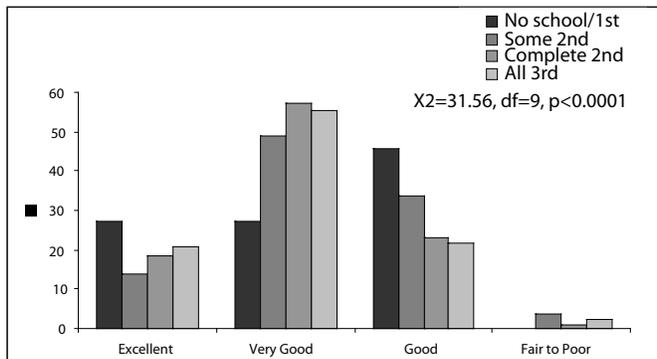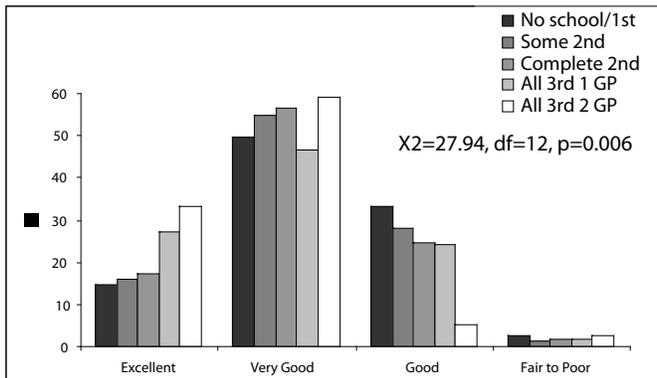
Figure 2c

Figures 2 a-c: Relationship between level of education of mother herself, of partner and of mother's parents to mother's self-rated health

Table 1	Socio-demographic characteristics of 1124 Lifeways participants at study enrollment	
	n	%
Region		
West	351	31.2
East	773	68.8
Working Status		
Working outside the home	731	65.6
GMS status		
Medical card	200	17.9
Household-adjusted income		
Below poverty line	156	16.4
Age		
14-23	209	18.7
24-33	611	54.7
34-43	298	26.7
Marital status		
Married	716	64.3
Cohabiting	138	12.4
Separated/Divorced	27	2.4
Single/Never married	233	20.9
Education Level Mother		
All third	543	49.6
Complete Second	349	31.9
Some second	189	17.3
No school/1st level	13	1.2
Education Level Father		
All third	415	40.8
Complete Second	275	27
Some second	295	29
No school/1st level	33	3.2
Education Level Maternal family		
All third 2	40	4.4
All third 1	107	11.8
Complete Second	183	20.2
Some second	271	29.8
No school/1st level	307	33.8

71.7% or cohabiting: 64.2%) were more likely to work than the single ones (separated/divorced: 48.1% or single/never married: 50.4%) (Chi²=38.942, df=3, p<0.0001).

There was a strong, significant educational gradient; mothers with the lowest education had the worst health (Fig. 2a). The level of education of the partner had a similar effect on mothers' self-rated health (Fig. 2b). The family (e.g. grandparental) education level also predicted self-rated health of mothers, those where both parents had third level education were far more likely to report having excellent/very good health than the other women (Fig. 2c).

The relationship between the GMS status and the 3 education factors was significant (respectively: Family mother education: Chi²=13.146, df=4, p=0.011, Father education: Chi²=46.380, df=3, p<0.0001 and Mother education: Chi²=116.464, df=3, p<0.0001). Each time an education gradient was observed where the lower level of education was associated with the greater likelihood of the mother holding a medical card, this gradient being particularly

stronger with her own education. An education gradient was also observed for the working status, this gradient being stronger for the education of the mother and just a tendency with her parents' education (respectively: Family mother education: Chi²=8.496, df=4, p=0.075, Father education: Chi²=30.209, df=3, p<0.0001 and Mother education: Chi²=110.363, df=3, p<0.0001).

The Uni-variate figures illustrate an asymmetrical pattern separating excellent and very good on one side and good to poor/fair health on the other. Consequently, in the next models self-rated health, used as the dependent variable, is dichotomised into "good" (= excellent/very good) and "poor" (= good/fair/poor).

In the combination of factors entered in the first Model 1 (Table 2), region no longer affects significantly SRH (tendency: p=0.079) but the younger women still rate their health worse than the older ones. Working mothers are more likely to rate their health well. In the second model, working status is no longer significant when the other two economic factors are added. GMS medical card status

Table 2	Adjusted odd-ratios for mother's self-rated health in four different models							
	Model 1		Model 2		Model 3		Model 4	
	Odds-ratio	CI 95%	Odds-Ratio	CI 95%	Odds-ratio	CI 95%	Odds-ratio	CI 95%
Region								
West	1.306	0.970-1.759	1.257	0.911-1.735	1.201	0.862-1.672	1.104	0.753-1.618
East*	1.000		1.000		1.000		1.000	
(p-value)	(0.079)		(0.163)		(0.280)		(0.612)	
Age								
14-23	0.482	0.325-0.715	0.564	0.358-0.887	0.735	0.421-1.285	0.817	0.412-1.620
24-33	0.951	0.687-1.316	0.978	0.688-1.391	1.056	0.736-1.515	1.048	0.692-1.587
34-43*	1.000		1.000		1.000		1.000	
(p-value)	(<0.0001)		(0.018)		(0.334)		(0.708)	
Work Status								
Working	1.510	1.143-1.995	1.049	0.736-1.495	1.042	0.725-1.496	0.903	0.583-1.397
Not working	1.000		1.000		1.000		1.000	
(p-value)	(0.004)		(0.793)		(0.826)		(0.646)	
GMS								
No medical card			1.804	1.219-2.669	1.616	1.051-2.484	1.578	0.921-2.703
Medical card*			1.000		1.000		1.000	
(p-value)			(0.003)		(0.014)		(0.097)	
Household Income								
High Income			1.702	1.230-2.354	1.656	1.166-2.353	1.514	1.002-2.288
Low Income			1.000		1.000		1.000	
(p-value)			(0.001)		(0.005)		(0.049)	
Marital status								
Married					1.308	0.784-2.182	1.231	0.650-2.331
Cohabitating					0.722	0.424-1.229	0.576	0.296-1.123
Separated/Divorced					1.045	0.391-2.792	1.098	0.308-3.918
Single/Never Married*					1.000		1.000	
(p-value)					(0.088)		(0.047)	
Mother family education								
All 3rd 2 GP							6.960	1.549-31.274
All 3rd 1 GP							1.207	0.670-2.175
Complete 2nd							1.491	0.918-2.422
Some 2nd							1.486	0.958-2.304
No school/1st*							1.000	
(p-value)							(0.058)	
Father education								
All 3rd							1.482	0.563-3.898
Complete 2nd							1.969	0.734-5.280
Some 2nd							1.373	0.534-3.532
No school/1st*							1.000	
(p-value)							(0.374)	
Education Mother								
All 3rd							0.647	0.101-4.145
Complete 2nd							0.560	0.089-3.532
Some 2nd							0.463	0.073-2.949
No school/1st*							1.000	
(p-value)							(0.604)	
% Correct predictions	70.1		71		71.7		73.1	
Nagelkerke R2	0.049		0.079		0.088		0.110	
Model n	1080		920		915		724	

Table 3	Self-rated "good" health reported by women in their early pregnancy	
	Odds-ratio	CI 95%
GMS		
No medical card	1.659	1.006-2.737
Medical card*	1.000	
(p-value)	(0.047)	
Household Income		
High income	1.620	1.100-2.363
Low income*	1.000	
(p-value)	(0.012)	
Marital Status		
Married	1.687	0.934-2.491
Cohabiting	0.883	0.368-1.261
Separated/Divorced	0.724	0.383-4.338
Single/Never married*	1.000	
(p-value)	(0.010)	
Family education		
All 3rd 2 GP	7.696	1.750-33.836
All 3rd 1 GP	1.301	0.740-2.286
Complete 2nd	1.621	1.014-2.592
Some 2nd	1.559	1.024-2.375
No school/1st*	1.000	
(p-value)	(0.020)	
Model n	724	
Nagelkerke R2	0.101	

*: Reference group.

All p-values within parenthesis are related to a "Wald test".

and belonging to a household with high income remain significant.

Marital status was included in Model 3. This factor tends to affect women's SRH (borderline significance p=0.088), married women being more likely to rate health as good. While the first 2 models showed that the youngest women (14 to 23-years-old) were less likely to report good health, as soon as the marital status is taken into account the age effect disappeared. Education factors were added in Model 4 and only mother's family education significantly predicts SRH. The mothers whose both parents have achieved a third level of education were almost 7 times more likely to report good health than the women coming from families with lower levels of education. The addition of education factors increases the differences according to marital status, slightly reduces household income effect and makes GMS status non significant (p=0.097).

Finally, to get a clean picture of the respective effects of the chosen factors on SRH, we ran a last analysis following a forward stepwise procedure. The final model included four predictors for SRH: marital status, family education, GMS status and household-adjusted income (Table 3).

Discussion
The hypothesis that socio-demographic factors can affect self-rated health in pregnant women is broadly confirmed. While all the chosen factors are individual or uni-variate predictors of self-rated health, the analysis of their combined effect shows that only four, GMS status, household-adjusted income, marital status and maternal parental education independently predict self-rated health, the effect of the other potential determinants possibly being mediated through the effect of these four predictors.

Previous studies have shown that working status was predictive of good health[4,5], but this does not remain independently significant in the final models. This may reflect the need of individuals to work. When going through pregnancy women who can afford to do so may stop working if their partner can provide for material security. It is important to note that both economic variables independently predict SRH. It is well known that people's economic satisfaction is a very powerful predictor of self-perceived health[3,6] and significant associations, in pregnancy and early motherhood, between poorer health and both material deprivation and low social support have been previously shown[7]. GMS is known to be a very robust measure of actual income[8] and yet the other income measure (household-adjusted income) is also a significant factor in the models, indicating the importance of financial circumstances in pregnancy.

Waldron and colleagues[9] have shown that motherhood in teenagers is associated with worse health trends. Pregnancy can also be very stressful for very young mothers-to-be, which in turn can have health effects as chemical changes in the brain could lead to changes in immune system for instance[10]. However, as soon as the marital status is taken into account the age effect disappeared. Therefore age could be a confounding factor, the negative effect of pregnancy for very young women disappearing when the stress of this experience is alleviated by the securing presence of a partner. Another explanation is that these young mothers-to-be may adjust their expectations in what they consider to be "good" health as they get older[11,12]. Our results confirm that married women are more likely to rate well their health than the other women, in particular lone mothers, allowing for socio-economic factors[11,13,14]. It is possible that marriage is a healthy state related to healthier lifestyle and better psychosocial health whereas previously married people are likely to have suffered considerable stress during marital breakdown with long term adverse consequences on their health[15]. Previous studies have shown that single or never married women have a health status quite similar to that of married women[15,4]. Our results do not support these findings with the single mothers-to-be rating their health the same the cohabiting women do. It seems then that for a pregnant woman the presence of a partner is important in terms of mental health for emotional support, household tasks and later practical help with childcare[7] but the fact that she is married to him makes a significant difference. Gjerdingen and colleagues[16] have shown that mental well-being, strongly linked to general health, is associated with support by the spouse in pregnant women.

Previous studies have shown that education achievement was predictive of SRH for women even when socio-economic factors were taken into account[17] [8]. In this analysis pregnant women's education was a predictor for SRH only at Uni-variate level. However, education does predict SRH in pregnant women through their parents. The effect of the education level of either a woman's mother or father has been studied previously[18,19]. In our analysis it was the combined effect for maternal grandparents, the education status of grandfather or grandmother alone was not independently predictive. However, the effect of maternal parental education on SRH of pregnant women may not be inconsistent with previous findings [17] [8] as the education level of a woman is the result of both genetic and environmental conditions[20], strongly predicted by her parents educational status and is strongly associated with her partner's also. Grandparental education can be seen as an indicator of the contribution of inherited human and learnt social capital transmitted from the earlier generation via the mother to the child and therefore being of primary importance during the process of motherhood.

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Dietary Habits of Pregnant Women in Ireland

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Abstract

This analysis of the Lifeways Cohort study mothers during pregnancy (n=1124), utilises information from a standard food frequency questionnaire completed at baseline recruitment during early pregnancy. We demonstrate that 76% of women achieved recommended intakes of 5 plus portions of fruit and vegetables daily, though this is strongly socially patterned, inversely associated with age and positively associated with level of education. Achievement of the other recommended shelf intakes of the Food Pyramid is much lower, ranging from 12% achieving the recommended sparing intake of foods high in fat, salt or sugar, to 45% consuming the recommended 3 portions per day of meat and poultry. General medical services eligible respondents are generally less likely to achieve recommended intakes. While 61% of women under 25 years old stopped drinking during pregnancy, this dropped to 38% of expectant mothers over 35 years. Less than half (45%) of those (n=860) who responded specifically to the question reported peri-conceptual folate supplement intake, again strongly socially patterned. These findings both provide important prevalence data and highlight the need for more concerted and supportive health promotion interventions during pregnancy.

Introduction

During pregnancy women are advised to ensure that their diet is providing energy and nutrients adequate for the baby to grow and develop, and also to cope with the physiological changes demanded as both progress towards term. In western countries severe nutritional deficiency or inadequate calorie intake is rare, but micronutrient deficiency may be more of a concern, and the possibility of foetal malformation, particularly in the formative first trimester, is an important public health issue. Dietary messages must be practical and achievable. The Food Pyramid is a useful tool to ensure that pregnant women consume a variety of foods to meet their basic nutritional requirements and has been the educational method of choice by the Republic of Ireland's Health Promotion Policy Unit[1]. It is, however unclear, whether these guidelines are being met by pregnant Irish women as systematic and detailed nutritional surveys are rare.

Folic Acid – One of Life's Essentials is a cross border health promotion campaign, encouraging women who are likely to become pregnant to take 400µg folic acid daily as well as consuming a diet rich in folate. Despite high awareness of the benefits of taking folic acid this is not matched by pre-conception intake[2]. It is also recognised that the consumption of excess alcohol during pregnancy adversely affects foetal development and pregnancy outcomes. The influence of moderate drinking is more controversial[3]. Health messages aimed at changing behaviours of pregnant women vary in their prominence and their impact. Our objectives in this analysis were to document dietary patterns in expectant mothers based on the information they provided in the self completed questionnaire at booking visit, to examine intake of folate and alcohol in particular and to characterise socio-demographic patterns related to those dietary patterns.

Methods

The Lifeways study is a longitudinal population based cross-generational cohort study comprised at baseline of 1124 mothers recruited during their first antenatal visit between October 2001 and January 2003 in Galway and Dublin. In addition to the routine EUROCAT ante-natal and birth record, the mothers self-completed a questionnaire providing information on their health, socio-demographic information, pregnancy and family. The questionnaire included a detailed food frequency questionnaire, data from which contribute to the current analysis. The methodology is described in detail elsewhere.

For the purpose of the present analysis we examined in particular three groups. First we wished to profile those achieving the healthy eating recommendations of the Health Promotion Policy Unit according to the food pyramid recommendations. Secondly we wished to compare characteristics of those mothers who stopped drinking while they were pregnant compared to those who cut-down on alcohol. Thirdly we compared those reporting peri-conceptional folic acid supplementation with those not.

Socio-demographic characteristics considered were age, general medical services eligibility, marital status, region, and level of education. Categorical comparisons were made by means of chi-squared tests as appropriate and for multivariate analyses, logistic models were devised based on achievement or not of each of the three outcome measures above.

Results

General Healthy Eating

Table 1 summarises the % of women achieving the recommended guidelines for each of the food pyramid recommendations. The most satisfactory rate was for fruit and vegetables, in that 76% of pregnant women achieved the recommendations, but less than half met the recommendations for the remaining shelves of the food pyramid. Notably, just 12% reported achieving the guidelines for the top shelf, that is convenience foods high in salt, fat or sugar. General Medical Services status showed a consistent association with achievement of the Food Pyramid recommendations generally, in that medical card holders were less likely than other women to do so. Fruit and vegetable consumption was associated significantly at univariate level with socio-demographic variables age, marital status, medical card or GMS eligibility, region and marital status (see Table 2). Achievement or not of the fruit and vegetable recommendation was consequently used as the dependent variable for further logistic analysis. Table 3 shows that women most likely to achieve the recommendations are over 33, living in the Galway area, married, with no medical card and a high level of education.

Folic Acid

Of 860 women who completed the question, 45% reported taking folic acid during the 3-month period before becoming pregnant, 61% during the first six weeks of pregnancy and rising to 66% between the 7th and 12th week of pregnancy. The mean age of women who had taken pre-pregnancy supplements was 31.7 (SD

Table 1 Daily reported intakes of portions within each category of the Food Pyramid (n= 1124)

	Cereals, Breads & Potatoes	Fruit & Vegetables	Milk, Cheese & Yoghurt	Meat, Fish & Poultry	Foods high in fat, salt and/ or sugar
Recommended number of portions	6+	5+	3	3	≤3
% of pregnant women achieving recommendations	29%	76%	13%	45%	12%
Mean number of portions	5.47	6.71	4.42	2.47	7.65
Std Deviation	3.47	3.89	1.97	3.45	5.51
1st Tertile	3.86	4.71	3.36	1.68	4.93

Table 2 Socio-demographic characteristics of mothers achieving the fruit and vegetable recommendations

Characteristic	n	%	p value
Age			
14 to 23	125	14.7	
24 to 33	465	54.8	$\chi^2 = 47.25$; 2 df;
34 to 43	258	30.4	$p < 0.0001$
Total	848	100	
Marital Status			
Married	589	69.5	
Cohabiting	94	11.1	$\chi^2 = 42.00$; 3 df;
Separated/Divorced	18	2.1	$p < 0.0001$
Single/Never married	147	17.3	
Total	848	100	
Mother's Education			
No school/primary only	9	1.1	
Some secondary	120	14.4	$\chi^2 = 24.525$; 3 df;
Complete secondary	260	31.3	$p < 0.0001$
Third level	442	53.2	
Total	831	100	
Medical Card			
Yes	123	14.6	
No	720	85.4	$\chi^2 = 23.25$; 1 df;
Total	843	100	$p < 0.0001$
Region			
East	557	65.5	
West	293	34.5	$\chi^2 = 16.97$; 1 df;
Total	850	100	$p < 0.0001$

Table 3	Socio-demographic predictors of those achieving Fruit and Vegetable recommendations			
Variable	Categories	n (%)	Mean portions of F&V	Exp (B)
Age	14 to 23	206 (18.6)	5.97	.000	
	24 to 33	608 (54.8)	6.53	.000	.324
	34 to 43	296 (26.7)	7.60	.002	.534
Mother's Education	no school/ Primary only	13 (1.2)	6.19	.044	
	Some Secondary	186 (17.1)	6.24	.298	.508
	Complete Secondary	349 (32.1)	6.28	.006	.563
	Third level	540 (49.6)	7.21	.107	.755
Medical Card	Yes	196 (17.7)	6.04		
	No	912 (82.3)	6.85	.061	.695
Region	East	767 (68.7)	6.49		
	West	349 (31.3)	7.19	.015	.654

Table 4	Factors associated with pre-conception intake of folic acid		
Folic acid supplement use	Yes % (n)	No %(n)	Total %(n)
Total	45.1 (388)	54.9 (472)	100 (860)
GMS card	25.6 (34)	74.4 (99)	15.5 (133)
No GMS card	48.6 (351)	51.1 (372)	84.5 (723)
			100 (856) (P=0.0001)
Planned	61.0 (291)	39 (186)	59.8 (477)
Not Planned	8.5 (23)	91.5 (248)	36.2 (271)
			100 (748) (P=0.0001)
Third level Education	49.2 (216)	50.8 (223)	51.0 (439)
Completed Secondary education	44.5 (121)	55.5 (151)	31.6 (272)
<Completed Secondary education	33.0 (43)	66.9 (87)	17.4 (150)
			100 (861) (P=0.005)
Married	58.5 (336)	41.5 (238)	68.4 (574)
Single	12.7 (20)	87.3 (138)	18.8 (158)
Co-habiting	29.2 (31)	70.8 (75)	12.6 (106)
Mean age	31.7 (SD 4.4)	28.0 (SD6.2)	100 (855)

4.4) years versus 27.9 (SD 6.1) years in women who did not; the difference in means was 3.7 years (95% CI 3.0 to 4.5) p=0.0001. Despite this overall difference, only 26.6% of pregnant women over the age of 35 years took folic acid. Table 4 shows the factors associated with women who took folic acid supplements three months prior to conception compared to those who did not.

Alcohol
While 20.5% of women did not normally drink alcohol, 77.7% reported changing their drinking patterns since becoming pregnant and 1.8% made no change. With increasing age, women were more likely to drink less rather than stop; 30.4 years (SD 5.8) versus 28.6 years (SD 5.8); difference in mean 1.8 (95% CI 0.99 to 2.6). As indicated in Table 5 a strong trend across age categories was demonstrated (P=0.001).

Those who reduced alcohol consumption had a higher prevalence of 3rd level education relative to those who stopped drinking; 56.7% versus 50.4% (P =0.03). There was no significant difference in drinking patterns between women who lived in the east of the country compared to the west. Marital status, medical card status, smoking, change in smoking habit and folic acid consumption were not associated with stopping or reducing. There was significant difference in baseline alcohol consumption (number of drinks consumed per drinking session) between those who reduced and those who stopped drinking in the 12-month period before pregnancy; mean number of drinks 4.0 (SD in stoppers and in reducers (Stoppers Z=-2.448; P=0.014). Women who decided to drink less during their pregnancy consumed wine more frequently than other types of alcohol. Twenty percent consumed wine twice or more per week while 11.1% consumed beer/lager or cider, 1.6% consumed spirits; 0.8% consumed port/sherry/liqueurs twice or

Table 5	Pattern of alcohol drinking habits during pregnancy according to age group amongst those reporting a change in drinking pattern while pregnant (n=795)			
	Age group (years)			
	≤25	26 to 30	31 to 34	≥35
	(%)	(%)	(%)	(%)
Drank less	39.1	40.9	49.5	62.4
Stopped drinking	60.9	59.1	50.5	37.6

more per week. Women who breast fed their last child were more likely to reduce alcohol consumption (62.7%) than women who did not breast feed (50.6%).

Discussion
The findings from this analysis of the Lifeways cohort study show that a reasonably high percentage of pregnant women are meeting the fruit and vegetable recommendations from the Health Promotion Unit's Healthy Eating Guidelines based on the food pyramid, but less than half achieved the remaining recommendations. A similar pattern has been observed among Irish women in the general population, in that the SLAN survey of lifestyles, attitudes and nutrition reports 70% reaching the fruit and vegetable recommendations but as little as 17.5% achieving the recommendations for high fat, salt and sugar foods[4]. Targeted and supportive health promotion interventions for

certain groups of pregnant women may be appropriate since it is clear from this analysis that socio-economic factors are associated with achieving dietary recommendations in pregnant women, in keeping with previous studies. Older, higher-income, better educated pregnant women were found to consume higher percentages of recommended vegetable servings and have better overall diet quality[5]. Nutritional knowledge and access to an affordable healthy diet is less likely among low and middle-income pregnant women, which may prevent them from meeting the nutritional requirements of pregnancy[6]. Regional differences have also been demonstrated in other studies, with poorer women in more rural areas consuming less varied and less nutrient-dense diets[7], but in the present analysis the Dublin based women were more likely to report a less adequate diet.

Recommendations for folic acid supplementation for all Irish women capable of becoming pregnant have been in place since early 1993 with limited success reported[2]. This is not unique to Ireland as other countries with similar policies have proven to be ineffective[8]. Overall pre-conception folic acid consumption of 45% is high relative to other Irish studies. This may be accounted for in part by a positive reporting bias as 23% of women omitted to answer the folic acid questions and these non respondents may be more likely not to have taken folate supplements. Despite possible over-reporting, we have demonstrated that even when the pregnancy is planned, 40% of women did not take folic acid during this critical time. We have also demonstrated significant health inequality in that younger, poorer, less educated women are less likely to take folic acid. The National Committee on Folic Acid Food Fortification recommends that the Department of Health and Children should make new regulations to introduce that mandatory fortification of all bread marketed in Ireland. However, the committee also recommend that sexually active women of child bearing age should continue to take folic acid supplements.

While alcohol abuse and binge drinking has been shown unequivocally to cause foetal alcohol syndrome there is less concerted evidence on the possible effect of moderate alcohol consumption throughout pregnancy. Caution is appropriate given the problem of self report in assessing the relationship between alcohol consumption and outcome, with a consequent lack of clarity on whether a safe threshold exists and abstinence is therefore the preferred message. Despite similar pre-pregnancy baseline consumption of alcohol in our study, some women stopped drinking alcohol when pregnant whereas other women reduced the amount they consumed but many women continued to drink alcohol during their pregnancy. It appears from our study that older, educated women continue to consume alcohol but younger women stopped entirely. Wine was the beverage of choice, which may indicate that these women drank as part of their daily routine possibly during mealtimes rather than for social reasons outside the home but their drinking behaviour were not explored as a primary part of this study. This analysis has provided some useful data relating to the effectiveness of health messages, which are being adopted by pregnant women in Ireland.

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The Risk Factor Profile of Grandparents

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Abstract
In the Lifeways Cross Generation Cohort Study, mothers were asked to recruit at least one of 4 potential living grandparents to the study, and 1177 grandparents became active participants who either completed a health status questionnaire only (n=707), or subsequently underwent a cardiovascular risk assessment examination at home (n=958). Mean age of grandfathers at baseline was 61.5 years (SD 10.3), of grandmothers 59.2 years (SD 9.1), with a range of 40-83 years, 21% of grandmothers and 16% of grandfathers were third level educated. Risk factor profile of grandparents tended to be more adverse than the general population as assessed by the standard cardiovascular risk factor SCORE. Grandparents' socio-demographic characteristics were similar, whether maternal or paternal in origin. Predictors of positive self-rated health were non smoking (OR 1.5, p=0.06) and non GMS eligibility (OR 1.99, p<0.001). At four year follow-up, complete general practice data were available for 285 of 488 respondents with full recruitment data (58.4%). Increased GP utilisation pattern was predicted by baseline morbidity characteristics, though heavier male drinkers were less likely to attend.

Introduction

Life-course epidemiology is concerned with the study of long-term effects on risk of chronic disease of physical and social exposures during gestation, childhood, adolescence, young adulthood and later adult life. There are two main schools of thought underpinning this research, the biological and social pathways model and the foetal programming hypothesis re-introduced by David Barker in the early 1990s[1,2]. It is well established for instance that the health status of a newborn infant is critically dependent on mother's own health status and immediate proximal characteristics such as maternal smoking and nutrition are important[3]. Few studies have the longitudinal capacity to identify family influences across two or more generations of the same family. Follow-up has focused traditionally on examining exposures in a single cohort, such as recruited through pregnancy or at birth, but more recently the scope for examining cross-generational transmission of biological and social characteristics has become feasible, primarily through linkage or historical data using unique identifier mechanisms[4,5]. The Life ways cohort affords an opportunity to assess this issue and our objective in the present analysis is two-fold, to describe the health status profile at recruitment of the grandparents participating directly in this study, and in the sub-group of grandparents for whom general practice follow-up was available 4 years on, to describe how utilisation was predicted by their baseline characteristics.

Methods

At recruitment stage during ante natal booking visit, all mothers were asked if, in addition to their infant and partner, they would attempt to recruit to the project at least one of the available living grandparents. Given resource limitations it was planned to include if possible at least one living grandparent per family, that is 1000 respondents and accordingly where more than one was available, to rotate selection at random of maternal grandmother, paternal grandmother, maternal grandfather and paternal grandfather. Following informed consent, grandparents were asked to complete a self-administered questionnaire covering self-reported health status, socio-economic circumstances, lifestyle, health care utilisation and nutrition. This was distributed to grandparents with the pregnant mother's assistance.

Funding also became available subsequently to offer a cardiovascular examination in the home by a trained nurse, organised directly from the coordinating centre through contact information on the database. The examination protocol for this was based on the European Health Risk Monitoring Cardiovascular examination guidelines (www.ktl.fi/ehrm). Respondents completed a brief additional questionnaire on family history of cardiovascular disease, medications and other inter-current health problems. They then underwent standardised measurement of weight, using a balance scales, height using a portable stadiometer, waist circumference, systemic blood pressure measured with a mercury sphygmomanometer. Blood samples were drawn for measurement of non fasting total serum cholesterol and lipoprotein profile and plasma fibrinogen. All samples were posted by the nurse within 24 hours to the same biochemistry and haematology laboratory at University College Hospital Galway. Results of these tests were returned, with the grandparent's prior consent, to a nominated general practitioner and patients also agreed to follow up for subsequent health outcome through that general practice.

In summer 2005, four years after recruitment, general practices were contacted directly and asked to complete a short one page form on whether the grandparent had developed a serious illness such as heart disease or cancer, had died, how frequently he or she had consulted in the interim since recruitment and whether there was any chart record of either blood pressure or serum cholesterol measurement.

We report here basic descriptive characteristics of grandparents, their cardiovascular risk profile compared with national lifestyle survey data[6] and weighted according to the internationally accepted SCORE[7] protocol. We also constructed two multivariate models, first to see if any grandparental characteristics predicted their self rated health status at baseline, and secondly whether general practice utilisation patterns by fourth year of follow-up were predicted by their status at baseline. In a logistic multi-variate model to predict excellent or very good self rated health, we included region (east or west of the country), gender, GMS eligibility, marital status, level of education and smoking status. For the second analysis the outcome was an ordinal measure based on quintiles of GP consultation between baseline and follow-up times. We used a cumulative logistic regression model to predict the level of GP consultation in terms of cardiovascular lifestyle risk factors (high cholesterol, high blood pressure, medicine use, smoking status, alcohol consumption, salt consumption, obesity, and exercise level), controlling for socio-demographic variables (age, sex, GMS status).

Results

Overall, data were obtained for 1177 grandparents, from an initial pool of 2734 addresses of those willing in principle to participate. This included 707 grandparents who completed the questionnaire, 958 who were examined at home and 488 who provided complete data. The discrepancy in numbers is accounted for by two factors. Firstly, subsequent non return of questionnaires left by nurses with those examined was experienced. Secondly, not all those who completed and returned the self administered questionnaire initially were available subsequently for examination by home appointment. All four types of grandparents were included, with maternal grandmother participating in higher numbers than the other three categories.

Findings from the baseline questionnaire indicates that mean age of grandfathers was 61.5 years (SD 10.3), and of grandmothers 59.2 (SD 9.1) with a range from 40-83 years. 21% of grandmothers and 16% of grandfathers were third level educated. Just under half of grandfathers (46%) worked, while 39% were retired and 53% of grandmothers were homemakers, 27% worked still outside the home and 14% were retired. Twenty four % of grandfathers and 36% of grandmothers were general medical services eligible. Eighteen % of grandfathers and 27% of grandmothers smoked. Table 1 shows grandparents' risk factor profile based on questionnaire data only, categorised into four groups, maternal or paternal grandfather or grandmother (n=707 respondents). Whilst rates of current smoking were about average for the population, past smoking rates were high and respondents were relatively inactive.

Notably, the risk factor profiles were very similar, whether paternal or maternal grandparents in origin (see also Table 2). The average age of both grandfather groups was 61 years, of maternal grandmothers 58 years and paternal grandmothers 59 years. Mean age of school leaving was just over 15 years in all four groups. More grandfathers were ex smokers than grandmothers. Height, weight and body mass index were comparable between grandmothers and grandfathers.

In the logistic model of questionnaire data, Self-rated health was rated better among non medical card general medical services eligible grandparents. Only two factors were predictive of better self rated health, non smoker (OR 1.5, p=0.06) and non medical card holder (OR 1.99, p<0.001).

Examination data for cardiovascular risk factors are presented in Tables 2 and 3. Overall, risk factor profile tended to be more adverse than expected for the general population. Compared to the findings of the National Lifestyle survey SLAN[6] conducted in the same year they had higher than expected self reported rates of angina, hypertension and treated cholesterol level. Mean total serum cholesterol was higher in grandmothers than grandfathers. This is reflected also in their SCORE[7], calculated from the standard system

Table 1 Baseline Characteristics of Lifeways Grandparents: Questionnaire data only (total n=707)				
	Maternal Grandmother n = 285	Maternal Grandfather n = 163	Paternal Grandmother n = 163	Paternal Grandfather n = 96
Smoking:				
Current: (yes % n)	23% (68)	13.5% (22)	26.4% (43)	20.8% (20)
Ever: (yes % n)	36% (103)	55.8% (91)	37.4% (61)	64.6% (62)
Alcohol consumption:				
Times per week	2.7 (1.8)	3.3 (1.9)	2.5 (1.6)	4.0 (2.2)
Number of drinks/time	3.8 (2.8)	5.4 (3.9)	3.8 (2.2)	5.9 (5.8)
Exercise: times per week mean (SD)				
Strenuous	0.21 (0.99)	0.39 (1.3)	0.18 (1.0)	0.6 (1.9)
Moderate	2.1 (2.7)	1.8 (2.5)	2.0 (2.9)	1.8 (2.2)
Mild	2.6 (2.6)	2.8 (3.4)	3.1 (3.6)	2.1 (2.5)
Self-report Weight mean kg (SD)	66.7 (13.9)	78.9 (13.7)	65.8 (10.9)	82.1 (15.7)
Self-report Height mean m (SD)	1.52 (0.07)	1.56 (0.09)	1.51 (0.07)	1.55 (0.10)
GMS card now (% n)	39.5% (111)	39.1% (63)	50.0% (80)	43.8% (42)
GMS card ever (% n)	21.5% (34)	21.3% (20)	15.1% (11)	13.7% (7)
Self reported own birth weight, if known (mean gms SD)	3.48 (0.89)	3.57 (1.20)	3.30 (1.16)	3.40 (0.73)
Age left school; (mean SD)	15.5 (2.05)	15.1 (2.65)	15.7 (1.8)	15.7 (2.4)
Range	10-23	8-26	13-22	11-26
Self-rated health:				
Excellent	9.1%	9.2%	10.1%	12.1%
Poor	0.4%	2.0%	0.7%	2.4%

that takes account of smoking status, level of blood pressure, body mass index and total serum cholesterol (table 4).

Finally we examine general practice utilisation patterns. The objective of this part of the analysis was to examine the association between socio-demographic and lifestyle risk factors and number of GP consultations over a three-year follow-up period. General Practice follow-up clinical record data by summer 2006 were available for 285 of the grandparents (mean age 60.9 years, SD 9.2 years) for whom full cardiovascular examination and questionnaire data were available (n=488, ascertainment rate 58.4%). The main outcome measure for this part of the analysis was the level of GP consultations, divided into quintiles with cut-off points at 5, 9, 13 and 23 consultations.

The level of consultations increased linearly with age (p=0.0005). People who were taking medicines at the initial examination (OR = 2.83 95% CI 1.64, 4.87), those who had been told in the 12 months prior to the initial examination that they had high cholesterol (OR 3.45, 95% CI 1.87, 6.37), those who were obese (OR 2.43, 95% CI 1.47, 4.02) and those with GMS cards (OR 2.79, 95% CI 1.65, 4.71) were more likely to have a high level of GP consultations. There was no evidence that the effect of GMS status was influenced by age. Men who consumed over the recommended alcohol limit (14 units per week) had a lower level of consultations than women or men who consumed under the recommended alcohol limit (OR = 0.20, 95% CI 0.06, 0.70). Socio-demographic and lifestyle variables included in the model which were not significant were smoking status, high salt consumption, exercise level, knowledge of high blood pressure, illness at baseline, and use of medicines for high cholesterol or high blood pressure. These factors were significant at uni-variate level with high-risk behaviours (smoking, salt intake) associated with a lower level of consultations – however this was explained in the multivariate model by the effect of age, where younger people were more likely to have higher-risk lifestyles and also had a lower rate of GP consultations.

Table 2 Baseline Characteristics of Life-ways Grandparents: Physical Examination data (n=958)				
	Maternal Grandmother	Maternal Grandfather	Paternal Grandmother	Paternal Grandfather
	n= 372	n= 221	n=220	n=145
*Age (SD)	58.1 (8.9)	61.0 (10.1)	59.2 (8.9)	61.1 (8.7)
†SR hypertension (yes %)	28.0%	28.0%	35%	26.2%
SR medication for hypertension (yes %)	25.0%	29.0%	31.8%	23.5%
SR elevated cholesterol (yes %)	19.6%	19.5%	23.2%	22.8%
SR med. for elevated cholesterol (yes %)	10.0%	13.1%	10.0%	13.8%
SR diabetes (yes %)	4.8%	7.7%	4.6%	4.1%
SR med. for diabetes (yes %)	3.0%	6.3%	3.6%	4.1%
SR Aspirin (yes %)	10.7%	19.5%	13.2%	29.7%
No. of cigarettes smoked (mean SD)	6.1(10.3)	4.5(10.4)	5.5(9.8)	5.7(19.4)
1st degree relative heart disease (yes %)	50.5%	44.8%	50%	47.2%
Any medication (yes %)	65.9%	56.1%	72.3%	56.6%
Resting 60 sec pulse	75.9(13.9)	73.1(13.9)	73.8(10.8)	73.5(13.5)
‡ Systolic BP (Mean SD)	138.3(19.6)	139.9(20.2)	139.1(19.3)	141.7(18.0)
‡ Diastolic BP (Mean SD)	82.7(9.6)	83.4(10.5)	82.2(10.4)	84.6(10.2)
Weight (mean kg SD)	72.4(15.7)	83.4(13.5)	73.1(13.6)	84.5(14.2)
Height (mean cm SD)	157.9(7.0)	171.6(6.3)	157.4(7.7)	170.0(10.9)
Waist circumference (mean cm SD)	91.5(13.7)	99.9(11.2)	93.2(12.3)	101.9(11.5)
Hip circumference (mean cm SD)	106.0(11.9)	105.3(7.4)	107.2(10.5)	105.8(7.4)
Body mass index (kg/m²)	29.2(7.4)	28.3(4.1)	29.8(8.4)	29.8(8.3)

*Age at examination † SR = Self Report ‡ Mean three readings

Table 3 Baseline Characteristics of Life-ways Grandparents: Blood Measurements (n=849)				
	Maternal Grandmother	Maternal Grandfather	Paternal Grandmother	Paternal
	n=332	n=198	n=192	n=127
Total serum cholesterol (mean SD)	5.58(1.1)	5.39(1.1)	5.78(1.1)	5.50(1.0)
Serum Triglycerides (mean SD)	2.11(1.3)	2.51(1.7)	2.29(1.3)	2.67(1.9)
Serum HDL cholesterol (mean SD)	1.51(0.4)	1.28(0.33)	1.48(0.4)	1.33(0.4)
Serum LDL cholersterol (mean SD)	3.13(0.9)	3.09(1.0)	3.32(1.0)	3.06(0.9)
Serum Cholesterol / HDL ratio (mean SD)	3.82(1.1)	4.23(1.1)	4.02(1.1)	4.17(1.1)
Plasma Fibrinogen (mean SD)	3.38(0.7)	3.36(0.8)	3.36(0.8)	3.23(0.7)

Table 4	Cardiovascular Risk Factors for Lifeways Grandparents according to smoking status, giving also absolute SCORE risk estimate				
		Age in years (SD)	Systolic Blood Pressure mmHg (SD)	Total Serum Cholesterol mmols/dl (SD)	Absolute CVD Risk
Men	Smoker (n=87)	59 (11)	138 (20)	5.6 (1.1)	12%
	Non-smoker (n=273)	62 (9)	142 (20)	5.3 (1)	5%
Women	Smoker (n=192)	55 (9)	134 (20)	5.6 (1.1)	2%
	Non-Smoker (n=391)	60 (8)	140 (20)	5.7 (1)	2%

Discussion

Inclusion of grandparents in the Life-ways cohort is of considerable importance in the prospective follow-up of the index or proband children. It has presented considerable logistical problems in both recruitment and follow-up as we were reliant on the mothers in the cohort to contact and obtain the initial support of both their own parents and that of their parents-in law. We aimed for at least one grandparent per family, which was achieved, but had resources allowed we would have liked to recruit more of those interested or available. We opted not to focus only on the maternal grandmother as our interest was also on paternal influences and on grandfather's characteristics. There were also logistical problems in undertaking the cardiovascular examinations of grandparents as these were conducted in the home by two trained nurses and proved very time consuming to set up and follow through. At this point the limitations of the information on grandparents must be acknowledged.

Nonetheless the findings to date are of considerable interest. There is evidence, as might perhaps be expected, that participating grandparents are less healthy than the general population, a possible motivating factor for their participation. We have already shown in other analyses that the maternal grandmother in particular has an influence on both her daughter and her grandchild's health, which may have both a biological or a social explanation, based on the emerging research literature[4,5].

It is notable that the two sets of grandparents, linked only through marriage of their respective children, are very similar in group socio-demographic characteristics. Mean school leaving age, at 15 years, is the same for all four groups. Self reported biological variables, such as height and in the grandmothers' weight, are also very comparable. The literature indicates in a variety of different cultural contexts, that individuals seek life partners with similar social backgrounds[8,9,10], and of course mix in similar networks, confirmed to a degree by grandparents' profiles in this analysis. This can be explored further in future sweeps.

We also show in the sub group for whom full information was available that general practice utilisation patterns are predicted by both socio-economic and health status characteristics. Whilst numbers in this sub-analysis are small, the ascertainment rate was reasonable and not influenced by respondent bias since the data were accessed from co-operating general practitioners. These findings confirm that significant morbidity increases likelihood of consultation, but also show, as with other primary care based studies, that non attenders, especially men, may have more adverse lifestyles[11]. In future sweeps we hope to maintain as high ascertainment of grandparental health status as possible, particularly those who agreed to active participation.

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Self-Reported Pre-Pregnancy Maternal Body Mass Index and Infant Birth-Weight

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Abstract
This analysis examines the association between maternal characteristics, particularly body mass index (BMI) and infant birth weight in 1048 live infants. Mean reported pre pregnancy BMI of mothers was 23.74 kg/m^2 (SD 4.21). The educational level of the mother's parents was independently associated with maternal BMI, those with higher educated parents having a lower reported BMI (F=2.787, p=0.029). Mean infant birth weight was 3493 g (SD 18.1) and there was a strong graduated relationship to estimated gestational age. In a sub-group of participating maternal grandmothers (n=171), reported BMI was 26.7Kg/m^2 The BMI of expectant mothers was significantly associated with their own mother's BMI. (r=0.179, p=0.005) in this sub-group. These preliminary findings, which will be investigated further with recorded height and weight, suggest that familial factors are influential, perhaps through genetic predisposition or shared socio-cultural factors such as diet.

Introduction

Body weight, measured in relation to height (body mass index, BMI) is recognised as a simple and practical indicator of health status and previous studies have demonstrated the importance of maternal BMI for pregnancy outcome[1,2] particularly the influence on infant birth weight. Mothers with a high BMI may be more likely to have children who are overweight or obese[3,4]. Similarly mothers who were themselves of a low birth weight are more likely to produce low birth weight babies[5]. In recent years the significance of birth weight for infant and later adult health[6] has been recognised increasingly and it appears highly likely that intra-uterine influences on growth and development may influence not just proximal outcomes like birth weight in itself but also programme the development of the growing infant, in turn influencing probability of a variety of adult onset disease specific outcomes. These physical outcomes may be passed through generations as a result of genetic and socio-demographic factors but few studies contain data on more than one generation of the same family. Tracking body weight from birth through adulthood may yield vital information on the influence of early life factors on adult health. The Lifeways Cross-generation cohort study was established to explore the degree to which social position might influence biological growth and development of infants. Our objective in the present analysis was to examine predictors of maternal body mass index at first hospital visit, to see how maternal BMI related to infant birth-weight and in turn to examine predictors of infant birth weight.

Methods

Lifeways is a longitudinal population based cohort study comprising 1048 infants and their mothers. A third of maternal grandmothers are also active study participants. The methodology for study is described elsewhere[7]. We particularly wished to examine whether socio-demographic characteristics of the mothers-to-be themselves and their own mothers were associated with either maternal body mass index or with the infant's birth weight. Data employed in this analysis were based on self-completed questionnaires of all participating mothers at recruitment and self completed questionnaires from the maternal grandmothers. Information on infants is based on hospital linkage data from delivery notes and other charted information.

The purpose of the first part of this analysis was to examine factors associated with pre-pregnancy maternal body mass index (BMI). At recruitment expectant mothers reported their own immediate pre pregnancy weight and their height. They also reported their own level of education and that of each of their parents. Grandmothers subsequently recruited to the study also reported their own height and weight. We first examined whether there was any correlation between the mother's immediate pre pregnancy BMI and that reported by her own mother. We then grouped both maternal and grand-maternal body mass index according to the highest level of educational attainment in the expectant mother's family. The educational variable was based on five categories, both maternal grandparents third level educated, one grandparent 3rd level educated, both complete second level, both some second level and both primary level only. We then performed a logistic analysis, to examine the relationship, if any, between region, age, working status, means-tested General Medical Services (GMS) eligibility, marital status, mother's education and grandparents' education on mother's self-reported body mass index (BMI), categorised into quintiles.

The second analysis was based on infant birth weight as the outcome variable, based on recorded hospital data. Gestational age as verified by ultrasound was not available for all cohort participants as routine diagnostic ultrasound was not undertaken in every delivery. Gestational age is well known to be difficult to calculate, especially for outlier infants, who are either small for dates or premature or conversely large for dates or postmature babies. However, estimated dates of delivery (EDD) were recorded at booking visit based on last menstrual period, a standard means of assessment in pregnant women and gestational age was estimated

Table 1 — Mean birth-weights of 935 infants (SD=standard deviation) categorised according to estimated gestational age (Difference between Estimated Date of Delivery and Date of Birth)

Estimated Gestational Age (weeks)	N (%)	Mean birth weight (grams)	SD	Minimum	Maximum
26 to 30	4 (0.4)	1210	257.5	840	1430
30 to 34	12 (1.3)	2300	873.0	1260	3640
34 to 36	14 (1.5)	2475	591.0	1800	3628
36 to 38	71 (7.6)	3052	519.0	1985	4410
38 to 40	346 (37.0)	3437	503.8	1430	5240
40 to 42	454 (48.6)	3719	458.0	2438	5360
> 42	34 (3.6)	3563	472.4	2585	4600

Table 2	Indicators of maternal health status and socio-demographic characteristics, categorised according to infant birth-weight percentiles					
	Percentiles	20	40	60	80	100
	Birth weight (Grams)	<3060	3061 - 3396	3397 - 3656	3657 - 3965	>3966
		n (%)	n (%)	n (%)	n (%)	n (%)
Age group	14 – 23	54 (25.8)	41 (19.3)	38(18.5)	44(19.9)	25(11.9)
	24 – 33	109 (52.2)	130(61.3)	105(51.2)	114(51.6)	120(57.1)
	34 - 43	46 (22.0)	41 (19.3)	62(30.2)	63(28.5)	65(31.0)
Smoker	No	119 (57.2)	147 (70.7)	161 (79.3)	181 (83.0)	179(85.2)
	Yes, regularly	79 (38.0)	52 (25.0)	32 (15.8)	29 (13.3)	24 (11.4)
	Yes, occasionally	10 (4.8)	9 (4.3)	10 (4.9)	8 (3.7)	7 (3.3)
Breastfeeding	No	66 (47.5)	71 (46.7)	59 (39.6)	66 (42.3)	90 (50.8)
	Yes	36 (25.9)	42 (27.6)	53 (35.6)	56 (35.9)	62 (35.0)
	Not applicable	37 (26.6)	39 (25.7)	37 (24.8)	34 (21.8)	25 (14.1)
Self rated health	Excellent	27 (13.3)	44 (21.3)	39 (19.1)	32 (14.9)	41 (19.8)
	Very good	101 (49.8)	113 (54.6)	102 (50.0)	122 (56.7)	103(49.8)
	Good	70 (34.5)	48 (23.2)	60 (29.4)	56 (26.0)	55 (26.6)
	Fair	70 (34.5)	48 (23.2)	60 (29.4)	56 (26)	55 (26.6)
	Poor	0	0	0	0	1 (0.5)
BMI (kg/m^2)	<25	122 (74.4)	142 (78.5)	126 (75.9)	121 (65.4)	110(64.3)
	25 to 30	29 (17.7)	32 (17.7)	25 (15.1)	48 (25.9)	37 (21.6)
	>30	13 (7.9)	7 (3.9)	15 (9.0)	16 (8.6)	24 (14.0)
Mothers Education	No school/ 1st level only	1 (0.5)	3 (1.4)	4 (2.0)	2 (0.9)	3 (1.5)
	Some 2nd level	45 (22.6)	34 (16.1)	34 (16.7)	35 (16.2)	31 (15.2)
	Complete 2nd level	63 (31.7)	68 (32.2)	64 (31.5)	68 (31.5)	65 (31.9)
	Complete 3rd level	90 105(45.2)	106 (50.2)	101 (49.8)	111 (51.4)	105(51.5)
Mothers family education	No school/ 1st level only	49 (32.0)	69 (39.7)	51 (29.7)	66 (35.9)	59 (34.1)
	Some 2nd level	50 (32.7)	49 (28.2)	58 (33.7)	51 (27.7)	47 (27.2)
	Complete 2nd level	31 (20.3)	33 (19.0)	33 (19.2)	32 (17.4)	42 (24.3)
	1 grandparent complete 3rd level	17 (11.1)	18 (10.3)	21 (12.2)	26 (14.1)	17 (9.8)
	2 grandparents complete 3rd level	6 (3.9)	5 (2.9)	9 (5.2)	9 (4.9)	8 (4.6)
Marital Status	Married	110 (53.1)	136 (64.2)	139 (68.1)	137 (62.0)	148(71.2)
	Cohabiting	25 (12.1)	24 (11.3)	27 (13.2)	37 (16.7)	20 (9.6)
	Separated/Divorced	7 (3.4)	5 (2.4)	4 (2.0)	5 (2.3)	4 (1.9)
	Single/Never married	65 (31.4)	47 (22.2)	34 (16.7)	42 (19.0)	36 (17.3)
Region	East	164 (77.7)	145 (67.8)	137 (66.8)	151 (68.3)	142(67.3)
	West	47 (22.3)	69 (32.2)	68 (33.2)	70 (31.7)	69 (32.7)
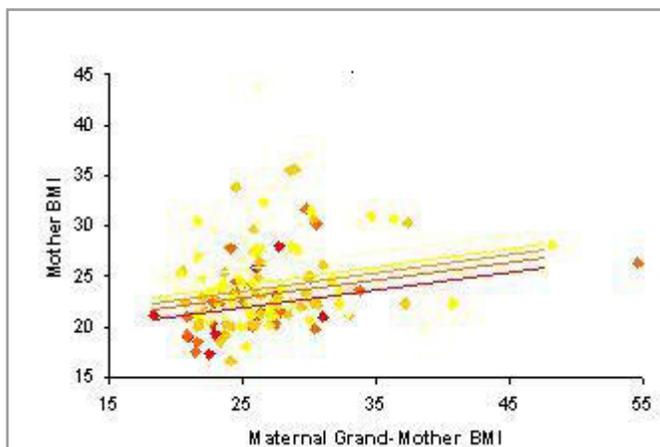
Figure 1   BMI for the expectant mother and her mother at five education levels

Legend

Both Grandparents 3rd Level	u
One Grandparent 3rd Level	u
Complete 2nd Level	u
Some 2nd Level	u
No School/1st level only	u

as the difference between actual birth date (DOB) and EDD. We excluded EDDs that were not biologically credible so that information was available for 935 babies. We grouped birth weight of infants into quintiles and examined each quintile according to maternal socio-demographic, lifestyle and health behaviour characteristics. Employing ordinal regressional models, the first model tested the effect on birth weight of the following maternal characteristics, smoking status, intention of breast-feeding, self-rated health, area (urban vs. rural), age, general medical services eligibility, marital status, grand parents' education, mother's education, and mother's self-reported pre-pregnancy BMI. A further model, with more limited complete data in 171 of 285 respondent grandmothers, tested the same variables but included the grandmother's self-reported BMI only.

Results

The mean reported pre-pregnancy BMI of the mothers at first booking visit was 23.74 kg/m^2 (S.D =4.21, range: 14.90 kg/m^2 to 44.95 kg/m^2). In the logistic model based on questionnaire information for all mothers, there was a strong educational gradient, with higher educational level of expectant mother's parents independently associated with lower maternal BMI (F=2.787, df=4, P=0.029). The adjusted model is demonstrated in Figure 1. The pregnant mother's education status also proved to be independently significant, but not working status or GMS eligibility. The BMI of the participating sub-group of grandmothers at recruitment was 26.70 kg/m^2 (S.D.=5.57, range: 17.66 kg/m^2 to 54.57 kg/m^2). The BMI of the expectant mothers was significantly and positively associated with their mother's BMI (r=0.179, P=0.005).

The mean infant birth weight was 3,493g (S.D.=18.1, range: 840g to 5,360g). The data in table 1 show the relationship between birth-weight and estimated gestational age. Mean birth weight increases as expected with gestational age, reaching 3719 grams (SD 458) between 40 and 42 weeks and decreasing after 42 weeks. Table 2 shows the relationship at uni-variate level between

maternal characteristics and infant's birth-weight, in five percentile categories. The highest proportion of teenage mothers are in the lowest birth-weight quintile, and conversely older mothers tend to be in the higher quintile categories. There is a clear gradient in relation to maternal smoking, from 38% in the lowest quintile, to 11.4% in the highest. Intention to breastfeed is also inversely related to birth-weight quintile. The highest proportion of those rating their health as fair is in the lowest birth-weight quintile and this group also has a higher proportion of incomplete second level educated mothers. There is a direct, graduated relationship between marital status and birth-weight. There is also a direct relationship between BMI and birth-weight, in that the rate of overweight or obesity tends to increase according to birth-weight quintile. In the lowest quintile, mothers are more likely to be from the East than the West.

In the adjusted logistic model (n=1043), only the variables mother's BMI and smoking status significantly predicted birth weight. Lower birth weight was associated with regular smoking (P=0.017) and BMI<25 kg/m^2 (P=0.001). In the second model including grandmothers (n=171), birth weight was associated with grandmother's BMI and grandparents' education. Infants were more likely to have a low birth weight if their grandparents had achieved a low level of education (1st level and less: P=0.041) and, of borderline significance, if their grandmother had a lower BMI (P=0.080).

Discussion

These findings demonstrate the significant influence of socio-demographic factors on both maternal body mass index and infant birth weight. Both smoking and maternal BMI have been well documented as having an affect on foetal growth – smoking in limiting the oxygen supply to the foetus and BMI as an index of maternal nutritional status[8, 9,10]. We show here that both socio-demographic and lifestyle factors are associated with smaller weight babies. There is clearly a relationship between gestational age and birth-weight, which affects immediate birth outcome and is an important prognostic factor[11]. Recent evidence indicates there is very considerable variability in birth weight distributions between populations, which merits further research. It is likely that the group with the lowest birth-weight did have more adverse pregnancy outcomes, based on our data on estimated gestational age, which showed the expected pattern of lower birth weight with prematurity.

This analysis also shows that it is not just education of the mother but the education of the previous generation, that is, of her own parents, that influences outcome. Reported grandparental education was influential both of a mother's own BMI and in a sub-group of infants, on birth-weight. The cross-generational effect on birth weight may be simply be a result of genetic inheritance but evidence suggests that the foetal genome plays a subordinate role in determining the growth achieved during pregnancy and it is the environment in which the foetus develops that dominates. Experimental studies in animals have shown also that under nutrition over many generations can have cumulative effects[12]. In human populations the influence of a woman's own birth weight on the birth weight of her child indicates that maternal nutrition status may affect subsequent generations. We propose to investigate this relationship in more depth in future sweeps of this cohort when actual height and weight of both mothers and children and further grandparental information will be available.

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Primary Care Utilisation Rates in Pre-School Children

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Abstract
A key objective of the Lifeways cross generation cohort study is to examine health and healthcare, according to socio-economic indicators, during the first five years of life. GP contact details were available for 1032 children. 772 GPs in 589 practices were approached and data were obtained on 640 children (59% of original cohort). The mean follow-up time was 3.0 years (95% CI 2.5-3.5). 20.5% of children had a medical card. The mean GP consultation rate was 5.5 visits per child per year, 6.6 visits for children with a medical card and 5.1 for those without (95% CI 1.1 to 1.9) p=0.001. 68 had a diagnosis of asthma; 19.1% with a medical card and 8.9% without (95% CI 3.0-17.5) p= 0.0001. 138 children had ever been admitted to hospital; 26.2% with a medical card and 21.0% without (95% CI -3.3% to 13.6%) p=0.2. Incremental increases in parental income significantly decreased both the risk of asthma (p= 0.02) or hospital admission (p=0.008).

Introduction

The primary care strategy puts primary care at the centre of on-going health service reform in Ireland[1]. New primary care teams (PCTs) composed of multi-disciplinary community professionals require detailed information on all aspects of primary care in order to assess needs and plan services. Information on consultation rates in particular is vital for planning[2].

Epidemiological evidence shows that adults eligible for means-tested general medical services (GMS), - as opposed to universal eligibility by those age 70 and over[3] - have higher rates of morbidity and mortality than the rest of the population and that the GMS 'medical card' is a consistently reliable measure of health inequality[4]. However we have no information on how means-tested free primary care reflects health and healthcare during the first five years of life. Socioeconomic differences in childhood primary care consultation rates have never before been examined in Ireland.

There is no national primary care morbidity database to allow direct calculation of consultation rates[5]. The limited information that is available on utilisation has been based on patient or parental recall of consultations. Here we have calculated consultation rates from direct examination of charts over three years of follow-up in a cohort of over a thousand children.

Methods

Design, sampling, recruitment, response rates and instruments used in the Lifeways cohort study have been outlined in detail elsewhere. 1124 pregnant women were recruited at the Coombe Hospital Dublin and University College Hospital, Galway between 2001 and 2003 to a cross-generation cohort study. 1094 babies were born to 1082 mothers. Participants informed the study team of their GP's name and address at recruitment. Informed consent was obtained to allow examination of routine health records for a follow-up period of five years.

During spring/summer 2005 GPs were contacted by post and asked to complete a one-page summary on each study participant registered with them. Where a practice had more than 10 study participants, the GP's was offered assistance in completing the forms by one of two Health Research Board summer students who were employed and trained to perform this task. Patient contacts between the date of birth of the index case and the last date the patient was seen in the practice (or the date of form completion) were counted. Types of consultation i.e. home visit, telephone contact were not differentiated. There was insufficient data to analyse the impact of doctor only cards. Two common primary care scenarios, a diagnosis of asthma and whether the patient was ever admitted to hospital were also examined. These were chosen as they may reflect primary care utilisation and/or morbidity. A pragmatic approach to asthma diagnosis was taken and a positive diagnosis was recorded when the notes indicated asthma as the working diagnosis. This reflects actual clinical practice.

Consultation rates i.e. the mean number of consultations per year were calculated over a three year period within various categorical

Table 1 Baseline characteristics of children and mean consulting rates				
		Total n	n (%)	Mean number of consultations per year
Sex	Boys		299 (46.8)	5.4
	Girls	639	340 (53.2)	5.6
				0.2 (- 0.04 to 0.45) p=0.09
GMS card	Yes		502 (79.7)	6.6
	No	630	128 (20.3)	5.1
				1.5 (1.1 to 1.9) p=0.0001
Insurance status	GMS		133 (24.7)	6.6
	None		201 (49.7)	5.3
	Private		205 (38.0)	4.9
		639		p=0.001
Region	Galway		223 (31.4)	5.5
	Dublin	641	418 (68.6)	5.5
Lone parent	Yes		107 (18.8)	6.5
	No	568	461 (81.2)	5.3
				1.2 (0.9 to 1.6) p=0.0001
Tenure	Council		54 (8.8)	6.2
	Private rent		73 (11.9)	5.8
	Owner occupier		488 (79.3)	5.3
		615		p =0.0001
Income £/wk	Less than 300		104 (17.9)	6.2
	300 to <500		163 (28.0)	5.4
	500 to <900		252 (43.3)	5.3
	>900		63 (10.8)	5.2
		582		p =0.004
Employment status	Unemployed		45 (7.2)	6.7
	Student		19 (3.0)	7.8
	Homemaker		135 (21.7)	5.4
	Employed		424 (68.1)	5.4
		623		Employed v unemployed 1.3 (0.5 to 1.6) p=0.0001
Smoking at delivery	current		123 (19.6)	6.1
	ex		132 (21.0)	5.4
	never		373 (59.4)	5.3
		628		p = 0.009
Diagnosis of asthma	Yes		68 (10.7)	8.1
	No		566 (89.3)	5.1
		634		3.0 (2.6 to 3.5) p=0.0001
Admitted to hospital	Yes		140 (22.1)	7.2
	No		493 (77.9)	5.0
		633		2.2 (1.9 to 2.5) p=0.0001

Table 2	Differences in asthma diagnosis and hospital admission by socio-economic factors				
		Asthma		Admitted to hospital	
		yes	no	yes	no
Sex	male	46 (15.6)	249 (84.4)	62 (18.4)	274 (81.6)
	female	22 (6.5)	316 (93.5)	77 (26.0)	219 (74.0)
			χ^2 p=0.001		χ^2 p=0.02
GMS card	yes	24 (19.1)	102 (80.9)	33 (26.2)	93 (73.8)
	no	44 (8.9)	457 (91.1)	105 (21.0)	395 (79.0)
			χ^2 p=0.001		χ^2 p=0.2
Insurance status	GMS	24 (18.5)	106 (81.5)	35 (26.9)	95 (73.1)
	None	22 (11.0)	178 (89.0)	39 (19.5)	161 (80.5)
	Private	23 (10.9)	281 (92.4)	67 (22.1)	236 (77.9)
			χ^2 p=0.004		χ^2 p=0.28
Region	Galway	15 (6.8)	206 (93.2)	52 (23.5)	169 (76.5)
	Dublin	53 (12.8)	360 (87.2)	87 (21.4)	324 (78.6)
			χ^2 p=0.02		χ^2 p=0.5
Lone parent	yes	16 (15.4)	88 (84.6)	27 (25.7)	78 (74.3)
	no	48 (10.5)	409 (89.5)	96 (21.1)	359 (78.9)
			χ^2 p=0.1		χ^2 p=0.3
Tenure	Council	6 (11.3)	47 (88.7)	12 (22.6)	41 (77.4)
	Private rent	11 (15.1)	62 (84.9)	20 (27.4)	53 (72.6)
	Owner occupier	47 (9.7)	436 (90.3)	102 (21.2)	380 (78.8)
			χ^2 p=0.4		χ^2 p=0.5
Income £/wk	Less than 300	19 (18.2)	85 (81.8)	35 (34)	68 (66)
	300 to <500	10 (6.2)	151 (93.8)	38 (23.5)	124 (76.5)
	500 to <900	25 (10.0)	224 (90.0)	43 (17.3)	206 (82.7)
	>900	6 (9.8)	55 (90.2)	14 (22.9)	47 (77.1)
			χ^2 p=0.02		χ^2 p=0.008
Employed	Unemployed	10 (23.3)	33 (76.7)	12 (27.3)	32 (72.7)
	Student	5 (26.3)	14 (73.7)	6 (31.6)	13 (68.4)
	Homemaker	14 (10.4)	120 (89.6)	25 (18.8)	108 (81.2)
	Employed	39 (9.3)	382 (90.7)	90 (21.4)	330 (78.6)
			χ^2 p=0.006		χ^2 p=0.5
Smoking	current	43 (11.6)	328 (88.4)	82 (22.2)	288 (77.8)
	ex	10 (7.7)	120 (92.3)	28 (21.7)	101 (78.3)
	never	15 (12.4)	106 (87.6)	27 (22.1)	95 (77.9)
			χ^2 p=0.4		χ^2 p=0.9

variables. The t-test was used to examine differences in mean consultation rate across two categories, analysis of variance was used where there were more than two categories and the chi squared test was used to test differences in asthma diagnosis and admission to hospital across various categorical variables.

Results

772 GPs in 589 practices were approached and GP contact details were available for 1032 children. Data were obtained for 640 children (59% of original cohort). GP consultation rates were calculated from 7767 consultations over 44 months of follow-up.

Table I shows the mean number of consultations per year in children by baseline characteristics and socio-economic variables. There are significant differences in consultation rates across all socio-economic measures. 68 had a diagnosis of asthma; 19.1% with a medical card and 8.9% without, a difference of 10.2% (95% CI 3.0-17.5) p= 0.0001. These children had a higher mean consultation rate in comparison to those without asthma; 8.1 consultations per year versus 5.1 a difference in mean consultation rate of 3.0 (95% CI 2.6 to 3.5 p=0.0001). 138 children had ever been admitted to hospital; 26.2% with a medical card and 21.0% without, a difference of 5.2% (95% CI -3.3% to 13.6%) p=0.2. Children who had ever been admitted to hospital had a mean consultation rate of 7.2 versus 5.0 in those who had never been admitted, a difference of 2.2 (95% CI 1.9 to 2.5) consultations per year p=0.0001.

Table II shows the differences in asthma diagnosis and hospital admission by baseline characteristics and socio-economic factors.19% of children with GMS medical cards had a diagnosis of asthma versus 9% in those without (p=0.001). A diagnosis of asthma is also positively associated with the other socio-economic factors such as lower income and maternal unemployment. Hospital admission was not associated with GMS status but was more common in those with a lower income.

Discussion

We have shown that children of families who are socio-economically disadvantaged consult more frequently in Irish primary care. While the GMS medical card was the strongest predictor of consultation rates our findings were consistent across all socio-economic variables. The increase in consultations in disadvantaged children could be as a result of more frequent and severe illnesses, as opposed to differences in access and health seeking behaviour. However we were able to use two proxy measures of morbidity, a diagnosis of asthma and ever having been admitted to hospital and examine the prevalence of these two measures across the same socio-economic variables. Both were strongly inversely related to socio-economic conditions suggesting that higher consultation rates may be as a result of morbidity and not merely access to services.

As far as we are aware this is the first study of pre-school consultation rates in Ireland by direct observation of the GP notes using person-years-at-risk as the denominator. Our findings are similar to several UK studies which show a strong inverse relationship between consultation rates in children and social class[6] and suggest that this is explained by greater morbidity[7]. It is noteworthy that the ratio of consulting rates among Irish preschool children for GMS to paying patients is much lower than for adults. Indeed, although consulting rates do significantly decrease with income increments, the differences are relatively small (Table 1). A prevalence of asthma of 10.7% with a slight preponderance in boys is consistent with other studies. However there was no association between asthma and maternal smoking recorded at ante-natal booking. This is unexpected as there is a known association between asthma in children and parental smoking - both maternal smoking in pregnancy[8] and environmental tobacco smoke[9]. There are two possible explanations for this. There are no definitive diagnostic criteria for the diagnosis of asthma in children under three years of age. Doctor diagnosed asthma in this case

is likely to reflect recurring upper respiratory tract infection with wheeze or recurring cough which responds to bronchodilators. As well as some misclassification of asthma, there may be systematic misclassification or reporting bias of smoking at ante-natal booking. Nevertheless, we feel a diagnosis of asthma in the notes reflects moderate childhood illness in primary care and we have shown that it is more prevalent in lower socio-economic groups and is associated with higher GP utilisation.

In Irish primary care only 30 to 40% of patients are formally registered with a GP or practice. This presents a persistent and challenging problem for research, planning, and disease surveillance. In this study, consultation rates are potentially under-estimated or overestimated based on the end-date used in the calculation. Date of form completion is the most appropriate for registered GMS patients – incorporating all person-years at-risk of a consultation, while the date on which the patient was last seen is the most appropriate for a private non-registered patient – including only the certain time-at-risk. We performed a sensitivity analysis using both dates. We chose to present the rates calculated using the date the patient was last seen in the practice for all patients because although it may slightly over-estimate the consultation rate it is the last date we are certain that the patient was a patient of the particular practice and it gives a valid person-years-at-risk denominator.

We have shown that, as the international literature suggests[7,9], socio-economically disadvantaged children have both significantly higher GP consultation and asthma prevalence rates than those who pay for primary care services. However, children who pay for services also have relatively high GP consultation rates and significant morbidity (e.g. 21% admitted to hospital). Of concern in Irish primary care is that there may be an unmet health needs in children whose families cannot afford to pay.

Spencer[10] in an important review of poverty and child health noted that:

'health services alone cannot address the health problems caused by poverty but, working imaginatively with other agencies, can reduce health inequalities and promote equity in health.'

The new doctor-only medical cards are intended to facilitate access to primary care of a larger proportion of children, providing a graduated access to services rather than 'all or nothing'. However, their uptake has been low with, by December 2006, only 54,000 being issued; it has been suggested that an overly bureaucratic application process is partly responsible[11]. The actual number of full medical cards is lower now, despite our increasing population, than in 1995. Yet, both health care utilisation and morbidity among Irish preschool children remain high across all income levels.

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Mothers' Dietary Patterns during Pregnancy and Risk of Asthma Symptoms in Children at 3 Years

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Abstract

There is increasing evidence that dietary factors in early life play a role in the aetiology of childhood asthma. Our objective in this analysis was to assess whether maternal dietary patterns during pregnancy, as measured by a validated food frequency questionnaire, influenced general practitioner diagnosis of asthma by the age of 3 years in the Life-ways cohort of children. General Practice follow-up records were available for 631 of 1001 singleton children, twins having been excluded (63% follow-up rate). Overall 10.4% of children had diagnosed asthma, a prevalence rate comparable with other studies. In logistic regression models, based on quartiles of intake, which adjusted for maternal lifestyle and socio-economic circumstances, relatively higher maternal fruit and vegetable intake and oily fish consumption were associated with lower risk of children developing asthma, whilst those with relatively higher spreadable fat intake had a higher risk of asthma. These findings warrant further investigation as they imply an important role for maternal diet in childhood asthma, though the confounding effect of other social and lifestyle factors should be assessed as the children get older.

Introduction

Diagnosed rates of Asthma are increasing in Western populations, though the reason is unclear. It is possible that some of this is explicable by higher levels of ascertainment, in that more children are presenting for investigation than previously. However there may be a true underlying increase in propensity and incidence. Several candidate environmental allergens have been proposed besides the traditional sources such as house dust mites and domestic pets[1] and food sources in particular have received attention. It has been hypothesized in an expanding scientific literature that increasing rates of asthma are due to significant dietary shifts at population level. People arguably consume fewer vegetables and oily fish and more plant-based fats than previously and it has been suggested that antioxidants found in fruit and vegetables might have a protective effect.

The role of the mother's diet during pregnancy has been a focus of considerable recent attention, in line with the evidence of the developmental origins of disease [2-10]. This may be supported by the fact that the majority (70%) of asthma cases occur before 3 years of age[3]. Specific foods, nutrients and micronutrients have been investigated. Omega-3 fats found in sources such oily fish have been proposed as protective, while the opposite is true of omega-6 fats found in plant-based oils [2,4,5,6] Anti-oxidant, vitamin and trace metal intakes during pregnancy have also been implicated[7,8]. In addition, there is evidence that parity has an effect on the risk of asthma as cord blood immunoglobin E concentration is significantly

decreased as birth order increases[10]. More research is required, both from a mechanistic perspective on allergenic pathways mediated at cellular or micro-nutrient level as well as demonstrable clinical or epidemiological information that links a firm diagnosis of asthma with food and nutrient consumption patterns.

The aims of the Life-ways Cross-Generation Cohort Study have been described previously. Our objective in this analysis was to identify factors associated with asthma in the Life-ways Cohort children followed up from birth through general practice records, and specifically to assess the influence of aspects of the mothers' diets during pregnancy, controlling for socio-demographic, lifestyle and environmental factors.

Methods

Data

All general practitioners were contacted, with prior consent of the mother, during summer 2005, when the children were on average three years old, and asked to review their clinical records for the proband child. The outcome measure for this analysis was a record of diagnosed asthma in the GP notes for each child by age three. The data available are summarised in Figure 1, which shows the explanatory variables considered as potentially associated with asthma. At baseline, there were hospital records for the mothers and babies, and the mothers were asked to complete a questionnaire on health, lifestyle and nutrition during pregnancy.

The self-administered questionnaire included a semi-quantitative food frequency questionnaire (SQFFQ). This was adapted for the Survey of Lifestyle, Attitudes and Nutrition (SLAN) from the SQFFQ used in the UK arm of the European Prospective Investigation of Cancer (EPIC) study. The EPIC SQFFQ has been validated in several populations. The Irish version was developed for SLAN and was validated at NUI Galway using 7-day weighed inventory and face validity by socio-economic group[11, 12]. The food frequency part of the questionnaire was designed to cover the whole of the Irish diet and included 149 food items, arranged by food group. Each food item was assigned a standard portion size. Mothers were asked to indicate their average use of each food item during pregnancy.

We estimated the average number of servings per day of fruit and vegetables for each mother based on number of servings consumed per day over a notionally recorded week. Data were categorized into quartiles of fruit and vegetable consumption for this analysis. We also estimated the average number of servings per week of oily fish, and the average number of servings per day of added or spreadable fats. Added or spreadable fats considered included butter, margarine and other spreads, salad dressings and mayonnaise. We focused for this analysis only on pure fat products, rather than considering total fat intake based on foods that have partial or hidden fats. Constituent foods included in each group are shown in Table 1.

Statistical Methods
Mantel-Haenszel tests were used to assess the univariate associations between quartiles of added fat and of fruit and vegetable intake and categorical covariates, and linear regression

Table 1	Constituents of food groups considered
Group	Individual Foods
Fruit	Apples, Pears, Oranges satsumas & mandarins, Grapefruit, Bananas, Grapes, Melon, Peaches plums & apricots, Strawberries raspberries & kiwi fruit.
Vegetables	Carrots, Spinach, Broccoli spring greens & kale, Brussels sprouts, Cabbage, Peas, Green beans & runner beans, Marrow & courgettes, Cauliflower, Parsnips & turnips, Leeks, Onions, Garlic, Mushrooms, Sweet peppers, Bean sprouts, Green salad & lettuce, Cucumber & celery, Watercress, Tomatoes, Sweetcorn, Beetroot, Coleslaw, Avocado.
Oily fish	Oily fish, fresh or canned, eg mackerel, kippers, tuna, salmon, sardines, herring.

using median values for each quartile was used to assess the associations with continuous covariates.

To examine the relationships between maternal dietary factors and asthma in children at age three we used multivariate logistic models. These were stratified by hospital of birth. To assess the effect of potentially confounding covariates we examined the association of dietary factors with asthma before and after including the covariates in the model. These were maternal age, maternal BMI, maternal
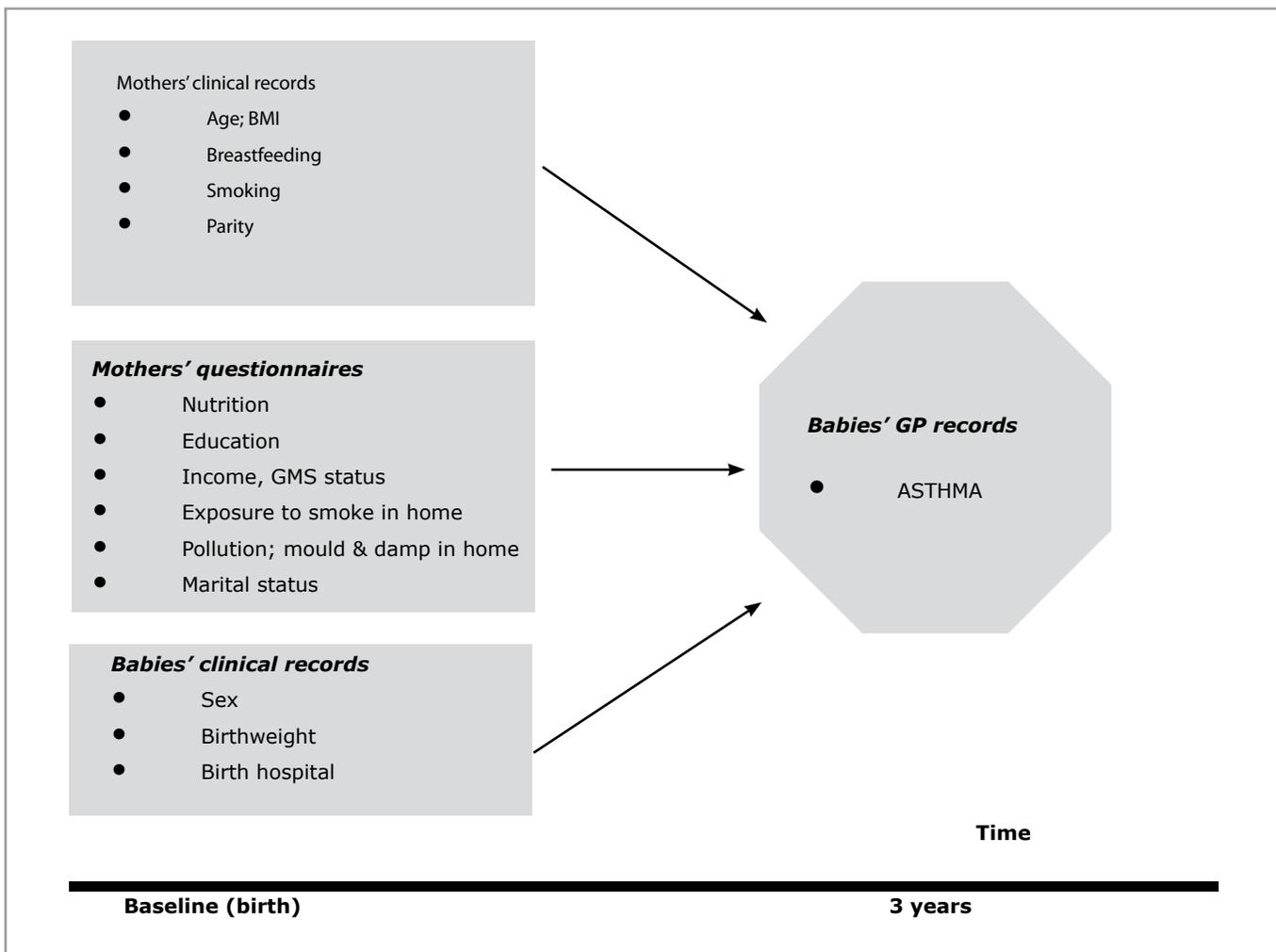
Figure 1

Table 2	Baseline characteristics of 1001 mother-singleton baby pairs with GP follow-up at 3 years			
Baseline characteristic	N	No follow-up	Follow-up	P *
Number	1001	370	631	
Mother's age yrs mean(sd)	996	29.2(5.9)	30.3(5.9)	0.006
Mother's BMI kg/m^2 mean(sd)	833	23.8(4.2)	24.0(4.2)	0.60
Galway	1001	96(26%)	219(35%)	0.004
GMS	993	71(19%)	105(17%)	0.31
Low income	910	64(19%)	107(19%)	0.83
3rd level education	977	177(49%)	304(49%)	0.87
Single	993	86(23%)	109(18%)	0.03
First baby	984	169(47%)	268(43%)	0.27
Mould/damp in home	996	57(15%)	76(12%)	0.14
Pollution a problem	983	123(34%)	212(34%)	0.88
Smoking at delivery	957	96(28%)	115(19%)	0.002
Exposure to smoke in home	999	116(31%)	157(25%)	0.03
Fruit & veg servings mean(sd)	1001	5.6(3.8)	5.6(3.2)	0.80
Added fat servings mean(sd)	1001	2.6(2.4)	2.5(2.3)	0.46
Oily fish weekly	983	77(21%)	145(23%)	0.39
Birthweight grams mean(sd)	980	3528(564)	3523(563)	0.88
Breastfeeding	888	139(42%)	238(43%)	0.92

* Follow-up at 3 years versus no follow-up group

smoking during pregnancy, exposure to smoke in the home, mould or damp in home, problems with pollution in the local area, maternal university education, GMS status, income, maternal parity, child's birthweight, child's gender, and breast feeding (see Figure 1). Potential confounders were retained in the model based on change to the log-likelihood of the model. From the parameter estimates we calculated the odds ratio and 95% confidence intervals of a record of asthma by age three in relation to the selected dietary factors. For mothers' fruit and vegetable consumption, divided into quartiles, we calculated the p-value for the contrast between the highest quartile and the three lower quartiles. Models were fitted using SAS version 9 (SAS Institute, Cary, NC).

Results

Table 2 shows maternal characteristics during pregnancy that may be associated with asthma in children for those with and without GP follow-up at 3 years. There were 1001 singleton babies born, whose mothers had completed the FFQ during pregnancy, of which 631 had GP follow-up. Twins were excluded. Mainly due to a higher follow-up rate for the Galway mothers, who were on average older than the Dublin mothers, more likely to be married and less likely to smoke, these factors were significantly different for the follow-up and non follow-up groups. Mothers' dietary habits and other characteristics were not significantly different for the groups with and without follow-up.

Tables 3 and 4 show the associations between maternal added fat and fruit and vegetable consumption during pregnancy and potentially confounding factors. Mothers in the lowest quartile of fat consumption were more likely to be single, first time mothers, to have GMS cards and to smoke during pregnancy. They also tended to consume a smaller quantity of fruit and vegetables. Mothers who consumed more fat during pregnancy were more likely to breast feed, more likely to eat oily fish and more likely to be from Galway. Mothers who consumed a small quantity of fruit and vegetables were more likely to be of lower socio-economic level: having no university education, low income, GMS card and single. Mothers who ate a large quantity of fruit and vegetables were more likely to breast feed and to eat oily fish, and to be from Galway rather than Dublin.

65 (10.4%) of children had a diagnosis of asthma by age 3. In the multivariate logistic model, the factors included in the model for asthma in children at 3 years were birth-weight (babies with low and high birth-weights were at higher risk of asthma than those in the middle of the range), gender (boys at higher risk of asthma than girls), smoke exposure in the home, and means-tested General Medical Services eligibility. Socio-demographic and lifestyle variables that were not significant and had no effect on parameter estimates were mother's age, mother's BMI, education levels of mother, marital status, parity, breastfeeding, self-reported pollution in the environment and mould and damp in home. Notably maternal smoking during pregnancy was not significant.

Table 5 gives the odds ratios and 95% confidence intervals for asthma in children aged 3 by maternal fruit and vegetable consumption during pregnancy, and tests the odds of asthma in the highest quartile of fat consumption against the three lower quartiles. Adjusting for fat consumption increased the risk of asthma to children whose mothers were in the highest quartile of fruit and vegetable consumption, and controlling for other covariates further increased the significance of this. However, adjusting for the consumption of oily fish decreased the risk of asthma in this group. There was no evidence of significant interactions between

Table 3	Associations between fruit and vegetable consumption and potentially confounding covariates				
	Quartile of mother's fruit & vegetable consumption during pregnancy (servings per day)				
	Q1	Q2	Q3	Q4	
Median	2.3	4.1	6.0	8.9	
Range	0-3.4	3.4-5.0	5.0-7.1	>7.1	
N	146	166	146	173	P trend*
Mother's age mean (sd)	27.9(5.9)	30.4(5.7)	31.5(5.5)	31.2(5.9)	0.19
Mother's BMI mean (sd)	24.3(4.3)	24.2(4.4)	23.5(3.8)	23.9(4.3)	0.39
Galway	42(29%)	53(32%)	52(36%)	72(42%)	0.01
GMS	44(30%)	26(16%)	17(12%)	18(10%)	<0.0001
Low income	35(27%)	26(17%)	22(16%)	24(15%)	0.01
3rd level education	52(37%)	76(48%)	77(53%)	99(59%)	0.0001
Single	40(29%)	28(17%)	17(12%)	24(14%)	0.0006
First baby	71(49%)	69(42%)	56(37%)	72(42%)	0.22
Mould/damp in home	22(15%)	18(11%)	17(12%)	19(11%)	0.35
Pollution a problem	44(31%)	52(32%)	56(39%)	60(35%)	0.32
Smoking at delivery	47(34%)	35(22%)	17(12%)	16(10%)	<0.0001
Exposure to smoke in home	49(34%)	39(23%)	30(21%)	39(23%)	0.03
Fat servings mean(sd)	1.7(1.9)	2.3(2.0)	2.6(2.3)	3.1(2.8)	0.02
Oily fish weekly	16(12%)	28(17%)	36(25%)	65(38%)	<0.0001
Birthweight grams mean(sd)	3412(564)	3552(596)	3560(535)	3557(548)	0.27
Breastfeeding	40(29%)	58(40%)	62(48%)	78(53%)	<0.0001
Male baby	70(48%)	78(47%)	61(42%)	82(49%)	0.85

*P trend based on Mantel-Haenszel tests for categorical variables and linear regression against median fruit and vegetables consumption for continuous variables.

the dietary factors.
Table 6 gives the odds ratios and 95% confidence intervals for asthma in children aged 3 by maternal added fat consumption during pregnancy, and tests the odds of asthma in the highest quartile of fat consumption against the three lower quartiles. Adjusting for other dietary factors (fruit and vegetables and oily fish) increased the risk of asthma to children whose mothers were in the highest quartile of fat consumption, and controlling for other covariates further increased the significance of this.

Discussion
This analysis demonstrates a significant relationship between maternal diet, social circumstances and diagnosis of asthma by the age of three. Broadly speaking women who reported meeting a recommended healthy diet, that is high fruit and vegetable and fish oil intake and relatively sparing fat intake [12] were less likely to have children who developed asthma. The follow up rate, at 63% was reasonable and a function of GP's rather than respondents' cooperation, so systematic bias is unlikely. The prevalence of asthma at 10.4% is consistent with that of the United Kingdom's Millennium Birth Cohort findings for children recruited in the same

period, which reports that by age 3, 12.3% of children had ever had asthma and 20.3% had wheezed in the past 12 months[13], suggesting a reasonably accurate prevalence estimate in the current study. However the problem of ascertainment bias, particularly for younger mothers with less social support, who might be more likely to present to a general practitioner, remains an issue[14]. The impact of socio-economic circumstances on asthma as an outcome is as might be expected and is the obvious confounding possibility for an apparent influence of diet, as less affluent families are more likely to have both a more limited diet and concurrent exposures to other risk factors. Nonetheless maternal nutrition factors during pregnancy were significant predictors of asthma in children at 3 years after controlling for socio-demographic, lifestyle and clinical variables. It is possible that asthma in this cohort is related to the relative balance of omega-3 and omega-6 content of the maternal diet, or to other antio-oxidant or micronutrients, but the data are preliminary and a more detailed dietary assessment would be necessary to assess this.

We are not yet able to control for children's diet in itself as such information has not yet been collected, though it is proposed to do

Table 4 Associations between fat consumption and potentially confounding covariates.

	Quartile of mother's added fat consumption during pregnancy (servings per day)				
	Q1	Q2	Q3	Q4	
Median	0.57	1.3	2.6	5.1	
Range	0-1.0	1.0-1.9	1.9-3.2	>3.2	
N	200	135	136	160	P trend*
Mother's age mean (sd)	28.8(6.2)	30.2(5.5)	30.9(5.8)	31.8(5.6)	0.06
Mother's BMI mean (sd)	24.3(4.5)	23.8(3.8)	24.1(4.7)	23.6(3.7)	0.26
Galway	54(27%)	52(39%)	47(35%)	66(41%)	0.01
GMS	51(26%)	12(9%)	18(13%)	24(15%)	0.01
Low income	39(22%)	23(19%)	18(14%)	27(18%)	0.24
3rd level education	87(46%)	76(58%)	66(49%)	75(47%)	0.95
Single	54(26%)	24(18%)	14(10%)	17(11%)	<0.0001
First baby	103(53%)	57(44%)	58(43%)	50(31%)	<0.0001
Mould/damp in home	31(16%)	10(7%)	17(13%)	18(11%)	0.38
Pollution a problem	71(37%)	35(26%)	45(33%)	61(38%)	0.67
Smoking at delivery	49(26%)	23(18%)	20(15%)	23(15%)	0.007
Exposure to smoke in home	57(29%)	30(22%)	34(25%)	36(23%)	0.25
Fruit & veg servings mean(sd)	4.6(2.9)	6.1(3.5)	5.8(3.1)	6.4(2.8)	0.26
Oily fish weekly	34(18%)	30(23%)	35(26%)	46(29%)	0.01
Birthweight grams mean(sd)	3546(559)	3494(503)	3480(631)	3555(560)	0.70
Breastfeeding	61(35%)	53(43%)	56(48%)	68(48%)	0.01
Male baby	90(45%)	68(51%)	63(46%)	70(44%)	0.68

*P trend based on Mantel-Haenszel tests for categorical variables and linear regression against median fat

Table 5 Odds ratios (95% CIs) for asthma in children aged 3 by mother's consumption of fruit and vegetables during pregnancy

		Quartile of mother's fruit and vegetable consumption during pregnancy (servings per day)				
		Q1	Q2	Q3	Q4	
Median		2.3	4.1	6.0	8.9	
Range		0-3.4	3.4-5.0	5.0-7.1	>7.1	
N		146	166	146	173	
Asthma n cases(%)	N	OR	OR (95%CI)	OR (95%CI)	OR (95%CI)	p-contrast Q4 vs Q1+Q2+Q3
Univariate n=66(10.4%)	631	1.00	0.99 (0.51,1.9)	0.80 (0.39,1.6)	0.49 (0.22,1.1)	0.07
Multivariate n=66(10.4%) +fat	631	1.00	0.99 (0.50,2.0)	0.71 (0.33,1.5)	0.43 (0.19,0.97)	0.04
Multivariate n=64(10.4%) +oily fish fat	618	1.00	1.1 (0.55,2.3)	0.81 (0.37,1.7)	0.53 (0.23, 1.2)	0.09
Multivariate n=63(10.3%) +birthweight, sex, Smoke exposure, fat, Oily fish,	610	1.00	1.1 (0.53,2.3)	0.93 (0.42,2.0)	0.49 (0.20,1.2)	0.06
Multivariate n=62(10.2%) +birthweight, sex, Smoke exposure, fat, Oily fish, GMS	605	1.00	1.1 (0.53,2.3)	0.89 (0.39,2.0)	0.50 (0.21,1.2)	0.07
Multivariate n=64(10.4%) +birthweight, sex, Smoke exposure, fat, GMS	618	1.00	1.0 (0.49,2.1)	0.76 (0.34,1.7)	0.42 (0.18,0.99)	0.04

| Table 6 | Odds ratios (95% CIs) for asthma in children aged 3 by mother's consumption of added fats during pregnancy. Mothers' dietary patterns during pregnancy and risk of asthma symptoms in children at 3 years |||||

		Quartile of mother's added fat consumption during pregnancy (servings per day)			
		Q1	Q2	Q3	Q4	
Median		0.57	1.3	2.6	5.1	
Range		0-1.0	1.0-1.9	1.9-3.2	>3.2	
N		200	135	136	160	
Asthma n cases(%)	N	OR	OR (95%CI)	OR (95%CI)	OR (95%CI)	P contrast Q4 vs Q1+Q2+Q3
Univariate n=66(10.4%)	631	1.00	0.66 (0.30,1.5)	0.57 (0.26,1.3)	1.5 (0.81,2.8)	0.01
Multivariate n=64(10.4%) +fruit&veg, Oily fish	618	1.00	0.65 (0.28,1.5)	0.54 (0.23,1.4)	1.8 (0.93,3.5)	0.002
Multivariate n=63(10.3%) +birthweight, sex, Smoke exposure.	610	1.00	0.68 (0.29,1.6)	0.62 (0.28,1.6)	1.9 (0.95,3.7)	0.003
Multivariate n=62(10.2%) + GMS	605	1.00	0.78 (0.33,1.9)	0.70 (0.30,1.6)	2.1 (1.0,4.2)	0.003

so as part of the 5 year follow-up with families in 2007. It may be that maternal diet during pregnancy is a proxy for children's own diets or for mothers' ongoing diets, rather than the causal factor in itself and as such reflects more prolonged household exposure to a particular type of diet. Given that the data were collected at a single time point as part of a food frequency questionnaire during pregnancy, it is in fact remarkable that any impact was demonstrated. There is a mounting literature suggesting the biological coherence of a link between maternal diet and asthma with which this analysis is consistent [2-10]. In a similar cohort study in Aberdeen with follow-up of 700 children by the age of 5 years, maternal vitamin e and zinc intakes during pregnancy were found to be negatively associated with wheeze and asthma in the last year, supporting the hypothesis that maternal diet can have long term consequences. That study adjusted also for children's own intakes[5].

In conclusion these findings merit a more detailed dietary assessment and analysis of this issue in the Lifeways cohort, which will be elucidated further in the next sweep of data collection.

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Interpersonal Relationships as Predictors of Positive Health among Irish Youth: The More the Merrier?

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Abstract
To investigate positive health and its associations with supportive relationships with friends and family members, we conducted an analysis of data from the 2002 Irish Health Behaviour in School-Aged Children Study (HBSC); a cross-sectional survey of 8,424 Irish schoolchildren aged 10-18. 36.0% and 63.4% of the students reported lack of emotional and physical symptoms respectively, 56.1% reported high life satisfaction, 46.9% scored highly on positive life index and 44.2% reported that they are very happy with their life. Parent, sibling and friend relationships were independent predictors of positive health, with higher odds ratios for parents than those for siblings or friends. A greater number of supportive relationships was strongly associated with positive health. Gender and age variations are also reported. The data suggest that there are gains to be made in terms of adolescent health from assisting adolescents to build and maintain their interpersonal relationships, and independently to support parents in their relationships with their children.

Introduction
Although traditionally viewed as a time of optimal health with low levels of morbidity, adolescence is the typical onset age for a range of disorders that are predictive for later mental health[1,2,3]. Poor parental relationships are predictive of a range of negative outcomes[4,5,6,7,8] and boys are more likely than girls to report lack of parental support[6]. During adolescence relationships with friends assume more significance and are predictive of both social and mental health outcomes[7,9,10]. It is widely argued that as adolescence progresses the influence of peers increases as that of the family decreases[11,12,13].

Well-being should be viewed as more than the absence of distress with equal importance to the presence of positive affective states, e.g. happiness and life satisfaction[14]. While predictive associations between peers, parents and ill-health or risk behaviour have been explored, there are gaps in our understanding of positive health; including the role of siblings and parents and how these relationships vary by gender or age. This paper thus investigates several constructions of positive health and their associations with supportive relationships with friends and family members across gender and age groups.

Methods
Sample
This study employs data from the 2002 Irish Health Behaviours in School-aged Children study, a part of the WHO collaborative study (WHO-HBSC) and which was collected in accordance with the international research protocol[15]. The sampling unit for this study was the classroom. Schools were randomly selected from Department of Education and Science lists and individual classrooms within these schools were each randomly selected for inclusion. Data were collected using a self-completion questionnaire in April-June, and September-October 2002, from 8,424 schoolchildren. The response rate in this study was 51% of schools and 83% of schoolchildren. Full details of the procedures adopted can be found elsewhere[16].

Measurement
Dependent variables: Lack physical and emotional symptoms
Children were asked to report the frequency, in the six months prior to the survey, that they experienced a variety of symptoms. These items were used for calculating two dichotomous variables: those reporting two or fewer emotional symptoms (feeling low, nervous, bad tempered, afraid or tired and exhausted) at least once a week during the previous six months (Cronbach alpha: 0.637); and those reporting two or fewer physical symptoms (headache, stomach-ace, backache, dizzy or neck and shoulder pain) at least once a

week in previous six months (Cronbach alpha: 0.646).

High life satisfaction
Children were asked to rank themselves from 0 to 10 on a life satisfaction ladder[17]. Scores greater than 7 were classified as indicating high life satisfaction.

Positive life index
Children were asked to respond on a 4 point likert scale to 6 statements about their life in the past few weeks; those who reported that they always or often "like the way things are going for me", "feel that my life is going well", "feel I have a good life" and "I feel good about what is happening to me", and, that they never or sometimes "would like to change many things in my life" where classifed as having a high positive life index (Cronbach alpha: 0.864).

Happiness
Self-reported happiness was measured by the single item "How do you feel about your life in general?" Responses were dichotomised at very happy versus quite happy, not very happy and not happy at all.

Independent variables: Interpersonal relationships
Relationships with family members and friends were measured by the question "How easy is it for you to talk to the following persons about things that really bother you?" with a list including parents, elder siblings and friend. Responses were dichotomised at very easy and easy versus difficult and very difficult.

Statistical Analyses
Associations between friend, sibling and parental relationships and aspects of positive health are expressed in odds-ratios from logistic regression models in SPSS, version 12.0. All analyses were adjusted for paternal occupational status. Employing the classroom as the sampling unit, but the individual as the unit of analysis, has a potential to mask clustering effects, nevertheless, previous analyses have shown that such effects are less likely in the variables under investigation[18].

Results
Overall 36.0% of the students reported that they experienced fewer than three emotional symptoms in the last six months, 63.4% of the students reported that they had fewer than three physical symptoms in the last six months, 56.1% reported high life satisfaction, 46.9% scored highly on the positive life index and 44.2% reported that they are very happy with their life. More boys then girls reported a low frequency of emotional symptoms (39.8%

Table 1	Logistic regression models predicting positive health with different sources of support, by gender				
		Few emotional symptoms	Few physical symptoms	High life satisfaction	High positive life index	Very happy about life
Total	Father	2.15***	1.71***	2.71***	2.29***	2.41***
	Mother	2.12***	1.76***	2.42***	2.30***	2.46***
	Elder brother	1.62***	1.34***	1.61***	1.65***	1.74***
	Elder sister	1.56***	1.17*	1.79***	1.53***	1.94***
	Best friend	1.60***	1.36**	1.91***	1.75***	1.86***
	Friend same sex	1.52***	1.09	1.70***	1.41***	1.69***
	Friend opposite sex	1.34***	0.95	1.30***	1.21***	1.48***
		5033	5033	4986	5033	5006
Boys	Father	2.10***	1.62***	2.60***	2.02***	2.50***
	Mother	2.00***	1.70***	2.00***	1.91***	1.96***
	Elder brother	1.60***	1.17	1.65***	1.61***	1.67***
	Elder sister	1.40*	1.15	1.76***	1.43*	1.74***
	Best friend	1.53***	1.46**	1.75***	1.61***	1.79***
	Friend same sex	1.56***	1.12	1.42***	1.18	1.53***
	Friend opposite sex	1.41***	1.04	1.34**	1.22*	1.54***
		2040	2040	2011	2040	2022
Girls	Father	2.25***	1.83***	2.84***	2.52***	2.39***
	Mother	2.25***	1.82***	2.84***	2.68***	3.04***
	Elder brother	1.66***	1.48***	1.60***	1.69***	1.80***
	Elder sister	1.77***	1.19	1.82***	1.64***	2.16***
	Best friend	1.69***	1.22	2.12***	1.95***	1.94***
	Friend same sex	1.50***	1.10	2.13***	1.78***	1.95***
	Friend opposite sex	1.34***	0.92	1.30***	1.21*	1.46***
		2993	2993	2975	2993	2984

Analyses controlled for age and paternal occupational status

Table 2	Logistic regression models predicting positive health with different sources of support, by age group				
		Few emotional symptoms	Few physical symptoms	High life satisfaction	High positive life index	Very happy about life
10-11 years old	Father	2.12***	2.15***	3.39***	2.51***	2.18***
	Mother	2.17***	2.38***	3.02***	2.47***	3.30***
	Elder brother	1.95**	1.57	1.64*	2.02**	2.20***
	Elder sister	1.14	1.25	2.19**	2.05**	2.82***
	Best friend	2.11**	1.54	2.03**	1.79*	1.87**
	Friend same sex	1.57*	1.39	1.53*	1.32	1.34
	Friend opposite sex	1.69*	1.48*	1.59*	1.07	1.59**
		627	627	620	627	621
12-14 years old	Father	2.20***	1.80***	2.87***	2.20***	2.47***
	Mother	2.17***	1.80***	2.73***	2.19***	2.45***
	Elder brother	1.67***	1.19	1.56***	1.54***	1.69***
	Elder sister	1.44*	1.07	1.79***	1.37*	1.89***
	Best friend	1.49**	1.35*	1.79***	1.70***	1.82***
	Friend same sex	1.48***	0.99	1.57***	1.29*	1.67***
	Friend opposite sex	1.20*	0.87	1.09	1.05	1.35***
		2362	2362	2340	2362	2351
15-17 years old	Father	2.26***	1.61***	2.40***	2.40***	2.42***
	Mother	2.24***	1.65***	2.08***	2.43***	2.36***
	Elder brother	1.39*	1.54***	1.71***	1.68***	1.64***
	Elder sister	1.76**	1.29	1.68***	1.68***	1.65**
	Best friend	1.51*	1.14	2.25***	1.93***	1.95***
	Friend same sex	0.75	1.18	2.11***	1.76***	1.99***
	Friend opposite sex	1.41**	0.97	1.56***	0.89	1.60***
		1994	1994	1975	1994	1984

Analyses controlled for gender and paternal occupational status

Table 3	Cumulative logistic regression models predicting positive health with number of sources of support by gender					
		Few emotional symptoms	Few physical symptoms	High life satisfaction	High positive life index	Very happy about life
Total	0 sources	-	-	-	-	-
	1 source	0.63**	0.99	0.83	0.89	0.69*
	2 sources	0.72*	1.50**	1.28	1.77***	0.90
	3 sources	0.79*	1.32*	1.25	1.78***	1.10
	4 sources	.90	1.50**	1.65***	2.09***	1.37*
	5 sources	1.28*	1.77***	2.24***	2.99***	1.82***
	6 sources	1.56**	1.73***	2.27***	3.13***	2.00***
	7 sources	1.98***	1.96***	3.08***	3.38***	2.66***
	n	6745	6745	6632	6745	6687
Boys	0 sources	-	-	-	-	-
	1 source	0.54**	1.08	0.70	0.99	0.69
	2 sources	0.71	1.78**	1.29	1.90***	1.19
	3 sources	0.75	1.55*	0.97	1.94***	1.14
	4 sources	0.78	1.56*	1.12	1.97***	1.32
	5 sources	1.22	2.02***	1.57*	2.96***	1.78**
	6 sources	1.26	1.92***	1.89**	2.70***	2.02***
	7 sources	1.74*	1.94**	2.28***	2.97***	2.30***
	n	2867	2867	2797	2867	2832
Girls	0 sources	-	-	-	-	-
	1 source	0.75	0.84	1.07	0.78	0.68
	2 sources	0.77	1.22	1.43	1.67*	0.68
	3 sources	0.87	1.08	1.74*	1.69*	1.06
	4 sources	1.10	1.34	2.46***	2.19***	1.39
	5 sources	1.48*	1.54*	3.40***	3.05***	1.85**
	6 sources	2.09***	1.53*	3.07***	3.57***	1.98**
	7 sources	2.45***	1.93*	4.67***	3.99***	3.14***
	n	3878	3878	3835	3878	3855

Analyses controlled for age and paternal occupational status

Table 4	Cumulative logistic regression models predicting positive health with number of sources of support by age group					
		Few emotional symptoms	Few physical symptoms	High life satisfaction	High positive life index	Very happy about life
10-11 years old	0 sources	-	-	-	-	-
	1 source	1.00	0.71	1.04	0.46*	0.40*
	2 sources	0.73	1.32	1.20	1.18*	0.62
	3 sources	1.28	1.47	1.70	1.38	0.73
	4 sources	1.10	1.39	1.95*	1.91*	1.04
	5 sources	1.57	2.46*	2.58*	2.70**	1.31
	6 sources	2.32*	1.93	3.53**	2.62**	1.17
	7 sources	2.02	2.86*	2.11	2.17	1.16
	n	1029	1029	1010	1029	1018
12-13 years old	0 sources	-	-	-	-	-
	1 source	0.55*	1.04	0.80	1.11	0.79
	2 sources	0.67*	1.55*	1.34	2.12***	1.03
	3 sources	0.71*	1.31	1.12	2.17***	1.15
	4 sources	0.90	1.65**	1.55*	2.21***	1.50*
	5 sources	1.22	1.67**	1.86***	3.04***	1.84**
	6 sources	1.31	1.58*	2.16***	3.30***	2.16***
	7 sources	1.74*	2.12**	2.84**	3.31***	2.96***
	n	3192	3192	3132	3192	3156
15-17 years old	0 sources	-	-	-	-	-
	1 source	0.46*	0.97	0.61	0.84	0.56
	2 sources	0.79	1.42	1.16	1.68*	0.85
	3 sources	0.66	1.19	1.21	1.59*	0.85
	4 sources	0.79	1.30	1.64*	2.14**	1.23
	5 sources	1.16	1.72*	2.53***	3.33***	1.32
	6 sources	1.63*	1.88**	2.19***	3.46***	2.06**
	7 sources	2.34**	1.52	3.47***	4.39***	2.24***
	n	2436	2436	2403	2436	2425

Analyses controlled for gender and paternal occupational status

and 33.2% respectively; p<0.01) and physical symptoms (69.1% and 59.2% respectively; p<0.01). Additionally, more boys (47.1%) than girls (42.1%) reported that they were very happy (p<0.01). No significant gender differences were found with respect to life satisfaction or on the positive life index.

Table 1 indicates that parent, sibling and friend relationships are independent predictors of positive health. Relationships with parents appear most important and the odds-ratios tend to higher for girls than for boys. These relationships are least consistent for physical symptoms. Table 2 confirms the importance of parental relationships throughout the early to mid adolescent period. Although the odds ratios for relationships with parents are lower for some indicators of positive health among the eldest age group, this is not found throughout, and with only three exceptions the odds ratios for parents are higher than those for siblings or friends in all age groups and for all measures of positive health.

Tables 3 and 4 indicate that, in general, the greater the number of supportive relationships reported, the more likely adolescents are to report positive health. This is consistent across both age groups and genders. In addition, reporting fewer supportive relationships is predictive of higher levels of reported emotional symptoms and, at least for younger children, lower self-reported happiness. Gender differences are found with fewer physical symptoms more common among boys with more supportive relationships and high life satisfaction more common among girls with such relationships.

Discussion
These data confirm that emotional symptoms are more frequent than physical symptoms among these age groups and rates of positive health are relatively high. The gender differences identified both mirror and extend previously published findings from International and Irish data and confirm general patterns reported elsewhere on the importance of positive supportive relationships for child health. The findings reported extend our appreciation of the importance of both mothers and fathers as well as siblings for positive health and well-being over the adolescent period. Most importantly, the relevance and continuity of the role of parents is emphasised.

That an increasing number of supportive relationships is predictive of greater positive health also has practical implications and should be contrasted with the relative lack of risk for those reporting fewer such relationships. This may be explained by the sample characteristics; all participants were sampled in school and may not represent those most at risk, in terms of either inter-personal relationships or positive health. Some of these findings may also be explained by a shared variance in well-being[19], and could be influenced by the self-report methods adopted.

However, that the patterns are reliable across measures of positive health provides some external validity to these findings, and even the relative lack of consistency for the physical symptoms measure reinforces this, given that physical symptoms may be qualitatively different from emotional symptoms and feelings. Taken together these data suggest that there are gains to be made in terms of adolescent health from assisting children and adolescents to build and maintain their interpersonal relationships[20], and independently to support parents in their relationships with their children.

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20. Byrne M, Barry MM, Sheridan A. Implementation of a school-based mental health promotion programme in Ireland. Int J Mental Health Promotion 2004; 6: 17-25. Table 1: logistic regression models predicting positive health with different sources of support, by gender.

Assessing the use of the Family Affluence Scale (FAS) among Irish Schoolchildren

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Abstract
The objective of this analysis was to examine the answering rates, internal reliability and external validity of the Family Affluence Scale (FAS) employing data from the 2002 Irish Health Behaviour in School-aged Children study HBSC; a cross-sectional survey of 8,424 Irish schoolchildren aged 10-18. Father's occupation was reported by 80.6% of the schoolchildren and 60.6% reported on mother's occupation, while over 96% reported on the FAS items. Lower answering rates on parental occupation were found among younger schoolchildren and among those with poorer material circumstances. Analysis of the FAS revealed a moderate internal reliability and FAS scores were significantly associated with reported parental occupation. The traditional SES measures suffer from poor answering rates that pose a serious methodological threat. The FAS has moderate internal reliability and does not capture the SES status in full, but it has high completion rates, and can be used as an additional measure of SES in late childhood and adolescence.

Introduction

The associations between socioeconomic (SES) status and health are well established among adults[1] and children[2], but not among adolescents[3,4]. SES is most commonly determined by three measures: occupation, education and income[5], measures that do not easily apply to adolescents. Studies tend to classify adolescents' SES according to the head of the household's status[6], but the appropriateness of this is unclear. Whereas some studies suggest that adolescents are able to provide valid data on their parents' occupational status[6,7,8], others suggest otherwise[9,10].

One way of overcoming these difficulties is measuring the material affluence of the family. The Family Affluence Scale (FAS) is a composite of four self-report questions: family car ownership, number of holidays, number of computers and having one's own bedroom[9, 11, 12], based on Townsend's work on material deprivation[13]. The FAS was found to be a good predictor of poor self-rated health in 22 European and North American countries[14].

Some aspects of the FAS were previously validated internationally[15], but not in the Irish context. The current study aims to assess the internal and the external validity of the FAS in Ireland, based on data collected in 2002 HBSC survey.

Methods
Sample
This study employs data from the 2002 Irish Health Behaviours in School-aged Children study, a part of the WHO collaborative study (WHO-HBSC)[16]. Schools were randomly selected from Department of Education and Science lists and individual classrooms within these schools were randomly selected for inclusion. Data were collected using a self-completion questionnaire in April-June, and September-October 2002, from 8,424 10-18 year old schoolchildren. The response rate in this study was 51% of schools and 83% of schoolchildren. A full description of the methods employed can be found elsewhere[17,18].

Measurement
Participants were asked to report where their father and mother work, and what exactly their job was. These open-ended questions were coded into a 7 category SES scale: 1 - professional; 2 - managerial/technical; 3 - skilled non-manual; 4 - skilled manual; 5 - partly skilled; 6 - unskilled; 7 - unknown or unclassifiable. The latter category was re-coded as missing.

The Family Affluence Scale was calculated as a sum score of the following: Does your family own a car, van or truck? 0 - no; 1 - yes, one; 2- yes, two or more; Do you have your own bedroom? 0 - no; 1 - yes; During the past 12 months, how many times did you travel away on holiday with your family? 0 - not at all; 1 - once; 3 - more than twice; and How many computers does your family own? 0 - none; 1 - one; 2 - two; 3 - more than two. The sum score created an 8-point scale that was later collapsed into low FAS (FAS 0,1,2,3); medium FAS (FAS 4,5); and high FAS (FAS 6,7).

Statistical Analyses
The internal and external reliability characteristics of the FAS as

Table 1 Answering rates for parental occupation and FAS items by gender and age group

	Total	Boys	Girls	10-11yrs	12-13yrs	15-17yrs
	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
Father	80.6 (6791)	79.5 (2872)	81.7 (3917)	78.8 (1029)	81.2 (3193)	81.6 (2436)
Mother	60.8 (5126)	59.9 (2164)	61.7 (2958)	57.6 (752)	61.0 (2396)	62.6 (1869)
Own bedroom	99.4 (8370)	99.2 (3585)	99.5 (4774)	99.5 (1299)	99.2 (3901)	99.6 (2973)
Family vacations	99.2 (8354)	98.9 (3573)	99.4 (4770)	98.9 (1292)	98.9 (3889)	99.7 (2975)
No. of computers	99.4 (8373)	99.2 (3585)	99.6 (4777)	99.5 (1299)	99.3 (3903)	99.6 (2973)

Table 2 Spearman correlations: FAS items

	Family car	Own Bedroom	Family vacations
Own Bedroom n	0.102** 8111		
Family vacations n	0.200** 8113	0.129** 8360	
No. of computers n	0.131** 8093	0.0869** 8339	0.178** 8344

Table 3   Percentages of adolescents reporting on parental occupation, by FAS categories

	Professional	Managerial/technical	Skilled non-manual	Skilled manual	Partly skilled	Unskilled
	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
Father's occupation						
Total	7.2 (486)	31.0 (2106)	10.9 (739)	33.4 (2269)	13.0 (882)	4.6 (309)
FAS low	1.8 (22)	27.3 (329)	7.0 (84)	40.2 (484)	16.6 (200)	7.1 (86)
FAS medium	5.1 (160)	28.6 (893)	11.2 (350)	36.0 (1121)	14.1 (441)	4.9 (153)
FAS high	12.3 (274)	35.5 (792)	12.4 (276)	27.3 (610)	9.6 (214)	3.0 (66)
Mother's occupation						
Total	3.2 (164)	34.3 (1756)	29.2 (1495)	6.0 (307)	18.9 (967)	8.5 (437)
FAS low	1.9 (18)	26.3 (247)	24.9 (234)	6.9 (65)	24.3 (228)	15.7 (147)
FAS medium	2.9 (68)	33.8 (793)	29.8 (699)	6.4 (151)	19.3 (452)	7.7 (180)
FAS high	4.4 (75)	39.6 (674)	30.2 (515)	4.8 (81)	15.5 (264)	5.5 (94)

Table 4   Answering rates for parental occupation by FAS categories, gender and age group

	Total	Boys	Girls	10-11yrs	12-13yrs	15-17yrs
	% (n)	% (n)	% (n)	% (n)	% (n)	% (n)
Father's occupation						
FAS low	70.8 (1205)	71.5 (542)	70.2 (663)	69.9 (179)	72.4 (534)	69.9 (463)
FAS medium	81.6 (3118)	80.6 (1331)	82.6 (1786)	78.2 (494)	81.3 (1446)	84.6 (1111)
FAS high	87.4 (2232)	85.2 (916)	89.2 (1316)	85.1 (338)	88.2 (1091)	88.0 (767)
Mother's occupation						
FAS low	55.1 (939)	56.1 (425)	54.4 (514)	59.8 (153)	53.0 (391)	55.4 (367)
FAS medium	61.4 (2343)	59.7 (985)	62.8 (1357)	56.3 (356)	60.8 (1082)	65.5 (861)
FAS high	66.7 (1703)	65.2 (701)	67.8 (1000)	58.2 (231)	68.1 (843)	68.5 (597)

proposed by Wardle et al[18] were examined using SPSS, version 12.0.

Results

Out of the 8,424 schoolchildren sampled, 80.6% reported father's occupation and 60.8% reported mother's occupation. In contrast, 96.4% reported on having a family car, 99.4% own bedroom; 99.4% computers; and 99.2% holidays. No gender differences were found in likelihood of reporting on any of the measures, however, younger children were less likely to report parental occupations. This trend was not found with regard to the material affluence items (Table 1).

Prior to computing the FAS, intercorrelations between the four items used to compose the scale were examined and revealed modest but statistically significant associations (Table 2). The Cronbach's alpha of the final scale was moderate ($\alpha=0.401$).

To assess external validity, associations between parental occupation and FAS were examined. Data presented in Table 3 suggest that those with lower FAS scores were more likely to report partly skilled or unskilled parental occupations whereas those from the highest FAS group were more likely to report that their parents were in professional and managerial/technical occupations (Chi-square: 310.24, $p<0.001$ for father's occupation and Chi-square: 159.40, $p<0.001$ for mother's occupation).

Finally, we examined the percentages answering the parental occupation questions by FAS categories, gender and age group (Table 4). The percentages of respondents reporting on parental occupation from the low FAS groups were lower than that those from the higher FAS groups. In addition, within the higher FAS categories, girls and older schoolchildren were more likely than boys to report parental occupation (all statistically significant at $p<0.001$).

Discussion

The aim of this paper was to examine the internal reliability and the external validity of the Family Affluence Scale developed by Currie et al[9] in the Irish context. The approach undertaken here follows the work of Wardle et al[18] validating the Home Affluence Scale (HASC). Previous studies have highlighted the difficulty of obtaining valid information on parental occupation from children and adolescents using self-reports. Currie et al[9], for instance, reported a 20% non-response to these questions. The first step of our analysis was, therefore, to determine the non-response rate in this Irish sample. Approximately 20% of the schoolchildren did not report on father's occupation and approximately 40% did not report on mother's occupation. Whether this was due to questions unanswered or a reported occupation that was unclassifiable, the result is the same: SES information for a large proportion of the sample was not available, posing a potential bias to analyses using this measure. Examining the answering rates to the individual FAS items revealed that in excess of 96% of participants responded to each of the items. The intercorrelations between the FAS items were low but statistically significant and the Cronbach's alpha was moderate. The low associations may be explained by the small number of items composing the scale and by the fact that they represent different aspects of material affluence[18].

The external validity of the FAS was examined by associations with parental occupation. The results suggest that statistically significant associations exist between FAS and parental occupation, with more schoolchildren from high FAS categories reporting on high parental occupation status and vice versa, however deviations from this trend do exist suggesting that the FAS and parental occupation do not overlap and should not be used as alternates.

Finally, we examined whether differences in response rate on parental occupation exist across the three FAS categories. This analysis revealed differential answering on parental occupation; those reporting lower FAS scores and younger children were less likely to provide sufficient information for classification. These findings coincide with previous studies[8,9] and they suggest a bias toward higher SES and that low SES is under represented in data collected from adolescents in a self-report manner.

The Family Affluence Scale is not perfect in the sense that it does not capture the same concept as parental occupational status or socio-economic status. Neither does it assess the totality of the concept of material affluence and thus it cannot replace the classic SES measures; indeed the scale is continuously subject to examination and refinement[11,12]. Nevertheless, the FAS represents a simple, short and reliable measure, comprised of questions that can easily be answered by schoolchildren in these age groups and that is associated with national level measures of wealth[15], and, that has demonstrated relationships various health outcomes[14].

In the Irish context FAS has moderate internal reliability, suggesting that it should not be used as the only measure for material status or as an alternative for the more traditional SES measures such as parental occupation. However the high answering rates achieved by the FAS items and the association between FAS and parental occupations suggest that the FAS should be used as a complimentary measure of material affluence.

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Correlates of Increased Risk of Eating Disorders in Irish School Children

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Abstract
Currently there are no large-scale data on the prevalence of disordered eating behaviours in Irish children and adolescents. We examined the 2002 Health Behaviour in School Aged Children (HBSC) study to estimate those Irish children who are potentially at risk of developing an eating disorder. Body Mass Index (BMI) data, based on self-reported height and weight were available for 2,469 pupils (29% of all participants). This analysis showed that 32.2% of adolescents were underweight (BMI<18.5 kg m^{-2}) and 10.7% of this group 'thought they were too fat'. These latter (n-86) were identified as the 'risk' group and compared with group 2 (n=717) who reported they were underweight and had indeed a low BMI and group 3, (n=856) those with a normal range BMI (18.5-25Kg/m$^{2)}$ Those at risk were significantly more likely to choose a large silhouette, be unhappy, poorly satisfied with life and perceive themselves as not good looking, to have diet concerns, be bullied at least twice per month and feel they were average/below average in their academic work (all p<0.001). These data indicate psycho-social associations with an important potentially pathological population sub-group of at risk children.

Introduction
Previous studies have indicated that disordered eating behaviour may be increasing in prevalence[1]. Of equal concern is the fact that the age of onset of these disorders may be decreasing[2]. This behaviour is an inherent problem in Western societies, particularly among adolescent girls. Disordered eating attitudes and behaviours are associated with increased rates of smoking, alcohol and drug use, and of depression and suicide[3]. The medical and psychological consequences of eating disorders can persist throughout life.

By contrast with the other prevalent diet-related disorder, obesity, evidence to date has shown that eating disorders affect only a small percentage of children. However there is an association between Body Mass Index and eating disturbances which suggests a potential link between disordered eating and overweight[2]. The prevalence of anorexia nervosa and bulimia nervosa, estimated at 0.5 to 1% worldwide, makes these disorders the third commonest chronic illness of adolescence[4]. Currently there are no estimates for Irish children. The aim of this paper was to profile Irish children who are potentially at risk of developing an eating disorder using the rich dataset from the HBSC 2002 study of over eight thousand Irish children.

Methods
The participants in this analysis are from the Health Behaviour in School-Aged children (HBSC), a World Health Organisation (European) Collaborative Study which is conducted on a 4 year cycle. The 2002 study was comprised of Irish primary and post-primary students aged 10-18. The respondents (N = 8,424) completed a health and life-style questionnaire in schools and the sampling and methodology have been described elsewhere [5,6,7.]

Participants were categorized according to their Body Mass Index (Weight/Height^2) and their perceived body size ("Do you think your body is too thin/ about the right size/ too fat?)". Those who were thought to be at risk of an eating disorder were identified as those who were both underweight (BMI<18.5kg/m^2) and thought they were too fat (group 1). This group was compared to group 2 who were underweight and felt they were too thin or about the right size and group 3 who were normal weight (18.5-25kg/m^2) and felt the right size.

Chi-Square statistical analysis was carried out to describe the groups. A binary logistic regression model was used to examine the influence on social and lifestyle factors on the 'at risk' group compared to those not at risk. The following variables were entered together into the model: age, gender, perceived shape/silhouette, looks, diet concerns, life satisfaction, happiness, academic achievement, bullying, and exercise.

Results
BMI data based on self-reported height and weight were available for 2,469 pupils. Among this sample 32.2% were categorised as underweight, 60.3% were normal weight and 7.5% were overweight or obese. Of those who were underweight, 10.7% thought they were too fat. These (n=86) were identified as 'risk' group 1 and compared to group 2 (n=717) and group 3 (n=856). A greater percentage of the 'at risk' group (77.9%) were girls; 14% were aged 10 to 11, 53.5% aged 12 to14 and 32.6% aged 15 to 17 (see Table 1). Those at risk were significantly more likely to choose a large silhouette, report that they were unhappy, poorly satisfied with life and perceive themselves as not good looking (p<0.001), to have diet concerns (p<0.001), be bullied at least twice per month (p<0.001) and feel they were average/below average in their academic work (p=0.013). Reported levels of physical activity did not vary significantly between groups.

In the regression model (Table 2) those more likely to be at risk were girls, aged 10-11, and 12-14 years, who thought they were not good looking, with poor or average life satisfaction and with diet concerns. Those choosing normal silhouettes and who had not been bullied were less likely to be in the high risk group.

Discussion
The results from this study indicate that there is a distinguishable group of Irish adolescents who are at the lower end of the weight spectrum and have a poor self-image and are unhappy with life. Fear of being or becoming overweight and body image dissatisfaction have been shown to be longitudinally related to the onset of an eating disorder[8]. Bullying has been shown to be associated with obesity but only one other study found an association between those at risk of an eating disorder and those who had experienced bullying[9], though it should be noted that this study also employs HBSC 2002 data and thus is not independent. Other variables such as dieting and low self-esteem have also individually been regarded as risk factors but by themselves are insufficient for predicting the development of eating disorders[10]. Disordered eating behaviours are complex and the application of multivariate models may be more appropriate to understand the factors which may influence their development[11].

Since the HBSC survey is a general health survey, measures specifically relating to eating disorders were not included. Yet it can identify those adolescents who have a distinguishable profile of poor body image and general dissatisfaction with life and who are potentially at risk of developing an eating disorder.

One limitation of this study is the use of adult BMI cut-offs for categorising those underweight which will lead to an overestimation of those underweight. These results however are exploratory and future research should use age and gender specific BMI centiles to assess body weight in children and adolescents. A BMI lower than the 5th centile defines underweight, lower than the 2nd centile

Table 1	Descriptive factors of 'at risk' group (n=86)				
Variable	Category	Sex	Age group (Years)		
		M/F	10 to 11	12 to 14	15 to 17
			n (%)	n (%)	n (%)
Looks	Good looking	M	1 (16.7)	4 (66.7)	1 (16.7)
		F	4 (28.6)	7 (50.0)	3 (21.4)
	Average	M	3 (50.0)	2 (33.3)	1 (16.7)
		F	3 (10.3)	16 (55.2)	10 (34.5)
	Not good looking	M	0	3 (60.0)	2 (40.0)
		F	1 (4.3)	12 (52.2)	10 (43.5)
	Don't think about looks	M	0	1 (50.0)	1 (50.0)
		F	0	1 (100)	0
Life satisfaction	Poor	M	0	0	1 (100)
		F	1 (6.7)	6 (40)	8 (53.3)
	Average	M	2 (18.2)	6 (54.5)	3 (27.3)
		F	4 (13.8)	16 (55.2)	9 (31.0)
	High	M	2 (28.6)	4 (57.1)	1 (14.3)
		F	3 (13.0)	14 (60.9)	6 (26.1)
Diet concerns	Yes	M	4 (44.4)	4 (44.4)	1 (11.1)
		F	7 (14.3)	24 (49.0)	18 (36.7)
	No	M	0	6 (60.0)	4 (40.0)
		F	1 (5.6)	12 (66.7)	5 (27.8)
Silhouettes	Large	M	2 (40.0)	2 (40.0)	1 (20.0)
		F	4 (25.0)	7 (43.8)	5 (31.3)
	Normal	M	2 (15.4)	8 (61.5)	3 (23.1)
		F	4 (9.1)	26 (59.1)	14 (31.8)
	Thin	M	0	0	1 (100)
		F	0	3 (42.9)	4 (57.1)
Bullied	Not recently	M	2 (16.7)	6 (50.0)	4 (33.3)
		F	5 (10.0)	25 (50.0)	20 (40.0)
	Once or twice last month	M	0	2 (100)	0
		F	1 (10.0)	7 (70.0)	2 (20.0)
	More than twice a month	M	2 (40.0)	2 (40.0)	1 (20.0)
		F	2 (33.3)	3 (50.0)	1 (16.7)
Happiness	Happy	M	4 (22.2)	10 (55.6)	4 (22.2)
		F	8 (15.1)	28 (52.8)	17 (32.1)
	Not happy	M	0	0	1
		F	0	8 (57.1)	6 (42.9)
Academic achievement	Good/Very good	M	3 (25.0)	8 (66.7)	1 (8.3)
		F	3 (9.1)	19 (57.6)	11 (33.3)
	Average/below average	M	1 (14.3)	2 (28.6)	4 (57.1)
		F	5 (15.2)	16 (48.5)	12 (36.4)
Exercise	Twice or less/week	M	0	0	1 (100)
		F	1 (5.0)	10 (50.0)	9 (45.0)
	Three or more times/ week	M	4 (23.5)	9 (52.9)	4 (23.5)
		F	7 (14.9)	26 (55.3)	14 (29.8)

indicates serious underweight.

Another limitation is the high rate of under-reporting of height and weight in the Irish HBSC participants – it is not clear why this should be the case, it may be explained by the fact that children simply do not know their own height and weight, or to more systematic bias, such as sensitivity around the issue but our pilot data did not provide any helpful information on this point.

There has been a general acceptance that while treatment of eating disorders is necessary there should be a shift in focus to prevent the onset of these disorders. However, like the obesity epidemic very little empirical research on prevention has been reported. The majority of programs which have been established consist of providing information about eating disorders, the dangers of unhealthy weight loss and encouraging healthy eating and exercise. Most of these do little to change or prevent unhealthy attitudes and behaviours[12]. One school-based intervention was successful in improving body image satisfaction and global self-esteem and in reducing dieting attitude scores at post intervention[13]. However, the gains were not maintained at the 12-month follow-up[14]. The introduction of the Social Personal and Health Education into schools may go some way to improving self-image and self-esteem among Irish children. Health professionals can also play a role in the prevention and detection of unhealthy eating attitudes and behaviours. Non-judgemental questions regarding body image and eating attitudes and behaviour can bring these issues to light in the primary care setting[2].

Table 2	Factors associated with risk of disordered eating behaviours: Binary Regressing Mode					
Covariates		Estimates	S.E.	df	P	OR
Gender	Girls	0.775	0.310	1	0.012	2.170
	Boys					
Age	10-11	1.215	0.444	1	0.006	3.369
	12-14	1.179	0.299	1	<0.001	3.250
	15-17					
Looks	Not Good looking	1.432	0.697	1	0.040	4.186
	Don't think about looks					
Life satisfaction	Poor	2.199	0.433	1	<0.001	9.018
	Average	0.608	0.289	1	0.036	1.837
	High					
Diet Concerns	2.298	2.298	.281	1	<0.001	9.959
Silhouettes	Large	-0.604	0.573	1	0.292	0.547
	Normal	-1.243	0.499	1	0.013	0.289
	Thin					
Bullied	Not recently	-0.817	0.432	1	0.059	0.442
	1/2 last month	-1.615	0.538	1	0.003	0.199
	> 2 month					

The results from this study support the consensus that all childhood-onset eating disorders must be considered using a multidimensional model that takes into account physical, psychological, social and family factors in origin, assessment, treatment and prevention.

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Influence on Self-Rated Health of Socio-Demographic, Lifestyle and Affluence Factors: An Analysis of the Irish and International Health Behaviours among School-Aged Children (HBSC) Datasets 1998

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Abstract
In this analysis we employed the International Health Behaviour Among School Aged Children (HBSC) 1998 data, comprising 8326 Irish children and 115,327 children in the International dataset, to examine influences on self reported health among young people. Factors were similar for both boys and girls and between countries. Daily smokers, those reporting intoxication at least once, those taking infrequent exercise and those reporting difficulty in making friends were all predictive of poor self-rated health in adjusted odds ratio models. Disposable means, as measured by the Family Affluence Score was also a significant predictor of self-rated health but not as influential as reported lifestyle. In a multi-level between country comparison of 15 OECD countries, individual health behaviours explained much, but not all of the variability in poor self reported health (0.26, SE 0.08), and of various ecological level indicators considered in the final model only % voting and % males with minimum 2nd level of male education in the population were influential factors, with between-country variations still not fully explained (0.10, SE 0.03).

Introduction
Over the last decade interest in early life influences on health and well-being has intensified and there has been considerable focus in the health inequalities literature on the extent to which so-called psycho-social and neo-material life circumstances may play a role[1,2]. It has been proposed that factors across early life may be influential, at critical periods such as biological development in utero, or through cumulative or trajectory pathways across childhood that influence lifestyle choices, educational opportunities and hence long-term social position[3,4].

In developed, highly industrialised societies particularly, the changes wrought to traditional family and social networks, to composition of neighbourhoods and communities has altered considerably how individuals function as part of wider society. These forces of social capital, as distinct from individual or economic capital may influence health and well-being also, through direct and indirect pathways. Whilst a number of analyses have been undertaken with adult population datasets that have attempted to de-construct the relative influence of deteriorating community or social capital on population health, particularly in disadvantaged communities, there is rather less work on this issue in children. The 1998 Health Behaviours among School-aged Children (HBSC) survey was conducted across 30 countries in Europe and included also the United States, Canada and Greenland[5]. That survey contained a question package on indicators associated with social capital. Our objective in this analysis, conducted especially for an associated workshop on health inequalities among children and young people held in Denmark in December 2002 as part of that country's European Union presidency[6], was to assess the degree to which social variations in health expectancy in school-aged children might be explained by individidual-level characteristics or by wider social forces characterising the composition or context of children's lives.

Methods
The methodology for the HBSC surveys is well established and has been described previously[5,7,8,9]. All participating countries must follow the pre-agreed questionnaire protocol and must attain minimum required completion rates to satisfy criteria for inclusion in the International dataset, which is cleaned through a clearing-house procedure in Norway. The questionnaires are self-completed by schoolchildren aged 9 -18 years in strict confidence under teacher supervision during late spring or early summer every 4 years. In 1998 data were available for 8326 children in the Republic of Ireland (48.8% male). In the international data set three age groups are considered, 11 year olds, 13 and 15 year olds.

As an outcome measure for this analysis we took self rated health, a well established proxy for objectively measured health status[10] in the longitudinal literature and known to show socio-demographic variability. Respondents rate their health as very, quite or not very healthy and this was dichotomised for this analysis into very versus quite or not very healthy groups. Demographic variables for the Irish analysis only were father's social class from 1 to 6 in ordinal scale based on reported occupation and Family Affluence Scale derived from several variables including having an annual holiday, receiving pocket money and having one's own bedroom[9,10]. Health risk behaviours included were current smoker (at least one cigarette daily), reported alcohol intoxication at least once, regular exercise and excess TV watching (more than four hours daily), reported psychosomatic symptoms (headache or tummy ache), quality of life (excellent or very good versus fair or poor) and measures of social network including quality of relationship with parents (poor or not), difficulty or not of making friends, reported ever been bullied in last year or inadequate time spent with friends. The cross-national rates for these variables have been previously reported[5]. We performed a multivariate logistic regression analysis predicting poor health or not in the Irish respondent dataset, reporting adjusted statistically significant odds ratios in the final models for both girls and boys separately. We then categorised all the participating countries into one of three groups, Western Europe and EU countries, pre-accession and former Communist countries and North America. This was because a previous analysis had shown marked variations in smoking status according to gender and country group[11]. First in a multivariate model we examined predictors of poor or good health by region. Then we sub-categorised respondents again according to family affluence score from highest (4) to lowest quartile and examined odds of reporting very good or poor health, adjusted for the other factors.

Finally, for the 15 OECD countries in the dataset we obtained ecological level information from routine datasources of the following variables: that country's Gini coefficient which is a standard economic measure of dispersion of income, % gross domestic product on public spending, % voting in the last election, suicide rate in the population, % males and % females with a minimum of second level education in the population. We then performed a three stage multi-level analysis. This established first whether there was variability between countries in reported poor self rated health. In the next compositional step we added individual level information to the model to see how much of the variance was thus explained. In the final model we added the ecological level variables to see whether any variability still remained or not.

Results
In Table 1 we present the findings separately for the Irish only school children and for the international HBSC dataset. In the Irish only group self reported life satisfaction was strongly related to

Table 1	Predictors of poor self-rated health in Irish Children and in all HBSC 1998 participating countries; Adjusted Odds Ratios from logistic models.			
	Ireland		International	
	M	F	M	F
	(n = 4063)	(n = 4263)	(n = 56,434)	(n = 58,893)
Variable				
Father's Social Class (5-6)	0.86	1.11	-	-
Low family affluence score (FAS)	1.63*	1.28	-	-
Daily smokers	4.61***	2.02***	1.83***	1.40***
Intoxicated at least once	1.67*	2.42*	1.41***	1.43***
Infrequent exercise	4.97***	2.86***	2.34***	1.82***
Psychosomatic symptoms	1.38	1.67**	2.50***	2.89***
Bullied ≥1 least year	1.93***	0.78	1.71***	1.59***
Difficulty making friends	2.03***	2.15***	1.88***	1.58***
Low self-reported life satisfaction	5.47***	5.38***	-	-
Excess TV watching	1.58*	2.10***	-	-
Poor communication with parents	-	-	1.46***	1.56***
Frequent Truant	-	-	1.00	1.27**

(*P< 0.05, **P< 0.01, ***P< 0.001)

self-rated health, as were adverse lifestyle factors. In boys, reported bullying was significant and in both sexes family affluence score was more weakly associated. The International pattern was similar.

In Table 2 predictors of not being very healthy are examined according to economic jurisdiction. In both boys and girls the ranking of adjusted odds was similar across jurisdictions, with infrequent exercise or frequent somatic symptoms being generally most important. Conversely, measures of networks, though significant, were less strong influences. The most notable difference by jurisdiction was that reported alcohol intoxication at least once was a significant predictor only in the Western European children.

In Table 3 we present the odds of either very good or not very good health separately by jurisdiction and according to family affluence quartile. This mainly shows a graduated relationship from least to most affluent. However in the North American group, in the case of boys, the effect was confined to the most affluent group compared to the rest.

Table 4 summarises the findings of the multi-level analysis. Significant between country variation in reported poor self rated health was observed (0.24, SE 0.08), which was not fully accounted for by the individual level risk factors examined. Addition of the ecological level indicators attenuated the model, with level of male education and % voting being significant predictors but substantial unexplained between country variability remained.

Discussion
The HBSC dataset has real strength for international comparison because it uses a standardised instrument. Clearly there is variability in lifestyle behaviours, as demonstrated in detail in the main report of the 1998 surveys[5]. For instance, those reporting having been intoxicated more than once varies from 63% of Danish girls to 10% of girls in Israel. We were able to conduct an analysis of the determinants of self-rated health accounting for lifestyle, socio-economic and social capital indicators. Examination of the Irish dataset alone confirms that self-rated health varies considerably according to lifestyle and social circumstances, though lifestyle predominates as a predictor. This is perhaps not surprising given

Table 2	Predictors of poor self-rated health among boys and girls in HBSC counties grouped by economic status; Adjusted Odds ratios from logistic models						
		Western Europe/EU-15		CIS, Central and Eastern Europe		North America	
		M	F	M	F	M	F
Variable							
Psychosomatic symptoms		2.43***	2.57***	2.81***	3.41**	1.83*	1.81*
Infrequent exercise		2.44***	1.89***	2.04***	1.36***	2.27***	2.16***
Daily smoker		2.24***	1.70***	1.42**	1.43***	1.78**	1.57***
Difficulty making friends		1.84***	1.60***	1.85***	1.64***	2.50***	1.57***
Intoxicated at least once		1.65**	1.77***	1.18	1.12	1.15	1.13
Bullied at least once last year		1.63***	1.43***	1.73***	1.53***	1.41*	1.62***
Poor communication parents		1.58***	1.69***	1.46***	1.61***	1.56**	1.68***
Little time with friends		1.04	1.13*	1.27**	1.13*	1.08*	1.00

* P< 0.05; ** P < 0.01; *** P < 0.001

Table 3	Adjusted ODDS ratio for self-reporting either very good or poor health, categorised by country grouping and family affluence score (FAS) where 4 is highest and 1 is lowest							
	Overall		Western Europe/EU-15		CIS, Central and Eastern Europe		North America	
Very Good Health	M	F	M	F	M	F	M	F
FAS 2	1.11***	1.12***	1.11*	1.09*	1.13*	1.13*	0.92	1.26*
3	1.26***	1.23***	1.28***	1.23***	1.19***	1.14*	1.06	1.33*
4	1.56***	1.45***	1.58***	1.46***	1.37***	1.31***	1.37***	1.48***
Poor Health	M	F	M	F	M	F	M	F
FAS 3	1.04	1.23**	1.01	1.17*	0.99	1.13	1.05	1.17
2	1.33***	1.34***	1.31***	1.27***	1.21	1.22*	1.15	1.15
1	1.68***	1.99***	1.59***	1.60***	1.24*	1.58***	1.34	1.50*

* = P < 0.05, ** = P < 0.01, *** = P < 0.001

Table 4	Multilevel model of determinates of poor self rated health combining individual and ecological level dates for 15 OECD countries (standard errors in brackets)		
	Null Model	Model 2 (compositional)	Model 3
• Gini coeffieient			0.07 (0.05)
• % GDP on Public Spending			0.06 (0.03)
• Divorce Rate/100 Marriages			-0.03 (0.06)
• % Voting			0.02* (0.01)
• Suicide Rate			-0.001 (0.02)
• % Males with Minimum 2nd Level Education			0.03* (0.01)
• % Females with Minimum 2nd level Education			-0.00 (0.01)
Between Country Variation	0.24 (SE 0.08)*	0.26 (SE 0.08)*	0.10 (SE 0.03)*

*Denotes statically significant

the age group under study, in that peer influenced adoption of lifestyle behaviours is notably important at this age. In the Irish dataset, parental occupation is not a strong predictor, which may be partly for methodological reasons, as occupation tends to be under-reported.

The Family Affluence Score is appropriate as a proxy for immediate disposable income and reflects what is directly available to young people in material amenities. This appears to be quite strongly related to health status across the HBSC countries and establishes the importance of material affluence on health status. Notably the network and social support factors were not as strong an influence, and this was true in all economic jurisdictions. While clearly important as measures of social adjustment and predictors of well-being, these factors are not as influential as lifestyle patterns. This suggests at least two possible explanations, though we must be speculative since these are cross sectional data and directionality is not possible to assess. It is possible that the influence of networks is mediated through lifestyle choice which in turn influences health status, since both parental and peer influences are well established to be the predominant influences on uptake or not of smoking and of alcohol behaviours. It is also possible that at this age health status is more immediately influenced by symptomatology so that those who report psycho-somatic problems are more consciously aware of its impact on health and this is the case in this analysis.

It is striking how little variability in predictors of health status is seen between countries, contrary to what might have been predicted. The globalised nature of the teenage experience may be one explanation. We do however see variability in health status between countries. While both individual level and contextual or environmental characteristics are important, the variables included in this analysis do not account fully for the variability seen between countries. Other factors not assessed here, including health service provision may be contributing in part to this, meriting future investigation.

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Predictors of Poor Self-Rated Health at Area Level in the Eastern Regional Health Authority: A Multilevel Analysis

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Abstract
In this analysis, employing 2002 data from SLAN Survey of Lifestyles, Attitudes and Nutrition and mortality data from the Eastern region of the Republic of Ireland, we examined predictors of area level variability in self-rated health across 101 electoral divisions (ED)s. Overall 11.5% of 1500 participants reported fair or poor health. We found area level variation in poor self-rated health (0.0357 (SE 0.160), p=0.03), which was related significantly to area-level standardised mortality ratio. Odds of poor self-rated health, adjusted for age and sex were 1.55 (95% CI 0.89, 2.71) in average SMR areas and 2.61 (95% CI 1.38, 4.92) in high SMR areas compared to low SMR areas. Adjusted models for age, sex, general medical services eligibility, an established proxy for income, problems in the neighbourhood and smoking rates largely explained any variability, suggesting a strong role for individual disadvantage in predicting health status, regardless of area, in Ireland.

Introduction

It is well established in the international literature that mortality rates vary at area level and this is may be demonstrated by calculating the area-level standardised mortality ratios (SMR) [1]. This indicates the degree to which the mortality rate in an area differs from a standard population, adjusting for differences in age distributions between the two populations. The Eastern Regional Health Authority (EHRA), now HSE Eastern, is the most populous administrative area in Ireland, and includes the country's growing capital city Dublin. The mortality patterns have been mapped by area, including electoral division for over two decades [2,3,4]. Variability is known to exist and there appears to be a North South gradient, particularly in greater Dublin, with evidence that areas of greater material deprivation have higher mortality in the north part of the city particularly.

In industrialised populations like the United Kingdom and the United States, where extremes of poverty are well documented, it is quite clear that disadvantaged areas have poor housing and social amenities but also are composed of populations where individual level deprivation is the norm, with consequences for lifestyle and well-being. More recently the health inequalities literature has focused on whether area deprivation can be explained by compositional characteristics of individuals or contextual characteristics of the area [5]. In this line of argument groups of individuals who are already deprived will be exposed to greater disadvantage if also they live in an area where collective amenities are poor. In mixed communities where people of differing incomes and means co-exist, shared standards of schooling, transport, work opportunities are all likely to be better. Further it is argued that communities that are deprived tend to be less cohesive and supportive. This loss of social as well as economic capital is in itself destructive of health and well-being. For this reason multilevel analyses that can deconstruct individual or compositional characteristics from area, ecological or contextual characteristics are required. Such analyses require individual level survey data and aggregate or ecological level information on community characteristics.

Self-reported poor health is a known predictor of mortality [6] and several publications from the National Surveys of Lifestyles, Attitudes and Nutrition (SLAN) have illustrated that it is socially patterned [1,7,8]. Our objectives in this analysis were firstly to examine whether there was variability in self-reported health at area level in the Eastern Regional Health Authority (ERHA), secondly to explore the relationship between standardised mortality ratio and self-reported health and finally to see whether established indicators of socio-economic disadvantage explained these patterns or not.

Methods

This was a multilevel cross-sectional analysis of the 2002 National Survey of Attitudes and Nutrition (SLAN), which has been described previously [7,8]. In the ERHA area, individuals were selected at random from 101 electoral divisions (EDs) and were asked to complete a standardised, previously validated questionnaire. We identified 1,500 adults (> 18 years) with full covariate information from a total of 1,799 respondents. This was merged with mortality data provided by the ERHA, which classified each ED according to Standardised Mortality Ratio (SMR) and in turn whether this was a high, medium or low mortality area. The main outcome measure was reported poor or fair self-rated health, hence termed "poor SRH". We used multilevel logistic regression models, thus allowing for the structure of the data by estimating variance at both ED and individual (within ED) levels. This approach enables us to test covariates at and across both levels. We wished to establish first whether there was significant variance in poor SRH at ED level and subsequently to examine the effect of SMR and individual-level covariates [9]. The individual-level covariates were age, gender, General Medical Services (GMS) eligibility, smoking status, % of those employed, and the number of self-reported local problems (rubbish, vandalism, racism, house break-ins, pollution, access to shops and public transport, and lack of public open spaces), which was categorised as 0, 1-2 and 3+ problems. Models were fitted using MLwiN 2.0 software [10].

Results

Table 1 summarises the relationships between the covariates and the ED-level SMR. Most respondents (62%) resided in areas with medium level SMR rates. Individuals living in areas with high SMR tended to be older, more likely than would be expected to have GMS cards, more likely to smoke, and more likely to report problems in their neighbourhoods. Eighty-four of 215 respondents in high SMR areas (39%) were GMS card holders compared to 180 of 931 respondents (19%) in medium mortality areas and 53 of 354 (15%) of respondents in low SMR areas.

Overall, 11.5% of respondents reported poor or fair health. In Table 2 we show the results of fitting a series of multilevel logistic regression models for poor SRH. In the baseline model, which included age and sex as covariates, there was evidence of significant differences in poor SRH across areas (variance 0.357 (SE 0.160), p= 0.03) Including ED-level SMR in the model reduced the variance in poor SRH at area level, making it no longer significant (variance 0.272 (SE 0.146), p=0.06). That is, the differences in the proportion of people with poor SRH between areas may be explained by an area-level measure of SMR, with people having poor SRH more likely to be living in high mortality areas. A trend in odds of reporting poor SRH according to residence in a low, average or high SMR area was confirmed (p=0.02).

However, as shown in Table 1, the SMR classification was associated with individual-level characteristics that may be associated with poor

Table 1 Characteristics of 1500 individuals in SLAN living in Eastern Regional Health Authority region according to ED-level SMR

		SMR at Electoral Division level			
		High	Medium	Low	Chi-square and P values
SMR					
Mean (SD)		134.0 (16.7)	94.4 (11.9)	68.0 (10.1)	
Number respondents (% total)		215 (14%)	931 (62%)	354 (24%)	
Sex (% total)	Male	81 (15%)	346 (63%)	124 (23%)	0.60/2df (p=0.74)
	Female	134 (14%)	585 (62%)	230 (24%)	
Age Mean (SD)		48 (18)	46 (16)	45 (16)	
GMS (% total)	No card	131 (11%)	751(64%)	301(25%)	51.37/2df (p<0.001)
	Card	84 (27%)	180 (57%)	53 (17%)	
Employment	Not working	93 (17%)	342 (61%)	126 (23%)	3.82/2df (p=0.15)
	work	122 (13%)	589 (63%)	228 (24%)	

Table 2 Odds ratio estimates (95% CI) for reporting fair or poor self rated health (SRH) according to Standardised mortality ratio SMR level, categorised as low, medium or high in Eastern Regional Health Authority and electoral division ED-level variance in poor SRH with standard errors (SE) and P values for significance

	SMR					
	Low	Average	High	P*	ED variance (SE)	ED variance p
Baseline model					0.357(0.160)	0.03
Adjusted for age and sex	1	1.55 (0.89,2.71)	2.61 (1.38,4.92)	0.02	0.272(0.146)	0.06
Adjusted for age, sex, GMS	1	1.47 (0.87, 2.50)	1.91 (1.01,3.60)	0.14	0.161(0.131)	0.22
Adjusted for age, sex, GMS, Neighbourhood problems, employment and smoking status	1	1.29 (0.77,2.16)	1.60 (0.85,2.98)	0.34	0.134(0.130)	0.30

*P value for Chi-square test for significance of SMR level.

SRH. When we included GMS status in the model, the ED-level variance was further reduced (variance 0.161 (0.131), p=0.22), and the SMR covariate became non-significant (p=0.14), although a trend in the odds ratios remained.

Including the covariates for environmental problems and employment status in the model further reduced the ED-level variance and slightly reduced the trend in odds ratios for SMR, although not to the same extent as the modification by GMS status. In the final model, the odds (95% CI) of reporting poor health among GMS card holders was 2.8 (1.8-4.6) times higher than among non-GMS card holders, adjusting for other covariates and ED-level variation.

Discussion
In this analysis we showed that area-level variation in self-reported poor health was associated with mortality but that the pattern was largely explained by individual-level characteristics, suggesting that compositional rather than contextual characteristics predominate in the often-observed area patterns of deprivation. We also demonstrated relationships between area-level SMR and individual characteristics; individuals living in high SMR areas were more likely to have GMS cards and to report problems with their neighbourhoods. However, deprived individuals were more likely than the non-deprived to report poor health regardless of the area in which they lived.

This has important policy implications in that it suggests that tackling individual-level disadvantage will yield best results. General Medical Services eligibility in the republic of Ireland is a robust indicator of economic status because it is rigorously means tested [1,2,3]. It is also a marker for service utilisation, likely service need and to a lesser extent since we have adjusted for age, of an

older client group. This may explain why it had such an impact on the relationship between health status and the area-level mortality classification since mortality patterns of course reflect current morbidity and mortality whereas self-reported health problems may influence future mortality in time. We have reported elsewhere that in Ireland individual level rather than area level deprivation is more important[11]. This is for two possible reasons. First, the concentrated patterns of extreme disadvantage applied only to specific inner city areas, though that pattern is rapidly changing, particularly in the Eastern part of the country. Second, measures of social capital remained well preserved, especially among older people. This is reflected to a degree in our model in that the composite measure of amenities did show a graduated relationship with self rated health and illustrates that quality of life, or perceived quality of life, does play a role. That pattern is also altering adversely. It is likely that public policies that serve to polarise urban areas particularly will only serve to compound health-related disadvantage for those of least means in Irish society and this needs to be addressed.

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Predictors of Self-Reported Poor Mental Health at Area Level in Ireland: A Multilevel Analysis of Deprivation and Social Capital Indicators

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Abstract
The 2002 National Survey of Lifestyle Attitudes and Nutrition (SLAN) includes data on self-reported mental health for 5992 adults living in 328 Electoral Divisions across Ireland. The aim of this analysis was to determine if there was significant variance in self-reported mental health at Electoral Division (ED) level, and to determine whether this could be explained by social capital and socio-demographic factors at individual or ED level. 25.0% of respondents reported poor mental health. There was significant variability at ED level (variance 0.123 SE 0.034). Controlling for individual-level social and demographic variables did not affect the variability at ED level (variance 0.131, SE 0.050). People living in rural areas were less likely to report poor mental health and were more likely to report high levels of trust, which independently reduced the risk of reporting poor mental health and significantly reduced the variability at ED level (variance 0.046 SE 0.043). Indicators of social capital may reflect well-preserved community networks and support but are not necessarily related to material or social disadvantage.

Introduction
Social Capital can be thought of as the pattern of networks between people and the shared values that arise from these networks[1]. People living within an area may share contextual characteristics associated with such accumulated Social Capital that contribute independently to health outcomes over and above their characteristics as individuals. A contextual effect of neighbourhood Social Capital upon poor self-rated health has been found in previous research.[2]

Ireland arguably presents a paradox with respect to social capital. In Ireland there are high rates of chronic disease and ill-health and, traditionally considerable disadvantage at home and abroad.

However Irish people have high levels of social capital as measured by religiosity, well preserved community networks and familial support, and generally self- report positive health status[2,3,4,5,6].

In the present analysis we aim to examine the variability in self-reported mental health problems at small area level in the Republic of Ireland, and to assess the relative influence, if any, of socio-demographic and social capital indicators on such variability. We use a multi-level modelling approach to assess the extent to which self reported mental health is explained at individual rather than area level[7].

Methods
Data
The 2002 Survey of Lifestyle, Attitudes and Nutrition (SLÁN) is a cross-section of adults aged 18 years and older residing in the Republic of Ireland. A multistage sampling design was used to select individuals from electoral divisions (ED) using the electoral register. Individuals thus selected were asked to complete a previously validated postal questionnaire. The response rate was 53%, comprising 5,992 individuals within 328 EDs.

The outcome measure and explanatory variables were obtained from SLÁN. The outcome measure was derived from a question on mental health: "Thinking about your mental health, which includes stress, depression and problems with emotions, for how many days during the past 30 days was your mental health not good?" This was converted to a binomial outcome: no days (0) versus any days (1).

Explanatory variables derived from the SLAN data included individual-level measures of social capital: trust, social support, formal participation and environmental problems. The measure of trust was based on four questions and classified as high (four positive responses) or low. The measure of social support was based on high support from four sources (parents, partners, children and friends) and classified as high (three or more sources) or low. Formal social participation was based on membership of two or more organisations, including political parties, churches, social clubs, evening classes, and parent-teacher organisations, but not including sports clubs, membership of which was included as a separate covariate). The measure of environmental problems was based on eight questions, relating to rubbish, vandalism, racism, break-ins, poor public transport, lack of access to shops, pollution and lack of public open spaces. This was classified as high (3 problems), medium (1-2 problems) and low (no problems). Socio-

Table 1	Descriptive Statistics			
Variable	Category	Count	Number (%) reporting mental health problems	Chi square
Gender	Female	3,512	1,001 (28.5%)	52.90/1df**
	Male	2,448	492 (20.2%)	
Age group	18-34	1,541	530 (34.4%)	174.78/2df**
	35-54	2,683	711 (26.5%)	
	55+	1,747	255 (14.6%)	
Education	Primary/secondary	3,531	745 (21.1%)	75.51/1df**
	Tertiary	1,862	594 (31.9%)	
GMS status	Not Eligible	4,073	1,063 (26.1%)	6.92/1df*
	Eligible	1,636	373 (22.8%)	
Income	<190 per week	865	237 (27.4%)	1.67/1df(ns)
	>190 per week	4,316	1,092 (25.3%)	
Employment	Working	3,498	850 (24.3%)	2.88/1df(ns)
	Not working	2,000	528 (26.4%)	
Smoking status	Smoker	1,468	462 (31.1%)	37.03/1df**
	Non-smoker	4,409	1,023 (23.2%)	
Social support	Low	3,405	933 (27.4%)	9.90/1df*
	High	1,885	443 (23.5%)	
Trust	Low	3,711	1,132 (30.5%)	148.33/1df**
	High	2,130	345 (16.2%)	
Problems (environmental)	None	3,347	733 (21.9%)	66.47/2df**
	Some (1-2)	2,034	594 (29.2%)	
	A lot (3+)	398	148 (37.2%)	
Sports club	Yes	1,967	476 (24.2%)	2.84/1df(ns)
	No	3,559	936 (26.3%)	
Other clubs/ organisations	0 or 1 club	4,375	1,085 (24.8%)	7.21/1df*
	2 or more clubs	1,196	342 (28.6%)	
ED type	Urban	2,542	760 (29.9%)	55.61/1df**
	Rural	3,132	664 (21.2%)	

* p<0.01 ** p<0.01 ns p>0.05

| Table 2	Parameter Estimates (Standard Errors) for Multilevel Logit Regression Models		
Parameter	**Model 1**	**Model 2**	**Model 3**
intercept	-1.122(0.037)**	-1.429(0.132)**	-1.013(0.137)**
Age (years)		-0.035(0.004)**	-0.033(0.004)**
male		0.099(0.157)	0.132(0.157)
gms		0.328(0.123)*	0.329(0.124)*
working		0.109(0.118)	0.117(0.119)
male*working		-0.593(0.187)**	-0.595(0.187)**
low income		0.315(0.127)†	0.415(0.129)*
University educated		0.370(0.091|)**	0.325(0.091)**
smoker		0.378(0.116)**	0.336(0.117)**
High social support		-0.199(0.106)	-0.155(0.106)
age*high social support		0.019(0.007)*	0.020(0.007)*
smoker*high social support		-0.448(0.196)†	-0.432(0.197)†
sports club		-0.249(0.090)*	-0.240(0.090)*
2+ clubs		0.277(0.100)†	0.228(0.100)†
1-2 environmental problems (vs 0)		0.292(0.087)**	0.329(0.088)**
3+ environmental problems (vs 0)		0.549(0.087)**	0.488(0.159)**
High trust			-0.602(0.096)**
rural			-0.466(0.090)**
ED variance	0.123(0.34)**	0.131(0.050)**	0.043(0.046)

* p<0.01, ** p<0.001, † p<0.05.
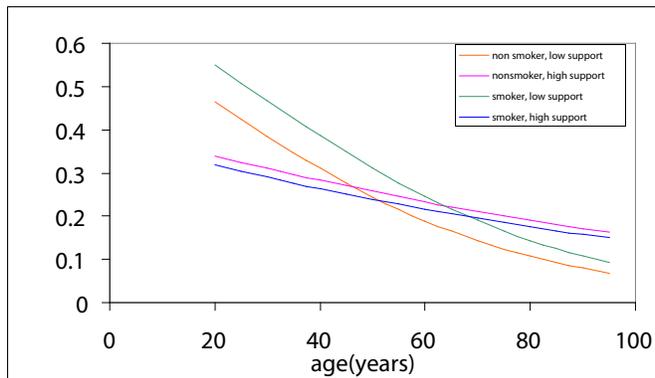
Figure 1   Predicted median probabilities of reporting poor mental health by age, smoking status and social support

demographic variables at individual level (age, sex, education, income, employment, GMS status and smoking) were also included. An ED-level measure from SLÁN was the classification of EDs as urban or rural.

Analysis
The clustering of individuals within electoral divisions may make single-level analyses inadequate due to the underestimation of standard errors. Therefore we used multilevel logit regression models to examine the prevalence of self-reported poor mental health across EDs. This allows us to estimate the standard errors, allowing for neighbourhood clustering. It also allows us to calculate the proportion of total variance in the outcome that may be attributed to ED-level factors.

We fit a series of nested logit regression models with random intercepts to test the significance of the ED-level variance with respect to our measure of poor mental health, and to examine the impact of explanatory variables at individual and ED level. Our initial model (Model 1) was an intercepts-only model with

random coefficients at ED level to test the hypothesis that there is variance in self-reported mental health between EDs. We then fit a model (Model 2) including significant explanatory variables and interactions at individual level to examine whether the variance could be accounted for by individual-level factors. Our final model (Model 3) included explanatory variables at ED level. Parameter estimates were based on MCMC methods using MLwiN[8]. These estimates are log odds ratios; a positive value indicates an increased risk of reported mental health problems. The significance of parameter estimates was assessed by Wald tests.

Results
Table 1 summarises the univariate associations between self-reported mental health and the explanatory variables. Overall 25.0% of respondents to SLAN reported problems with mental health in the previous month. 33% of these were male, average age was 41.6 years (SD 15.4 years). 47% lived in rural areas as defined by their ED location. People living in rural areas were less likely to report mental illness (χ^2=55.6 p<0.0001). People living in rural areas were more likely to report high levels of trust (χ^2=230.2 p<0.0001), which independently reduced the risk of reporting poor mental health (χ^2= 148.3, p<0.0001).

Parameter estimates for the multilevel logit models are summarised in Table 2. The baseline ED-level variance was significant (Model 1; estimate 0.123 SE 0.034 p=0.001). After including explanatory variables at individual level the ED-level variance remained significant (Model 2; estimate 0.131, SE 0.050 p<0.01).

People with GMS cards and similarly those with low incomes were at higher risk of reporting poor mental health. People with a university education were more likely to report problems with mental health. People who belonged to sports clubs were at a lower risk, while people who belonged to several other clubs or organisations were more likely to report mental health problems. People who reported problems in their communities such as racism, lack of facilities, petty crime, rubbish and pollution were more likely to report mental health problems and the risk increased with the number of reported

problems. People who reported a high level of trust were at lower risk of mental health problems.

There was no difference in the risk of reporting poor mental health among men and women who were not currently working. However men who were working were at significantly lower risk of reporting poor mental health than women (either working or non-working).

There was a significant interaction between smoking, age and social support and this is illustrated in Figure 1. Among younger people, low social support was associated with a higher risk of reporting mental health problems; younger people with high social support were less likely to report poor mental health. In middle aged and older people probability of reporting mental health problems was similar regardless of the level of social support. Smokers with low social support were more likely to report mental health problems than non-smokers with low social support, especially among younger people. However, among people with high social support there was no evidence of an association between smoking status and the probability of reporting mental illness.

Inclusion of individual-level trust, and the ED level variable indicating urban or rural location, significantly reduced the variance in self-reported poor mental health at ED level (Model 3; variance 0.046 SE 0.043 ns). The cross level interaction between ED location and trust was not significant, indicating their effects are additive.

Discussion

While there is area level variation in self-reported problems mental health not accounted for by individual level characteristics, this is largely explained by differences in urban and rural areas and patterns of trust in particular appear to be related to location. These findings give support for previous evidence that indicators of social capital may reflect well-preserved community networks and support but are not necessarily related to material or social disadvantage. In previous analyses we have shown that area level variation in health status appears largely to occur in an urbanised context. This suggests that in the main variability at area level reflects the composition of areas and that the compounding disadvantage of deteriorating social facilities and amenities is seen largely in an urban context. Clearly however the shift from a more rural based society is going to reflect change, and this is lent some support in this cross sectional analysis. There are also likely to be emerging secular or generational patterns in that older people appear to be both more trusting and less likely to report mental health problems. It mist also be borne in mind that the stigma associated with reporting poor mental health is more likely also to apply to older people.

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Social Capital and Self-Rated Health in the Republic of Ireland: Evidence from the European Social Survey

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Abstract

This paper analyses the determinants of self-reported health in Ireland, conditioning self-reported health on a set of socio-economic, labour market and social capital variables. Ireland has the highest self-reported health rate in Europe, a finding backed-up by other studies. Data were derived from the 2002 and 2005 European Social survey. The full 87,915 observations from both rounds were pooled and used to estimate mean self-rated health across Europe. The Irish data were isolated, totalling 2,049 individuals for 2002 and 2,286 individuals for 2005. The 2002 data were used to analyse the determinants of subjective health state, as it had a richer array of social capital variables. The results demonstrate statistically significant effects of income on self-reported health that are robust to different statistical specifications and statistically significant though modest effects of social capital variables such as associational membership and frequency of social meeting and labour market variables such as being on a limited as opposed to permanent contract.

Introduction

The extent to which health is distributed unequally across society and determined by social and labour market factors is an important question. Several studies have demonstrated that Ireland has very high self-rated heath and well-being compared to other countries.[1] However, there also exist considerable social disparities in terms of health outcomes.[2,3] Several recent papers have examined socio-economic determinants of health.[4,5] There has also been considerable international empirical evidence about associations between social capital and health[6-8] and labour market variables and health[9-11]. However the literature is still very much contested in terms of the nature and scope of these associations.[12,13] A previous examination of self-rated health in Ireland revealed marked social gradients in self-rated with health being related to age, marital status, tenure, educational status, social class, household size and eligibility for General Medical Services.[3] The properties of such scales and their relation to morbidity are discussed in several papers and there is strong evidence that single-item self-report measures are adequate survey measures of health with strong correlations to morbidity.[14-18] This paper further examines the relationship between self-reported health and a number of social capital and labour market variables, utilising data from the Irish round of the European Social Survey.

Data and Method

Data were derived from the 2002 and 2005 European Social Survey[19] and analysed using STATA 9. The full 87,915 observations from both rounds were pooled and used to estimate the mean self-rated health across Europe. The Irish data were isolated, totalling to a sample-size of 2,049 individuals for 2002 and 2,286 individuals for 2005. The 2002 Irish data were utilised to estimate a detailed set of linear and non-linear multiple regression models to analyse the determinants of subjective health state, which itself was a five point scale: "very bad", "bad", "fair", "good", "very good". The 2002 data is used for this purpose as it contains a richer array of social capital variables. 3240 households were selected for interview, of which 2046 interviews were achieved, giving a response rate of 64.46 per cent. The nationally representative sample was drawn from the electoral register. We utilise a number of measures of social capital: number of associational memberships, frequency socialising with friends, social trust (as measured by a 1-30 scale summing three separate trust items) and availability of someone to discuss problems with. Our measures of labour market factors are: number of hours worked, degree of control over working hours and the nature of the contract the person was working under (permanent versus limited).

Results

Table 1 displays the frequency distribution of self-reported health in 2002 and 2005. The majority of respondents describe their health as being fair, good or very good. There is no significant change in levels of self-rated health between the two rounds of the study. As can be seen in Table 2, the pooled data reveals that Ireland has the highest mean self-reported health of all the countries in the sample, thus replicating the other findings. Self-rated is highest in Ireland, Iceland, Denmark and Switzerland and lowest in Ukraine, Hungary, Estonia and Portugal.

We tested a number of specifications examining the link between self-reported health and social capital variables. The modelling strategy is similar to that pursued in a previous paper on well-being in Ireland.[20] Rather than omitting the 304 individuals that did not answer the income question, we impute their income as a linear function of their years of education. The results of the regression models are reported in Table 3. As can be seen, those who did not answer the income question do not differ in self-rated health in any of the five models. Model 1 examines the extent to which health is related to income and education without controlling for other factors and demonstrates a marked relationship between self-rated health and both measures. The stratification of health by income level is still very much apparent in the Irish context as

Table 1	Subjective Health in Ireland					
Subjective general health	2002			2005		
	Freq.	Percent	Cum.	Freq.	Percent	Cum.
very good	842	41.17	41.17	960	42.03	42.03
good	868	42.44	83.62	951	41.64	83.67
fair	284	13.89	97.51	317	13.88	97.55
bad	40	1.96	99.46	48	2.1	99.65
very bad	11	0.54	100	8	0.35	100
Total	2,045	100		2,284	100	

Table 2	Self-Reported Health by Country (Pooled Data)		
Country	Mean	Std. Deviation	N
Ireland	4.224	0.791	4329
Iceland	4.173	0.833	571
Denmark	4.120	0.906	2982
Switzerland	4.093	0.751	4179
Greece	4.045	0.984	4972
Austria	4.041	0.863	4506
Norway	3.997	0.892	3795
Sweden	3.985	0.869	3945
Belgium	3.983	0.797	3675
Israel	3.957	1.006	2487
United Kingdom	3.913	0.933	3942
Luxembourg	3.836	0.934	3185
Netherlands	3.831	0.773	4244
Finland	3.813	0.832	4019
Italy	3.726	0.814	1207
France	3.704	0.886	3308
Spain	3.661	0.923	3389
Germany	3.636	0.892	5785
Slovakia	3.621	0.926	1509
Czech Republic	3.560	0.947	4359
Slovenia	3.558	0.925	2957
Poland	3.538	0.942	3822
Portugal	3.396	0.882	3560
Estonia	3.350	0.898	1986
Hungary	3.332	0.965	3181
Ukraine	2.963	0.853	2021
Total	3.794	0.929	87915

Table 3	OLS Regression Estimates of Self-Reported Health (2002 Data)				
	1	2	3	4	5
Income	0.074***	0.046***	0.037***	0.040***	0.033***
	0.008	0.008	0.009	0.011	0.011
Imputation Dummy	0.029	0.001	0.012	0.033	0.019
	0.049	0.048	0.048	0.068	0.069
Years of Education	0.024***	0.017***	0.009*	0.010	0.001
	0.006	0.006	0.006	0.007	0.008
Age		-0.013***	-0.013***	-0.010***	-0.010***
		0.001	0.001	0.002	0.002
Female		-0.030	-0.032	0.056	0.035
		0.034	0.035	0.047	0.048
Separated		-0.136	-0.094	-0.238	-0.213
		0.099	0.101	0.130	0.131
Divorced		-0.223	-0.207	-0.156	-0.166
		0.159	0.157	0.194	0.194
Widowed		-0.037	-0.006	-0.044	0.037
		0.071	0.073	0.110	0.113
Never Married		-0.150***	-0.154***	-0.066	-0.069
		0.046	0.048	0.060	0.062
Social Trust			0.014***		0.009**
			0.003		0.004
Television Hours			-0.010		-0.020
			0.009		0.012
Associational Membership			0.023**		0.014
			0.011		0.014
Social Meeting			0.039**		0.031*
			0.012		0.017
No-one to discuss problems			-0.103		-0.093
			0.063		0.092
Prioritization of Work				0.029***	0.028***
				0.008	0.009
Prioritization of Leisure				0.029***	0.025***
				0.012	0.012
Ability to Organise Work				-0.034	-0.029
				0.023	0.023
Contract Working Hours				0.002	0.002
				0.002	0.002
Total Overtime				-0.002	-0.001
				0.002	0.002
Limited Contract				-0.084*	-0.089*
				0.053	0.053
Constant	3.500	4.434	4.178	3.959	3.938
	0.068	0.129	0.158	0.223	0.264
Number of obs	1980	1980	1887	1093	1053
F (3, 1976)	60.58	35.71	23.8	10.62	8
Prob > F	0	0	0	0	0
Adj R-squared	0.08	0.14	0.14	0.12	0.12
Root MSE	0.76	0.74	0.72	0.71	0.71

Notes: OLS coefficients reported with standard errors in parenthesis. Significance levels: *** 1%, ** 5%, * 10%

Table 4 Description of Covariates		
	Covariate	Description
Dependent Variable	Health	5-value categorical variable ("very bad" to "very good") indicating the respondent's subjective general health.
Demographic Variables	Income	10-value categorical variable of households' total net income, from all sources. Includes 304 missing values which have been imputed from Years of Education
	Imputation Dummy	A binary variable that identifies those observations for which income values have been imputed.
	Years of Education	Number of years of completed education.
	Age	Respondent's age calculated by subtracting the year they were born from 2005
	Female	Binary variable, 0 = Male, 1 = female
	Marital Status	5-value categorical variable indicating marital status ("married", "separated", "divorced", "widowed", "never married"). Implemented using dummy variables, with "married" as the base class.
Social Capital Variables	Social Trust	A measure of the general level of trust that the respondent has in society. It is generated by combining the scores given in answer to three questions: "Are people mostly helpful or mostly look out for themselves?"; "Do people mostly try to take advantage or try to be fair?"; and "Can most people be trusted?". Each question has a zero to ten range, yielding a zero to thirty range for the aggregate measure. Lower values indicate lower levels of trust.
	Television Hours	Zero to seven categorical variable ("No time at all" to "More than 3 hours") indicating how many hours are spent watching TV on an average weekday.
	Associational Membership	Total number of memberships held in the past year, calculated by adding up twelve binary variables, which indicate membership of the following types of clubs or associations: sports; humanitarian; cultural/hobby; trade union; business/professional/farming; consumer/automobile; environmental/peace/animal; religious; political party; science/education/teacher; social club; or other voluntary organisation.
	Social Meeting	One to seven categorical variable ("never" to "every day") indicating how often the respondent meets friends, colleagues or relatives socially.
	No-one to discuss problems	Binary variable indicating whether the respondent has someone to discuss intimate or personal concerns with.
Labour Market	Prioritization of Work	Zero to ten categorical variable ("extremely unimportant" to "extremely important") indicating the importance of work to the respondent.
	Prioritization of Leisure	Zero to ten categorical variable ("extremely unimportant" to "extremely important") indicating the importance of leisure time to the respondent.
	Ability to Organise Work	One to four categorical variable ("to a large extent" to "not at all") indicating the extent to which the respondent can organise their own work.
	Contract Working Hours	Total number of contracted hours, excluding overtime, per week in their main job.
	Total Overtime	Total number of hours of overtime worked,
	Limited Contract	Binary variable indicating the type of contract held by the respondent – "limited" or "unlimited".

it is by level of education. Model 2 adds to this model by including a range of demographic variables. Confirming the findings from SLAN, there are no gender differences in self-reported health levels. Self-rated health is significantly negatively related to age and being single as opposed to married.

The results of Model 3 show a statistically significant though modest effect a range of social capital variables. Associational membership and meeting socially with friends are both significantly associated with better self-rated health. There is no association between hours spent watching television and self-rated health. Social trust is statistically significantly associated with higher self-rated health. Model 4 removes the social capital variables and includes measures of job quality and difficulty. It is thus restricted to the sample engaged in market employment. Those on limited contracts show significantly lower health than their peers, even

controlling for several other demographic characteristics. There is evidence that placing a higher importance on work has an effect on health, but in fact a positive effect. Interestingly, this effect is statistically the same as the effect of placing a high importance on leisure. Model 5 examines the full set of variables. As can be seen, income remains positively associated with self-rated health and age remains negatively associated. Social trust, being on a permanent contract, and prioritising work and leisure are all associated with higher self-rated health.

Discussion
There are a number of key results from this paper. Firstly, the data confirm that Ireland had the highest level of self-rated health in Europe in both 2002 and 2005. Furthermore, there is a marked social gradient in self-rated health and statistically significant associations between self-reported health and social and labour

market factors at the individual level. The effects of both income and age are robust to the inclusion of several different social and labour market variables. Thus the paper offers further confirmation of social gradients in Irish health. The paper finds statistically significant though modest effects of standard social capital measures, such as associational membership, on self-reported health. Social trust is the social capital variable that has the highest association with health and this should be explored further.

In summary, the evidence for social capital and labour market effects on health at the individual level as gleaned from this important data-source is consistent with the view that individual access to networks and other types of social capital are health-promoting though the magnitude of the coefficients is small. However, it would be unwise to make wide-ranging conclusions on the basis of a single analysis and a number of research strategies are available. The existing archived data should be utilised to a far greater degree. Other secondary sources of data such as the Eurobarometers, World Values Survey, World Health Survey, Living in Ireland, Quarterly National Household Survey, International Social Survey Programme and several other similar data sources could be utilised to build up a picture of the determinants of health in Ireland. Instrumental variable regression techniques offer one potentially powerful tool for disentangling cause and effect. The key to such methodologies is to find variables that are associated with the independent variables but not directly with the dependent variables thus allowing the construction of algorithms that yield figures with causal interpretations. Furthermore, there is growing interest in the extent to which self-reported health measures are prone to differential item functioning and the development of anchoring vignette methodologies is a promising development in this regard.[14,21-23]

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Analysing the Relationship between Voter Turnout and Health in Ireland

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Abstract
Health issues are an integral part of the political agenda in Ireland. Yet no study to date has examined the impact of health concerns on political outcomes. This study investigates the relationship between health, both physical and psychological, and perceptions of the health service, and voter turnout in Ireland using the European Social Survey in 2005, (n=2286, RR 59.7%). The results show that individuals with poor subjective health are significantly less likely to vote in a General Election. Dissatisfaction with the health service is also associated with a lower probability of voting. However these effects interact: those with poor health and who are dissatisfied with the health service are more likely to vote. Psychological well-being has no effect on voter turnout. The health effects identified in this study are large and further work is needed in this area to identify the causal mechanisms underlying this relationship.

Introduction

Health issues are an integral part of the political agenda in Ireland. There is significant public concern about hospital waiting lists, the A&E 'crisis' and hospital closures. Yet no study to date has examined this link between health issues and voting behaviour in Ireland. The rational choice theory of voting behaviour posits that individuals vote in order to maximize their expected utility and will therefore only turn out to vote if the benefits of voting exceed the costs.[1] Yet the costs and benefits of voting may differ depending on health status. Those experiencing poor health have greater incentives to vote as they are more likely to be users of the health system and favour public provision of health services. Therefore, it is important to investigate if this is indeed true, given that poor health may also act as a barrier to voting.

Theoretical models of voter turnout divide the costs of voting into three sets of factors - physical resources, psychological resources and recruitment resources.[2] Poor health may affect all three factors. First, ill health may lead to a reduction in physical resources. For example, as voting requires a physical, and to some extent, a mental effort, poor health may impair these resources, consequently making it more difficult to vote. A study of voter turnout among the disabled finds that those with spinal cord injuries are 10% less likely to vote compared to otherwise similar individuals.[3] Second, adverse health may also decrease turnout as one must concentrate on 'holding body and soul together, not on remote concerns like politics,[4] which will lead to a reduction in psychological resources such as political interest, political efficacy and civic values. Finally, ill health may also affect voters' recruitment potential. As individuals in poor health are typically more isolated than others they may engage in less social activity and are less likely to be recruited by political activists. Overall if the perceived costs of voting are greater than the perceived benefits, turnout should be lower for the unhealthy.

Studies investigating the link between health and voter turnout within the general population are few, and have typically relied on aggregate level data. A study of mortality rates and turnout in Britain finds a negative correlation between the two.[5] Similar results have been found in studies of Russia and the US.[6,7] An individual-level analysis using British cohort data finds that poor general and mental health are associated with lower turnout.[8] The literature also identifies a relationship between poor health and left-wing voting.[9,10,11] The only study of this nature in Ireland finds a positive relationship between dissatisfaction with health, adverse lifestyle factors and support for left-wing parties.[12] This study presents the first analysis of the relationship between individual health and dissatisfaction with the health system and voter turnout in Ireland.

Methods

The data used is the second wave of the European Social Survey, collected in 2004/05.[13] This is a random sample of individuals over the age of 15. The response rate in Ireland was 59.7% giving a sample of 2,286. The sample available for the data analysis is smaller due to missing values. The dependent variable is whether the individual voted in the previous General Election - the 2002 election in this case. The three health variables of interest are a measure of subjective health, a measure of mental well-being and the respondent's opinion of the state of the health service. The self-assessed measure of general health indicates whether the respondent reported excellent/good health, or alternatively, poor/fair health. 15.6% of the sample reports poor health. Psychological health is measured by the World Health Organisation Well-Being Index (WHO-5) scale, which ranges from 0 to 25 and has been shown to perform well in screening for depression.[14] A score below 13 is used as an indication for further testing for depression. The mean for the sample was 17. Respondents were also asked their opinion of the health service, from 0 (extremely bad) to 10 (extremely good). We create a binary variable equal to one if they gave an answer between 0 and 4 (inclusive), and is zero otherwise,

Table 1	Estimates of probit models of voter turnout in 2002 Irish General Election		
Health measures:	1	2	3
Poor subjective general health	-0.067* (2.19)	-0.068* (2.21)	-0.144** (2.96)
Positive mental well being (WHO-5)	0.001 (0.45)	0.001 (0.46)	0.001 (0.52)
Negative perception of the health service	~	-0.042* (2.14)	-0.056** (2.60)
Interaction: Poor subjective health* Negative perception of health service	~	~	0.076* (1.97)
Controls:			
Education in years	0.010** (2.66)	0.010** (2.69)	0.010** (2.66)
Sufficient household income	0.021 (1.05)	0.02 (1.03)	0.021 (1.09)
Male	-0.017 (0.89)	-0.018 (0.95)	-0.018 (0.97)
Age	0.022** (7.11)	0.022** (7.30)	0.021** (7.22)
Age squared/100	-0.016** (5.11)	-0.016** (5.34)	-0.016** (5.23)
Trade union member	0.042 (1.89)	0.045* (2.06)	0.045* (2.09)
Placement on left-right political ideology scale	0.017* (2.79)	0.016** (2.73)	0.017** (2.79)
Observations	1691	1681	1681

Notes: All models estimated using probit. Marginal effects and robust z statistics (in parenthesis) are reported, for example, a trade union member is around 4% more likely to vote than a non trade union member, other things being equal. *Significant at 5%; **significant at 1%

as a measure of dissatisfaction with the health service. 57% of the sample is dissatisfied using this criterion. The control variables included are commonly used in the voting literature: education (measured in years), sex, age (entered as a quadratic), whether an individual is a member of a trade union, a self-assessed measure of political ideology on the left/right continuum from 1 (left) to 10 (right) and a binary indicator of whether the respondent's household is living comfortably on its present income. To control for the possibility that the health indicators reflect social circumstances we also included the father's education as a control for socioeconomic background, however it did not change the results significantly. While we have included all available confounding variables, it is possible that there are additional confounding factors which may explain the correlation between health and voter turnout which are omitted from the analysis. Hence there remains the possibility that some of our explanatory variables may be endogenous. Further work – and better data- is required to address this.

Statistical Analysis
Maximum likelihood probit models of the probability of an individual turning out to vote are estimated. The sample weights provided are used to correct for over/under sampling. The coefficients reported are the marginal effects, which indicate the effect of a unit change in the independent variables on the probability that an individual votes. All estimation is with Stata, version 9.2 using the dprobit routine.

Results
The results are presented in Table 1. Model 1 includes the subjective measure of general health and the measure of mental well-being along with the additional controls. An individual who reports bad health is 6.7% (i.e. 6.7 percentage points) less likely to vote. This coefficient is significant at the 5% level. The effect of good mental health/well-being, while positive, is not statistically significant. The other coefficients are in line with the international literature in general. Voting increases with age, but this effect declines as one gets older. More educated people are more likely to vote, with each additional year of education increasing the probability of voting by 1%. Trade union members and individuals placing themselves on the right of the ideological scale also have a greater probability of voting. Model 2 extends this analysis by including the binary measure of dissatisfaction with the health service. It shows that individual who are dissatisfied with the health service have a lower probability of voting. To test whether dissatisfaction with the state of the health service is moderated by one's own personal health situation an interaction between the subjective health measure and the dissatisfaction variable is included in Model 3. There is a well determined positive interaction between the two. Hence for someone who is satisfied with the state of the health service, being in poor health lowers the probability of voting by over 14%, whereas if that person is dissatisfied with the health service then the probability of voting is only about 7% lower. The additional covariates remain largely unchanged in the three models.

Discussion
This study finds that personal health and the state of the health service are important issues for Irish voters. Our results are consistent with the hypothesis that poor health is a contributory factor to individuals not engaging in political participation and suggest that the perceived cost of voting for the unhealthy (the effort involved in voting), is greater than the perceived benefits of voting (based on the policy implications of the election outcome). While poor general health lowers the probability of voting, we find that poor mental health, as characterized by the WHO-5, does not lead to a reduction in voter turnout. This is contrary to a study of mental health and turnout in Britain.[8]
The study also finds that individuals who are dissatisfied with the health service are less likely to turn out to vote. This result is somewhat surprising. Rather than being motivated to vote by their unhappiness with the health system, it would appear that some voters are sufficiently disillusioned with the health service as to discourage them from voting. Yet the inclusion of the interaction

term between personal health and dissatisfaction with the health service indicates that this perception is mediated by one's own personal health - if one is healthy (and therefore less likely to utilize the health service) then the state of the health service may be of less concern. Indeed the results suggest that if one believes one's personal health is poor and that the health service is unsatisfactory then these effects combine to increase the probability of voting. This may also reflect differences in the level of information about the health service. Those in poor health have to utilize health services, and subsequently have more information about the state of the health service than others. This subsequently could act as a trigger for their political mobilisation.

Electoral participation is one form of social capital and the level of voting is an important barometer of the health of civil society. A number of studies have noted the importance of social capital for generating both community and individual wellbeing.[15,16,17] Understanding the relationship between public health and political participation is therefore important. This study shows that poor health leads to lower voter turnout, which suggests that the interests of the unhealthy are less likely to be represented in government. Unhealthy non-voters, therefore, represent an untapped source of electoral support. A political party which succeeds in attracting the unhealthy non-voters into the electorate, by presenting a suitably targeted policy package, could help to minimise this inequality. Further work is needed in this area to identify the causal mechanisms underlying this relationship.

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The Relative Influence of Socio-Demographic, Lifestyle, Environmental Factors and Co-Morbidity on Self Rated health of the Irish Prisoner Population

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Abstract

A National survey of prisoners' health status was undertaken in 1999/2000 across 13 prisons. Median age of all male prisoners (n=718) was 25 years. At univariate level, prisoners demonstrated high levels of ill-health, associated with poor self-rated health, including chronic activity limiting illness, GHQ caseness, anxiety and depression. Those with poor self rated health were also of lower educational status, more likely to smoke, or to have taken drugs. In a final multivariate model (n=512), education level, GHQ caseness, prescribed medication, chronic self limiting illness and reported verbal abuse by prison officers were all independently predictive of poor self rated health. Upstream policy interventions are required to limit the impact of social disadvantage on offending and to maximise proactive health care and rehabilitation during prison stay.

Introduction

It has been well established for decades that imprisoned offenders are more likely on average to be relatively young and to come from disadvantaged backgrounds. Prisoners are also known to have higher rates of substance misuse and of general ill health, particularly from various forms of mental illness[1,2,3,4]. Though there are many studies of established mental illness among prisoners, the relative influence on their health of lifestyle factors and aspects of their social environment such as relationships with other prisoners and staff in prison is not as well understood. More recently Wilkinson and colleagues have suggested a re-appraisal of the determinants of ill-health among offenders, suggesting that an environment of chronic disrespect in which they find themselves at the bottom of the social hierarchy exacerbates mental health problems and social disadvantage and should be taken into consideration[5].

The state of prisoners' health raises policy questions in relation to strategies to prevent offending in the first place, appropriate health care and more general social rehabilitation while in prison and mechanisms of social support after release. In 1999/2000 the Centre for Health Promotion Studies at National University of Ireland Galway was commissioned to conduct an independent health study of Irish prisoners by the Republic of Ireland's government department of Justice, Equality and Law Reform and the main findings have been published previously[6,7].

Our objective in the present secondary analysis as part of the Unit for Health Status and Health Gain work programme was to examine the relative influence on self rated health of demographic and lifestyle characteristics, as well as of features in the immediate prison environment, taking measures of established co-morbidity into account. Self-rated health is now a commonly reported indicator, not alone as a subjective assessment but also as a strong predictor of longer-term morbidity and mortality in a variety of contexts and conditions[8]. While regularly employed in studies of disadvantage it has not been reported widely as a proxy measure for ill health in special categories such as prisoners[9], who might be expected to have high levels of both disadvantage and morbidity.

Methods

The methodology for the main survey has been described previously in the main report[6]. In this present analysis we include only men. The sample framework included all 13 prisons operating in the Republic of Ireland at the time, categorised as closed, open or semi-open. A required sample of approximately 800 prisoners (33% of the then current Irish male prison population) was estimated to be required, based on the projected prevalence of a number of health status and lifestyle factors based on a literature review. A stratified sampling technique was used, with the sample distribution proportionately based on the population size in each prison. Census samples were sought in the open and semi-open institutions as they house only 11% of total prisoner population and total numbers of in-mates were relatively small in each.

The survey was publicised in advance in each prison by means of an individualised leaflet distributed to every prisoner. This explained the purpose of the study was to identify health needs of the prisoner population in order to provide more effective health care services, stressed that participation was voluntary and absolutely confidential to the independent research team. The team visited each prison over a single day, distributing the questionnaires. Questionnaires were self-completed by the prisoners in privacy with assistance from a member of the research team if required for reasons of literacy or general comprehension. The instrument, which took about 35 minutes on average to complete, was designed for the project but derived significantly from that used in the main National Survey of Lifestyles, Attitudes and Nutrition, SLAN. It included sections on self-rated health status, service utilisation, general lifestyle prior to and including incarceration as appropriate and socio-demographic information.

For the purposes of the present analysis the following variables were included: Socio-demographic characteristics (age last birthday, whether ever employed or not, highest level of education (primary, some secondary, complete secondary, tertiary), use of a car outside of prison or not, tenure (rented, home owner), martial status (single, married, divorced/separated, other), difficulty reading or not. Lifestyle variables included exercise patterns (no regular exercise versus light or moderate exercise), ever used recreational drugs or not, and whether a current smoker or not. Current health status was assessed by the following, presence of chronic activity limiting illness or not, reported anxiety or depression, GHQ cases of threshold greater than or equal to a score of 3, regular taker of prescription medications and regular attendance of a health professional. The following aspects of the prison environment were also included, incarceration in a closed prison versus open prisoners or those on remand, reported irritation with prison life, experience of verbal abuse by prison officers, of physical abuse by prison officers, or verbal or physical abuse by other prisoners. Participation in educational activities, and having a prison job was also included. Finally length of received sentence and length of time served in prison in last 5 years were also included. All dichotomous variables were included first in an analysis according to whether they rated their health as fair or poor versus good, very good or excellent and tested for significance using chi-squared analysis. Those significant at univariate level were then entered into a stepwise logistic regression analysis, with self rated health (SRH) as the dependent variable.

Results

A total of 718 male prisoners (88% response rate) were surveyed. The means of each variable included in the analysis are presented in table 1. These confirm overall much lower than average socio-economic status, adverse lifestyle and high levels of ill-health among respondents than might be expected in the general population,

Table 1	Self reported Prisoners characteristics (n = 718) and % in each category reporting fair or poor health		
	% Overall	% of these with fair or poor health	P value compared with rest of sub group
A. Socio-demographic			
Tenure Home ownership	35	25	0.072
General Medical Services Card	52	30	0.804
Use of a car	69	28	0.032
Unemployed	42	30	0.872
Single	69	31	0.273
Difficulties reading	23	41	0.001
Education:			
1. none or primary	31	36	
2. some secondary	54	28	
3. completed secondary plus	15	26	0.061
B. Lifestyle			
Drugs in last year	61	34	0.014
No regular exercise	11	38	0.099
≥ 10 drinks when Drinking	55	33	0.339
Current Smoker	91	33	0.028
C. Health Status			
Chronic activity limiting illness	22	56	0.000
GHQ 12 caseness level	48	39	0.000
Current anxiety (EQ-SD)	37	40	0.000
Regular prescribed medicine	29	45	0.000
Regular health professional attendance	24	35	0.150
Serious injury in last 2 years	36	32	0.305
Reported poor prison health services	71	34	0.001
D. Environment			
Type of prison closed	69	34	0.002
Verbal abuse by prison officers	51	34	0.010
Physical abuse by prison officers	27	36	0.030
Verbal abuse by prisoners	24	33	0.219
Physical abuse by prisoners	14	30	0.960
Prison life upsetting	66	34	0.001
No participation in educational activities	43	36	0.005

though reported median age was only 25 years. At univariate level, among those with poor SRH, stage of completed education was lower, use of a car less likely, home ownership borderline less likely, but reported difficulty with reading higher. Those with poor SRH were also more likely to be smokers (albeit with remarkably high levels of current smokers at 91% of prisoners) and to have a history of drug use. Those with poor SRH were highly significantly more likely to report a chronic activity limiting illness, current anxiety or depression, GHQ caseness levels and regular prescription use. Those in closed prisons, those who had experienced either verbal or physical abuse by prison officers and those in prison for longest over last 5 years were also less likely to rate their health well, with those attending educational activities in prison likely to rate it better.

A multiple logistic regression model, adjusting for age, of 512 prisoners with adequate complete data, indicated that educational status and exposure to verbal abuse by prison officers each remained significantly predictive of poor SRH, along with GHQ caseness and regular use of prescription medications, though other variables significant at univariate level ceased to be independently predictive. The adjusted odds ratios from the final model are presented in Table 2.

Discussion

This analysis confirms that prisoners in Ireland, as elsewhere, experience considerable social disadvantage and also have relatively poor health[1-5]. In the main report we highlighted already the high prevalence of serious substance abuse and morbidity among both male and female prisoners, necessitating adequate health services in prison itself[6]. However in the present analysis we wished to deconstruct the inter-relationship between socio-economic, environmental and lifestyle factors in predicting poor self-reported health and to examine from a psycho-social perspective whether within prison relationships were important. What we show in the age-adjusted models is indeed the independent effect of all of these factors.

As might be expected, prisoners with an established chronic illness or on medication were more likely to rate their health as fair or poor. However, even in this very disadvantaged population of people, factors such as level of education were independently associated with health status and a measure of affluence, such as use of a car, was of borderline significance. The most serious offenders are in closed prisons, which may pose one explanation as to why this environment predicted poor health status. A second possibility is that such an environment necessarily impacts on mental health and well-being, re-enforced by the fact that inmates of more than a year's duration had worse self-rated health. The psycho-social dimension articulated by Wilkinson and others[5], is reinforced by this analysis, in that those subjected to verbal abuse by prison officers, albeit a small number of respondents, were also more likely to rate their health poorly.

The analysis has limitations in that the final model comprised 512 of the respondents, though this was through randomly missing data rather than systematic under-reporting by particular individuals or categories of respondents. Clearly too it is cross sectional so the directionality of the relationships cannot be inferred. Nonetheless prospective investigations in both France[10] and Australia[11] have confirmed that longer term outcomes are worse for prisoners with significant risk factor profiles, in keeping with our findings.

There are general policy implications from this type of analysis. In the main report we highlighted that many of the prisoners came from situations where there were successive generations of unemployment and social dependency. Concerted social re-inclusion policies and proactive within prison health services would benefit the current generation of offenders, many of whom have very significant levels of ill-health at the point of incarceration.

Independent Variables	Odds Ratio [95%CI]							
Age	0.99 [0.98, 1.01]	1.00 [0.98, 1.02]	1.00 [0.98, 1.02]	1.00 [0.98, 1.02]	0.99 [0.97, 1.01]	1.00 [0.98, 1.03]	1.01 [0.98, 1.03]	1.01 [0.99, 1.03]
Education		0.65 [0.43, 0.98]	0.66 [0.44, 1.00]	0.64 [0.42, 0.97]	0.61 [0.40, 0.93]	0.62 [0.40, 0.97]	0.63 [0.40, 0.98]	0.59 [0.38, 0.93]
Use of a Car			0.69 [0.46, 1.03]	0.73 [0.49,1.10]	0.73 [0.48, 1.10]	0.76 [0.49, 1.17]	0.77 [0.50, 1.20]	0.77 [0.50, 1.19]
Closed Prisons				1.80 [1.15, 2.81]	1.59 [1.00, 2.51]	1.67 [1.03, 2.71]	1.59 [0.97, 2.59]	1.51 [0.92, 2.48]
Verbal abuse from prison officers					1.66 [1.10, 2.48]	1.63 [1.07, 2.50]	1.59 [1.04, 2.45]	1.57 [1.02, 2.43]
Chronic illness						4.67 [3.00, 7.36]	4.29 [2.71, 6.81]	3.70 [2.30, 5.93]
GHQ caseness							1.91 [1.26, 2.89]	1.74 [1.14, 2.65]
Prescribed medication								1.96 [1.25, 3.07]

Table 2. Stepwise multivariate analysis showing Odds Ratios (with confidence intervals) for dependent variable self reported health (excellent/ vgood/good 0, fair/ poor 1) in 512 Male Prisoners

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Communities' Views on Tackling Health Inequalities: The Case of Ballyeast and Ballywest

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Abstract
This paper reports on the articulation of health needs in two disadvantaged communities. Health needs were articulated at the individual and community level and these were contextualised in light of the structural and environmental constraints and opportunities present in both communities. In both communities responses centred on community level improvements for health and suggestions were specific to the community. Indeed, the need for amenities, services and facilities other than health was the predominant matter residents believed was in need of redress. As such policy measures to improve the health of these communities' lies far beyond the area of health and moves to tackle such deprivation would require a holistic approach to regenerating the community.

Introduction

A growing body of research attempts to understand individuals within the context of their environment and explore the contribution of both individual behaviors and community influence upon health inequalities. Some believe that the area in which people live exerts an influence on their health, over and above the effects of their individual socio-economic circumstances[1-4]. This component of the HRB units work focused on two communities which are designated disadvantaged; one being a suburb of a city (Ballyeast) and the other a small town (Ballywest). This paper provides an overview of the view of the communities on how health inequalities might be redressed. It concludes that policy measures to improve the health of these communities' lies far beyond the area of health and moves to tackle such deprivation would require a holistic approach to regenerating disadvantaged communities.

Methods

The focus of this study was largely qualitative in nature including focus groups, interviews with key informants, community profiling as well as a door-to-door survey and participant observation. The key informants include individuals from statutory and voluntary services, in Ballyeast 17 key informants were interviewed, 19 in Ballywest. The key informant interview considered the social relationships between neighbours within the community, the physical environment of the community, the availability and access to services and the perceived health needs of the community. Focus groups and interviews were conducted in both communities and entailed purposive sampling of key groups; women's groups, Travellers, lone parents, early school leavers, older people, men and Carers in both communities. They were asked about causes of ill health, social capital in their community, services needs and adequacy, health inequalities and agency. Six focus groups were held in each community and all groups were naturally occurring groups joined by a common interest. The data were analysed thematically using Nvivo. The nature of the group is not identified in the coding and fictitious names were given to all respondents in order to preserve anonymity.

In order to create a greater profile of the community and elicit the views of a wider base of the population a door to door questionnaire survey was conducted also in each community in July 2003. In both communities local authority and voluntary housing were sampled and in Ballyeast there were 731 eligible households. We called at 284 houses, of these 112 questionnaires were completed with 60 no answers and 112 refusals, a response rate of 39%. In Ballywest we completed 109 questionnaires out of 570 eligible houses. We had 181 no answers and 71 refusals having called on 361 houses, thereby gaining responses from 30% houses called on. Measures include an assessment of health, tenure, education, age, number of persons in household, occupation, family finances, car ownership, social capital, participation or involvement in local groups, trust and social cohesion, social disorganization, the community and neighbours physical environment, and availability and accessibility of services.

Results

Health needs were articulated at the individual and community level and these were contextualised in light of the structural and environmental constraints and opportunities present in both communities. Social and community factors as causes of health and illness were specific to the communities. In Ballyeast the effect that living in a large housing estate has on health were regarded as compounding many of the psychosocial and life status causes of ill health. When asked what could be done to remove perceived barriers to better health participants identified the need to improve the standard of interaction between service providers and patients. Participants also spoke of the need for information relevant to individuals specific needs around illnesses and the type of health services and entitlements available to people. Money was viewed as enabling individuals to access private health services thereby not having to leave illness unattended.

In the qualitative data, attitudes toward levels of social integration were mixed with respondents speaking of highly integrated communities in the context of mutual assistance particularly in times of great need. In both communities the importance of good neighbours was deemed to be an important part of community life. Yet there was a sense that community relations have weakened due to anti-social behaviour. Incivilities were apparent in both communities and residents spoke of their frustration in this regard. However, efforts to deal with problems such as litter were regarded as futile and instances of tacking anti-social behaviour were reported as resulting in retaliatory damage to the property of the informant. Yet in both communities there is an abundance of collective efficacy to be found amongst those individuals engaged in community organisations whose aims are to improve the quality of life for all residents.

The views of the respondents on improving the health and quality of life in their community are shown in Table 1. In the survey participants were asked; what were the three things that could be done to improve the health of the people of their community. The question yielded over 123 different responses; these were than placed into 14 sub categories which are then clustered into three main categories; macro improvements that is those factors at the governmental level which participants believe could improve the health of the community, improvements for health at the meso or community level and micro or individual factors which respondents believe could improve the health of the community. In Ballywest macro level or structural improvements accounted for 13% of the overall responses, in Ballyeast 15%. These included improved access to health care which incorporates less waiting time for health services, cutting the waiting lists, removing cost as a barrier to the uptake of health care services, dealing with the public/private inequality in the health care system. In Ballyeast a direct bus service from the estate to the hospital was regarded an important factor in improving the health of the community something which was pertinent in the qualitative data. The extension of the eligibility threshold for medical cards was also raised with some people advocating free health care for all and others suggesting that more

people should be entitled to free health services. Some stated that an improved out of hours primary health care service and a better health service were needed for others more home help was requested. In Ballyeast respondents called for more house calls to be made by their GP's to elderly patients and children and an extension of the Public Health Nurse service.

In both communities the vast majority of responses centred on meso or community level improvements for health and the suggestions were specific to the community. Whilst there was overlap in the context of the need for more activities for young people and adults in the sphere of service provision the responses were relative to the community. The need for amenities, services and facilities other than health was the predominant area residents believed was in need of redress. A better community spirit or improved neighbourly relations was posited as something which would improve the health and quality of life in both communities. In terms of anti-social behaviour there was a view that by tackling this, the health and well-being of many individuals within both communities could be improved. At the micro level those respondents who focused on individual lifestyle changes to improve health and well being pointed to the need for people to have better diets, take more exercise, modify their alcohol intake, make regular visits to their GP, have more check ups, adopt a better attitude toward their health and stop smoking all of which it was perceived would contribute to a healthier lifestyle.

These interview findings correlate with the qualitative data as participants were quick to cite improvements in their community as a means of improving the health of people in the community. In this study much of the discussion focussed on the community itself and that might account for the quantity of community factors however the residents of these communities did report significant levels of problems in their communities ranging from a lack of services and amenities to incivilities and it is not astounding that dealing with these deficiencies and problems would be a priority for respondents.

Table 1	What respondents in Ballyeast and Ballywest thought could be done to improve the health/ quality of life for people of the community	
	Ballyeast	Ballywest
Macro Level Improvements	15%	13%
Improved access to health care	3% (9)	3% (8)
Extend Free Health Care Eligibility	2% (5)	0% (1)
Health Promotion	3% (8)	0% (1)
Improved Health Services	4% (11)	4% (9)
Employment	1% (3)	4% (10)
Increase Income	2% (5)	2% (4)
Meso Level Improvements	82%	76%
More Health Services Based in the Community	17% (48)	21% (63)
Need for amenities or services in the Community	45% (126)	37% (92)
Better Community Spirit	2% (6)	1% (2)
Tackle Litter/Rubbish	10% (28)	9% (22)
Tackle Environmental Problems	4% (12)	4% (9)
Tackle Anti social behaviour	3% (8)	5% (12)
Micro Level Improvements	3%	11%
Need for Individual Lifestyle Changes	3% (8)	11% (27)

Discussion

By exploring the health and related needs of disadvantaged communities, this study has enabled us to contextualise the health behaviours and requirements of such localities by moving beyond lifestyle factors and seeing how environmental factors interact with health. Factors such as a lack of basic services and amenities in community coupled with poor public transport, incivilities, negative self-image and the effects of social exclusion combine to create social spaces that compound inequalities in society. Whilst the participants in this study focused on the need to redress inequalities in health by increasing the GMS eligibility threshold and reducing waiting lists for hospital care much of their narrative focused on the needs of their community and invoked solutions which span areas such as the environment, law and order, housing, planning, education, sports and employment. As such policy measures to improve the health of these communities' lies far beyond the area of health and moves to tackle such deprivation would require a holistic approach to regenerating the community. Most importantly, however, the capacity of the communities to bring about positive changes in the lives of the residents cannot be ignored: the residents of both communities were solution-orientated and able to provide a range of services identified by the community for the community.

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Social and Health Capital in Northern Ireland

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Abstract

This paper will discuss findings from Department of Health, Northern Ireland, (DHSSNI) funded ethnographic research which looked at health and the assessment of related need in two small rural towns in Northern Ireland (one Catholic and one Protestant). The initial study conducted in 1996-7 addressed a series of interrelated issues which influenced health and health status. This included detailing local resources, perceived needs, local cultural practices, health beliefs (lay and professional) and health behaviours. A primary reading of the data suggested that, in terms of major health concerns, health perceptions and health problems, the similarities in both communities were more striking than observed differences. This discussion presents findings from a closer analysis of the data. It suggests that over and above structural and environmental considerations, there was a complex interaction of influences on health and social well-being for both communities and it suggests important differences.

Introduction

The study was part of a government focus on targeting health and social need in Northern Ireland, in response to (The White paper The Heath of The Nation 1991). This came at a time of serious reconfiguration of the health services in Northern Ireland. It was primarily an investigation of a) self reported health and health needs, b) factors influencing health status and health chances, c) health service provision and take up of services, d) perceptions of health service delivery, and e) prioritisation of local health needs. This discussion focuses on specific and perhaps more esoteric dimensions of this research.

Northern Ireland has for a significant period been characterized by high levels of social deprivation, unemployment and civil unrest, and by disproportionately high levels of morbidity and mortality. The region is often characterised as a clash of two cultures, two religions and two identities. The social and political aspects of such differentiation have been long discussed and continue to be debated, the health aspects, much less so. This paper looks at the connections between ethnic-religious identity, social capital and health chances.

Methods

Key government objectives targeted inequalities in health and social well-being in Northern Ireland. Successive regional strategies aimed to improve health, and to provide an equitable health care system province wide. A statistical survey of health in Northern Ireland (replicating the approach used by Townsend 1979) had previously been conducted, essentially mapping health inequalities[1].

A subsequent second statistical analysis (at sub ward level) deemed this to be a crude measure and pointed up more widespread geographical inequalities in mortality than first thought[2]. Indeed, controlling for deprivation it suggested higher ill health in some Protestant wards. This was also confirmed by the London Health Economics Consortium which suggested that Catholics and Protestants displayed, correspondingly poor health status but that Catholic men appeared to smoke and drink more heavily than Protestants. Crucially, this concluded that wards which were overwhelmingly Catholic or overwhelming Protestant tended to display above average deprivation and ill health[3].

In addition, research which addressed community differentials in self reported health using the 1990/91 Continuous Household survey study found few differences in self reported health between Catholics and Protestants but noted a link between Catholic affiliation and smoking[4]. This concluded that, whilethere were no significant differences between the proportion of Catholics and Protestants who drank alcohol, there were differences in the quantity of alcohol consumed by Catholics. Catholic men were more likely to be classified as heavy drinkers.

Further (qualitative) research was needed to address social and cultural aspects deemed difficult to assess by using quantitative research techniques. In response, the DHSS (NI) commissioned anthropological research to investigate more nuanced aspects of health, health care and health behaviour[5]. The method adopted was an ethnographic investigation of two rural villages in Northern Ireland which had roughly similar characteristics -Ballymacross (a predominantly Catholic community) Hunterstown (a predominantly Protestant community). The actual fieldwork phase lasted more than four months in each community. The towns were studied consecutively.

The research sought to investigate factors that impinge on health and health status using an ethnographic approach, incorporated methods from social anthropology. Information richness rather than representativeness was sought; for this purpose a maximum variation sample was chosen[6]. This approach identifies variations that have emerged in adapting to different conditions and identifies important common patterns that cut across variations[7].

Criteria for selection of towns.
1. Both had to be located within the same unit of health-service management to ensure comparability of health service provision.
2. Each to be identifiable as predominantly Roman Catholic or Protestant. (derived from census data, symbols, for example flags and physical checks made by the fieldworker).
3. Demography: Both to have roughly the same population size and characteristics (details derived from Small Areas Statistics for Northern Ireland).
4. Both to be roughly similar distance from a major hospital.
5. Both to be roughly similar distance from the main urban centre.
6. Neither to have 'contaminating influences' (for example a high level of tourism, higher than average retirement population, or large university population).

The following data sources were used.
1. Key informants, that is, '……..informants who have special knowledge, status, or access to observations denied the researcher[8], ' ……..who provide an insider's account or analysis[9],' ……..who are currently active within their own culture in order to represent accurately that culture to the researcher[10].
2. Interviews with Professional staff and local residents (including local GPs). These were semi structured and addressed five research aims using specific questions and 'prompted discourse'.
3. Group discussions. These included groups of women, men, mixed groups of older persons, health professionals. (arranged through community leaders and local councilors).
4. Participant observation: This was effected by living in each of these communities for approximately four months.

It was by involvement in everyday interactions and social activities in these communities.

5. Secondary material: census data, local newspapers and news sheets, health centre and clinic leaflets. Health board data (demographic and morbidity data, health policies and strategic reports), parish journals, local histories.

6. Community profiles of both towns from respective health professionals.

7. Fieldwork journals and diary.

8. Research team meetings and debriefings (independent readings and cross [multiple] triangulation).

A fuller, more comprehensive account of the rationale for the study, providing further detail of the methodology employed, including choice and location of towns, etc, is presented as a separate, stand alone, publication elsewhere[5]. The key findings of the research were produced as two separate government reports for DHSS (NI) and presented in several published papers[11,12].

This discussion presents recent findings from a closer and more detailed analysis of the data which was not possible at the time of the initial publications because of a) the volumous amount of data that had to be analysed, b) the fact that two studies were being done consecutively, c) time constraints and research deadlines.

Results

The local economy for both small towns was mostly agricultural. These were very small market towns where sheep and cattle and dairy farming were important. There were also small, usually family run family businesses. In Ballymacross (Catholic) smallholdings were more common than in Hunterstown (Protestant). Many farmers in Ballymacross had to supplement their income by taking additional employment in construction (usually small building firms) factory work in neighbouring towns, or in services. Unemployment was high in both towns.

Marriage in both towns was traditionally endogamous. Intermarriage in Northern Ireland is infrequent. Close kinship structures interaction in personal and private life, and lack of intermarriage restricted Protestant – Catholic interactions at the personal level.

Some tended to marry within the locality and remain geographically close to relatives. This meant that the community comprised of a number of long standing, extended family groups. For other family members employment opportunities were limited and it was not unusual for several family members to temporarily or permanently live abroad, (Previously this was usually the USA and more recently England, or the Irish Republic).

Family groupings combined to determine the overall town membership: they were the reference point for definition of individuals as insiders, i.e., coming from and being of the community, or 'blow-ins', those (few) who came from outside the town.

The initial study pointed up a number of significant factors impinging on health and health behaviour of rural communities, including among other things, social and economic deprivation, community funding issues, transport, access to, and interface with services, and local informal health care. Attitudes to health (including lay health beliefs, such as beliefs in cures and charms), health issues and health care experiences (including the interface with health care agencies) in both communities appeared to be remarkably similar.

Further (secondary) analysis of the data suggests that ethnic religious identity played an important role in relation to health and health chances of local people. This was expressed through local culture, social organization and social networks, what has cumulatively been referred to as 'social capital'[13, 19]. Religious affiliation is seen as being of central importance. It is expresses as a cultural system in the sense that it is recognized and shared core values and symbols which bind people together[14]. It is a bond and sense of belonging to a real or 'imagined community'[15].

In Northern Ireland religion and religious affiliation have consequences for social organization; culture and identity; physical and mental boundaries; a sense of belonging, language and expression; a sense of security; feelings and fears; neighbourliness and cooperation. This involvement and embodiment of local identity and culture has been described by Pierre Bourdieu as 'habitus'. That is, cultural structures which are embodied in people, in their mind, their personality and behaviour[16].

In the Republic of Ireland and in Northern Ireland the church has played a significant role in establishing and regulating social, political, cultural, psychological and moral boundaries. Recent research has discussed the idea of religious culture or 'habitus' of Irish Catholics[17]. This explores the link between the Catholic collective conscience and nationalism and what is describes as the Catholic churches 'moral monopoly'

Northern Ireland is a potent representation of religion as a cultural system. While it would be false to suggest that this society is completely dichotomized, it should be noted that more than 60 percent of the population live in areas which have more than 80 percent of one religion, emphasising a high degree of homogeneity and of social separation[18].

The data suggested that over and above structural issues (such as economic, environmental, transport or resource issues) which affected both communities, there appeared to important social factors which influenced health and health chances. This related to the social structure, local culture and how communities operated at the local level. It was to do with identity, religion, ethos, social capital and the potential for social capital. Social capital refers to the rules that reflect community values and norms and which provide for various coping strategies, durable networks, marriage and kinship networks, extra familial support structures and secular and religious community institutions. It is the cumulative totality of all of the resources available to individuals through their social affiliations and membership.

The data suggested that the two communities had different experiences in terms of accessing social capital. In the initial study we concede that socio-economic position was considered a major influence affecting health and life chances, but local culture and religious 'habitus' appeared to influence social living. The research suggested that although the construction of health and the health experiences of both communities were in many ways similar, there were important nuanced differences in terms of social networks, information needs and accessing resources. These differenced hinged on ethnic religious affiliation and had consequences for physical and mental health and well-being.

In other words religious affiliation was an important organizing principle affecting the health lifestyle (and indeed health risks) of both communities. Ethnic religious identity provided the basis for extended or limited social capital potential.

The difference between the two towns studied, was the degree of, and scope for, social capital potential. Both encapsulated communities recognized this. They knew the operating structures in relation to this, and the cultural limitations emphasised by their respective communities.

Ballymacross for example, was seen as supporting a unified Catholic ethos and cultural identity, with the strict involvement of religion and the church. Religion and religiosity were central, in terms of local identity, and national allegiance and the church was deeply involved in social living at various levels. This included such things as local

policing, therapeutic listening and administering advice. As well as actively supporting social, cultural and sporting events, much of this was facilitated and medicated through the church.

Hunterstown reflected not only historical Protestant denominational divisions, but also more recent fundamentalist factions in the form of what might be described as new 'inspirational' Protestantism. The ethos emphasised a degree of asceticism and personal success (sola fide). The social structure in Hunterstown was characteristically more fissile than that of Ballymacross. While the hallmarks of Ballymacross were a unified, universal doctrine emphasizing social, moral, values and religious obedience, there was no unified church or overarching moral authority in Hunterstown. Rather, it translated into various atomized groups and competing interests, fatalistic attitudes, and feelings of relative deprivation. In Ballymacross an egalitarian Catholic ethos culturally promoted social / health capital and well-being for established local people (although interestingly not necessarily for outsider co religionists). This contrasted with Hunterstown where the ethos for many was personally and socially restrictive.

While Protestants living in or near Ballymacross could tap into local (Catholic) resources, those in the most vulnerable position of all were Catholics living in or near Hunterstown who expressed a greater degree of physical and social isolation than their Protestant neighbours.

Discussion

In relatively recent times 'social capital' has become a popular (if not always well defined) explanation for health differences between social groups in the public health field. While Putnam has emphasized the positive aspects and possible emancipatary potential of social capital, others, namely Bourdieu have pointed up its negative features such as the potential for exclusion and social reproduction of deprivation[19, 16.]

This short discussion points to social capital as having an effect. The analysis revealed important local cultural issues in relation to health and well-being, something which is often over-looked in top-down inspections of health inequality issues. While structural factors (as economic and physical resources) likely to influence health and health gain, remain, this discussion highlights the need to recognize that local culture, religion, religious affiliation and ethnicity importantly influence health and health chances in very profound ways.

Recommendations

Governments and health services are advised to take cognizance of emic and bottom-up research findings in addition to the overwhelming use of quantitative research. The use of both methodological approaches provide for a more three dimensional discussion, in this case, highlighting nuanced cultural factors which influence health and health status.

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Towards a Strategy for Older People in Ireland

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Abstract
This paper makes the case for the development of a new National Strategy for Older People in Ireland. The new Strategy should be holistic and focus on all aspects of older people's lives. New opportunities for older people to maximize their capabilities in economic, social and civic life should be created and supported. If these opportunities are to arise, ageist attitudes need to be confronted and defeated. Older people should be treated as individuals, their preferences respected and their autonomy guaranteed. The vulnerability of older people should be protected where warranted, particularly in respect to the regulation of long-stay care. But it is equally important not to stereotype all older people as vulnerable and constantly in need of intervention and support. That is not the reality and repeatedly caricaturing older people as dependent is ageist in itself. Older people have to capacity to contribute much more to society than we currently allow them, in relation to work, volunteering, wisdom and culture. This paper provides the framework for the emergence of a new Strategy which will facilitate a much more significant role for older people in Irish society.

Introduction

Current policy for older people is driven by a policy document that is almost twenty years old – The Years Ahead[1]. The latter has many fine attributes but it has not delivered the fundamental changes necessary to allow older people to live meaningful, independent and social lives. The Years Ahead did not adopt a person-centred approach to the care and support of older people. Healthy ageing issues were neglected. Neither was there enough attention paid to the fundamental rights of older people as citizens and as consumers of services. Similarly, The Years Ahead failed to address the economic and social changes necessary to improve the quality of live of older people in society. Nor did the report provide enough detail on the instruments, pathways and budgets necessary to secure the implementation of its own recommendations. One of the consequences has been the failure to secure the implementation of many of these recommendations over the past two decades.

The time is long overdue, therefore, for the development of a new Strategy for Older People in Ireland. One of the lessons of the past decade is that resource allocation is directly linked to carefully crafted and successful Strategies, as is evident from the significant progress made in relation to both cancer and cardiovascular services in the country. A new Strategy for Older People would provide the basis for a comprehensive coverage of older people issues, ranging from citizenship to health and social care provision. Any new Strategy for Older People should reflect the views of older people and be firmly rooted in the Age Friendly Society framework developed by the National Council on Ageing and Older People[2]. The Strategy should also build upon the success of the National Disability Strategy[3] in relation to the development of policy for older people with disabilities. The emphasis should be on multi-sectoral and multi-disciplinary co-operation linked to new integrated models of care, supported by effective legislation. A new Strategy would be an important agent for change and would contain the potential to transform the lived experience and quality of life of older people in the country.

Principles for a New Strategy

The United Nations (UN) has played a key role in the development of international policy understanding of ageing around a holistic model of ageing for older people. Therefore, it is important that any new Strategy embraces the UN Principles for Older Persons[4]:

- Independence
- Participation
- Care
- Self-Fulfillment
- Dignity

These principles are concerned with maximising the capabilities of older people through their active involvement at all levels in society. They also address core quality of life issues for older people. People can be independent at all stages of their life even when they have significant disability, provided that there is a willingness within society to remove all artificial barriers to independent living. To ensure independence, we need to separate dependency from situations of dependency in the lives of older people. Participation is necessary in all aspects of people's lives and incorporates work, volunteering, civic life and family life. Older people want to contribute, but they also want that contribution acknowledged and valued. A significant number of older people will require care at some point in their life. That care must be person-specific, integrated and delivered when and where people need it. Self-fulfillment for older people requires that their autonomy is respected and validated. Empowerment is a key pre-requisite for self-fulfillment, as is the capacity to make choices in all care situations and settings. Finally, dignity is an important principle and is linked to self-respect among older people. The latter can only occur when older people are accorded full citizenship rights in the context of a well-developed and consistently nurtured inter-generational model of person-centred relationships. Based on these principles, it is possible to tentatively set out what a new Strategy for Older People in Ireland might look like.

Elements of a New Strategy

Citizenship

Older people must be treated the same way as all other citizens. Discrimination on the grounds of age must, therefore, continue to be addressed. Economic and social structures and processes must be monitored to ensure that ageist attitudes and prejudices are eliminated where they exist. Expectations need to be changed, as much among older people as in younger age groups. Age-proofing of government policies is central to removing discrimination. So also are clear and consistent legislation and information on the rights and entitlements of older people. Older people need to be encouraged and facilitated to remain active in economic, social and cultural life. Their role as mentors and educators should be acknowledged and nurtured through the development of formal knowledge-transfer programmes. In every society citizens are valued for who they are and what they do; for being and doing. Much more information is needed on the current status of older people in Irish society; on who they are (their intrinsic worth) and what they do (their extrinsic worth).

Self-Image and Identity

A critical aspect of quality of life for older people is their conception of the self. Of course, our perception of the self is formed and reformed over the life-course, not just in older age, and reflects the narrative of our life. Our own image is constructed and reconstructed in response to our experience of the social world in which we are participants. Therefore, social structures and process matter for our self-worth and identity. If that is the case then any new Strategy for Older People should examine the political economy and sociology of ageing and develop policies that promote positive self-image and identity over the life course. This may mean intervention at early stages in the life cycle; it may also mean positive discrimination for particular categories of older people that have been damaged by

social disadvantage. Attention should also be paid to the impact of care structures on perceptions of the self and identity in older age. For example, residential care should enhance positive images of the self, rather than dismantle personal identity, which seems to be happening at present[5].

Income and Wealth

Inadequate income and resources place some older people at risk of exclusion and marginalization from participating in activities which are considered the norm for other people in society. That risk needs to be acknowledged and addressed. While older people tend to have a slightly lower than average risk of consistent poverty their risk of relative poverty remains high[6]. Currently, older women are a particularly disadvantaged group in society. It is, therefore, important to examine income distribution among older people for evidence of income polarization. Some older people are economically advantaged, not disadvantaged. The Strategy should pay particular attention to the role of cumulative disadvantage, assets and pensions in determining the economic circumstances of older people.

Work and Retirement

The Strategy for Older People should address the role of work and retirement in the lives of older people. There are strong incentives to retire built into national social security systems across the world, as well as many private pensions[7]. This situation must change. Mandatory retirement at 65 years should be replaced by a more flexible model of retirement. The skills, knowledge and experience of older people are essential to continued economic growth. There may also be physical and mental health benefits of continuing in work for as long as possible[8]. However, mandatory retirement should not be replaced by forced labour and older people should be provided with range of strategies for labour force participation, beyond the age of 65, including training opportunities. Volunteering in later life should be promoted as an alternative to paid work. Many studies show the benefits of volunteerism for older people in terms of increased psychological well-being[9].

Healthy Ageing

An important goal of the new Strategy should be to increase life expectancy for people aged 65 years and over. Despite recent improvements, life expectancy in Ireland continues to lag behind the current EU 25 average[10]. As people get older it is also important that added years are accompanied by good health. In that regard, exercise, nutrition and lifestyle behaviours remain important in older age. Prevention and early detection of disease in primary care settings are also essential for increased life expectancy and quality of life in older age. As part of a new emphasis on healthy ageing, attention should be focused on minimising the impact of disability and disease on older people. This means action on falls prevention, pain relief for arthritis sufferers, early intervention for people with sensory disabilities, support for carers, and various screening programmes in respect of both cancer and cardiovascular diseases. A new social insurance funding model should be considered to generate the requisite funding for higher levels of investment in the care of older people.

Independent Living for Older People with Disabilities

Public policy has a vital role to play in improving the quality of life of older people with disabilities. Health and social services need to work together to ensure that older people with disabilities get the services they need, both at home and in long-stay facilities. Practical interventions such as hearing aids, reading glasses, rehabilitation and transport can yield huge benefits for older people with disabilities, but these are sometimes absent leading to unnecessary suffering for people[10]. A more person-centred focus within the Health Service Executive would help to integrate ageing and disability services and community and residential facilities for older people. This would incorporate a single shared assessment of health and social care needs of older people linked to a system of care and case management. There are numerous potential opportunities for co-operation and integration between the ageing and disability sectors, particularly in the areas of housing and transport, which are not being exploited at present. Many older people are only able to live independently at home through invaluable support they receive from family carers, so they too must be supported through variety and flexibility in formal care services, including respite provision. Independence needs to be encouraged within long-stay facilities through person-centred initiatives designed to give power and autonomy to residents over their physical and social environment.

Policy Implementation

The Strategy needs to build on existing good practice and policy. There are many existing policy reports that contain the basis for progress in a number of different ageing fields; for example The Action Plan on Dementia [11], Age Friendly Society[2]; NESF Care for Older People[12] and the Disability Act 2005. Similarly, many examples already exist in relation to good practice across the country; all that is needed is to share this information and prioritise spending on older people. Funding is critical to the success of any new Strategy and the NESF target of 500 million euro should be the baseline estimate for any new investment. Priority in respect of additional investment should be given to the most disadvantage older people, which includes people with dementia, people suffering elder abuse, older people with mental health problems and older homeless people, Standard-setting and the establishment of performance indicators should form part of the implementation agenda. The evidence-base also needs to be expanded through the development of an over-arching information network to inform policy and practice. Finally, a new National Partnership Forum for Older People should be established to oversee the development and implementation of the new Strategy for Older People.

Conclusion

This short paper makes the argument for a new Strategy for Older People in Ireland. The new Strategy should emphasise the richness and variety of the ageing experience in this country. Ageing is about diversity not dependency. The Strategy must deliver the mindset changes and additional resources necessary to achieve a new approach to care services for older people, underpinned by the principles of independence, participation, care, self-fulfillment and dignity. Targets must be set and progress must be monitored through the development of performance-enhancing inform ation systems. Finally, the new Strategy must be developed in conjunction with older people themselves and their advocates in a genuine spirit of partnership and inter-generational solidarity.

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A Review of Early Childhood Studies

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Abstract
Evidence based policy drawn from research in the life and social sciences, overwhelmingly supports investment in early childhood interventions. These policies have mainly been drawn from targeted interventions. In addition, the rigorous development of longitudinal studies has influenced the life course approach to childhood studies as well as contributing to policy debate and formation. This study provides an introduction to the many aspects of childhood studies. Analyses of the studies have identified a series of objectives common to many. Some have been achieved through different strategies particularly interventions. Many have been rigorously evaluated to varying levels of scientific success. In order to simplify the vast amount of information a typology of early childhood studies was developed with six strands identified. Some of the familiar themes to have emerged from these studies are highlighted and the paper concludes with a caveat for the development of such studies in Ireland.

Introduction

There is a considerable body of evidence from longitudinal studies and developmental neuroscience for investments in early childhood interventions[1]. Analyses of the interventions undertaken in early childhood studies have revealed a diversification in line with the theoretical shifts in developmental science. This analysis has revealed the development of comprehensive, holistic and, increasingly, multilevel interventions targeting outcomes across child, parent and community domains.

Objectives of Childhood Studies

Given the large number of Early Childhood Studies that have been carried out worldwide a number of common objectives have emerged. The primary starting point for many of the studies in this review is to focus on the child's health, social development, cognitive, language and literacy skills. Following on from this primary focus, the studies tracked the school performance of the children over both the short-term and long-term. Assessments of initial childhood studies recognised that family and, in particular, parental involvement was crucial. Thus, subsequent studies widened their remit to include assessment of and intervention in parenting skills and parent-child relationships. Arising from these studies was the recognition of the provision of appropriate social support for both children and parents. It was recognised that poor living conditions were contributing to social, behavioural and mental health problems. Studies with a longitudinal focus sought highlighted these problems and sought to ameliorate the worst effects over the life course.

Overview of Early Childhood Studies

For the purposes of this review over one hundred and twenty Early Childhood Studies (hereafter ECS) have been considered. The majority are in the US although others include Canada, Britain and Australia. A number of the ECS have been completed in non-English speaking countries such as the Wasa Wasi Study (Peru) and the Colombia Promesa Programme[2]. In such countries the expenditure per child has been lower and the focus has been primarily on nutrition and health.

Within the ECS a number of intervention strategies have been identified. These include home visiting, centre-based services, group meetings and workshops. Within the US further distinctions have been made between the type and scope of implementation of the studies. Model programmes are regarded as being of a higher quality; have attracted more funding per child; there has been a closer supervision of staff by the expert. Such programmes are also characterised by a stronger methodological control. Public programmes tend to have a greater number of participants; are implemented on a wider scale but usually within existing structures[3].

Evaluations of ECS can be arranged along a continuum ranging from weak where the studies are small, qualitative and have no comparison group through to rigorous where the studies are large-scale, have been subject to randomised control tests, and are longitudinal in nature. The evaluations process recognises the problem of participant attrition. Many of the ECS deal with children living in poverty who are more likely to be transient and difficult to retain in studies. Interventions in ECS may not yield the same results for children from more affluent areas and similarly the outcomes for children from urban areas cannot be generalised to children living in rural areas.

Typology of Early Childhood Studies

Strand 1

This group of ECS consists of targeted interventions that strive to improve child development directly. They are child-focused and implemented in a centre-based setting such as a child-care or pre-school facility. Studies falling within this band include the Perry Preschool Program (Ypsilanti, MI, 1962-67)[4]; Head Start (US various locations, 1965-present)[5]; High/Scope Pre-School Curriculum Study (Ypsilanti, MI, 1967-70); Chicago Child-Parent Center (Chicago, IL, 1967-present)[6].

Strand 2

This group of ECS consists of targeted interventions aimed at improving parental interactions with their children. The children are drawn from across the early childhood age range. Parents participating in the study are from low-income backgrounds and/or with some associated risk such as a low weight baby or a history of depression. Studies included in this band include the Elmira Pre-Natal and Early Infancy Study (Elmira, US, 1978-82)[7]; Hawaii's

Healthy Start Program (Hawaii, 1985-88)[8]; Home Instruction for Parents of Pre-School Youngsters [HIPPY] (Israel and subsequently introduced into Australia; international and ongoing)[9]; Houston Parent-Child Development Center (Houston, TX)[10].

Strand 3
The population targeted in this band's interventions are parents of children across the early childhood age range from welfare recipient backgrounds. The aim of these interventions is to improve family economic self-sufficiency and/or parental employment. Studies included the Florida Family Transition Project (Florida, 1994-2000); Teenage Parent Demonstration Project (US, 1986-1998)[11].

Strand 4
A holistic approach typifies the targeted interventions of this band of ECS. It involves parent skills training and child education components delivered in various community locations. Studies in this band include the Carolina Abecedarian Project[12]; Sure Start (UK)[13]; Incredible Years (US and UK)[14]; Better Beginnings, Better Futures (Canada, 1991-present)[15].

Strand 5
This band differs from the other four as its interventions are universal rather than targeted. These studies are directed at children only; parents only or both children and parents. The interventions that occur within this band differ, as do the programme locations. Studies in this band include Parents as Teachers [PAT] (Massachusetts, 1984-present)[16]; Cuyahoga County Early Childhood Initiative (Ohio, 2000-02)[17]; Positive Parenting Programme (Triple P)[18].

Strand 6
Bands one to five above are concerned with interventions and outcomes in early childhood. The studies that fall into band six are concerned with birth cohort studies. Carried out in many countries they involve repeated surveys of large samples of individuals from birth onwards. Information has been collected on variables including social background and parenting; education and employment outcomes; physical and mental health. These studies have been initiated at different time periods. They contain a wealth of information on the individual allowing for analyses of the many aspects of societal change. More importantly as the children of these studies reach adulthood and the outcomes of their life experiences become apparent analyses of these studies have informed policy debate and formation on issues such as poverty and social exclusion; education and equality of opportunity; and social class differences in health. Birth cohort studies in Britain include the 1958 National Child Development Study; 1970 British Cohort Study and the more recent Millennium Cohort Study[19]. In the US studies include the Early Childhood Longitudinal Study. Within this ECLS study there are two separate studies: a longitudinal study of the kindergarten class of 1998-99 and the other a study of the birth cohort of 2001[20].

In addition to the birth cohort studies referenced above, there are a number of national repeating early childhood studies. One of the best known is the National Household Education Surveys in the US[21]. One of the regular general topics is on Early Childhood Care and Education. Within this framework two repeated early childhood surveys are the School Readiness and Early Childhood Program Participation surveys. The School Readiness survey was conducted in 1993, with a limited number of questions asked in the Parent-NHES survey of 1999. The Early Childhood Program Participation surveys occurred in 1991, 1995, 2001, and 2005, with a subset of questions also asked in 1999.

Summary of Outcomes from Early Childhood Studies
With so many ECS the outcomes are numerous. Some of the key results are presented in this summary. These are not exhaustive and by no means mutually exclusive. In the area of child health low birth weight has been shown to have a detrimental effect on cognitive ability and also to contribute to behavioural problems. Similarly poor nutrition has an impact on cognitive impairment and decreased motivation. Parental health problems, in particular mental health issues, have a deleterious effect on children's emotional and behavioural welfare. In the area of early care it has been shown that high quality care and education lead to better cognitive test scores; school achievements; and completion rates. The Perry Program was one amongst many reviewed above that provided such early quality care and education with a greater impact on children from low-income families.

Many of the above studies focused on the issue of poverty within the family environment. Poverty, even when measured according to different standards, has a negative impact on children's cognitive and verbal skills and also leads to an increase in emotional and behavioural problems. A number of the ECS deal with contextual effects. Thus children from higher poverty neighbourhoods face higher mortality rates; levels of child abuse; rates of teen pregnancy; and school dropout rates. However poor neighbourhood effects have been negated by positive home environments.

Conclusion
Policy measures based on interventions later rather than earlier in life have been shown not to be cost-effective[22]. Returns from early childhood investment include better outcomes in education and health, increased work productivity, and reduced crime rates. Whilst we have much to learn in an Irish context from the above early childhood studies it should be noted that given the socio-economic, political and cultural differences between the different countries some of the most successful outcomes may not always be easily transferable into an Irish context.

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Women, Disadvantage and Health

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Abstract
This paper addresses the issue of disadvantage and health and how gender also affects health inequalities. Socio-economic status has been found to influence access to many social determinants of health, such as education and employment, food and nutrition, work opportunities, and housing. Socio-economic status has also been found to greatly impact on a person's access to effective healthcare in Ireland. Ireland has one of the widest gaps between rich and poor in Europe. Women in less well-off socio-economic groups are at the greatest disadvantage with regard to health and have been found to be at greater risk of developing poor health. The health of disadvantaged women is compromised by: lack of education, lack of information, and lack of awareness of factors that contribute to disease. These issues are explored in the paper with special focus on cancer, mental health, cardiovascular disease and sexual health.

Introduction
The Women's Health Council is a statutory body established in 1997 to advise the Minister for Health and Children on all aspects of women's health. Following a recommendation in the Report of the Second Commission on the Status of Women (1993), the national Plan for Women's Health 1997-1999 was published in 1997. One of the recommendations in the Plan was that a Women's Health Council be set up as 'a centre of expertise on women's health issues, to foster research into women's health, evaluate the success of this Plan in improving women's health and advise the Minister for Health on women's issues generally.'

The mission of the Women's Health Council is to inform and influence the development of health policy to ensure the maximum health and social gain for women in Ireland. Its membership is representative of a wide range of expertise and interest in women's health.

The Women's Health Council has five functions detailed in its Statutory Instruments:
1. Advising the Minister for Health and Children on all aspects of women's health.
2. Assisting the development of national and regional policies and strategies designed to increase health gain and social gain for women.
3. Developing expertise on women's health within the health services.
4. Liaising with other relevant international bodies which have similar functions as the Council.
5. Advising other Government Ministers at their request.

The work of the Women's Health Council is guided by three principles:
o Equity based on diversity – the need to develop flexible and accessible services which respond equitably to the diverse needs and situations of women
o Quality in the provision and delivery of health services to all women throughout their lives
o Relevance to women's health needs

In carrying out its statutory functions, the Women's Health Council has adopted the WHO definition of health, a measure reiterated in the Department of Health's 'Quality and Fairness' document (2001). This definition states that

'Health is a state of complete physical, mental and social well being'.

Disadvantage and Health
Disadvantage and inequalities in health has long been an area of interest to the Council. 'Promoting Women's Health; A population investment for Ireland's future'[1] identified disadvantage as an area for priority action. It is clear that inequalities exist in relation to health in Irish society, those who live in poverty are subject to poorer or bad health, and women have a critical influence in relation to family and social support as well as to their own direct health needs. In 2004, the WHC published a report on the area entitled 'Women, Disadvantage and Health'[2].

The concept of disadvantage was used by the WHC because it is all embracing, and links with the WHO definition of health (adopted by the WHC) as 'a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity'. Disadvantage is a much broader concept than poverty - it recognises the multi-dimensional nature of poverty and considers it in terms of the lack of some basic needs and the complex consequences this can have on individuals' lives. Socio-economic

status influences access to education and employment, food and nutrition, work opportunities, housing and environmental conditions, levels of stress and social support, as well as age at bearing children[3] [4]. Socioeconomic status has also been found to greatly impact on a person's access to effective healthcare in Ireland. In fact, Ireland has been identified as one of the developed countries with the most inequitable health system[5] [6], clearly limiting the ability of the less well off to take full advantage of health promotion, screening, diagnostics and ongoing care services. Studies assessing the equity of the Irish health system have pointed out that, after controlling for need differences, people with higher incomes are significantly more likely to see a specialist than people with lower incomes[6]. Higher income clearly gives people more access to comprehensive and advanced diagnostics, as well as treatment options not available through primary care.

Health Inequalities and Gender
More women are at risk of poverty compared to men and their percentage is increasing rather than decreasing in recent years[7]. Ireland has one of the widest gaps between rich and poor in Europe and women in less well-off socio-economic groups are at the greatest disadvantage with regard to health. These groups include: carers, women with disabilities, rural women, homeless women, women from various ethnic groups, including Traveller women, women who misuse drugs, lone parents and elderly women.

Women have been found to be at greater risk of developing poor health. The health of disadvantaged women is compromised by: lack of education, lack of information, and lack of awareness of factors that contribute to disease[8] [9]. Less access to health information means disadvantaged women may miss out on health promotion activities e.g. cancer screening[10].

Cancer
In addition to the individual and biological factors that contribute to a woman's risk developing cancer social and economic factors also need to be taken into account. The data collected for the NCRI-WHC report[11] indicated that socio-economic status plays a role in cancer treatment and mortality rates in this country. Overall in Ireland research has shown that death rates for all cancers are twice as high in the least skilled occupational group than they are in the most affluent group. Socio economic circumstances are important predictors of adverse lifestyle in women (and men). Studies in many countries including Ireland have found important differences between the socioeconomic groups in the prevalence of risk factors for cancer, with risk being substantially higher in disadvantaged groups. As stated earlier this is most likely because socioeconomic status not only reflects income but a person's social and other circumstances. – leading an optimally healthy lifestyle may not be possible or affordable for people living in poverty or disadvantage. Previous analyses of colorectal cancer in Ireland have shown that while incidence is higher in women resident in the more affluent areas of the country, the chance of having surgery for the disease is lower among patients in deprived areas, as is survival. Similar observations have been made for other cancers in other countries. These types of findings demonstrate the need for specialist cancer diagnostic and treatment services to be made more accessible to women (and men) in the most deprived socio-economic groups.

One of the report's most striking findings was that older women are much less likely to receive treatment for cancer than women in younger age groups. The reasons for this age disparity are not entirely clear and have been little researched, but possible explanations include: older women often have co-existing medical conditions which act as contra-indications for treatment; there may be a perception among clinicians that treatments are less effective among older women; or that this group may be more badly affected by the toxicity of treatments such as chemotherapy or radiation

therapy, although these conclusions are not supported by research evidence. In fact, older people are usually excluded from clinical trials, so there is often a complete lack of evidence on treatment effectiveness and side effects in older patients.

Mental Health
Women and men are affected by mental health problems in equal proportion but they are affected by different problems[12]. Women are twice as likely to experience depression, and more likely to experience anxiety, eating disorders, and attempt suicide[13] [14]. Women are less likely to receive specialist care and twice as likely to be prescribed psychotropic drugs[13]. Disadvantaged women are more vulnerable e.g. lone mothers, drug misusers, ethnic minorities. In fact, lone mothers have been found to experience high rates of mental health problems[15], especially depression[16]. Single motherhood status is a strong independent predictor of mental health morbidity. Women from ethnic minorities experience a disproportionate amount of stress due to additional social roles, for example as cultural mediators. 80% of people from ethnic minorities affected by stress and symptoms of depression[17]. Cultural norms also affect the assessment and treatment process. Women who misuse drugs experience higher rates of depression and anxiety, suicidal tendencies, isolation and general psychological distress. They are affected by greater social stigma for their drug misuse than men and live in fear of losing their children. 70% of women who misuse drugs have also been subjected to violence[18]. Therefore they require integrated services which address women's many health and social needs.

Cardiovascular Disease
Women are ten times more likely to develop coronary heart disease than breast cancer[19]. However, this disease is still perceived as a 'male' condition. This is due to a number of factors. Time lag: Women on average 10 yrs older than men when they develop CHD; 20 yrs older for heart attack. Atypical symptoms: Women may have neck, shoulder or abdominal discomfort, dyspnea, fatigue, nausea or vomiting. Gender bias: there is a lack of gendered research & analysis. The condition is often misdiagnosed in women; and there are differences in the treatment and participation of women in rehabilitation. Therefore, specific attention must be paid to gender.

Sexual Health
Research of sexual behaviour in a number of different countries have shown that young men and women from lower social class backgrounds and those with lower educational qualifications are more likely to have earlier sexual intercourse and less likely to use contraception when they did so .The reasons for these patterns are embedded in a complex socio economic processes. Knowledge of contraception including emergency is lower among women with lower levels of education. Therefore, targeted health information strategies are required. Communication of sexual information is poor among working class households. The cost of condoms also discourages use (pack of 3 condoms cost €4.30-€6.00 at this time).

Poverty and social exclusion have also been identified as clearly linked with the risk of STI infection in England[20] and the USA[21]. The UK Department of Health identified the highest burden of STI being borne by women, gay men, teenagers and young adults, and minority ethnic groups[22]. The Irish Contraception and Crisis Pregnancy (ICCP) survey found links between low levels of education and difficulties in talking to a sexual partner about contraception[23]. Statistics recently collated by the Well Woman Centres in Dublin also point to a distinct social gradient in Chlamydia infection among women[24]. Economic dependency in relationships can make it hard for women to negotiate condom use or leave a relationship that puts them at risk. While women are increasingly joining the labour market in Ireland, and their employment rate has now reached 55.3%[25], due to their caring responsibilities many of them work only

on a part-time basis. Women are also overrepresented in clerical and secretarial jobs, which would not attract high remuneration. The Irish social welfare system is still very much based on a male-breadwinner model, which treats the woman as a dependant and gives her no independent entitlement to income support within a household[26]. Finally, more women are at risk of poverty compared to men (20.4% vs. 18.9% in 2004), and, their percentage is increasing rather then decreasing in recent years[27]. The Women's Health Council is currently collaborating with MABS (The Monetary Advice and Budgeting Service) on a study entitled "Women, Indebtedness & Health". This is a preliminary study to explore the extent to which poor health comes up in MABS consultations and the links between debt and ill health in women.

Conclusion
The needs of disadvantaged women continue to be a priority for the Women's Health Council. The Council supports any initiative at policy, community, or health service level that addresses this situation of disadvantage by reducing social inequality, promoting well-being, providing support for improvement in lifestyle and health practices and providing equitable access to health care.

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Poverty, Health and Participation

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Abstract
Poverty is an important influence on health and despite continuing economic growth, poverty and health inequalities persist. Current public policy aims to reduce the inequalities in the health, by focussing on the social factors influencing health, improving access to health and personal social services for those who are poor or socially excluded and by improving the information and research base in respect of the health status and service access for the poor and socially excluded groups. It is important that processes for target setting and evaluation involve people experiencing poverty, at all levels through consultative and participative structures and processes and in the roll-out of primary care teams. A number of projects throughout the country aim to address health inequalities using community development. These are essentially about widening participation in the development, planning and delivery of health services and ensuring that the community is actively involved in the decision making process about health services in their area.

Introduction
This paper looks at health policy and poverty and puts forward proposals to address health inequalities through the development of outcome targets, appropriate performance indicators and through the participation of people in poverty in the design and delivery of health interventions. It looks at participation in health and more particularly at community development approaches to health demonstrating some of the lessons emerging from Combat Poverty's Building Healthy Communities Programme[1].

Inequalities in Health - The Policy Context
It is widely accepted that poverty is an important influence on health. Poor people experience poorer health and die younger than those who are well off. Certain minority groups experience health problems including Travellers, homeless persons, prisoners and asylum seekers. Poor people are more likely to live in damp and inadequate accommodation and live in neighbourhoods with higher levels of crime and anti-social behaviour. These factors together with poor diet and higher levels of smoking and stress can all contribute to poorer health. Despite continuing economic growth, poverty and health inequalities persist within Irish society[2-4].

These inequalities in health are acknowledged in Building an Inclusive Society – the Government's Review of the NAPS, published in 2002, which has a broad objectives and a number of specific targets in relation to health inequalities. Its overall is to reduce the inequalities in the health of the population, to be achieved by making health and health inequalities central to public policy, by acting on the social factors influencing health, by improving access to health and personal social services for those who are poor or socially excluded, and by improving the information and research base in respect of the health status and service access for the poor and socially excluded groups. It contains three specific quantified targets, to be met by 2007[5]. These targets are currently being reviewed in preparation for the new National Action Plan against Poverty and Social Exclusion and Poverty (NAP/inclusion)[6].

Setting Targets and Performance Indicators for Health Inequalities
In 2006, Combat Poverty commissioned Brian Nolan of the ESRI to provide advice on setting targets to reduce health inequalities. He suggests that targets could be framed at different levels: high-level outcome targets for reducing health inequalities over a lengthy period to be combined with shorter-term targets for intermediate outcomes and goals and that progress on meeting the targets should be a key priority and should be accompanied by an implementation framework, designated responsibilities and budgetary provision to support implementation. He puts forward a structure for incorporating the different components involved in target setting which are illustrated below[7]. This overall framework is being put forward by Combat Poverty in order to inform the development of targets for the next NAP/inclusion.

Long-term High-Level Outcome Goals

Medium-term Outcome Targets

Medium-term Policy Strategies

National-level Policy and Performance Indicators

Local-level Policies and Performance Indicators
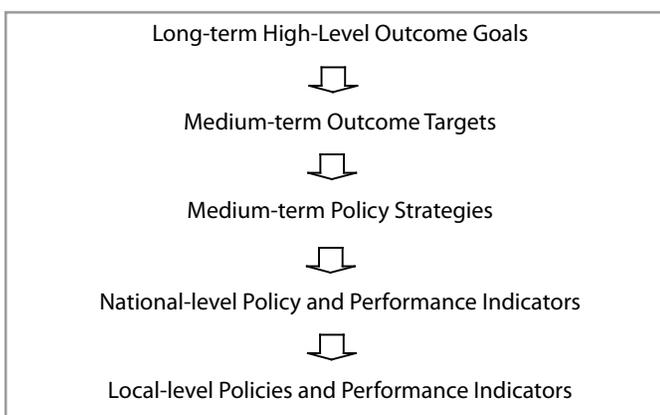
Figure 1   Setting Targets for Health

The development and achievement of health targets over the forthcoming period will require designated budgets assigned to support implementation, designated responsibility for delivering on targets, supports for building capacity within the reformed health services to deliver social inclusion outcomes and mechanisms for cross-departmental and cross-sectoral working, including health impact assessments[7].

This need for capacity building of the health sector is echoed in the Integrated Report on Supporting the Strategic Implementation of NAPS in the Health Sector[8] which clearly identifies concerns in relation to community involvement, lack of training and information in relation to both NAPS and interagency working, relatively low level awareness of NAPS and NAPS targets (particularly among staff at the front line of health services) and low levels of anti-poverty activity to date, particularly activity specific to NAPS[8].

Participation of People in Poverty in Health
Together with capacity building and awareness-raising in relation to NAPS and anti-poverty work for those in the health sector, Combat Poverty advocates for the participation of people in poverty and those groups experiencing health inequalities in the monitoring and evaluation of polices affecting them[9]. There is a need to involve those delivering and receiving services at local level both in the design of targets and in evaluating performance. It is important that these processes involve people experiencing poverty on an ongoing basis, both at national level and at a local level through local consultative and participative structures and processes.

The principle of participation is embedded in recent health policy. The Chief Medical Officer identifies community participation as an essential component of a more responsive and appropriate system of care which is truly people-centred[10]. The national health strategies and policies contain the principles of equity, access to services and community / consumer involvement in order to inform the design and delivery of services. The National Health Strategy 2001 names as one of its guiding principles people-centredness and states that communities should be supported in taking greater control, but also greater responsibility, for their own health and that there must be increased involvement of service users as partners in planning and evaluation as an important component in promoting openness and accountability[4]. To support the achievement of this principle, the Health Boards Executive produced Community Participation Guidelines which provide a useful framework for developing an approach to community participation at local level[11].

The Primary Care Strategy has an objective that community participation in primary care will be strengthened by encouraging and facilitating the involvement of local community and voluntary groups in the planning and delivery of primary health care services[12]. And linked to this the Health Promotion Strategy commits to the provision of support for community based and community development projects with a focus on low income groups….. including the establishment of pilot projects 'with a view to identifying models of good practice that provide a holistic approach to health within disadvantaged areas[13].

In a review of Primary Care Projects funded under the first phase of Combat Poverty's Building Healthy Communities Programme, Crowley outlines the benefits of community participation in primary care as:

- Improved and more relevant policies to address health inequalities;
- Problems anticipated at design stage;
- Services are more responsive to the needs of the community;
- Equitable and inclusive services which helps to address social exclusion and poverty;
- Increased resources as services are more cost effective; and,
- Services become more accountable to the communities they operate in and for[1].

Building Healthy Communities

The Building Healthy Communities Programme (funded and supported by Combat Poverty, the DOHC and the HSE)[14] supports poor communities, both geographical and sectoral, to tackle poverty and health inequalities. One of its main aims is to promote the principles and practice of community development in improving health and wellbeing outcomes for poor communities. It encourages innovation and capacity building by groups in exploring the links between poverty and health and in responding to health inequalities.

The first phase of the Building Healthy Communities programme highlights a number of key characteristics of projects which aim to address health inequalities from a community development perspective including:

- Helping people to obtain better access to information on health and other related issues;
- Involving members of the community in identifying their own health needs;
- Enabling people to come together to share their health experiences and knowledge and form community groups;
- Helping people to set up and run community health facilities, events and activities;
- Supporting the community to become involved in the design and delivery of health services;
- Promoting a broad view of the determinants of health that includes areas such as employment, education, physical environment, recreation facilities and social networks; and,
- Encouraging communities to challenge the health inequalities and discrimination that faces them by working to influence health policies and services that impact upon them[3].

Community development approaches to health are essentially about widening participation in the development, planning and delivery of health services and ensuring that the community is actively involved in the decision making process about health services in their area[3].

The external evaluators of the current phase of the Building Healthy Communities Programme conclude in their first policy paper that Current policy within Ireland is focused on the NAPs targets and the question must be how can community development add real value to the process of reducing the gap between rich and poor in Ireland and affecting real change on the ground? CLES suggest that the Programme demonstrates that it can add significant value to the delivery of health policy and the NAPs targets by engaging with vulnerable groups, tackling the determinants of health and gathering evidence about health inequalities which will be invaluable for government departments in the planning and targeting of health services in the future[2].

Conclusion

The benefits of community participation in primary care identified by Crowley and the characteristics of community development approaches to health clearly highlight the benefits for both health service providers and for those experiencing health inequalities[1].

The principles of involvement, participation and community development are central to tackling health inequalities and are reflected in current health policy. This will mean the development of more consultative and participative structures involving communities experiencing health inequalities, giving those in receipt of services more of a say in how they are planned and delivered. It is important that processes are as inclusive as possible and that people experiencing health inequalities, including people living in poverty are resourced and supported to participate fully.

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