

## Iceland: inequalities and social cohesion in psychosomatic health – individual and community processes

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### Executive summary

Mental and physical health are intimately related to inequality and marginalization. People with higher socioeconomic status tend to enjoy better health than people in lower positions. The association between inequality and poor health appears to be rooted in various social, cultural, economic and behavioural differences.

The socioeconomic status of parents may influence the psychological and physical health of children in similar ways as among adults. At community level, adolescents living in neighbourhoods characterized by low socioeconomic status, material deprivation, regional marginalization and high levels of non-traditional families may also experience more physical, psychological and social problems. Adolescents also belong to social status hierarchies of educational achievement and peer popularity that are partially independent of their families.

The Iceland case study presents a multilevel model of these processes that was tested among Icelandic adolescents taking part in the 2006 HBSC survey. It was found that adolescents who did not live with both biological parents reported significantly poorer psychosomatic health. The presence of a step-parent in the household did not seem to diminish the negative effect of the absence of a biological parent, and other types of inequalities in economic situation, social status and social inequality did not seem to account for this effect of family structure. Both material deprivation and having parents who were not employed had a direct, significant effect on diminished psychosomatic health among children and adolescents. Lack of parental employment appeared to have a stronger effect in some communities than others.

Icelandic girls aged 10–17 suffered from significantly poorer psychosomatic health than boys. This effect persisted after other inequalities related to families, status and social support had been taken into account. The strength of this effect varied significantly across school communities.

Lack of academic achievement in school was a significant stressor that diminished psychosomatic health among young people. Similarly, a lack of social achievement in the adolescent society of school was also associated with a significant diminution in psychosomatic health. Social support had a strong main effect of psychosocial health, independent of other factors. Somewhat unexpectedly, this effect varied significantly between school communities. Measures of community-level differences did not play an important role in individual psychosomatic health status among adolescents.

Due to the small size of the country, Iceland provides a unique opportunity to study the implementation of a nationwide policy, its successes and shortcomings, and the lessons learned.

The Public Health Institute of Iceland has for several years promoted an integrated approach to adolescent public health policy. The importance of social integration in the collective well-being of adolescents is emphasized, with special attention to the potential of social and normative cohesion among parents for creating positive outcomes among adolescents. This strategy covers such diverse topics as mental and physical health, substance use, hygiene and nutrition.

Implications for future research are discussed.

### Introduction

Mental and physical health is intimately related to inequality and marginalization. People with higher education and socioeconomic status tend to enjoy better health than people in lower positions (1,2). The association between inequality and poor health appears to be rooted in various social, cultural, economic and behavioural differences. Frequently cited factors

contributing to this association include differences in lifestyle and consumption patterns, increased physical and emotional strain at work, and the strain of poverty and lack of social mobility (3). Unemployment in particular appears to be related to increased psychological distress (4,5). Women experience more physical and psychological problems than men, which can in part be traced to gender inequalities in society (6,7).

Parents' socioeconomic status may influence the psychological and physical health of children in similar ways as among adults. Parental education and income can affect children's life chances in various ways (8,9), and children share the lifestyle and consumption patterns of their parents to a considerable degree. Family structure has various social and economic repercussions and the social and emotional complexities of a non-traditional family structure may be a significant stressor in the lives of children (10). At community level, adolescents living in neighbourhoods characterized by low socioeconomic status, material deprivation, regional marginalization and high levels of non-traditional families may also experience more physical, psychological and social problems than those living in more stable and affluent communities (11–13).

However, adolescents also belong to social status hierarchies independent of their families. In schools, there are two status hierarchies based on achievement: the formal education system, and the informal hierarchy of adolescent society (14,15). Inequalities in educational achievement among adolescents may cause similar strains to those caused by inequalities in socioeconomic status among adults. Adolescents can therefore be expected to suffer from doing poorly in school. Similarly, the strict social ranking of adolescents among themselves creates profound inequalities that may have a strong negative impact on “unpopular” children – those with the lowest status in adolescent society (16).

Social cohesion and social support have been found to be effective “buffers” against the negative effects of social inequalities (4). In the case of adolescents, social support from parents is the most important form of such support (17). The negative effects on psychosomatic health of lower parental socioeconomic status, non-traditional family structure, academic troubles and unpopularity in school can therefore be expected to be less serious for those adolescents enjoying strong parental support.

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## Iceland as a case study

Due to the small size of the country, Iceland provides a unique opportunity to study the implementation of a nationwide policy, its success and shortcomings, and the lessons learned. Icelandic schools are almost exclusively neighbourhood based and consequently provide a reasonable approximation of neighbourhood-level processes. A wealth of information exists on the situation in each school and their participation in various public health efforts as well as the communities and neighbourhoods in which they are situated.

The establishment of the Public Health Institute of Iceland on 1 July 2003 was an important step towards a more integrated Icelandic public health policy. The institute was established by merging the Tobacco Prevention Council, the Council of Alcohol and Drug Prevention, the Dental Health Council and the Nutrition Council. Later, the Mental Health Promotion Project was also merged with the Public Health Institute. Since the establishment of the institute, the Division of Research and Development and the Division of Education and Communications have been integrated with all health promotion and prevention projects.

Effective public health policy must address social determinants of health. A research strategy that addresses social determinants of health work in both national and local settings is necessary to support individual and community-based health initiatives. The Institute's research strategy includes support for Icelandic participation in the European School Survey Project on Alcohol and Other Drugs (18) and the HBSC multinational research projects and development of research on health and well-being of the Icelandic population, with special attention to social gradients in physical and mental health.

The Institute's main roles include coordination and initiation of activities in health promotion and prevention, advising the government on health policy, evaluation of health promotion projects and monitoring of major indicators of health. Many projects at the Institute aim explicitly or implicitly towards improved well-being through, for instance, improved nutrition, increased physical activity and reduced tobacco, alcohol and drug use. The goal of the project “Everything affects us, especially ourselves!”, for example, is to promote healthy lifestyles of children and their families by emphasizing increased physical activity and improved diet in schools and thereby increased general well-being.

Mental health promotion is an important aspect of the work of the Public Health Institute. This is done through active cooperation with various stakeholders in the field of mental health, with special emphasis on cooperation around World Mental Health Day. The mental health promotion project emphasizes increased awareness of mental health as being essential to good overall health and well-being and educates people about ways to improve their mental health. Additionally, the project promotes awareness of positive mental health and seeks ways to reduce prejudices towards mental health problems. The Institute also runs “Zippie’s friends”, a programme that teaches school-aged children various coping skills.

## Method

### Data collection

The data used in this study are drawn from the Icelandic section of the HBSC survey (19). The sample consisted of all students attending the compulsory sixth (11–12-year-olds), eighth (13–14) and tenth (15–16) grades in all Icelandic secondary schools. Anonymized questionnaires were administered to all students who were present in class on the day of administration in February 2006. Teachers and research assistants distributed the questionnaires and students sealed completed questionnaires in blank envelopes upon completion (for methodological considerations, see Bjarnason (20)).

Valid questionnaires were obtained from 86% of all Icelandic sixth, eighth and tenth grade students. In other words, every individual in these three cohorts in the country that was present in school participated in the survey. The study is therefore based on responses from most of the national population in these age groups. Due to a split-half sample in the tenth grade, however, only half of the tenth grade students in the country were eligible for the current analysis. Since each anonymous individual response can be linked to a specific school student identification number, these data provide a unique opportunity to study multilevel processes of social cohesion on mental health in adolescents.

### Missing values

The proportion of missing values on each of the items used in the following analysis ranges from 0.9% to 5.3%, with an average of 2.2% missing values across all measures. Missing values on continuous independent variables were replaced by stochastic mean substitution, adding a normally distributed error term to each substituted value (see Kalton (21)). Missing values on heavily skewed dichotomous variables such as family structure and parental employment were assigned to the majority group. Cases with missing values on gender and the dependent variable were excluded from further analysis. The final sample used in the following analysis includes 8908 students in 163 schools.

### Dependent variable

The dependent variable of psychosomatic well-being, shown in Table 1, is constructed from an eight-item symptom checklist (22).

### Family structure

Research has consistently found that adolescents living with both biological parents are somewhat better than those living in other arrangements (23). For the purposes of this case study, responses to a checklist of individuals living in the household with the respondent were used to construct two dichotomous variables (0–1) indicating family structure:

1. single-parent family with one biological parent in the household (16%)
2. step-parent family with step-parent in the household (14%).

Families with both biological parents in the household serve as a contrast in the following analysis. At school level, the prevalence of non-traditional families is measured as the percentage of adolescents not living with both biological parents (an average of 28% across schools).

### Parental employment

Student responses to questions about their parents’ employment status were used to construct two dichotomous variables (0–1) indicating:

**Table 1**

Descriptive statistics for multilevel models of the influence of inequalities and cohesion on psychosomatic health among 12–17-year-old students in Iceland, 2006

	Range	Mean	SD
<b>LEVEL 2</b>			
Unemployment	0.00–0.29	0.04	0.05
Deprivation	0.33–2.00	1.01	0.30
Non-traditional families	0.00–0.67	0.28	0.13
Capital region	0–1	0.64	0.48
Generational integration	2.71–4.00	3.36	0.22
<b>LEVEL 1</b>			
Family inequalities			
Single parent	0–1	0.16	0.36
Step-parent	0–1	0.14	0.35
Father not employed	0–1	0.04	0.19
Mother not employed	0–1	0.12	0.33
Material deprivation	0–6	0.98	1.02
Status inequalities			
Female	0–1	0.50	0.50
Age	10–17	13.32	1.53
School status	1–4	2.18	0.86
Peer status	3–15	5.98	2.23
Social support			
Parental support	1–4	3.40	0.73
Dependant variable			
Psychosomatic health	8–40	31.52	6.65
<b>N (Level 2)</b>	<b>163</b>		
<b>N (Level 1)</b>	<b>8,908</b>		

1. father not employed (4%)
2. mother not employed (12%).

According to Statistics Iceland (24), about 6% of 25–54-year-old males and 15% of 25–54-year-old females were not active in the labour force at the time of the survey in the first quarter of 2006. Families with both parents employed serve as a contrast in the following analysis. It should be noted that children indicating that a parent is not employed does not necessarily mean that the parent is unemployed; some parents are not in the labour market because they are, for instance, students, retired, disabled or working at home. This is particularly relevant in the case of mothers, who may be staying at home with young children.

At school level, the prevalence of unemployed parents is measured as the average of unemployed fathers (an average of 4% across schools). In comparison, the official unemployment rate in Iceland in the first quarter of 2006 was 2.2% among males and 2.4% among females (24). This use of not-employed fathers to estimate the unemployment rate in school communities is not without problems. It is nevertheless the best available proxy measure since unemployment is not recorded at the level of the school community and can be expected to be highly correlated with the actual unemployment rate on an aggregate level.

The material situation of the family is measured by a summary scale constructed from family ownership of computers and cars and family vacations in the past year. The scale was inversely coded as a measure of material deprivation so that “6” indicates none of these things and “0” indicates at least two of each. On the aggregate level, the average level of reported deprivation in each school is used as an indicator of community deprivation.

### Capital region

There is a relatively sharp distinction in Iceland between the capital region, where about two thirds of the population reside, and the remaining areas of the country. The rapidly growing capital area surrounding Reykjavik offers a diversity of professional, service, government and business opportunities that cannot be matched in other areas of the country (25). In sharp contrast, occupational opportunities in many rural areas are rather limited and tend to be highly gendered (26). The aggregate-level variable capital region indicates if the school is situated in the capital region (coded “1”) or not (coded “0”).

### Status hierarchies

A single item is used to measure school status as the perceived academic status of children in the eyes of their teachers. The item was recoded so that “1” indicates “below average” and “4” indicates “very well”. Peer status is the sum of three items measuring how well students get along with their classmates. The resulting measure ranges from “3” (low peer status) to “15” (high peer status).

Parental support is coded from the responses to four questions about how easy it is for the adolescent to talk about worries with mother, stepmother, father or stepfather. Under the assumption that the strength of the strongest relationship is the crucial factor rather than the average strength of all relationships, the variable parental support was coded so that “1” indicated it was very difficult to talk to everyone on the list, while “4” indicates that it is very easy to talk to at least one of these four potentially relevant persons about things that are really worrying. On the aggregate level, the average level of parental support in each school is used as an indicator of generational integration.

## Statistical analysis

The following data analysis is based on multilevel modelling techniques (27,28) and was conducted by use of the HLM 6 software. This methodology allows us to address empirically several important theoretical and conceptual issues. Extending the general multiple regression model, hierarchical linear regression allows the estimation of individual-level models of the effects of inequalities and social cohesion on psychosomatic health as:

$$Y_{ij} = \beta_{0j} + \sum_{q=1}^Q \beta_{qj} X_{qij} + r_{ij}$$

where  $Y_{ij}$  is the psychosomatic health of student  $i$  in school  $j$ ,  $\beta_{0j}$  is the individual-level intercept for each school,  $\beta_{qj}$  ( $q=1,2,\dots,Q$ ) are individual-level slopes for each school  $j$ ,  $X_{qij}$  is the  $q$ th individual-level predictor for student  $i$  in school  $j$ , and  $r_{ij}$  is the individual-level error term. This extends the general regression model by allowing the estimation of variable intercept models of the effects of school-level predictors on these individual-level adolescent outcomes, as well as allowing the estimation of variable slopes for individual-level predictors across school communities. In effect, each of the individual-level coefficients  $\beta_{qj}$  can be modelled as an outcome variable in the school-level model:

$$\beta_{qj} = \gamma_{q0} + \sum_{s=1}^S \gamma_{qs} W_{sj} + u_{qj}$$

where  $\gamma_{q0}$  is the school-level intercept for the individual-level slope  $q$  in school  $j$ ,  $\gamma_{qs}$  ( $s=1,2,\dots,S$ ) are school-level slopes associated with the individual-level slope  $q$ ,  $W_{sj}$  is the  $s$ th school-level predictor for school  $j$ , and  $u_{qj}$  is the school-level error term. In other words, both the average psychosomatic health in each school and the strength of individual-level predictors (such as age and economic deprivation) in each school can be modelled as a function of school-level characteristics (proportion of single parents in the school community, for instance). All individual-level and school-level predictors are centred to the grand mean in the following analysis.

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## Results

The first column in Table 2 shows the results of regressing psychosomatic health on school-level characteristics. The results show that psychosomatic health is on average less in schools where there are higher levels of parents that are not employed, where more children report material deprivation and where there is less generational integration. When these factors have been taken into account, there is no net effect of the community-level proportion of non-traditional families or geographical marginalization.

Model 2 shows the effects of family inequalities on psychosomatic health at the individual level. Those living with a single parent or one parent and a step-parent experience more problems, as do those whose parents are not employed. Finally, those who report greater material deprivation also experience worse psychosomatic health.

Model 3 shows the effects of status inequalities on psychosomatic health. The results show that females and younger students report more such health problems. Those who do worse academically and have less status in adolescent society also report less psychosomatic health.

In Model 4, the variables introduced in the first three models are all included in a single model. The results show that while all the individual-level predictors continue to be statistically significant, those associated with family inequalities are substantially reduced by the inclusion of measures of status inequalities. At school level, only the measure of generational integration continues to be statistically significant.

In Model 5, parental support is introduced as a buffer against the effects of social inequalities on psychosomatic health. The results present a mixed picture. After taking parental support into account, the effect of non-traditional family structure is in fact slightly stronger than before. Some buffering effects are found for father's unemployment, age, school status and peer status. Parental support, however, appears to have a mainly direct, independent effect; the greater parental support enjoyed by children, the less psychosomatic problems they experience.

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## Discussion

The main objective of the welfare state is to ensure minimum standards of income, nutrition, health, housing and education for every citizen (29). In Iceland, this has primarily been achieved through universal benefits for the entire population, rather than targeted assistance to those who need it most (30). For instance, rather than advocating a free lunch programme for needy children, the Public Health Institute of Iceland has encouraged local governments to offer healthy meals free of charge to all children in elementary schools. Similarly, municipal initiatives to increase sports and social participation among children have been based on a voucher system where all children in the municipalities can participate in such activities free of charge, the organizers being refunded by local government based on participation figures.

Such universal programmes are intended to benefit the whole population and, at the same time, eliminate the stigma associated with public assistance. They are thought to lead, for instance, to better nutrition and increased participation in sports and social activities for everyone, but in particular for those who are disadvantaged. They should therefore buffer the effects of social inequalities on mental health and inhibit the formation of pockets of marginalization where community-level disadvantages negatively affect the mental health of all children.

The findings presented here confirm and extend several findings of previous literature. In line with earlier research (see McLanahan & Sandefur (10)), adolescents who do not live with both biological parents report significantly poorer psychosomatic health. The presence of a step-parent in the household does not seem to diminish the negative effect of the absence of a biological parent. Contrary to studies in other areas (see Bjarnason et al. (23)), other types of inequalities in economic situation, social status and social inequality do not seem to account for this effect of family structure. Finally, these results show that the effect of non-traditional family structure has similar effects across different school communities in Iceland.

Ross et al. (13) found that poverty and social disorder at neighbourhood level increased individual powerlessness and fear, which in turn led to psychological distress. Unemployment is also directly related to increased psychological distress among adults and young people (4,5). The results of this study show that both material deprivation and having parents who are not

**Table 2**

Multilevel models of the influence of inequalities and cohesion on psychosomatic health among 12–17-year-old students in Iceland, 2006 (unstandardized HLM coefficients)

	Model 1	Model 2	Model 3	Model 4	Model 5	Variance
<b>LEVEL 2</b>						
Unemployment	-5.31*			---	---	
Deprivation	-1.00**			---	---	
Non-traditional families	---			---	---	
Capital region	---			---	---	
Generational integration	-3.63***			-1.49***	---	
<b>LEVEL 1</b>						
Family inequalities						
Single parent		-1.07***		-0.77***	-0.82***	---
Step-parent		-1.16***		-0.75***	-0.90***	---
Father not employed		-1.74***		-1.28**	-1.10**	5.66***
Mother not employed		-0.63**		-0.51*	-0.49*	1.30**
Material deprivation		-0.57***		-0.26***	-0.21**	---
Status inequalities						
Female			-1.82***	-1.79***	-1.76***	0.70**
Age			-0.64***	-0.62***	-0.50***	0.11***
School status			-1.48***	-1.38***	-1.23***	---
Peer status			-0.77***	-0.74***	-0.68***	---
Social cohesion						
Parental support					1.42***	0.29**
<b>Intercept</b>	31.33***	31.55***	31.48***	31.43***	31.49***	0.16***
<b>R<sup>2</sup> Level 2</b>	84.0%	33.9%	57.1%	62.0%	66.6%	
<b>R<sup>2</sup> Level 1</b>	0.0%	3.7%	18.3%	19.7%	22.1%	

R<sup>2</sup> R-squared, standard notation for explained variance

\* p < .05    \*\* p < .01    \*\*\* p < .001

employed has a similarly direct, significant effect on diminished psychosomatic health among children and adolescents. The effect of material deprivation does not vary significantly across school communities, but a lack of parental employment appears to have a stronger effect in some communities than others. Future research should seek to identify factors that increase or decrease the negative effects of having parents who are not employed.

As is the case in most other studies of sex differentials in health and mortality (see, for example, Verbrugge & Wingard (6)), Icelandic girls aged 10–17 report significantly poorer psychosomatic health than boys. This effect persists after other inequalities related to families, status and social support are taken into account. Interestingly, it was also found, however, that the strength of this effect varies significantly across school communities. Community-level factors that increase or decrease female psychosomatic health have not been studied in this context, but may represent an important direction for further research.



Inequalities in adolescent status hierarchies also affect psychosomatic health. Lack of academic achievement in school is a significant stressor that decreases psychosomatic health among young people. Similarly, a lack of social achievement in the adolescent society of school is also associated with a significant decrease in psychosomatic health. Importantly, these results suggest that the negative effects of these status inequalities are the same across different Icelandic school communities.

In line with previous research (4), parental support was expected to buffer the negative effects of inequalities on psychosomatic health among adolescents. Indeed, some evidence of this was found in the data. However, social support primarily has a strong main effect of psychosocial health, independent of other factors. Somewhat unexpectedly, this effect varies significantly between school communities. It is possible that this variation could be attributed to differences in intergenerational closure as a form of community-level social capital (31,32). This should be further examined in future studies.

These measures of community-level differences do not play an important role in individual psychosomatic health among adolescents. Higher unemployment, material deprivation and lack of generational integration at school level are associated with less psychosomatic health. However, these community-level effects vanish when individual-level predictors are added to the equation. In other words, individual-level inequalities appear to fully account for the effects of community-level inequalities. Furthermore, these community-level effects do not explain the significant variation in the strength of individual-level predictors between school communities. Identifying structural factors that may account for differences in the effects of individual-level inequalities is a major goal for future research in this area.

## Lessons learned

Social disorganization and concentration of poverty can affect health and social well-being in various ways (33). Icelandic public health policy is based on the principle of diminishing the negative effects of class and socioeconomic status by universal programmes rather than targeted assistance. It is possible that one of the effects of this overall policy is to eliminate community-level variation in mental health among adolescents. It does not, however, eliminate individual-level variation, nor does it eliminate differences in the strength of individual-level predictors of mental health. In particular, the effects of parental employment on psychosomatic health vary significantly between schools, as does the beneficial effect of parental support. Similarly, the effect of age and gender on psychosomatic health varies significantly between schools.

Further work is needed to map the community and individual-level differences to support local-level policy-makers and to deliver programmes to reduce health inequalities. The effectiveness of public health policy and public health programmes rests on broad knowledge of health inequalities. Research projects such as HBSC are not only for international comparative research, but also for policy-makers and officials to identify needs and evaluate programmes' effectiveness. The Public Health Institute of Iceland will continue to use results from research at both national and local levels to develop and evaluate new and existing projects.

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