

Trends in self-rated health in European and North-American adolescents from 2002 to 2010 in 32 countries

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Background: Self-rated health (SRH) in adolescence is known to be associated with health outcomes in later life. We carried out a trend analysis on data coming from three waves of data collected in 32 countries (mostly European) from 2002 to 2010 coming from the Health Behaviour in School-Aged Children surveys. **Methods:** SRH in adolescents was assessed using a Likert scale (excellent, good, fair and poor). Responses were dichotomized into 'excellent' vs. 'rest'. Country, age and gender groups were compared based on the odds ratio of declaring excellent SRH in 2010 with respect to 2002 and 2006. **Results:** The trend for European adolescents indicates an improvement over the last decade, although, in the majority of countries, a higher proportion of adolescents rate their health as excellent during the period 2002–06 with respect to the second half of the decade (2006–10). Girls were found to constantly rate their health as poorer, compared to their male peers, in all countries. Age has also a very stable trend towards a decreasing rating of health with increasing age. **Conclusion:** Decreased rating of health in the period 2006–10 may be a signal of the socio-economic difficulties of Europe in the last part of this decade.

Introduction

Being in good physical and emotional health enables young people to deal with the challenges of adolescence and eases their transition to adulthood.¹

Self-Rated Health (SRH) is a subjective indicator of general health. Young people's appraisal of their health is thought to be shaped by their overall sense of functioning, including physical and psychological health dimensions,^{2,3} (emotional well-being, relationships with parents and peers, school acceptance) and is associated with a broad range of health indicators: medical, psychological, social and health behaviours.³

Background characteristics that are associated with poor SRH include a non-intact family structure, poor communication with parents⁴ and low family affluence. Cultural and social status are also significant, together with migrant status, level of education, access to education and the level of health and social services.⁵

Cavallo et al.⁶ reported a gender by age interaction in self-rated health, with girls reporting poorer health across ages 11–15.

Using the 1998 Health Behaviour in School-Aged Children (HBSC) material, Kelleher et al.⁷ found psychosocial, demographic, and health-related correlates of SRH such as more health complaints, lower life satisfaction, less physical activity and more difficulties in making friends. In another study on the 1997/98 data, Torsheim et al.⁸ reported a strong relationship between material circumstances at individual, school and country level and poor SRH.

Also non-HBSC studies confirm that there are multiple independent correlates of adolescent SRH,⁹ and that age-related increase in self-rated poor health can be observed during adolescence.¹⁰

SRH can be distinguished from more specific health constructs in that it captures an overall conception of health. The relevance of such general perceptions has been demonstrated in a number of empirical studies in which self-reported health has been an independent predictor of mortality, even after accounting for known demographic, social and medical risk factors.¹¹

Few articles^{12,13} have analyzed SRH trends across time, but mainly in single countries; whereas the HBSC dataset allows for a very wide comparison of trends among almost all European countries over a 10-year cycle, a period where many important changes have taken place in Europe as well as around the world. For this reason, the underlying assumption of our study is that change in adolescent SRH across the last decade might be, at least partially, influenced by macro socio-economic conditions during this period.

Methods

Data from the HBSC 2002, 2006 and 2010 surveys were analyzed.

The HBSC study has been collecting cross-sectional data on nationally representative samples of 11-, 13- and 15-year olds since 2001/02 in more than 30 countries in Europe and North America. Surveys are conducted every four years using standardized procedures for sampling (cluster sampling of classes in the selected schools) and data collection (a standardized questionnaire translated and back-translated from English in each national languages, anonymously filled-in by the children during school-class time).

Details on the general methodology of the HBSC survey have been published elsewhere.¹⁴

Among the 42 countries in the 2010 survey, only 32 participated in all three surveys (including Flemish and Francophone Belgium,

Table 1 ORs for excellent SRH (dichotomized in 'Excellent' vs. 'Good-Fair-Poor') for each country, adjusted for survey year, gender and age group

	<i>N</i> _{surveyed} (% with data)	2006 vs. 2002	2010 vs. 2002	2010 vs. 2006	Female	13 years	15 years
Austria	13 930 (93.1)	1.348***	1.166**	0.865**	0.567***	0.708***	0.490***
Belgium (Flemish)	14 347 (97.1)	0.949	0.705***	0.742***	0.681***	0.672***	0.483***
Belgium (French)	11 955 (93.3)	0.828***	0.907	1.095	0.641***	0.761***	0.558***
Canada	25 367 (98.1)	1.164**	1.212***	1.041	0.635***	0.667***	0.513***
Croatia	15 521 (99.6)	1.534***	1.403***	0.915	0.612***	0.733***	0.445***
Czech Republic	13 957 (98.4)	0.825***	0.991	1.201**	0.546***	0.913	0.774***
Denmark	14 158 (98.9)	1.197***	0.996	0.832**	0.567***	0.679***	0.571***
England	13 986 (97.8)	1.072	1.492***	1.392***	0.522***	0.720***	0.640***
Estonia	12 642 (99.7)	1.842***	1.669***	0.906	0.741***	0.905	0.764***
Finland	16 824 (98.1)	0.824***	0.843***	1.023	0.630***	0.714***	0.673***
Germany	17 636 (99.0)	1.407***	1.587***	1.128**	0.567***	0.753***	0.701***
Greece	12 316 (99.4)	2.267***	1.998***	0.882*	0.729***	0.648***	0.511***
Greenland	13 264 (95.0)	0.637***	0.692***	1.086	0.623***	0.626***	0.363***
Hungary	12 171 (98.6)	0.708***	0.836**	1.181**	0.612***	0.839**	0.570***
Ireland	12 301 (98.9)	1.301***	1.255***	0.964	0.674***	0.784***	0.635***
Italy	12 986 (99.2)	1.243***	1.211***	0.974	0.542***	0.757***	0.556***
Latvia	11 832 (99.1)	1.222**	1.502***	1.229**	0.525***	0.709***	0.532***
Lithuania	16 488 (99.3)	1.376***	1.758***	1.278***	0.515***	0.729***	0.545***
Macedonia	13 142 (99.6)	1.587***	1.783***	1.124*	0.620***	0.658***	0.455***
The Netherlands	12 926 (99.3)	1.317***	1.294***	0.983	0.528***	0.782***	0.584***
Norway	13 881 (98.8)	1.345***	1.271***	0.945	0.608***	0.819***	0.646***
Poland ^a	15 996 (99.7)	1.001	0.467***	0.467***	0.591***	0.716***	0.441***
Portugal	10 781 (99.1)	1.606***	1.611***	1.003	0.568***	0.821**	0.584***
Russia	21 238 (99.1)	1.591***	2.124***	1.335***	0.484***	0.759***	0.506***
Scotland	17 173 (99.4)	1.158**	1.144*	0.988	0.557***	0.653***	0.465***
Slovenia	14 416 (99.7)	0.995	1.193***	1.199***	0.559***	0.690***	0.511***
Spain	19 599 (99.2)	1.146**	1.518***	1.325***	0.551***	0.778***	0.568***
Sweden	14 739 (98.7)	1.057	1.059	1.002	0.596***	0.704***	0.564***
Switzerland	15 496 (98.6)	1.056	1.221***	1.155**	0.689***	0.815***	0.674***
Ukraine	14 848 (98.7)	0.866*	1.182**	1.366***	0.413***	0.651***	0.443***
USA	14 972 (98.6)	0.791***	0.955	1.206**	0.642***	0.723***	0.594***
Wales	13 518 (98.7)	1.352***	1.764***	1.305***	0.485***	0.715***	0.660***

****P*<0.001, ***P*<0.01, **P*<0.05.

a: Translation of this item was changed in 2010 therefore results might not be comparable with previous ones.

Scotland, Wales and England as separate countries) and were included in the analyses.

The variable relative to children's SRH was analyzed for the three surveys in conjunction with age and gender of the children. The measure of SRH has four answer categories (poor, fair, good and excellent), which for the purpose of the analysis were dichotomized in 'excellent' vs. all the other three categories. The reason for this classification was that the term 'fair' and 'poor' are understood differently across countries. In order to avoid bias in either a positive or a negative direction, the decision was to classify the three lower categories in one class.

Comparisons between countries, age groups and gender were then based on the computation, separately for each country, of the odds ratio (OR) of declaring an excellent SRH in 2010 with respect to 2002, and for the two periods separately, 2006 vs. 2002 and 2010 vs. 2006.

Data were modelled by a multivariate logistic regression where SRH (dichotomized in 'excellent' vs. 'all others') was the dependent variable and survey year, gender (males taken as reference) and age (11-year old school-students taken as reference) the independent ones.

A *P*-value for each OR was computed, presenting significance at the traditional values of 0.05, 0.01 and 0.001.

All analyses were performed using STATA v12.1 (StataCorp, College Station, TX:StataCorp LP).

Results

By comparing the year 2010 with 2002, five countries (Belgium-Flemish, Finland, Greenland, Hungary and Poland) showed a significantly lower level of SRH in 2010, with the lowest ORs in Poland and Greenland (0.467 and 0.692, respectively). In USA, Czech

Republic, Denmark and Francophone Belgium, the difference was not statistically significant. In all other countries adolescents reported a higher level of SRH in 2010, with the highest change in Russia and Greece (2.12 and 1.99, respectively, Table 1).

Analyzing the two periods separately (2006 vs. 2002 and 2010 vs. 2006), most countries demonstrate a consistent pattern over the total period (2002–10). An exception is represented by Finland, Greenland and Hungary, where the negative trend 2002–10 can probably be attributed to the negative score in the first period, as the second one seems to be stable around the value of 1.

Another one is Poland, where the situation is quite stable during the first period, while the second one brought about a sharp decrease, from an OR of 1 to the value of 0.467. Three other countries with no coherent trend within the two periods are Greece, with the sharpest change, going from a 2.27 in the 2002–06 period to a drop to 0.88 in the second one; Denmark and Austria, with a similar trend, even if the difference between first and second period is less marked (1.12 during 2002–06 vs. 0.83 during 2006–10 in Denmark and from 1.35 vs. 0.86 in Austria).

Two other countries show an opposite trend, Czech Republic and USA, which go from a significant decrease in the first period to a significant increase in the second one.

In general, in the majority of countries, a higher proportion of adolescents rate their health as excellent during the period 2002–06 with respect to the second half of the decade (2006–10).

In terms of gender, girls were found to consistently rate their health as poorer, compared with their male peers, in all countries, ranging from a minimum of 0.41 in Ukraine to a maximum of 0.74 in Estonia.

The impact of age also has a very stable trend towards a decreasing rating of the adolescents' health from 11 through 13 up to 15 years

of age. All decreasing ORs are highly significant ($P < 0.001$), except for 13-year olds in Estonia and Czech Republic.

Discussion

The strength of this study lies on the quantity and quality of data, collected in comparable ways and with similar protocols in all involved countries, allowing for the first time to obtain a cross-national view of a decennial trend in SRH in youth in Europe and North America.

The main limitation relates to the fact that comparison is based on relative changes, not on absolute levels. A country with a sharp decline from a high value may still end up having better life-satisfaction than a country which starts with a low value and shows a sharp increase. For the aim of the study this might not be a crucial drawback, as the focus is concerned with the analysis of changing trends within a country, with its possible relation with on-going macro socio-economic conditions, and on the different trends observed in different sets of countries behaving in a similar way.

Analysis by gender and age differences confirms known existing results,⁶ that is lower SRH among girls and a decreasing rating with age; this finding underlines the reliability and consistency of our data.

Given these strengths and limitations, the HBSC data indicate a positive trend for European adolescents in the way they perceive their health over the last decade.

In comparing the first and second half of the decade, although the majority of countries (20 out of 32) demonstrate a significant improvement in SRH from 2002 to 2006, a lower number (13 countries) do so in the second period. This observation, combined with the decreased perception of health in some affluent countries (Austria, Denmark and Belgium) but most of all the dramatic decrease in Greece, may be interpreted as a signal of the impact of the economic crisis in Europe which started in 2007–08.

It is difficult to compare these data with similar ones, as there is a paucity of literature comparing trends in SRH among adolescents; few studies are concerned with the reliability of the measure of SRH along time, through adolescence¹³ and from adolescence through to adulthood¹² and of its relationship with future health. Moreover some others try to relate it cross-sectionally with some background conditions, such as socioeconomic status.¹⁵ Interpreting these trends should therefore be done with much caution and with the help of significant data on the countries condition during this decade.

Should this relationship be confirmed by the analysis of macro data on the different countries, the SRH indicator could be a powerful and sensitive tool for public health in terms of monitoring the effect of large scale socio-economic events in a given society on the well-being of adolescents and not only as a predictor of their health in the adult life.

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Conflicts of interest: None declared.

Key points

- This is the first cross-national study of a decennial trend in Self-Rated Health (SRH) of youth in Europe and North America.
- HBSC data indicate an overall positive trend for European adolescents in the way they perceive their health over the last decade.
- A remarkable number of countries show a significant decrease in SRH in the period 2006–10, among them some affluent countries (Austria, Denmark and Belgium) but mainly Greece.
- This observation may be interpreted as a signal of the impact of the economic crisis in Europe which started in 2007–08.
- SRH can be considered a sensitive tool for public health in terms of monitoring the effect of large scale socio-economic events and not only as a predictor of health in the adult life.

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